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Health System Resilience in The Context of COVID-19 Vaccination Management in Indonesia

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ABSTRACT

COVID-19 cases are still increasing in all around the globe and some countries are even experiencing a surge in cases for the second time. The number of COVID-19 cases in Indonesia as of April 2021 has almost reached one million. The Indonesian government is targeting the COVID-19 vaccination in Indonesia to reach 70%, covering the target of vaccine recipients of around 181.5 million people. The target was conveyed optimistically by the government to be achieved within 15 months. However, the achievements during the initial 3 months were only 5.72% for Dose I and 2.99% for Dose II. This study aims to review the resilience of the health system in the context of COVID-19 vaccination. The approaches and methods used to obtain this information are qualitative with the method of desk study, expert study, and in-depth interviews. The results showed that the components of the health resilience strategy in the context of COVID-19 vaccination in Indonesia experienced obstacles, especially in the aspects of vaccine availability, data collection, and maximizing the role of human resources through the support of actual research on vaccine development. In the end, it is necessary to strengthen the health system that accompanies the COVID-19 vaccination program, including by continuing to implement health protocols, 3T surveillance (testing-tracing-treatment), and other approaches comprehensively.

Kasus COVID-19 masih bertambah di seluruh penjuru dunia bahkan beberapa negara sedang mengalami gelombang lonjakan kasus untuk yang kedua kalinya. Jumlah kasus COVID-19 di Indonesia per April 2021 hampir mencapai satu juta jiwa. Pemerintah Indonesia menargetkan vaksinasi COVID-19 di Indonesia dapat mencapai 70%, meliputi sasaran penerima vaksin sekitar 181,5 juta jiwa. Target tersebut disampaikan optimis oleh pemerintah mampu dicapai dalam kurun waktu 15 bulan. Akan tetapi, capaian selama 3 bulan awal baru 5,72% untuk Dosis I dan 2,99% Dosis II. Penelitian ini bertujuan meninjau ketahanan sistem kesehatan dalam konteks vaksinasi COVID-19 di Indonesia. Pendekatan dan metode yang digunakan untuk memperoleh informasi tersebut kualitatif dengan metode desk study, studi kepakaran, dan wawancara mendalam. Diperoleh hasil bahwa komponen strategi ketahanan kesehatan dalam konteks vaksinasi COVID-19 di Indonesia mengalami hambatan terutama pada aspek ketersediaan vaksin, pendataan, dan pemaksimalan peran sumber daya manusia melalui dukungan riset aktual pengembangan vaksin. Pada akhirnya, perlu penguatan sistem kesehatan pengiring program vaksinasi COVID-19 di antaranya dengan tetap menerapkan protokol kesehatan, surveilans 3T (testing-tracing-treatment), dan pendekatan lainnya secara komprehensif.

INTRODUCTION

The COVID-19 has infected almost all regions worldwide in this recent year. Globally, the COVID-19 was 137,282,894 (per April 13, 2021) and 2,959,607 of them died and the remaining 110,474,951 managed to recover (Worldometer, 2020). At the same time, the COVID-19 cases in Indonesia reached 1,577,526 with 42,782 deaths and 1,426,145 recovered (National COVID-19 Task Force COVID-19, n.d.). This number puts Indonesia in the 19th position of the country with the most COVID-19 cases (Worldometer, 2020).

Resilience is needed in the face of a pandemic. Resilience is a dynamic effort made to adapt positively on significant problems and difficulties (Glonti et al., 2015). The pandemic has become a public health problem for global population. It will subside after herd immunity is formed. Meanwhile, group immunity can be formed if the body's immunity is formed naturally after being infected with a virus and intentionally stimulated by vaccination (Djidjou-Demasse et al., 2020). Similar to other countries, in dealing with the pandemic, Indonesia's government has enacted various policies to deal with COVID-19. Non-pharmaceutical intervention becomes one of the chosen policy, encompassing large-scale social restrictions (PSBB) and health promotion to make people comply the health protocols. Then, the intervention strategy to reach herd immunity is through national vaccination program. Vaccination is one of the most important achievements for public health in the 20th century and now countries are competing to develop vaccines against the spread of this virus. (Hansen et al., 2020).

The Indonesian government has been targeting 70% population coverage, including 181.5 million vaccine recipients target. The government is optimistic that the target can be achieved within 15 months. The target number of vaccinations is the total population that can receive vaccinations (over 18 years of age) and has been reduced by the exclusion criteria.

The number of recipients of the first dose of vaccine as of April 13, 2021 was 10,377,734 people (5.72%). Meanwhile, the second dose of vaccine recipients accounted for more or less half, namely 5,433,715 (2.99%). This fact shows that the rate of vaccination and its coverage in Indonesia is still very far from the initial target of completing the vaccination target for 15 months since it was first launched on January 13, 2021.

Indonesia as the 4th largest population in the world, is not a country that produces vaccines independently. Indonesia still relies on other countries for vaccine products. That becomes one of challenges on fulfilling the government envision to cover population targets within 15 months. Apart from political interests, Indonesia is on the uncertain condition in terms of priority of vaccine allocation by vaccines manufacturer. The health system must be underpinned by effective intervention to survive in this uncertain condition.

The health system resilience in Indonesia, especially in the context of COVID-19 vaccination program, is not yet known. For this reason, this research was carried out in order to find out these conditions and what the next best steps needed to be in order to achieve maximum results.

RESEARCH METHOD

This is a qualitative research to capture Indonesia's health system resilience in the context of COVID-19 vaccination management. The methods used are desk study and expert study. Expert study we conducted by in-depth interviews with two informants from the Ministry of Health of the Republic of Indonesia and academics. Data and information regarding the situation of COVID-19 cases and COVID-19 vaccinations were obtained based on daily information issued by the Ministry of Health of the Republic of Indonesia and also the National COVID-19 Task Force. The situation we reviewed was taken the first trimester period of national vaccination implementation (starting from January 13, 2021 to April 13, 2021).

Dalam meninjau ketahanan kesehatan, situasi studi yang dipilih yakni vaksinasi COVID-19 yang merupakan salah satu upaya penanganan COVID-19 di Indonesia. Penilaian terhadap ketahanan kesehatan mengadopsi kerangka strategi penguatan sistem kesehatan dalam merespon tahapan guncangan (*shock*) dari siklus *shock* yang tertera dalam *policy brief* World Health Organization (WHO) (Thomas et al., 2020).

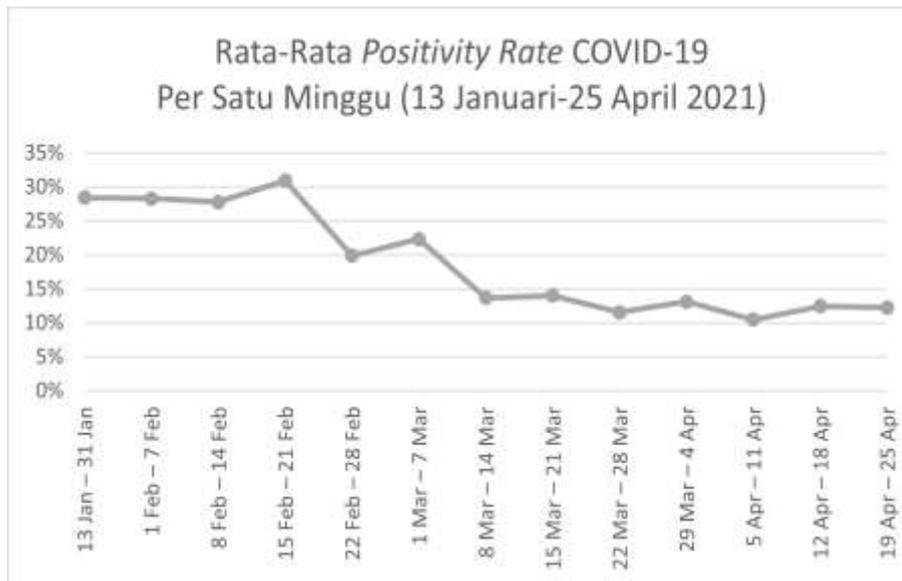
In reviewing health system resilience, the selected context of this study is the COVID-19 vaccination, which becomes one undertaking in controlling COVID-19 in Indonesia. The assessment of health system resilience adopts a strategic framework for strengthening the health system in response to the shock stages of the shock cycle as stated in the World Health Organization (WHO) policy brief (Thomas et al., 2020). Those components are:

1. Effective and participatory leadership with strong vision and communication
2. Coordination of activities between government and key stakeholders
3. Organizational learning culture that is responsive to crises
4. Effective information system and flows
5. Surveillance enables timely detection of shocks and their impacts
6. Ensuring sufficient monetary resources in the system and flexibility to reallocate and inject extra funds
7. Ensuring stability of health system funding through countercyclical health financing mechanisms and reserves
8. Purchasing flexibility and reallocation of funding to meet changing needs
9. Comprehensive health coverage
10. Appropriate level and distribution of human and physical resources
11. Ability to increase capacity to cope with sudden surge in demand
12. Motivated and well-supported workforce
13. Alternative and flexible approach to deliver care

We unite points 6, 7, and 8 into points 1: "flexibility and stability of funding". Therefore, the three are interrelated so the total consist of 11 points. Information related to these points was mainly obtained from in-depth interviews with the informants. In addition, other information was obtained through other supporting sources from desk studies (including other preceding panel experts discussion results).

RESULT AND DISCUSSION

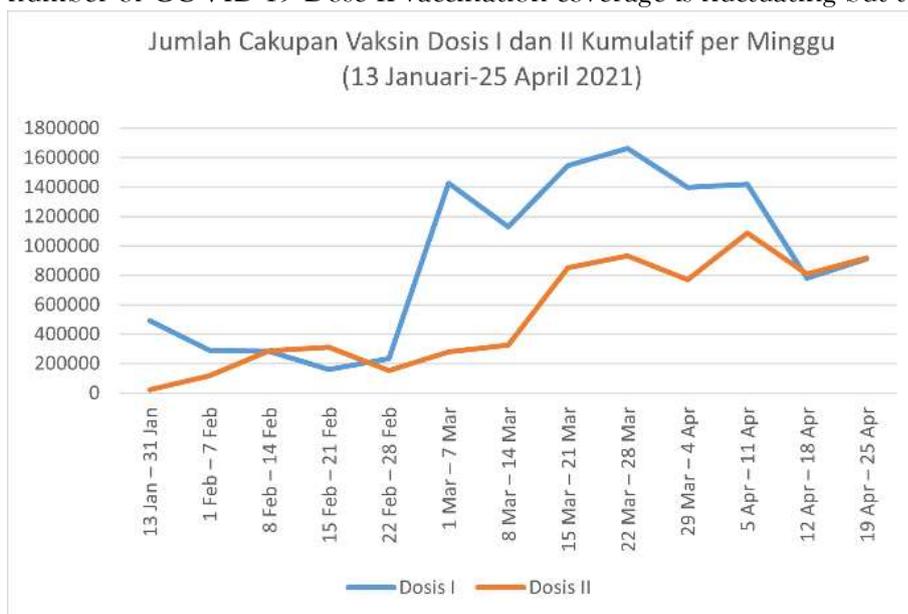
The number of recorded cases continue to soar. However, the average COVID-19 positivity rate since the beginning of the vaccination period until April 25, 2021 tends to decrease. The magnitude of the decrease was around 16.2%.



Picture 1. Average COVID-19 Positive Rate in Weeks (13 January – 25 April, 2021)

Source: processed from the covid19.go.id dashboard, 2021

The number of weekly cumulative Dose I COVID-19 vaccination coverage shows a fluctuating graph. The spike was quite extreme in the first week of March. Meanwhile, the number of COVID-19 Dose II vaccination coverage is fluctuating but tends to rise.



Picture 2. Total Cumulative Dose I and II Vaccine Coverage in Weeks (January 13 – April 25, 2021)

Source: processed from the covid19.go.id dashboard, 2021

Indonesia’s COVID-19 vaccination is still biased pertaining to its objectives. The target pursued by the Government is only the number of vaccinated population instead the impact of immunization (the immune response in the community). Whereas the establishment of individual immunity and herd-immunity are the important things as a sign of the successful vaccination program. This was conveyed by one of the informants as follows:

“The government is catching up for the number of injections, not the number of immune responses.. We all forget that the virus that is experiencing obstacles (to get in appropriate host) changes itself to

become more virulent. When it has a chance to enter the body, it will appear again like a new disease." (Informant 2)

Pertain to vaccination, communication between the central and local governments is heeding the value of decentralization. The central government monitors and encourages head of local government whether they found hurdles in vaccination process in their region. For example, by reminding the priority targets for 46 districts/cities that have not yet opened vaccination services for the elderly, as follow:

"For vaccination services for the elderly, there are still 46 regencies of the city that have not opened services for the elderly, because they focus on public service personnel. We remind them that elderly is priority." (Informant 1)

From in-depth interviews with two experts, it was found that the participatory leadership has been espoused in tackling COVID-19 pandemic. This is marked by coordination between levels of government and other elements such as health workers and the head of the neighbourhood, in distributing vaccines and implementing vaccination.

In terms of system management, handling, and provision of vaccination services, the Ministry of Health of the Republic of Indonesia is the leading sector. Various institutions act as partners in implementing vaccination activities, including the Food and Drug Supervisory Agency (BPOM) and the COVID-19 Handling Committee and National Economic Recovery (KPC PEN). BPOM plays a role in providing approval/regulatory reviews related to circulating vaccines, especially in the functions of granting distribution permits, quality assurance, and monitoring of vaccine side effects. Meanwhile, coordination with KPC PEN is more towards assistance in terms of education, information delivery, and intensifying health protocols.

Barriers to coordination at the operational level were encountered, for example in the case of cooperation with the private sector. So far, *Puskesmas* (primary health care) have been at the forefront of COVID-19 vaccination operations. This is described by one of the informants as follows:

*"The second thing that we convey, there are still many regions that are still hesitant to cooperate with the private sector. So they still rely more on *puskesmas* as the mainstay."* (Informant 1)

Then regarding Adverse Events After Immunization (*KIPI*), National Committee for *KIPI* coordinates with the Regional Committee in the province and district/city. The regular meetings are also held to discuss cases that occur and formulate follow-up actions.

One of the informants stated that the response of policy makers is still often trapped in the phenomenon of scientific shock syndrome. This is an old paradigm that tends to avoid novelty/innovation. Vaccines circulating in Indonesia are currently only processed from vaccine raw materials from other countries. In addition, the distributed vaccines have not considered the characteristics of the virus that have changed or mutated. This makes the need for further studies regarding the efficacy of vaccines, which only around 60%.

"This means that they really have to learn from other regions' experience, if there was a region that really slows implementing the vaccination, it should not be comparing. Because we are still depending upon vaccines stock which is distinct among regions ." (Informant 1)

COVID-19 vaccination data has been integrated into one vaccination data. The system is a collaboration of the *Puskesmas* PCare system and the care and protection system. PCare *Puskesmas* contains data related to COVID-19 vaccination operations. Meanwhile, there is also an application, *Peduli Lindungi* system, which function is more to interact with vaccination targets in the form of information blasting, vaccination e-certificates, and vaccination notification.

On the other hand, obstacles still occur, especially regarding data for COVID-19 vaccination plan. Data on health workers to map vaccination personnel is difficult to obtain in complete because they are scattered in different databases. Likewise, population data to map

vaccination targets are often duplicated. This is illustrated in the statement of one of the informants as follows.

"So we don't have complete data yet. When you want to prioritize health workers, it turns out that the data is scattered everywhere. For the general public, the same ID number is still found but different people" (Informant 1)

By utilizing the *PCare Puskesmas* application and the *Peduli Lindungi* application, it brings to the information system betterment for vaccination program. All information can be seen from the application. However, even so, there are still obstacles related to other administration, including data on health workers and data on people who must receive vaccinations.

There have been cases of transmission of COVID-19 in people who have been vaccinated even in people who have been taken their second dose. Supervision needs to be done to see the pattern of cases and formulate the right solution. An introduction to virus dynamics must be carried out regularly so that surveillance activities are necessary and cannot be separated. This was conveyed by one of the informants as follows:

"The vaccination should not be released through surveillance activities, if it is released, we will lose the dynamics of the virus, the new character of the virus because of vaccination" (Informant 2)

So far, monitoring the response to new vaccinations has only been *KIPI* monitoring. The supervisory mechanism is through officer reporting on websites or online communication groups in each region. Then discussed through regular meetings between National and Regional Committee of *KIPI*. That aims to handle *KIPI* as soon as possible.

Regarding to the budget, the government has made a diversion of the allocation of funds alleviate COVID-19 cases in Indonesia. This includes the budget for the COVID-19 vaccination. The new regulations that have been signed include the cost of health workers transportation which can be budgeted through the Non-Physical Special Allocation Fund (*DAK*). In addition, the budgeting policy for Personal Protective Equipment (*PPE*) for health workers can also be budgeted by the respective regional governments. This was conveyed by one of the informants as follows.

"Regarding PPE, it is provided by the provincial or district health offices, which we have budgeted for through the DAK. Recently, there has been a regulation on the use of non-physical DAK where there are transportation costs that can be paid by regional government (without looking at the private or public sector)... But if the PPE is from the regions such as alcohol swabs, injections, there are 3 main ones from the central government, when it comes to PPE from their respective regions." (Informant 1)

The funding constraint is more on the tight standard rules for budgeting. But it's all for the sake of accountability for the use of funds. Stakeholders follow these rules and are not fully flexible to act.

Comprehensive health protection efforts are carried out, one of which is through coordination with health insurance providers, namely *BPJS*. If the vaccination participant is not registered with *BPJS*, the cost will be claimed by the hospital, while if the participant is registered with *BPJS*, the *BPJS* mechanism applies. This facility is expected to facilitate the expansion of immunization coverage in the community. This was conveyed by one of the informants as follows.

"if someone does not have BPJS, he will be claimed by the hospital. To the contrary, it will be a BPJS mechanism" (Informant 1)

So that way, the government has reached out to the community to help and protect the community in terms of giving vaccines.

Since the beginning of the COVID-19 vaccination activity, the central government has trained 120,000 vaccinators on a number-based basis. Each vaccinator is assumed to be able to

do 60 injections, so the number and capacity are considered sufficient. If there is a shortage, the central government encourages the involvement of health workers other than those who have the authority to inject to assist in the operation of COVID-19 vaccination. This was conveyed by one of the informants as follows.

"Since the beginning, we have trained 120,000 vaccinators with calculations based on targets and the ability of the vaccinators is about 60 injections is sufficient" (Informant 1)

Regarding the vaccines distributed, the amount is adjusted based on the availability of national vaccines. If it has sufficient amount of vaccines, the center will distribute it almost evenly to all districts/cities. However, if the number of vaccines is insufficient, distribution will be based on the areas with the highest cases and targets. Areas with these characteristics will receive more vaccines.

Regarding resources, especially experts and tools, there are informants who state that experts and tools in Indonesia are available and adequate. Because it is considered that the COVID-19 pandemic situation is more or less the same as cases that have occurred before such as *Flu Burung* (H5N1 virus). Experts are everywhere and some of the tools when dealing with avian influenza outbreaks can be used in this COVID-19 situation. This is conveyed as follows:

"Though these experts are the same as before. There are experts everywhere and some of the tools are inherited from Flu Burung, and that can be used" (Informant 2)

The number of vaccines is highly dependent on the vaccine producing country. The availability of the vaccine in the last phase has not yet reached the government's target. This was due to delays from the AstraZeneca vaccine provider. The vaccinator staff is given self-capacity support by the Ministry of Health in the form of training. In addition, regarding incentives or transportation fees for them, it is left to the policies of their respective local governments. The alternative approach actually exists in the self-vaccination policy, but it has not been realized due to the limited vaccine doses available and also the use of weak data. In addition, the priority of this vaccine is still being directed in government programs to priority targets.

Indonesia continues to experience an increase in the number of COVID-19 incidents until now. Even though the positivity rate fell from February to March, then sloping down in March and April. The decline from the end of January to April occurred because an increase in testing. The morbidity of the infected community augments the health system's burden, especially in providing health services and equipment. This is only seen from the aspect of health infrastructure, not to mention the impact on other sectors such as the economy and social. If the health system is disrupted, the national defense system will be disrupted (Prasanti & Fitriani, 2017). Strengthening the health system resilience becomes pivotal during this pandemic epoch.

Health resilience is defined more broadly as the scientific literature evolves. In addition to definitions that focus on preparedness and response to shock, health resilience is also focused on minimizing risk and vulnerability and managing stress on the health system (both acute and chronic) (Barasa et al., 2019). Every country must build a stronger health system resilience. It needs multidisciplinary and multistakeholders approaches. Actors who capacitate the management of health system resilience are in the hands of stakeholders who have a major influence on the health system, both stakeholders in the health sector and beyond health sector (Blanchet et al., 2017).

The response to the COVID-19 response through vaccination is the choice of the Indonesian government as well as most other world leaders (Our World in Data-Oxford University, 2021). Vaccination is carried out as an effort to accelerate the formation of an immune response in the community. The time entity is important in controlling the spread of the COVID-19 virus (Rahman, 2021). In addition, vaccination is expected to be able providing benefits for many aspects, one of which is in the economic aspect because by carrying out

vaccinations, especially for public officers, workers can carry out their activities productively (Mansyur, 2021).

Several studies have shown that vaccination can have good impact on saving the economy. Kohli dkk. (2021), calculated the additional cost per Quality-Adjusted Life-Year (QALY) for the entire adult population and at each level in the three priority schemes, if vaccination was carried out or not. It was found that the additional cost per QALY obtained for the adult population in the United States was \$8,200 compared to no vaccination (Kohli et al., 2021).

The government's optimistic target for COVID-19 vaccination to 181 million Indonesians is quite an ambitious target. Based on the results of this study, which reviewed the components of the health resilience strategy, the main challenges faced were the availability of vaccines, data collection, and maximizing the role of human resources, especially in vaccine development or research. Based on data from the Indonesian Ministry of Health, it is known that the vaccine doses that have been given to the public as of April 13, 2021 are 11,741,559 for dose 1 vaccine and 6,829,415 for dose 2 vaccine (Kemenkes RI, 2021).

Vaccines are made through various stages until the vaccine can be produced and distributed to the public and is universally accepted (Makmun & Hazhiyah, 2020). Indonesia is not a "COVID-19 vaccine manufacturer" country. Thus, Indonesia's position is on the dependent side of vaccine manufacturer countries. Therefore, Indonesia needs greater efforts in terms of diplomacy and international politics in order to obtain vaccines. In this regard, efforts to procure vaccines not only ensure that vaccines are safe and in adequate quantities, but also heed the delivery and distribution process (Ozawa et al., 2016). The total budget that will be spent on the COVID-19 vaccine in Indonesia is more than 74 trillion rupiahs, this was conveyed by the Minister of Finance of the Republic of Indonesia at the webinar Women Empowered in Advanced Indonesia: Early Reflections of the Year 2021 on January 4, 2021.

The World Health Organization (WHO) is only able to facilitate member countries to obtain vaccines for a maximum of 20% of their total citizens. It also ultimately requires the leadership ability of a country. Based on the research results, leadership at the central government is considered quite good with monitoring and providing direction to regional government leaders. Meanwhile, it may be necessary to ensure that the leadership ability and effective communication of the leadership take place both at the regional level or lower. This capability can optimize the COVID-19 control (Forman et al., 2020). Another case is related to the aspect of the strength of the leadership's vision, which is said to be biased, especially regarding the short-term orientation (the number of people who have been injected with the COVID-19 vaccination).

The aspect that becomes the next challenge is human resources in relation to research support. A strong health system resilience is based on the capacity of human resources, financing, a strong information system, and strong government encouragement (Ozawa et al., 2016). Indonesia has many experts and has excellent research potential, but the government is still considered pragmatic. Research on the development of the COVID-19 virus should also be the focus of intervention and policy-making for this COVID-19 vaccination. Not just trusting completely and continuing the existing platform without adjusting the existing dynamics. Tight supervision is needed, not only focusing on one sector, but also other sectors, so that the efforts made in controlling this pandemic are carried out from upstream to downstream (Masnum et al., 2021).

Based on the results of the press conference of Indonesian President Joko Widodo on February 17, 2021 at the Merdeka Palace, Jakarta, it was stated that the number of COVID-19 vaccinators prepared in Indonesia was 30,000 vaccinators with uneven distribution. The vaccinators are provided with support by the central government in the form of training. In

addition, local governments have also obtained authority regarding incentives for health workers in their regions. This shows that the government has paid attention to the health workers implementing the COVID-19 vaccination. The amount of incentives given to health workers is based on the Decree of the Minister of Health (KMK) Number HK.01.07/MENKES/4239/2021 concerning the Provision of Incentives and Death Compensation for Health Workers who involved in COVID-19 prevention. The incentive is adjusted based on the risk or exposure to COVID-19 so that the amount of incentives from each health worker will be different according to certain zones.

In addition, strengthening in terms of quality and quantity of surveillance personnel is also needed in order to prevent additional cases in the community. Because if community surveillance is weak, the stakes are the burden on health services due to the increasing number of patients. Countries that are better at controlling COVID-19, for example South Korea, have good disease surveillance systems (Normile, 2020). An effective disease surveillance system not only reports sudden unusual health events, but also routine data on the morbidity patterns of each health care provider (Sundararaman et al., 2021). The same principle applies in the context of the COVID-19 vaccination.

Meanwhile, other strategic components, such as coordination, have been running even though the informants said that it was not optimal. One example of the implementation of this component is the coordination between institutions at the central and regional levels, for example in terms of handling KIPI. Then regarding data coordination, further improvements are still needed, especially data for the preparation of mass vaccination, for example target data that are not integrated or the poor quality of data. On the other hand, the recording and reporting of COVID-19 vaccinations has been pursued by a one-stop system managed by the central government.

Regarding funding and flexibility in the allocation of funds, it is not an obstacle. The central government has converged funds for COVID-19 both from the center through ministry/institutional funds as well as directives and priorities for the regions. Even in terms of community demand on the aspect of Willingness To Pay (WTP) in order to obtain vaccinations, it is quite high. This means that the government and society have a commitment to this COVID-19 vaccination program (Harapan et al., 2020).

Then regarding alternative approaches and flexibility in administering COVID-19 vaccination, there is no specific alternative. The COVID-19 vaccination program is carried out in one corridor through central government program and health facilities do not open COVID-19 vaccination services based on independent initiatives. In a study related to vaccine surveys in several countries, it was stated that the vaccine program was carried out centrally by the government. There are no health facilities that open vaccine services on an initiative and independent basis (Lazarus et al., 2021).

This study provides an overview of the implementation of COVID-19 vaccination in Indonesia, which still faces many obstacles and shortcomings in several aspects. The health system resilience is still faced with threats today and in the future. Some literature states that vaccination is not enough to overcome the COVID-19 pandemic. It is necessary to continue a robust multifaceted approach to disease treatment and prevention (Burgos et al., 2021).

CONCLUSION

Management of COVID-19 vaccination is quite complicated because the health system is still not strong enough. The main aspects that need to be strengthened are the availability of vaccines, data collection, and maximizing the role of human resources, especially in terms of supporting actual research on vaccine development. If the strategy for strengthening the health

system is not fulfilled, it will have negative excesses that extend beyond the health system. The programs that have been targeted by the government so far, such as stunting reduction, economic growth, and others, are threatened to be hampered. For this reason, besides doing COVID-19 vaccination program, we need promoting health protocols implementation, 3T surveillance (testing-tracing-treatment), and other comprehensive approaches.

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[JMMR] Editor Decision

1 message

Nuryakin Nuryakin <journal@umyogya.id>

Mon, Aug 15, 2022 at
9:10 AM

To: Hermawan Saputra <hermawan.saputra@uhamka.ac.id>

Cc: "Herlina J. R. Saragih" <herlinsara897@gmail.com>, Oskar Vitriano <oskar.v@ui.ac.id>, Nadilah Salma <nadilah.salma@ui.ac.id>

Hermawan Saputra:

We have reached a decision regarding your submission to JMMR (Jurnal Medicoeticolegal dan Manajemen Rumah Sakit), "Health System Resilience in The Context of COVID-19 Vaccination Management in Indonesia".

Our decision is to:

Nuryakin
Universitas Muhammadiyah Yogyakarta
Phone 082326796566
jmmr@umy.university

Reviewer B:

Is the manuscript written in proper and sound English?:

Yes

If no, are these only minor misspellings or does the entire article needs to be rewritten?:

Minor

Comments: Please re-check with the English grammar:

Please re-check with the English grammar

Are there the problem(s) on the manuscript state as one of the states of the art problem(s)?:

Yes

Do you find that the problem address clearly in the manuscript?:

Yes

Do the figures and tables reflected clearly with the goal and result of the experiment(s) on the manuscript?

:

Yes

TITLE

1. Has an interesting title (according to the issue of up-to-date, precise, brief, clear, and the scope of the journal)!

you can choose the score that matches the results of the review!

:

3

ABSTRACT

2. Has criticality of innovations/ideas to attract readers!

:

2

3. Presents an informative summary of what was done and what was found:

2

Comments according to the assessment results that have not reached the maximum score:

add an implication to abstract!

INTRODUCTION

4. Explains the background of the problem and reasons for the research reported (contributions to be made)!

:

2

5. States specific goals:

2

6. Mentions novelty of research conducted:

2

7. Uses up-to-date references (last 3 years):

2

METHOD

8. Explains the appropriate research design to answer the research question!

:

2

9. Describes the research subject (inclusion criteria and sampling method):

2

10. Explains measurement parameters (instrument, validity, and reliability) (specifically qualitative describes strategies to increase trustworthiness)

:

2

11. Describes how to analyze research:

2

RESULT

12. The presentation of the results (including tables and figures) explains/answers the research problem well

(qualitative only: presenting quotations according to the theme)

:

3

13. How to present interestingly: systematically research results (primary outcome, secondary outcome), not repetitive!

3

DISCUSSION

14. Presents the implications of the main results of research, both theoretical and or practical, as well as having a common thread with research objectives

:

2

15. Compares research results with previous studies using up-to-date references; has research strengths and weaknesses:

2

CONCLUSION

16. Summarizes the main results of the study clearly using different sentences in the results, but showing the main message of the research results (Key-home messages)!

:

2

17. Presents suggestions regarding research results on further research ideas or practical implications:

3

REFERENCES

18. Contain a minimum of 20 references, 80% using references from journals, and 50% up-to-date (5 years)

:

2

COMMENTS (Overall):

can be acceptable, but there is revision required!

Does the author adhere to the format according to the author guidelines? (e.g. Title, Abstract, literature review, experiment Report, Discussion, References, Figures, Tables, Abbreviations). The author guidelines can be found

at: <http://journal.umy.ac.id/index.php/mrs/about/submissions#onlineSubmissions> :

Yes

Overall evaluation

:

Revisions Required



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156K

- 3. Revision submitted (15-08-2022)**
 - Revisions and Amends**
 - Reviewer's revision**
 - Revised version with highlights**

-Revisions and Amends

MATRICES OF AMENDMENTS FOR REVIEWER

Comments and Suggestions for Authors	Author's Responds
Delete © 2020 JMMR. All rights reserved	Thank you very much for some inputs and points for the improvement of the paper. We will delete that part
In the introduction add to previous research!	Thank you, in the introduction we will add previous research
Add a novelty to this article!	We will add a novelty to our article
Use English in table titles!	Thank you, we will change it to english

-Reviewer's revision

Journal : *JMMR (Jurnal Medicoeticolegal dan Manajemen Rumah Sakit)*, 7 (x): x-xx, Date 201x

Website : <http://journal.umy.ac.id/index.php/mrs>

DOI : 10.18196/jmmr.6101

Health System Resilience in The Context of COVID-19 Vaccination Management in Indonesia

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Vaccination;
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Health System;

Kata kunci:

COVID-19;
Vaksinasi COVID-19;
Ketahanan
Kesehatan;
Sistem Kesehatan;

ABSTRACT

COVID-19 cases are still increasing in all around the globe and some countries are even experiencing a surge in cases for the second time. The number of COVID-19 cases in Indonesia as of April 2021 has almost reached one million. The Indonesian government is targeting the COVID-19 vaccination in Indonesia to reach 70%, covering the target of vaccine recipients of around 181.5 million people. The target was conveyed optimistically by the government to be achieved within 15 months. However, the achievements during the initial 3 months were only 5.72% for Dose I and 2.99% for Dose II. This study aims to review the resilience of the health system in the context of COVID-19 vaccination. The approaches and methods used to obtain this information are qualitative with the method of desk study, expert study, and in-depth interviews. The results showed that the components of the health resilience strategy in the context of COVID-19 vaccination in Indonesia experienced obstacles, especially in the aspects of vaccine availability, data collection, and maximizing the role of human resources through the support of actual research on vaccine development. In the end, it is necessary to strengthen the health system that accompanies the COVID-19 vaccination program, including by continuing to implement health protocols, 3T surveillance (testing-tracing-treatment), and other approaches comprehensively.

Kasus COVID-19 masih bertambah di seluruh penjuru dunia bahkan beberapa negara sedang mengalami gelombang lonjakan kasus untuk yang kedua kalinya. Jumlah kasus COVID-19 di Indonesia per April 2021 hampir mencapai satu juta jiwa. Pemerintah Indonesia menargetkan vaksinasi COVID-19 di Indonesia dapat mencapai 70%, meliputi sasaran penerima vaksin sekitar 181,5 juta jiwa. Target tersebut disampaikan optimis oleh pemerintah mampu dicapai dalam kurun waktu 15 bulan. Akan tetapi, capaian selama 3 bulan awal baru 5,72% untuk Dosis I dan 2,99% Dosis II. Penelitian ini bertujuan meninjau ketahanan sistem kesehatan dalam konteks vaksinasi COVID-19. Pendekatan dan metode yang digunakan untuk memperoleh informasi tersebut kualitatif dengan metode desk study, studi kepakaran, dan wawancara mendalam. Diperoleh hasil bahwa komponen strategi ketahanan kesehatan dalam konteks vaksinasi COVID-19 di Indonesia mengalami hambatan terutama pada aspek ketersediaan vaksin, pendataan, dan pemaksimalan peran sumber daya manusia melalui dukungan riset aktual pengembangan vaksin. Pada akhirnya, perlu penguatan sistem kesehatan pengiring program vaksinasi COVID-19 di antaranya dengan tetap menerapkan protokol kesehatan, surveilans 3T (testing-tracing-treatment), dan pendekatan lainnya secara komprehensif.

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INTRODUCTION

The COVID-19 has infected almost all regions worldwide in this recent year. Globally, the COVID-19 was 137,282,894 (per April 13, 2021) and 2,959,607 of them died and the remaining 110,474,951 managed to recover (Worldometer, 2020). At the same time, the COVID-19 cases in Indonesia reached 1,577,526 with 42,782 deaths and 1,426,145 recovered (National COVID-19 Task Force COVID-19, n.d.). This number puts Indonesia in the 19th position of the country with the most COVID-19 cases (Worldometer, 2020).

Resilience is needed in the face of a pandemic. Resilience is a dynamic effort made to adapt positively on significant problems and difficulties (Glonti et al., 2015). The pandemic has become a public health problem for global population. It will subside after herd immunity is formed. Meanwhile, group immunity can be formed if the body's immunity is formed naturally after being infected with a virus and intentionally stimulated by vaccination (Djidjou-Demasse et al., 2020). Similar to other countries, in dealing with the pandemic, Indonesia's government has enacted various policies to deal with COVID-19. Non-pharmaceutical intervention becomes one of the chosen policy, encompassing large-scale social restrictions (PSBB) and health promotion to make people comply the health protocols. Then, the intervention strategy to reach herd immunity is through national vaccination program. Vaccination is one of the most important achievements for public health in the 20th century and now countries are competing to develop vaccines against the spread of this virus. (Hansen et al., 2020).

The Indonesian government has been targeting 70% population coverage, including 181.5 million vaccine recipient's target. The government is optimistic that the target can be achieved within 15 months. The target number of vaccinations is the total population that can receive vaccinations (over 18 years of age) and has been reduced by the exclusion criteria.

The number of recipients of the first dose of vaccine as of April 13, 2021 was 10,377,734 people (5.72%). Meanwhile, the second dose of vaccine recipients accounted for more or less half, namely 5,433,715 (2.99%). This fact shows that the rate of vaccination and its coverage in Indonesia is still very far from the initial target of completing the vaccination target for 15 months since it was first launched on January 13, 2021.

Indonesia as the 4th largest population in the world, is not a country that produces vaccines independently. Indonesia still relies on other countries for vaccine products. That becomes one of challenges on fulfilling the government envision to cover population targets within 15 months. Apart from political interests, Indonesia is on the uncertain condition in terms of priority of vaccine allocation by vaccines manufacturer. The health system must be underpinned by effective intervention to survive in this uncertain condition.

The health system resilience in Indonesia, especially in the context of COVID-19 vaccination program, is not yet known. For this reason, this research was carried out in order to find out these conditions and what the next best steps needed to be in order to achieve maximum results.

RESEARCH METHOD

This is a qualitative research to capture Indonesia's health system resilience in the context of COVID-19 vaccination management. The methods used are desk study and expert study. Expert study we conducted by in-depth interviews with two informants from the Ministry of

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Health of the Republic of Indonesia and academics. Data and information regarding the situation of COVID-19 cases and COVID-19 vaccinations were obtained based on daily information issued by the Ministry of Health of the Republic of Indonesia and also the National COVID-19 Task Force. The situation we reviewed was taken the first trimester period of national vaccination implementation (starting from January 13, 2021 to April 13, 2021).

Dalam meninjau ketahanan kesehatan, situasi studi yang dipilih yakni vaksinasi COVID-19 yang merupakan salah satu upaya penanganan COVID-19 di Indonesia. Penilaian terhadap ketahanan kesehatan mengadopsi kerangka strategi penguatan sistem kesehatan dalam merespon tahapan goncangan (*shock*) dari siklus *shock* yang tertera dalam *policy brief* World Health Organization (WHO) (Thomas et al., 2020).

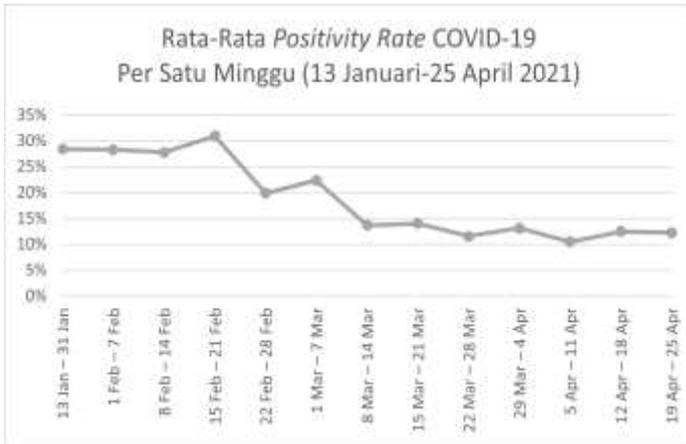
In reviewing health system resilience, the selected context of this study is the COVID-19 vaccination, which becomes one undertaking in controlling COVID-19 in Indonesia. The assessment of health system resilience adopts a strategic framework for strengthening the health system in response to the shock stages of the shock cycle as stated in the World Health Organization (WHO) policy brief (Thomas et al., 2020). Those components are:

1. Effective and participatory leadership with strong vision and communication
2. Coordination of activities between government and key stakeholders
3. Organizational learning culture that is responsive to crises
4. Effective information system and flows
5. Surveillance enables timely detection of shocks and their impacts
6. Ensuring sufficient monetary resources in the system and flexibility to reallocate and inject extra funds
7. Ensuring stability of health system funding through countercyclical health financing mechanisms and reserves
8. Purchasing flexibility and reallocation of funding to meet changing needs
9. Comprehensive health coverage
10. Appropriate level and distribution of human and physical resources
11. Ability to increase capacity to cope with sudden surge in demand
12. Motivated and well-supported workforce
13. Alternative and flexible approach to deliver care

We unite points 6, 7, and 8 into points 1: "flexibility and stability of funding". Therefore, the three are interrelated so the total consist of 11 points. Information related to these points was mainly obtained from in-depth interviews with the informants. In addition, other information was obtained through other supporting sources from desk studies (including other preceding panel experts discussion results).

RESULT AND DISCUSSION

The number of recorded cases continue to soar. However, the average COVID-19 positivity rate since the beginning of the vaccination period until April 25, 2021 tends to decrease. The magnitude of the decrease was around 16.2%.



Picture 1. Average COVID-19 Positive Rate in Weeks (13 January - 25 April, 2021)

Source: processed from the covid19.go.id dashboard, 2021

The number of weekly cumulative Dose I COVID-19 vaccination coverage shows a fluctuating graph. The spike was quite extreme in the first week of March. Meanwhile, the number of COVID-19 Dose II vaccination coverage is fluctuating but tends to rise.



Picture 2. Total Cumulative Dose I and II Vaccine Coverage in Weeks (January 13 - April 25, 2021)

Source: processed from the covid19.go.id dashboard, 2021

Indonesia's COVID-19 vaccination is still biased pertaining to its objectives. The target pursued by the Government is only the number of vaccinated population instead the impact of immunization (the immune response in the community). Whereas the establishment of

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individual immunity and herd-immunity are the important things as a sign of the successful vaccination program. This was conveyed by one of the informants as follows:

“The government is catching up for the number of injections, not the number of immune responses.. We all forget that the virus that is experiencing obstacles (to get in appropriate host) changes itself to become more virulent. When it has a chance to enter the body, it will appear again like a new disease.” (Informant 2)

Pertain to vaccination, communication between the central and local governments is heeding the value of decentralization. The central government monitors and encourages head of local government whether they found hurdles in vaccination process in their region. For example, by reminding the priority targets for 46 districts/cities that have not yet opened vaccination services for the elderly, as follow:

“For vaccination services for the elderly, there are still 46 regencies of the city that have not opened services for the elderly, because they focus on public service personnel. We remind them that elderly is priority.” (Informant 1)

From in-depth interviews with two experts, it was found that the participatory leadership has been espoused in tackling COVID-19 pandemic. This is marked by coordination between levels of government and other elements such as health workers and the head of the neighbourhood, in distributing vaccines and implementing vaccination.

In terms of system management, handling, and provision of vaccination services, the Ministry of Health of the Republic of Indonesia is the leading sector. Various institutions act as partners in implementing vaccination activities, including the Food and Drug Supervisory Agency (BPOM) and the COVID-19 Handling Committee and National Economic Recovery (KPC PEN). BPOM plays a role in providing approval/regulatory reviews related to circulating vaccines, especially in the functions of granting distribution permits, quality assurance, and monitoring of vaccine side effects. Meanwhile, coordination with KPC PEN is more towards assistance in terms of education, information delivery, and intensifying health protocols.

Barriers to coordination at the operational level were encountered, for example in the case of cooperation with the private sector. So far, *Puskesmas* (primary health care) have been at the forefront of COVID-19 vaccination operations. This is described by one of the informants as follows:

“The second thing that we convey, there are still many regions that are still hesitant to cooperate with the private sector. So they still rely more on puskesmas as the mainstay.” (Informant 1)

Then regarding Adverse Events After Immunization (KIPI), National Committee for KIPI coordinates with the Regional Committee in the province and district/city. The regular meetings are also held to discuss cases that occur and formulate follow-up actions.

One of the informants stated that the response of policy makers is still often trapped in the phenomenon of scientific shock syndrome. This is an old paradigm that tends to avoid novelty/innovation. Vaccines circulating in Indonesia are currently only processed from vaccine raw materials from other countries. In addition, the distributed vaccines have not considered the characteristics of the virus that have changed or mutated. This makes the need for further studies regarding the efficacy of vaccines, which only around 60%.

“This means that they really have to learn from other regions’ experience, if there was a region that really slows implementing the vaccination, it should not be comparing. Because we are still depending upon vaccines stock which is distinct among regions .” (Informant 1)

COVID-19 vaccination data has been integrated into one vaccination data. The system is a collaboration of the Puskesmas PCare system and the care and protection system. PCare Puskesmas contains data related to COVID-19 vaccination operations. Meanwhile, there is also an application, *Peduli Lindungi* system, which function is more to interact with vaccination targets in the form of information blasting, vaccination e-certificates, and vaccination notification.

On the other hand, obstacles still occur, especially regarding data for COVID-19 vaccination plan. Data on health workers to map vaccination personnel is difficult to obtain in complete because they are scattered in different databases. Likewise, population data to map vaccination targets are often duplicated. This is illustrated in the statement of one of the informants as follows.

"So we don't have complete data yet. When you want to prioritize health workers, it turns out that the data is scattered everywhere. For the general public, the same ID number is still found but different people" (Informant 1)

By utilizing the PCare Puskesmas application and the *Peduli Lindungi* application, it brings to the information system betterment for vaccination program. All information can be seen from the application. However, even so, there are still obstacles related to other administration, including data on health workers and data on people who must receive vaccinations.

There have been cases of transmission of COVID-19 in people who have been vaccinated even in people who have been taken their second dose. Supervision needs to be done to see the pattern of cases and formulate the right solution. An introduction to virus dynamics must be carried out regularly so that surveillance activities are necessary and cannot be separated. This was conveyed by one of the informants as follows:

"The vaccination should not be released through surveillance activities, if it is released, we will lose the dynamics of the virus, the new character of the virus because of vaccination" (Informant 2)

So far, monitoring the response to new vaccinations has only been KIPPI monitoring. The supervisory mechanism is through officer reporting on websites or online communication groups in each region. Then discussed through regular meetings between National and Regional Committee of KIPPI. That aims to handle KIPPI as soon as possible.

Regarding to the budget, the government has made a diversion of the allocation of funds alleviate COVID-19 cases in Indonesia. This includes the budget for the COVID-19 vaccination. The new regulations that have been signed include the cost of health workers transportation which can be budgeted through the Non-Physical Special Allocation Fund (DAK). In addition, the budgeting policy for Personal Protective Equipment (PPE) for health workers can also be budgeted by the respective regional governments. This was conveyed by one of the informants as follows.

"Regarding PPE, it is provided by the provincial or district health offices, which we have budgeted for through the DAK. Recently, there has been a regulation on the use of non-physical DAK where there are transportation costs that can be paid by regional government (without looking at the private or public sector)... But if the PPE is from the regions such as alcohol swabs, injections, there are 3 main ones from the central government, when it comes to PPE from their respective regions." (Informant 1)

The funding constraint is more on the tight standard rules for budgeting. But it's all for the sake of accountability for the use of funds. Stakeholders follow these rules and are not fully flexible to act.

Comprehensive health protection efforts are carried out, one of which is through coordination with health insurance providers, namely BPJS. If the vaccination participant is not registered with BPJS, the cost will be claimed by the hospital, while if the participant is registered with BPJS, the BPJS mechanism applies. This facility is expected to facilitate the expansion of immunization coverage in the community. This was conveyed by one of the informants as follows.

"if someone does not have BPJS, he will be claimed by the hospital. To the contrary, it will be a BPJS mechanism" (Informant 1)

So that way, the government has reached out to the community to help and protect the community in terms of giving vaccines.

Since the beginning of the COVID-19 vaccination activity, the central government has trained 120,000 vaccinators on a number-based basis. Each vaccinator is assumed to be able to do 60 injections, so the number and capacity are considered sufficient. If there is a shortage, the central government encourages the involvement of health workers other than those who have the authority to inject to assist in the operation of COVID-19 vaccination. This was conveyed by one of the informants as follows.

"Since the beginning, we have trained 120,000 vaccinators with calculations based on targets and the ability of the vaccinators is about 60 injections is sufficient" (Informant 1)

Regarding the vaccines distributed, the amount is adjusted based on the availability of national vaccines. If it has sufficient amount of vaccines, the center will distribute it almost evenly to all districts/cities. However, if the number of vaccines is insufficient, distribution will be based on the areas with the highest cases and targets. Areas with these characteristics will receive more vaccines.

Regarding resources, especially experts and tools, there are informants who state that experts and tools in Indonesia are available and adequate. Because it is considered that the COVID-19 pandemic situation is more or less the same as cases that have occurred before such as *Flu Burung* (H5N1 virus). Experts are everywhere and some of the tools when dealing with avian influenza outbreaks can be used in this COVID-19 situation. This is conveyed as follows:

"Though these experts are the same as before. There are experts everywhere and some of the tools are inherited from Flu Burung, and that can be used" (Informant 2)

The number of vaccines is highly dependent on the vaccine producing country. The availability of the vaccine in the last phase has not yet reached the government's target. This was due to delays from the Astrazeneca vaccine provider. The vaccinator staff is given self-capacity support by the Ministry of Health in the form of training. In addition, regarding incentives or transportation fees for them, it is left to the policies of their respective local governments. The alternative approach actually exists in the self-vaccination policy, but it has not been realized due to the limited vaccine doses available and also the use of weak data. In addition, the priority of this vaccine is still being directed in government programs to priority targets.

Indonesia continues to experience an increase in the number of COVID-19 incidents until now. Even though the positivity rate fell from February to March, then sloping down in

March and April. The decline from the end of January to April occurred because an increase in testing. The morbidity of the infected community augments the health system's burden, especially in providing health services and equipment. This is only seen from the aspect of health infrastructure, not to mention the impact on other sectors such as the economy and social. If the health system is disrupted, the national defense system will be disrupted (Prasanti & Fitriani, 2017). Strengthening the health system resilience becomes pivotal during this pandemic epoch.

Health resilience is defined more broadly as the scientific literature evolves. In addition to definitions that focus on preparedness and response to shock, health resilience is also focused on minimizing risk and vulnerability and managing stress on the health system (both acute and chronic) (Barasa et al., 2019). Every country must build a stronger health system resilience. It needs multidisciplinary and multistakeholders approaches. Actors who capacitate the management of health system resilience are in the hands of stakeholders who have a major influence on the health system, both stakeholders in the health sector and beyond health sector (Blanchet et al., 2017).

The response to the COVID-19 response through vaccination is the choice of the Indonesian government as well as most other world leaders (Our World in Data-Oxford University, 2021). Vaccination is carried out as an effort to accelerate the formation of an immune response in the community. The time entity is important in controlling the spread of the COVID-19 virus (Rahman, 2021). In addition, vaccination is expected to be able providing benefits for many aspects, one of which is in the economic aspect because by carrying out vaccinations, especially for public officers, workers can carry out their activities productively (Mansyur, 2021).

Several studies have shown that vaccination can have good impact on saving the economy. Kohli dkk. (2021), calculated the additional cost per Quality-Adjusted Life-Year (QALY) for the entire adult population and at each level in the three priority schemes, if vaccination was carried out or not. It was found that the additional cost per QALY obtained for the adult population in the United States was \$8,200 compared to no vaccination (Kohli et al., 2021).

The government's optimistic target for COVID-19 vaccination to 181 million Indonesians is quite an ambitious target. Based on the results of this study, which reviewed the components of the health resilience strategy, the main challenges faced were the availability of vaccines, data collection, and maximizing the role of human resources, especially in vaccine development or research. Based on data from the Indonesian Ministry of Health, it is known that the vaccine doses that have been given to the public as of April 13, 2021 are 11,741,559 for dose 1 vaccine and 6,829,415 for dose 2 vaccine (Kemenkes RI, 2021).

Vaccines are made through various stages until the vaccine can be produced and distributed to the public and is universally accepted (Makmun & Hazhiyah, 2020). Indonesia is not a "COVID-19 vaccine manufacturer" country. Thus, Indonesia's position is on the dependent side of vaccine manufacturer countries. Therefore, Indonesia needs greater efforts in terms of diplomacy and international politics in order to obtain vaccines. In this regard, efforts to procure vaccines not only ensure that vaccines are safe and in adequate quantities, but also heed the delivery and distribution process (Ozawa et al., 2016). The total budget that will be spent on the COVID-19 vaccine in Indonesia is more than 74 trillion rupiahs, this was

conveyed by the Minister of Finance of the Republic of Indonesia at the webinar Women Empowered in Advanced Indonesia: Early Reflections of the Year 2021 on January 4, 2021.

The World Health Organization (WHO) is only able to facilitate member countries to obtain vaccines for a maximum of 20% of their total citizens. It also ultimately requires the leadership ability of a country. Based on the research results, leadership at the central government is considered quite good with monitoring and providing direction to regional government leaders. Meanwhile, it may be necessary to ensure that the leadership ability and effective communication of the leadership take place both at the regional level or lower. This capability can optimize the COVID-19 control (Forman et al., 2020). Another case is related to the aspect of the strength of the leadership's vision, which is said to be biased, especially regarding the short-term orientation (the number of people who have been injected with the COVID-19 vaccination).

The aspect that becomes the next challenge is human resources in relation to research support. A strong health system resilience is based on the capacity of human resources, financing, a strong information system, and strong government encouragement (Ozawa et al., 2016). Indonesia has many experts and has excellent research potential, but the government is still considered pragmatic. Research on the development of the COVID-19 virus should also be the focus of intervention and policy-making for this COVID-19 vaccination. Not just trusting completely and continuing the existing platform without adjusting the existing dynamics. Tight supervision is needed, not only focusing on one sector, but also other sectors, so that the efforts made in controlling this pandemic are carried out from upstream to downstream (Masnum et al., 2021).

Based on the results of the press conference of Indonesian President Joko Widodo on February 17, 2021 at the Merdeka Palace, Jakarta, it was stated that the number of COVID-19 vaccinators prepared in Indonesia was 30,000 vaccinators with uneven distribution. The vaccinators are provided with support by the central government in the form of training. In addition, local governments have also obtained authority regarding incentives for health workers in their regions. This shows that the government has paid attention to the health workers implementing the COVID-19 vaccination. The amount of incentives given to health workers is based on the Decree of the Minister of Health (KMK) Number HK.01.07/MENKES/4239/2021 concerning the Provision of Incentives and Death Compensation for Health Workers who involved in COVID-19 prevention. The incentive is adjusted based on the risk or exposure to COVID-19 so that the amount of incentives from each health worker will be different according to certain zones.

In addition, strengthening in terms of quality and quantity of surveillance personnel is also needed in order to prevent additional cases in the community. Because if community surveillance is weak, the stakes are the burden on health services due to the increasing number of patients. Countries that are better at controlling COVID-19, for example South Korea, have good disease surveillance systems (Normile, 2020). An effective disease surveillance system not only reports sudden unusual health events, but also routine data on the morbidity patterns of each health care provider (Sundaraman et al., 2021). The same principle applies in the context of the COVID-19 vaccination.

Meanwhile, other strategic components, such as coordination, have been running even though the informants said that it was not optimal. One example of the implementation of

this component is the coordination between institutions at the central and regional levels, for example in terms of handling KIPI. Then regarding data coordination, further improvements are still needed, especially data for the preparation of mass vaccination, for example target data that are not integrated or the poor quality of data. On the other hand, the recording and reporting of COVID-19 vaccinations has been pursued by a one-stop system managed by the central government.

Regarding funding and flexibility in the allocation of funds, it is not an obstacle. The central government has converged funds for COVID-19 both from the center through ministry/institutional funds as well as directives and priorities for the regions. Even in terms of community demand on the aspect of Willingness To Pay (WTP) in order to obtain vaccinations, it is quite high. This means that the government and society have a commitment to this COVID-19 vaccination program (Harapan et al., 2020).

Then regarding alternative approaches and flexibility in administering COVID-19 vaccination, there is no specific alternative. The COVID-19 vaccination program is carried out in one corridor through central government program and health facilities do not open COVID-19 vaccination services based on independent initiatives. In a study related to vaccine surveys in several countries, it was stated that the vaccine program was carried out centrally by the government. There are no health facilities that open vaccine services on an initiative and independent basis (Lazarus et al., 2021).

This study provides an overview of the implementation of COVID-19 vaccination in Indonesia, which still faces many obstacles and shortcomings in several aspects. The health system resilience is still faced with threats today and in the future. Some literature states that vaccination is not enough to overcome the COVID-19 pandemic. It is necessary to continue a robust multifaceted approach to disease treatment and prevention (Burgos et al., 2021).

CONCLUSION

Management of COVID-19 vaccination is quite complicated because the health system is still not strong enough. The main aspects that need to be strengthened are the availability of vaccines, data collection, and maximizing the role of human resources, especially in terms of supporting actual research on vaccine development. If the strategy for strengthening the health system is not fulfilled, it will have negative excesses that extend beyond the health system. The programs that have been targeted by the government so far, such as stunting reduction, economic growth, and others, are threatened to be hampered. For this reason, besides doing COVID-19 vaccination program, we need promoting health protocols implementation, 3T surveillance (testing-tracing-treatment), and other comprehensive approaches.

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Health System Resilience in The Context of COVID-19 Vaccination Management in Indonesia

INDEXING

Keywords:

COVID-19;
COVID-19
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Health Resilience;
Health System;

Kata kunci:

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Vaksinasi COVID-19;
Ketahanan
Kesehatan;
Sistem Kesehatan;

ABSTRACT

COVID-19 cases are still increasing in all around the globe and some countries are even experiencing a surge in cases for the second time. The number of COVID-19 cases in Indonesia as of April 2021 has almost reached one million. The Indonesian government is targeting the COVID-19 vaccination in Indonesia to reach 70%, covering the target of vaccine recipients of around 181.5 million people. The target was conveyed optimistically by the government to be achieved within 15 months. However, the achievements during the initial 3 months were only 5.72% for Dose I and 2.99% for Dose II. This study aims to review the resilience of the health system in the context of COVID-19 vaccination. The approaches and methods used to obtain this information are qualitative with the method of desk study, expert study, and in-depth interviews. The results showed that the components of the health resilience strategy in the context of COVID-19 vaccination in Indonesia experienced obstacles, especially in the aspects of vaccine availability, data collection, and maximizing the role of human resources through the support of actual research on vaccine development. In the end, it is necessary to strengthen the health system that accompanies the COVID-19 vaccination program, including by continuing to implement health protocols, 3T surveillance (testing-tracing-treatment), and other approaches comprehensively.

Kasus COVID-19 masih bertambah di seluruh penjuru dunia bahkan beberapa negara sedang mengalami gelombang lonjakan kasus untuk yang kedua kalinya. Jumlah kasus COVID-19 di Indonesia per April 2021 hampir mencapai satu juta jiwa. Pemerintah Indonesia menargetkan vaksinasi COVID-19 di Indonesia dapat mencapai 70%, meliputi sasaran penerima vaksin sekitar 181,5 juta jiwa. Target tersebut disampaikan optimis oleh pemerintah mampu dicapai dalam kurun waktu 15 bulan. Akan tetapi, capaian selama 3 bulan awal baru 5,72% untuk Dosis I dan 2,99% Dosis II. Penelitian ini bertujuan meninjau ketahanan sistem kesehatan dalam konteks vaksinasi COVID-19. Pendekatan dan metode yang digunakan untuk memperoleh informasi tersebut kualitatif dengan metode desk study, studi kepakaran, dan wawancara mendalam. Diperoleh hasil bahwa komponen strategi ketahanan kesehatan dalam konteks vaksinasi COVID-19 di Indonesia mengalami hambatan terutama pada aspek ketersediaan vaksin, pendataan, dan pemaksimalan peran sumber daya manusia melalui dukungan riset aktual pengembangan vaksin. Pada akhirnya, perlu penguatan sistem kesehatan pengiring program vaksinasi COVID-19 di antaranya dengan tetap menerapkan protokol kesehatan, surveilans 3T (testing-tracing-treatment), dan pendekatan lainnya secara komprehensif.

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INTRODUCTION

The COVID-19 has infected almost all regions worldwide in this recent year. Globally, the COVID-19 was 137,282,894 (per April 13, 2021) and 2,959,607 of them died and the remaining 110,474,951 managed to recover (Worldometer, 2020). At the same time, the COVID-19 cases in Indonesia reached 1,577,526 with 42,782 deaths and 1,426,145 recovered (National COVID-19 Task Force COVID-19, n.d.). This number puts Indonesia in the 19th position of the country with the most COVID-19 cases (Worldometer, 2020).

Resilience is needed in the face of a pandemic. Resilience is a dynamic effort made to adapt positively on significant problems and difficulties (Glonti et al., 2015). The pandemic has become a public health problem for global population. It will subside after herd immunity is formed. Meanwhile, group immunity can be formed if the body's immunity is formed naturally after being infected with a virus and intentionally stimulated by vaccination (Djidjou-Demasse et al., 2020). Similar to other countries, in dealing with the pandemic, Indonesia's government has enacted various policies to deal with COVID-19. Non-pharmaceutical intervention becomes one of the chosen policy, encompassing large-scale social restrictions (PSBB) and health promotion to make people comply the health protocols. Then, the intervention strategy to reach herd immunity is through national vaccination program. Vaccination is one of the most important achievements for public health in the 20th century and now countries are competing to develop vaccines against the spread of this virus. (Hansen et al., 2020).

The Indonesian government has been targeting 70% population coverage, including 181.5 million vaccine recipient's target. The government is optimistic that the target can be achieved within 15 months. The target number of vaccinations is the total population that can receive vaccinations (over 18 years of age) and has been reduced by the exclusion criteria.

The number of recipients of the first dose of vaccine as of April 13, 2021 was 10,377,734 people (5.72%). Meanwhile, the second dose of vaccine recipients accounted for more or less half, namely 5,433,715 (2.99%). This fact shows that the rate of vaccination and its coverage in Indonesia is still very far from the initial target of completing the vaccination target for 15 months since it was first launched on January 13, 2021.

Indonesia as the 4th largest population in the world, is not a country that produces vaccines independently. Indonesia still relies on other countries for vaccine products. That becomes one of challenges on fulfilling the government envision to cover population targets within 15 months. Apart from political interests, Indonesia is on the uncertain condition in terms of priority of vaccine allocation by vaccines manufacturer. The health system must be underpinned by effective intervention to survive in this uncertain condition.

The health system resilience in Indonesia, especially in the context of COVID-19 vaccination program, is not yet known. For this reason, this research was carried out in order to find out these conditions and what the next best steps needed to be in order to achieve maximum results. This is the first research on COVID-19 vaccination management in relation to health resilience in Indonesia. For this reason, its originality can be used as a reference for future research and sustainability of COVID-19 vaccination program in Indonesia.

RESEARCH METHOD

This is a qualitative research to capture Indonesia's health system resilience in the context of COVID-19 vaccination management. The methods used are desk study and expert study. Expert study we conducted by in-depth interviews with two informants from the Ministry of Health of the Republic of Indonesia and academics. Data and information regarding the situation of COVID-19 cases and COVID-19 vaccinations were obtained based on daily information issued by the Ministry of Health of the Republic of Indonesia and also the National COVID-19 Task Force. The situation we reviewed was taken the first trimester period of national vaccination implementation (starting from January 13, 2021 to April 13, 2021).

In reviewing health resilience, the setting chosen was the COVID-19 vaccination, which is one of the efforts to handle COVID-19 in Indonesia. The assessment of health resilience adopts a strategic framework for strengthening the health system in response to the shock stage of the shock cycle as stated in the World Health Organization (WHO) policy brief. (Thomas et al., 2020).

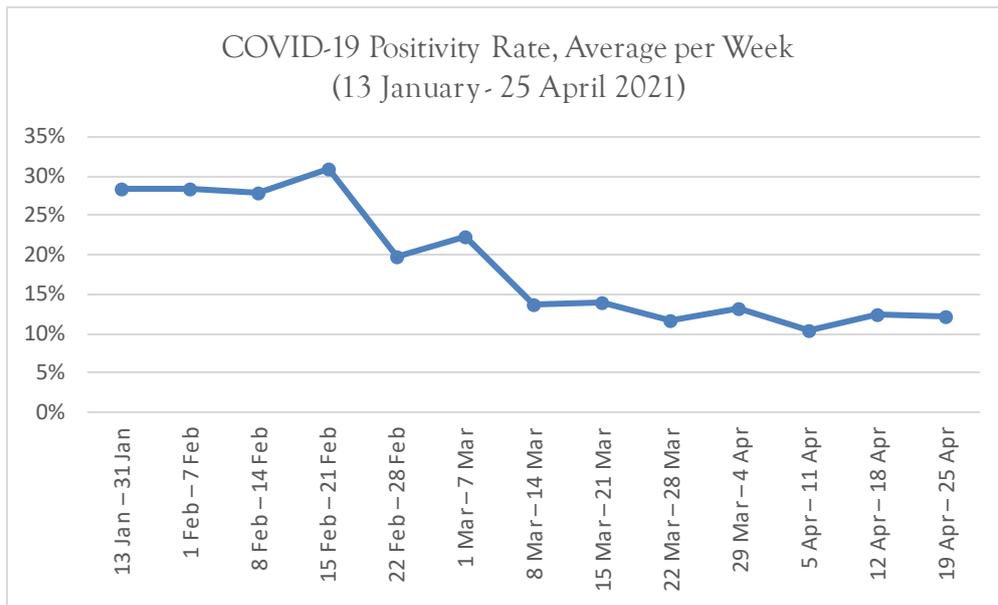
In reviewing health system resilience, the selected context of this study is the COVID-19 vaccination, which becomes one undertaking in controlling COVID-19 in Indonesia. The assessment of health system resilience adopts a strategic framework for strengthening the health system in response to the shock stages of the shock cycle as stated in the World Health Organization (WHO) policy brief (Thomas et al., 2020). Those components are:

1. Effective and participatory leadership with strong vision and communication
2. Coordination of activities between government and key stakeholders
3. Organizational learning culture that is responsive to crises
4. Effective information system and flows
5. Surveillance enables timely detection of shocks and their impacts
6. Ensuring sufficient monetary resources in the system and flexibility to reallocate and inject extra funds
7. Ensuring stability of health system funding through countercyclical health financing mechanisms and reserves
8. Purchasing flexibility and reallocation of funding to meet changing needs
9. Comprehensive health coverage
10. Appropriate level and distribution of human and physical resources
11. Ability to increase capacity to cope with sudden surge in demand
12. Motivated and well-supported workforce
13. Alternative and flexible approach to deliver care

We unite points 6, 7, and 8 into points 1: "flexibility and stability of funding". Therefore, the three are interrelated so the total consist of 11 points. Information related to these points was mainly obtained from in-depth interviews with the informants. In addition, other information was obtained through other supporting sources from desk studies (including other preceding panel expert discussion results).

RESULT AND DISCUSSION

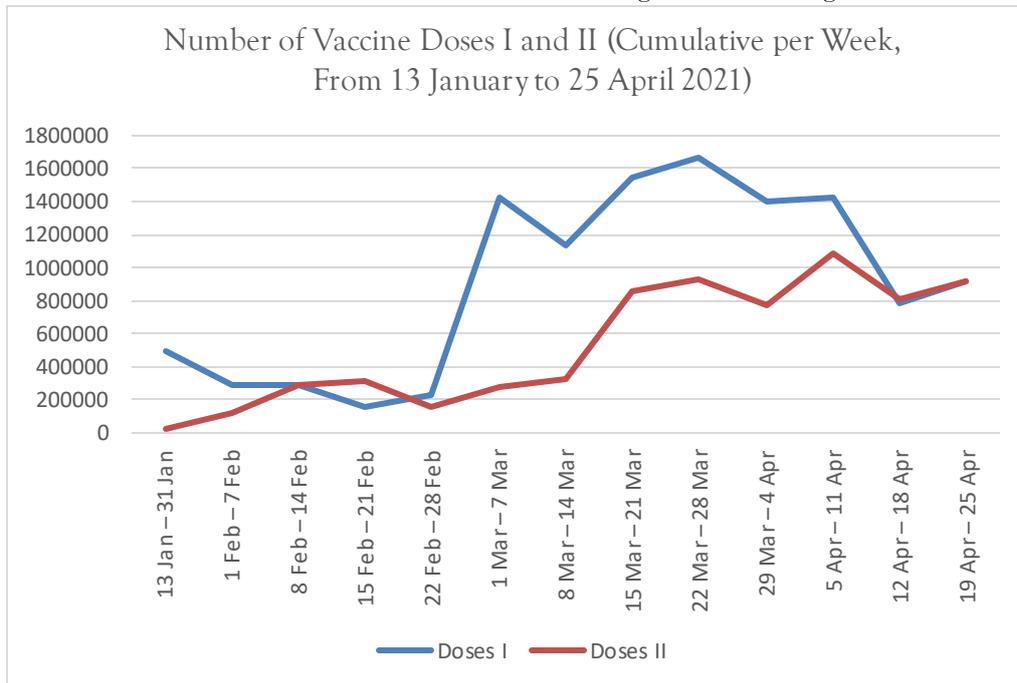
The number of recorded cases continue to soar. However, the average COVID-19 positivity rate since the beginning of the vaccination period until April 25, 2021 tends to decrease. The magnitude of the decrease was around 16.2%.



Picture 1. Average COVID-19 Positivity Rate in Weeks (13 January – 25 April, 2021)

Source: processed from the covid19.go.id dashboard, 2021

The number of weekly cumulative Dose I COVID-19 vaccination coverage shows a fluctuating graph. The spike was quite extreme in the first week of March. Meanwhile, the number of COVID-19 Dose II vaccination coverage is fluctuating but tends to rise.



Picture 2. Total Cumulative Dose I and II Vaccine Coverage in Weeks (January 13 – April 25, 2021)

Source: processed from the covid19.go.id dashboard, 2021

Indonesia's COVID-19 vaccination is still biased pertaining to its objectives. The target pursued by the Government is only the number of vaccinated population instead the impact of immunization (the immune response in the community). Whereas the establishment of individual immunity and herd-immunity are the important things as a sign of the successful vaccination program. This was conveyed by one of the informants as follows:

"The government is catching up for the number of injections, not the number of immune responses. We all forget that the virus that is experiencing obstacles (to get in appropriate host) changes itself to become more virulent. When it has a chance to enter the body, it will appear again like a new disease." (Informant 2)

Pertain to vaccination, communication between the central and local governments is heeding the value of decentralization. The central government monitors and encourages head of local government whether they found hurdles in vaccination process in their region. For example, by reminding the priority targets for 46 districts/cities that have not yet opened vaccination services for the elderly, as follow:

"For vaccination services for the elderly, there are still 46 regencies of the city that have not opened services for the elderly, because they focus on public service personnel. We remind them that elderly is priority." (Informant 1)

From in-depth interviews with two experts, it was found that the participatory leadership has been espoused in tackling COVID-19 pandemic. This is marked by coordination between levels of government and other elements such as health workers and the head of the neighborhood, in distributing vaccines and implementing vaccination.

In terms of system management, handling, and provision of vaccination services, the Ministry of Health of the Republic of Indonesia is the leading sector. Various institutions act as partners in implementing vaccination activities, including the Food and Drug Supervisory Agency (BPOM) and the COVID-19 Handling Committee and National Economic Recovery (KPC PEN). BPOM plays a role in providing approval/regulatory reviews related to circulating vaccines, especially in the functions of granting distribution permits, quality assurance, and monitoring of vaccine side effects. Meanwhile, coordination with KPC PEN is more towards assistance in terms of education, information delivery, and intensifying health protocols.

Barriers to coordination at the operational level were encountered, for example in the case of cooperation with the private sector. So far, *Puskesmas* (community health center) have been at the forefront of COVID-19 vaccination operations. This is described by one of the informants as follows:

"The second thing that we convey, there are still many regions that are still hesitant to cooperate with the private sector. So they still rely more on Puskesmas as the mainstay." (Informant 1)

Then regarding Adverse Events After Immunization (KIPI), National Committee for KIPI coordinates with the Regional Committee in the province and district/city. The regular meetings are also held to discuss cases that occur and formulate follow-up actions.

One of the informants stated that the response of policy makers is still often trapped in the phenomenon of scientific shock syndrome. This is an old paradigm that tends to avoid novelty/innovation. Vaccines circulating in Indonesia are currently only processed from vaccine raw materials from other countries. In addition, the distributed vaccines have not considered the characteristics of the virus that have changed or mutated. This makes the need for further studies regarding the efficacy of vaccines, which only around 60%.

"This means that they really have to learn from other regions' experience, if there was a region that really slows implementing the vaccination, it should not be comparing. Because we are still depending upon vaccines stock which is distinct among regions." (Informant 1)

COVID-19 vaccination data has been integrated into one vaccination data. The system is a collaboration of the *Puskesmas PCare* system and the care and protection system. *Puskesmas PCare* contains data related to COVID-19 vaccination operations. Meanwhile, there is also an application, *PeduliLindungi* system, which function is more to interact with vaccination targets in the form of information blasting, vaccination e-certificates, and vaccination notification.

On the other hand, obstacles still occur, especially regarding data for COVID-19 vaccination plan. Data on health workers to map vaccination personnel is difficult to obtain in complete because they are scattered in different databases. Likewise, population data to map vaccination targets are often duplicated. This is illustrated in the statement of one of the informants as follows.

"So we don't have complete data yet. When you want to prioritize health workers, it turns out that the data is scattered everywhere. For the general public, the same national ID number is still found but different people" (Informant 1)

By utilizing the *Puskesmas PCare* application and the *PeduliLindungi* application, it brings to the information system betterment for vaccination program. All information can be seen from the application. However, even so, there are still obstacles related to other administration, including data on health workers and data on people who must receive vaccinations.

There have been cases of transmission of COVID-19 in people who have been vaccinated even in people who have been taken their second dose. Supervision needs to be done to see the pattern of cases and formulate the right solution. An introduction to virus dynamics must be carried out regularly so that surveillance activities are necessary and cannot be separated. This was conveyed by one of the informants as follows:

"The vaccination should not be released through surveillance activities, if it is released, we will lose the dynamics of the virus, the new character of the virus because of vaccination" (Informant 2)

So far, monitoring the response to new vaccinations has only been *KIPI* monitoring. The supervisory mechanism is through officer reporting on websites or online communication groups in each region. Then discussed through regular meetings between National and Regional Committee of *KIPI*. That aims to handle *KIPI* as soon as possible.

Regarding to the budget, the government has made a diversion of the allocation of funds alleviate COVID-19 cases in Indonesia. This includes the budget for the COVID-19 vaccination. The new regulations that have been signed include the cost of health workers transportation which can be budgeted through the Non-Physical Special Allocation Fund (*DAK*). In addition, the budgeting policy for Personal Protective Equipment (*PPE*) for health workers can also be budgeted by the respective regional governments. This was conveyed by one of the informants as follows.

"Regarding PPE, it is provided by the provincial or district health offices, which we have budgeted for through DAK. Recently, there has been a regulation on the use of non-physical DAK where there are transportation costs that can be paid by regional government (without looking at the private or public sector)... But if the PPE is from the regions such as alcohol swabs, injections, there are 3 main ones from the central government, when it comes to PPE from their respective regions." (Informant 1)

The funding constraint is more on the tight standard rules for budgeting. But it's all for the sake of accountability for the use of funds. Stakeholders follow these rules and are not fully flexible to act.

Comprehensive health protection efforts are carried out, one of which is through coordination with health insurance providers, namely BPJS. If the vaccination participant is not registered with BPJS, the cost will be claimed by the hospital, while if the participant is registered with BPJS, the BPJS mechanism applies. This facility is expected to facilitate the expansion of immunization coverage in the community. This was conveyed by one of the informants as follows.

“if someone does not have BPJS, he will be claimed by the hospital. To the contrary, it will be a BPJS mechanism” (Informant 1)

So that way, the government has reached out to the community to help and protect the community in terms of giving vaccines.

Since the beginning of the COVID-19 vaccination activity, the central government has trained 120,000 vaccinators on a number-based basis. Each vaccinator is assumed to be able to do 60 injections, so the number and capacity are considered sufficient. If there is a shortage, the central government encourages the involvement of health workers other than those who have the authority to inject to assist in the operation of COVID-19 vaccination. This was conveyed by one of the informants as follows.

“Since the beginning, we have trained 120,000 vaccinators with calculations based on targets and the ability of the vaccinators is about 60 injections is sufficient” (Informant 1)

Regarding the vaccines distributed, the amount is adjusted based on the availability of national vaccines. If it has sufficient amount of vaccines, the center will distribute it almost evenly to all districts/cities. However, if the number of vaccines is insufficient, distribution will be based on the areas with the highest cases and targets. Areas with these characteristics will receive more vaccines.

Regarding resources, especially experts and tools, there are informants who state that experts and tools in Indonesia are available and adequate. Because it is considered that the COVID-19 pandemic situation is more or less the same as cases that have occurred before such as *Flu Burung* (H5N1 virus). Experts are everywhere and some of the tools when dealing with avian influenza outbreaks can be used in this COVID-19 situation. This is conveyed as follows:

“Though these experts are the same as before. There are experts everywhere and some of the tools are inherited from Flu Burung, and that can be used” (Informant 2)

The number of vaccines is highly dependent on the vaccine producing country. The availability of the vaccine in the last phase has not yet reached the government's target. This was due to delays from the Astrazeneca vaccine provider. The vaccinator staff is given self-capacity support by the Ministry of Health in the form of training. In addition, regarding incentives or transportation fees for them, it is left to the policies of their respective local governments. The alternative approach actually exists in the self-vaccination policy, but it has not been realized due to the limited vaccine doses available and also the use of weak data. In addition, the priority of this vaccine is still being directed in government programs to priority targets.

Indonesia continues to experience an increase in the number of COVID-19 incidents until now. Even though the positivity rate fell from February to March, then sloping down in

March and April. The decline from the end of January to April occurred because an increase in testing. The morbidity of the infected community augments the health system's burden, especially in providing health services and equipment. This is only seen from the aspect of health infrastructure, not to mention the impact on other sectors such as the economy and social. If the health system is disrupted, the national defense system will be disrupted (Prasanti & Fitriani, 2017). Strengthening the health system resilience becomes pivotal during this pandemic epoch.

Health resilience is defined more broadly as the scientific literature evolves. In addition to definitions that focus on preparedness and response to shock, health resilience is also focused on minimizing risk and vulnerability and managing stress on the health system (both acute and chronic) (Barasa et al., 2019). Every country must build a stronger health system resilience. It needs multi-disciplinary and multi-stakeholders approaches. Actors who capacitate the management of health system resilience are in the hands of stakeholders who have a major influence on the health system, both stakeholders in the health sector and beyond health sector (Blanchet et al., 2017).

The response to the COVID-19 response through vaccination is the choice of the Indonesian government as well as most other world leaders (Our World in Data-Oxford University, 2021). Vaccination is carried out as an effort to accelerate the formation of an immune response in the community. The time entity is important in controlling the spread of the COVID-19 virus (Rahman, 2021). In addition, vaccination is expected to be able providing benefits for many aspects, one of which is in the economic aspect because by carrying out vaccinations, especially for public officers, workers can carry out their activities productively (Mansyur, 2021).

Several studies have shown that vaccination can have good impact on saving the economy. Kohli et al. (2021) calculated the additional cost per Quality-Adjusted Life-Year (QALY) for the entire adult population and at each level in the three priority schemes, if vaccination was carried out or not. It was found that the additional cost per QALY obtained for the adult population in the United States was \$8,200 compared to no vaccination (Kohli et al., 2021).

The government's optimistic target for COVID-19 vaccination to 181 million Indonesians is quite an ambitious target. Based on the results of this study, which reviewed the components of the health resilience strategy, the main challenges faced were the availability of vaccines, data collection, and maximizing the role of human resources, especially in vaccine development or research. Based on data from the Indonesian Ministry of Health, it is known that the vaccine doses that have been given to the public as of April 13, 2021 are 11,741,559 for dose 1 vaccine and 6,829,415 for dose 2 vaccine (Ministry of Health of the Republic of Indonesia, 2021).

Vaccines are made through various stages until the vaccine can be produced and distributed to the public and is universally accepted (Makmun & Hazhiyah, 2020). Indonesia is not a "COVID-19 vaccine manufacturer" country. Thus, Indonesia's position is on the dependent side of vaccine manufacturer countries. Therefore, Indonesia needs greater efforts in terms of diplomacy and international politics in order to obtain vaccines. In this regard, efforts to procure vaccines not only ensure that vaccines are safe and in adequate quantities, but also heed the delivery and distribution process (Ozawa et al., 2016). The total budget that

will be spent on the COVID-19 vaccine in Indonesia is more than 74 trillion rupiahs, this was conveyed by the Minister of Finance of the Republic of Indonesia at the webinar *Women Empowered in Advanced Indonesia: Early Reflections of the Year 2021* on January 4, 2021.

The World Health Organization (WHO) is only able to facilitate member countries to obtain vaccines for a maximum of 20% of their total citizens. It also ultimately requires the leadership ability of a country. Based on the research results, leadership at the central government is considered quite good with monitoring and providing direction to regional government leaders. Meanwhile, it may be necessary to ensure that the leadership ability and effective communication of the leadership take place both at the regional level or lower. This capability can optimize the COVID-19 control (Forman et al., 2020). Another case is related to the aspect of the strength of the leadership's vision, which is said to be biased, especially regarding the short-term orientation (the number of people who have been injected with the COVID-19 vaccination).

The aspect that becomes the next challenge is human resources in relation to research support. A strong health system resilience is based on the capacity of human resources, financing, a strong information system, and strong government encouragement (Ozawa et al., 2016). Indonesia has many experts and has excellent research potential, but the government is still considered pragmatic. Research on the development of the COVID-19 virus should also be the focus of intervention and policy-making for this COVID-19 vaccination. Not just trusting completely and continuing the existing platform without adjusting the existing dynamics. Tight supervision is needed, not only focusing on one sector, but also other sectors, so that the efforts made in controlling this pandemic are carried out from upstream to downstream (Masnum et al., 2021).

Based on the results of the press conference of Indonesian President Joko Widodo on February 17, 2021 at the Merdeka Palace, Jakarta, it was stated that the number of COVID-19 vaccinators prepared in Indonesia was 30,000 vaccinators with uneven distribution. The vaccinators are provided with support by the central government in the form of training. In addition, local governments have also obtained authority regarding incentives for health workers in their regions. This shows that the government has paid attention to the health workers implementing the COVID-19 vaccination. The amount of incentives given to health workers is based on the Decree of the Minister of Health (KMK) Number HK.01.07/MENKES/4239/2021 concerning the Provision of Incentives and Death Compensation for Health Workers who involved in COVID-19 prevention. The incentive is adjusted based on the risk or exposure to COVID-19 so that the amount of incentives from each health worker will be different according to certain zones.

In addition, strengthening the quality and quantity of surveillance personnel is also needed to prevent additional cases in the community. Because if community surveillance is weak, the stakes are the burden on health services due to the increasing number of patients. Countries that are better at controlling COVID-19, for example South Korea, have good disease surveillance systems (Normile, 2020). An effective disease surveillance system not only reports sudden unusual health events, but also routine data on the morbidity patterns of each health care provider (Sundararaman et al., 2021). The same principle applies in the context of the COVID-19 vaccination.

Meanwhile, other strategic components, such as coordination, have been running even though the informants said that it was not optimal. One example of the implementation of this component is the coordination between institutions at the central and regional levels, for example in terms of handling KIPI. Then regarding data coordination, further improvements are still needed, especially data for the preparation of mass vaccination, for example target data that are not integrated or the poor quality of data. On the other hand, the recording and reporting of COVID-19 vaccinations has been pursued by a one-stop system managed by the central government.

Regarding funding and flexibility in the allocation of funds, it is not an obstacle. The central government has converged funds for COVID-19 both from the center through ministry/institutional funds as well as directives and priorities for the regions. Even in terms of community demand on the aspect of Willingness to Pay (WTP) in order to obtain vaccinations, it is quite high. This means that the government and society have a commitment to this COVID-19 vaccination program (Harapan et al., 2020).

Then regarding alternative approaches and flexibility in administering COVID-19 vaccination, there is no specific alternative. The COVID-19 vaccination program is carried out in one corridor through central government program and health facilities do not open COVID-19 vaccination services based on independent initiatives. In a study related to vaccine surveys in several countries, it was stated that the vaccine program was carried out centrally by the government. There are no health facilities that open vaccine services on an initiative and independent basis (Lazarus et al., 2021).

This study provides an overview of the implementation of COVID-19 vaccination in Indonesia, which still faces many obstacles and shortcomings in several aspects. The health system resilience is still faced with threats today and in the future. Some literature states that vaccination is not enough to overcome the COVID-19 pandemic. It is necessary to continue a robust multifaceted approach to disease treatment and prevention (Burgos et al., 2021).

CONCLUSION

Management of COVID-19 vaccination is quite complicated because the health system is still not strong enough. The main aspects that need to be strengthened are the availability of vaccines, data collection, and maximizing the role of human resources, especially in terms of supporting actual research on vaccine development. If the strategy for strengthening the health system is not fulfilled, it will have negative excesses that extend beyond the health system. The programs that have been targeted by the government so far, such as stunting reduction, economic growth, and others, are threatened to be hampered. For this reason, besides doing COVID-19 vaccination program, we need promoting health protocols implementation, 3T surveillance (testing-tracing-treatment), and other comprehensive approaches.

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1 message

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To: Hermawan Saputra <hermawan.saputra@uhamka.ac.id>

Hermawan Saputra:

We have reached a decision regarding your submission to JMMR (Jurnal Medicoeticolegal dan Manajemen Rumah Sakit), "Health System Resilience in The Context of COVID-19 Vaccination Management in Indonesia".

Our decision is to: Accept Submission

Nuryakin

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#12007 Summary

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Title and Abstract

Title Health System Resilience in the Context of COVID-19 Vaccination Management in Indonesia

Abstract COVID-19 cases are still increasing, and some countries are even experiencing a surge in cases for the second time. COVID-19 cases in Indonesia as of April 2021 almost reached one million. The Indonesian government is targeting the COVID-19 vaccination in Indonesia to reach 70%, covering the target of vaccine recipients of around 181.5 million people. The government conveyed the target optimistically to be achieved within 15 months. However, the achievements during the initial 3 months were only 5.72% for dose I and 2.99% for dose II. This study aims to review the health system's resilience in COVID-19 vaccination. The approaches and methods used to obtain this information were qualitative with the method of desk study, expert study, and in-depth interviews. The results showed that the components of the health resilience strategy in COVID-19 vaccination in Indonesia experienced obstacles, especially in the aspects of vaccine availability, data collection, and maximizing the role of human resources through the support of actual research on vaccine development. Thus, it is necessary to strengthen the health system that accompanies the COVID-19 vaccination program by implementing health protocols, 3T surveillance (testing-tracing-treatment), and other approaches comprehensively.

Indexing

Keywords COVID-19; COVID-19 Vaccination; Health Resilience; Health System;

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-Final paper

Health System Resilience in The Context of COVID-19 Vaccination Management in Indonesia

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INDEXING

Keywords:

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ABSTRACT

COVID-19 cases are still increasing in all around the globe and some countries are even experiencing a surge in cases for the second time. The number of COVID-19 cases in Indonesia as of April 2021 has almost reached one million. The Indonesian government is targeting the COVID-19 vaccination in Indonesia to reach 70%, covering the target of vaccine recipients of around 181.5 million people. The target was conveyed optimistically by the government to be achieved within 15 months. However, the achievements during the initial 3 months were only 5.72% for Dose I and 2.99% for Dose II. This study aims to review the resilience of the health system in the context of COVID-19 vaccination. The approaches and methods used to obtain this information are qualitative with the method of desk study, expert study, and in-depth interviews. The results showed that the components of the health resilience strategy in the context of COVID-19 vaccination in Indonesia experienced obstacles, especially in the aspects of vaccine availability, data collection, and maximizing the role of human resources through the support of actual research on vaccine development. In the end, it is necessary to strengthen the health system that accompanies the COVID-19 vaccination program, including by continuing to implement health protocols, 3T surveillance (testing-tracing-treatment), and other approaches comprehensively.

Kata kunci:

COVID-19;

Vaksinasi COVID-19;

Ketahanan

Kesehatan;

Sistem Kesehatan;

Kasus COVID-19 masih bertambah di seluruh penjuru dunia bahkan beberapa negara sedang mengalami gelombang lonjakan kasus untuk yang kedua kalinya. Jumlah kasus COVID-19 di Indonesia per April 2021 hampir mencapai satu juta jiwa. Pemerintah Indonesia menargetkan vaksinasi COVID-19 di Indonesia dapat mencapai 70%, meliputi sasaran penerima vaksin sekitar 181,5 juta jiwa. Target tersebut disampaikan optimis oleh pemerintah mampu dicapai dalam kurun waktu 15 bulan. Akan tetapi, capaian selama 3 bulan awal baru 5,72% untuk Dosis I dan 2,99% Dosis II. Penelitian ini bertujuan meninjau ketahanan sistem kesehatan dalam konteks vaksinasi COVID-19. Pendekatan dan metode yang digunakan untuk memperoleh informasi tersebut kualitatif dengan metode desk study, studi kepakaran, dan wawancara mendalam. Diperoleh hasil bahwa komponen strategi ketahanan kesehatan dalam konteks vaksinasi COVID-19 di Indonesia mengalami hambatan terutama pada aspek ketersediaan vaksin, pendataan, dan pemaksimalan peran sumber daya manusia melalui dukungan riset aktual pengembangan vaksin. Pada akhirnya, perlu penguatan sistem kesehatan pengiring program vaksinasi COVID-19 di antaranya dengan tetap menerapkan protokol kesehatan, surveilans 3T (testing-tracing-treatment), dan pendekatan lainnya secara komprehensif.

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INTRODUCTION

The COVID-19 has infected almost all regions worldwide in this recent year. Globally, the COVID-19 was 137,282,894 (per April 13, 2021) and 2,959,607 of them died and the remaining 110,474,951 managed to recover (Worldometer, 2020). At the same time, the COVID-19 cases in Indonesia reached 1,577,526 with 42,782 deaths and 1,426,145 recovered



(National COVID-19 Task Force COVID-19, n.d.). This number puts Indonesia in the 19th position of the country with the most COVID-19 cases (Worldometer, 2020).

Resilience is needed in the face of a pandemic. Resilience is a dynamic effort made to adapt positively on significant problems and difficulties (Glonti et al., 2015). The pandemic has become a public health problem for global population. It will subside after herd immunity is formed. Meanwhile, group immunity can be formed if the body's immunity is formed naturally after being infected with a virus and intentionally stimulated by vaccination (Djidjou-Demasse et al., 2020). Similar to other countries, in dealing with the pandemic, Indonesia's government has enacted various policies to deal with COVID-19. Non-pharmaceutical intervention becomes one of the chosen policies, encompassing large-scale social restrictions (PSBB) and health promotion to make people comply the health protocols. Then, the intervention strategy to reach herd immunity is through national vaccination program. Vaccination is one of the most important achievements for public health in the 20th century and now countries are competing to develop vaccines against the spread of this virus. (Hansen et al., 2020).

The Indonesian government has been targeting 70% population coverage, including 181.5 million vaccine recipient's targets. The government is optimistic that the target can be achieved within 15 months. The target number of vaccinations is the total population that can receive vaccinations (over 18 years of age) and has been reduced by the exclusion criteria.

The number of recipients of the first dose of vaccine as of April 13, 2021 was 10,377,734 people (5.72%). Meanwhile, the second dose of vaccine recipients accounted for more or less half, namely 5,433,715 (2.99%). This fact shows that the rate of vaccination and its coverage in Indonesia is still very far from the initial target of completing the vaccination target for 15 months since it was first launched on January 13, 2021.

Indonesia as the 4th largest population in the world, is not a country that produces vaccines independently. Indonesia still relies on other countries for vaccine products. That becomes one of challenges on fulfilling the government envision to cover population targets within 15 months. Apart from political interests, Indonesia is on the uncertain condition in terms of priority of vaccine allocation by vaccines manufacturer. The health system must be underpinned by effective intervention to survive in this uncertain condition.

The health system resilience in Indonesia, especially in the context of COVID-19 vaccination program, is not yet known. For this reason, this research was carried out in order to find out these conditions and what the next best steps needed to be in order to achieve maximum results. This is the first research on COVID-19 vaccination management in relation to health resilience in Indonesia. For this reason, its originality can be used as a reference for future research and sustainability of COVID-19 vaccination program in Indonesia.

RESEARCH METHOD

This is qualitative research to capture Indonesia's health system resilience in the context of COVID-19 vaccination management. The methods used are desk study and expert study. Expert study we conducted by in-depth interviews with two informants from the Ministry of Health of the Republic of Indonesia and academics. Data and information regarding the situation of COVID-19 cases and COVID-19 vaccinations were obtained based on daily information issued by the Ministry of Health of the Republic of Indonesia and also the



National COVID-19 Task Force. The situation we reviewed was taken the first trimester period of national vaccination implementation (starting from January 13, 2021 to April 13, 2021).

In reviewing health resilience, the setting chosen was the COVID-19 vaccination, which is one of the efforts to handle COVID-19 in Indonesia. The assessment of health resilience adopts a strategic framework for strengthening the health system in response to the shock stage of the shock cycle as stated in the World Health Organization (WHO) policy brief. (Thomas et al., 2020).

In reviewing health system resilience, the selected context of this study is the COVID-19 vaccination, which becomes one undertaking in controlling COVID-19 in Indonesia. The assessment of health system resilience adopts a strategic framework for strengthening the health system in response to the shock stages of the shock cycle as stated in the World Health Organization (WHO) policy brief (Thomas et al., 2020). Those components are:

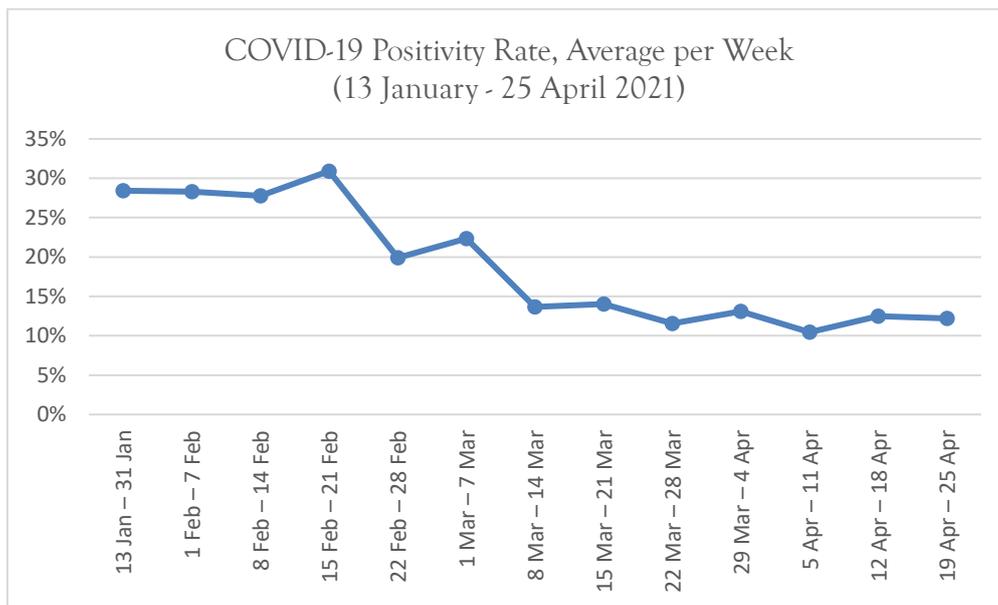
1. Effective and participatory leadership with strong vision and communication
2. Coordination of activities between government and key stakeholders
3. Organizational learning culture that is responsive to crises
4. Effective information system and flows
5. Surveillance enables timely detection of shocks and their impacts
6. Ensuring sufficient monetary resources in the system and flexibility to reallocate and inject extra funds
7. Ensuring stability of health system funding through countercyclical health financing mechanisms and reserves
8. Purchasing flexibility and reallocation of funding to meet changing needs
9. Comprehensive health coverage
10. Appropriate level and distribution of human and physical resources
11. Ability to increase capacity to cope with sudden surge in demand
12. Motivated and well-supported workforce
13. Alternative and flexible approach to deliver care

We unite points 6, 7, and 8 into points 1: "flexibility and stability of funding". Therefore, the three are interrelated so the total consist of 11 points. Information related to these points was mainly obtained from in-depth interviews with the informants. In addition, other information was obtained through other supporting sources from desk studies (including other preceding panel expert discussion results).

RESULT AND DISCUSSION

The number of recorded cases continue to soar. However, the average COVID-19 positivity rate since the beginning of the vaccination period until April 25, 2021 tends to decrease. The magnitude of the decrease was around 16.2%.

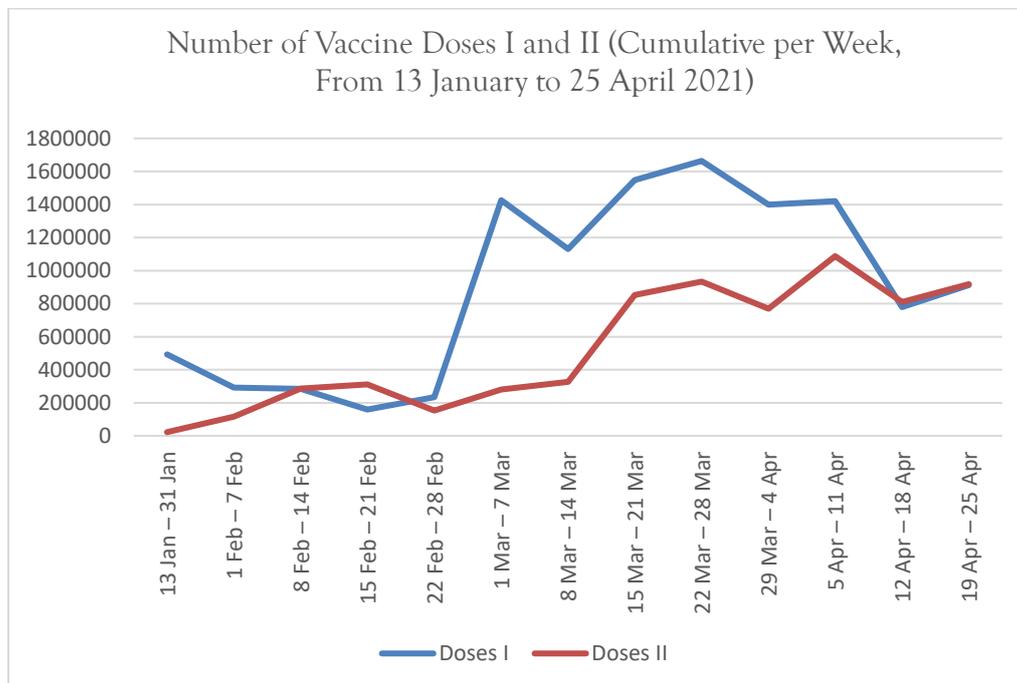




Picture 1. Average COVID-19 Positivity Rate in Weeks (13 January – 25 April, 2021)

Source: processed from the covid19.go.id dashboard, 2021

The number of weekly cumulative Dose I COVID-19 vaccination coverage shows a fluctuating graph. The spike was quite extreme in the first week of March. Meanwhile, the number of COVID-19 Dose II vaccination coverage is fluctuating but tends to rise.



Picture 2. Total Cumulative Dose I and II Vaccine Coverage in Weeks (January 13 – April 25, 2021)

Source: processed from the covid19.go.id dashboard, 2021



Indonesia's COVID-19 vaccination is still biased pertaining to its objectives. The target pursued by the Government is only the number of vaccinated populations instead the impact of immunization (the immune response in the community). Whereas the establishment of individual immunity and herd-immunity are the important things as a sign of the successful vaccination program. This was conveyed by one of the informants as follows:

"The government is catching up for the number of injections, not the number of immune responses... We all forget that the virus that is experiencing obstacles (to get in appropriate host) changes itself to become more virulent. When it has a chance to enter the body, it will appear again like a new disease." (Informant 2)

Pertain to vaccination, communication between the central and local governments is heeding the value of decentralization. The central government monitors and encourages head of local government whether they found hurdles in vaccination process in their region. For example, by reminding the priority targets for 46 districts/cities that have not yet opened vaccination services for the elderly, as follow:

"For vaccination services for the elderly, there are still 46 regencies of the city that have not opened services for the elderly, because they focus on public service personnel. We remind them that elderly is priority." (Informant 1)

From in-depth interviews with two experts, it was found that the participatory leadership has been espoused in tackling COVID-19 pandemic. This is marked by coordination between levels of government and other elements such as health workers and the head of the neighborhood, in distributing vaccines and implementing vaccination.

In terms of system management, handling, and provision of vaccination services, the Ministry of Health of the Republic of Indonesia is the leading sector. Various institutions act as partners in implementing vaccination activities, including the Food and Drug Supervisory Agency (BPOM) and the COVID-19 Handling Committee and National Economic Recovery (KPC PEN). BPOM plays a role in providing approval/regulatory reviews related to circulating vaccines, especially in the functions of granting distribution permits, quality assurance, and monitoring of vaccine side effects. Meanwhile, coordination with KPC PEN is more towards assistance in terms of education, information delivery, and intensifying health protocols.

Barriers to coordination at the operational level were encountered, for example in the case of cooperation with the private sector. So far, *Puskesmas* (community health center) have been at the forefront of COVID-19 vaccination operations. This is described by one of the informants as follows:

"The second thing that we convey, there are still many regions that are still hesitant to cooperate with the private sector. So they still rely more on Puskesmas as the mainstay." (Informant 1)

Then regarding Adverse Events After Immunization (KUPI), National Committee for KUPI coordinates with the Regional Committee in the province and district/city. The regular meetings are also held to discuss cases that occur and formulate follow-up actions.

One of the informants stated that the response of policy makers is still often trapped in the phenomenon of scientific shock syndrome. This is an old paradigm that tends to avoid novelty/innovation. Vaccines circulating in Indonesia are currently only processed from vaccine raw materials from other countries. In addition, the distributed vaccines have not considered the characteristics of the virus that have changed or mutated. This makes the need for further studies regarding the efficacy of vaccines, which only around 60%.



"This means that they really have to learn from other regions' experience, if there was a region that really slows implementing the vaccination, it should not be comparing. Because we are still depending upon vaccines stock which is distinct among regions." (Informant 1)

COVID-19 vaccination data has been integrated into one vaccination data. The system is a collaboration of the *Puskesmas PCare* system and the care and protection system. *Puskesmas PCare* contains data related to COVID-19 vaccination operations. Meanwhile, there is also an application, *PeduliLindungi* system, which function is more to interact with vaccination targets in the form of information blasting, vaccination e-certificates, and vaccination notification.

On the other hand, obstacles still occur, especially regarding data for COVID-19 vaccination plan. Data on health workers to map vaccination personnel is difficult to obtain in complete because they are scattered in different databases. Likewise, population data to map vaccination targets are often duplicated. This is illustrated in the statement of one of the informants as follows.

"So we don't have complete data yet. When you want to prioritize health workers, it turns out that the data is scattered everywhere. For the general public, the same national ID number is still found but different people" (Informant 1)

By utilizing the *Puskesmas PCare* application and the *PeduliLindungi* application, it brings to the information system betterment for vaccination program. All information can be seen from the application. However, even so, there are still obstacles related to other administration, including data on health workers and data on people who must receive vaccinations.

There have been cases of transmission of COVID-19 in people who have been vaccinated even in people who have been taken their second dose. Supervision needs to be done to see the pattern of cases and formulate the right solution. An introduction to virus dynamics must be carried out regularly so that surveillance activities are necessary and cannot be separated. This was conveyed by one of the informants as follows:

"The vaccination should not be released through surveillance activities, if it is released, we will lose the dynamics of the virus, the new character of the virus because of vaccination" (Informant 2)

So far, monitoring the response to new vaccinations has only been *KIPI* monitoring. The supervisory mechanism is through officer reporting on websites or online communication groups in each region. Then discussed through regular meetings between National and Regional Committee of *KIPI*. That aims to handle *KIPI* as soon as possible.

Regarding to the budget, the government has made a diversion of the allocation of funds alleviate COVID-19 cases in Indonesia. This includes the budget for the COVID-19 vaccination. The new regulations that have been signed include the cost of health workers transportation which can be budgeted through the Non-Physical Special Allocation Fund (*DAK*). In addition, the budgeting policy for Personal Protective Equipment (*PPE*) for health workers can also be budgeted by the respective regional governments. This was conveyed by one of the informants as follows.

"Regarding PPE, it is provided by the provincial or district health offices, which we have budgeted for through DAK. Recently, there has been a regulation on the use of non-physical DAK where there are transportation costs that can be paid by regional government (without looking at the private or public sector) ... But if the PPE is from the regions such as alcohol swabs, injections, there are 3 main ones from the central government, when it comes to PPE from their respective regions." (Informant 1)

The funding constraint is more on the tight standard rules for budgeting. But it's all for the sake of accountability for the use of funds. Stakeholders follow these rules and are not fully flexible to act.

Comprehensive health protection efforts are carried out, one of which is through coordination with health insurance providers, namely BPJS. If the vaccination participant is not registered with BPJS, the cost will be claimed by the hospital, while if the participant is registered with BPJS, the BPJS mechanism applies. This facility is expected to facilitate the expansion of immunization coverage in the community. This was conveyed by one of the informants as follows.

“if someone does not have BPJS, he will be claimed by the hospital. To the contrary, it will be a BPJS mechanism” (Informant 1)

So that way, the government has reached out to the community to help and protect the community in terms of giving vaccines.

Since the beginning of the COVID-19 vaccination activity, the central government has trained 120,000 vaccinators on a number-based basis. Each vaccinator is assumed to be able to do 60 injections, so the number and capacity are considered sufficient. If there is a shortage, the central government encourages the involvement of health workers other than those who have the authority to inject to assist in the operation of COVID-19 vaccination. This was conveyed by one of the informants as follows.

“Since the beginning, we have trained 120,000 vaccinators with calculations based on targets and the ability of the vaccinators is about 60 injections is sufficient” (Informant 1)

Regarding the vaccines distributed, the amount is adjusted based on the availability of national vaccines. If it has sufficient number of vaccines, the center will distribute it almost evenly to all districts/cities. However, if the number of vaccines is insufficient, distribution will be based on the areas with the highest cases and targets. Areas with these characteristics will receive more vaccines.

Regarding resources, especially experts and tools, there are informants who state that experts and tools in Indonesia are available and adequate. Because it is considered that the COVID-19 pandemic situation is more or less the same as cases that have occurred before such as *Flu Burung* (H5N1 virus). Experts are everywhere and some of the tools when dealing with avian influenza outbreaks can be used in this COVID-19 situation. This is conveyed as follows:

“Though these experts are the same as before. There are experts everywhere and some of the tools are inherited from Flu Burung, and that can be used” (Informant 2)

The number of vaccines is highly dependent on the vaccine producing country. The availability of the vaccine in the last phase has not yet reached the government's target. This was due to delays from the Astrazeneca vaccine provider. The vaccinator staff is given self-capacity support by the Ministry of Health in the form of training. In addition, regarding incentives or transportation fees for them, it is left to the policies of their respective local governments. The alternative approach actually exists in the self-vaccination policy, but it has not been realized due to the limited vaccine doses available and also the use of weak data. In addition, the priority of this vaccine is still being directed in government programs to priority targets.

Indonesia continues to experience an increase in the number of COVID-19 incidents until now. Even though the positivity rate fell from February to March, then sloping down in

March and April. The decline from the end of January to April occurred because an increase in testing. The morbidity of the infected community augments the health system's burden, especially in providing health services and equipment. This is only seen from the aspect of health infrastructure, not to mention the impact on other sectors such as the economy and social. If the health system is disrupted, the national defense system will be disrupted (Prasanti & Fitriani, 2017). Strengthening the health system resilience becomes pivotal during this pandemic epoch.

Health resilience is defined more broadly as the scientific literature evolves. In addition to definitions that focus on preparedness and response to shock, health resilience is also focused on minimizing risk and vulnerability and managing stress on the health system (both acute and chronic) (Barasa et al., 2019). Every country must build a stronger health system resilience. It needs multi-disciplinary and multi-stakeholders' approaches. Actors who capacitate the management of health system resilience are in the hands of stakeholders who have a major influence on the health system, both stakeholders in the health sector and beyond health sector (Blanchet et al., 2017).

The response to the COVID-19 response through vaccination is the choice of the Indonesian government as well as most other world leaders (Our World in Data-Oxford University, 2021). Vaccination is carried out as an effort to accelerate the formation of an immune response in the community. The time entity is important in controlling the spread of the COVID-19 virus (Rahman, 2021). In addition, vaccination is expected to be able providing benefits for many aspects, one of which is in the economic aspect because by carrying out vaccinations, especially for public officers, workers can carry out their activities productively (Mansyur, 2021).

Several studies have shown that vaccination can have good impact on saving the economy. Kohli et al. (2021) calculated the additional cost per Quality-Adjusted Life-Year (QALY) for the entire adult population and at each level in the three priority schemes, if vaccination was carried out or not. It was found that the additional cost per QALY obtained for the adult population in the United States was \$8,200 compared to no vaccination (Kohli et al., 2021).

The government's optimistic target for COVID-19 vaccination to 181 million Indonesians is quite an ambitious target. Based on the results of this study, which reviewed the components of the health resilience strategy, the main challenges faced were the availability of vaccines, data collection, and maximizing the role of human resources, especially in vaccine development or research. Based on data from the Indonesian Ministry of Health, it is known that the vaccine doses that have been given to the public as of April 13, 2021 are 11,741,559 for dose 1 vaccine and 6,829,415 for dose 2 vaccine (Ministry of Health of the Republic of Indonesia, 2021).

Vaccines are made through various stages until the vaccine can be produced and distributed to the public and is universally accepted (Makmun & Hazhiyah, 2020). Indonesia is not a "COVID-19 vaccine manufacturer" country. Thus, Indonesia's position is on the dependent side of vaccine manufacturer countries. Therefore, Indonesia needs greater efforts in terms of diplomacy and international politics in order to obtain vaccines. In this regard, efforts to procure vaccines not only ensure that vaccines are safe and in adequate quantities, but also heed the delivery and distribution process (Ozawa et al., 2016). The total budget that

will be spent on the COVID-19 vaccine in Indonesia is more than 74 trillion rupiahs, this was conveyed by the Minister of Finance of the Republic of Indonesia at the webinar *Women Empowered in Advanced Indonesia: Early Reflections of the Year 2021* on January 4, 2021.

The World Health Organization (WHO) is only able to facilitate member countries to obtain vaccines for a maximum of 20% of their total citizens. It also ultimately requires the leadership ability of a country. Based on the research results, leadership at the central government is considered quite good with monitoring and providing direction to regional government leaders. Meanwhile, it may be necessary to ensure that the leadership ability and effective communication of the leadership take place both at the regional level or lower. This capability can optimize the COVID-19 control (Forman et al., 2020). Another case is related to the aspect of the strength of the leadership's vision, which is said to be biased, especially regarding the short-term orientation (the number of people who have been injected with the COVID-19 vaccination).

The aspect that becomes the next challenge is human resources in relation to research support. A strong health system resilience is based on the capacity of human resources, financing, a strong information system, and strong government encouragement (Ozawa et al., 2016). Indonesia has many experts and has excellent research potential, but the government is still considered pragmatic. Research on the development of the COVID-19 virus should also be the focus of intervention and policy-making for this COVID-19 vaccination. Not just trusting completely and continuing the existing platform without adjusting the existing dynamics. Tight supervision is needed, not only focusing on one sector, but also other sectors, so that the efforts made in controlling this pandemic are carried out from upstream to downstream (Masnum et al., 2021).

Based on the results of the press conference of Indonesian President Joko Widodo on February 17, 2021 at the Merdeka Palace, Jakarta, it was stated that the number of COVID-19 vaccinators prepared in Indonesia was 30,000 vaccinators with uneven distribution. The vaccinators are provided with support by the central government in the form of training. In addition, local governments have also obtained authority regarding incentives for health workers in their regions. This shows that the government has paid attention to the health workers implementing the COVID-19 vaccination. The amount of incentives given to health workers is based on the Decree of the Minister of Health (KMK) Number HK.01.07/MENKES/4239/2021 concerning the Provision of Incentives and Death Compensation for Health Workers who involved in COVID-19 prevention. The incentive is adjusted based on the risk or exposure to COVID-19 so that the amount of incentives from each health worker will be different according to certain zones.

In addition, strengthening the quality and quantity of surveillance personnel is also needed to prevent additional cases in the community. Because if community surveillance is weak, the stakes are the burden on health services due to the increasing number of patients. Countries that are better at controlling COVID-19, for example South Korea, have good disease surveillance systems (Normile, 2020). An effective disease surveillance system not only reports sudden unusual health events, but also routine data on the morbidity patterns of each health care provider (Sundararaman et al., 2021). The same principle applies in the context of the COVID-19 vaccination.



Meanwhile, other strategic components, such as coordination, have been running even though the informants said that it was not optimal. One example of the implementation of this component is the coordination between institutions at the central and regional levels, for example in terms of handling KIPI. Then regarding data coordination, further improvements are still needed, especially data for the preparation of mass vaccination, for example target data that are not integrated or the poor quality of data. On the other hand, the recording and reporting of COVID-19 vaccinations has been pursued by a one-stop system managed by the central government.

Regarding funding and flexibility in the allocation of funds, it is not an obstacle. The central government has converged funds for COVID-19 both from the center through ministry/institutional funds as well as directives and priorities for the regions. Even in terms of community demand on the aspect of Willingness to Pay (WTP) in order to obtain vaccinations, it is quite high. This means that the government and society have a commitment to this COVID-19 vaccination program (Harapan et al., 2020).

Then regarding alternative approaches and flexibility in administering COVID-19 vaccination, there is no specific alternative. The COVID-19 vaccination program is carried out in one corridor through central government program and health facilities do not open COVID-19 vaccination services based on independent initiatives. In a study related to vaccine surveys in several countries, it was stated that the vaccine program was carried out centrally by the government. There are no health facilities that open vaccine services on an initiative and independent basis (Lazarus et al., 2021).

This study provides an overview of the implementation of COVID-19 vaccination in Indonesia, which still faces many obstacles and shortcomings in several aspects. The health system resilience is still faced with threats today and in the future. Some literature states that vaccination is not enough to overcome the COVID-19 pandemic. It is necessary to continue a robust multifaceted approach to disease treatment and prevention (Burgos et al., 2021).

CONCLUSION

Management of COVID-19 vaccination is quite complicated because the health system is still not strong enough. The main aspects that need to be strengthened are the availability of vaccines, data collection, and maximizing the role of human resources, especially in terms of supporting actual research on vaccine development. If the strategy for strengthening the health system is not fulfilled, it will have negative excesses that extend beyond the health system. The programs that have been targeted by the government so far, such as stunting reduction, economic growth, and others, are threatened to be hampered. For this reason, besides doing COVID-19 vaccination program, we need promoting health protocols implementation, 3T surveillance (testing-tracing-treatment), and other comprehensive approaches.

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