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INDONESIAN VACCINE DIPLOMACY TO THE INDO-PACIFIC: OPPORTUNITIES AND CHALLENGES

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Abstract

The Covid-19 vaccine is one way to prevent the spread of Covid-19. Indonesia has produced Indovac, a Covid-19 vaccine made by Biopharma, which has the opportunity to be distributed to countries in the Indo-Pacific Region. This article explains the opportunities and challenges of Indonesia's vaccine diplomacy during the Covid-19 pandemic to the Indo-Pacific region through Biopharma. By using a vaccine diplomacy approach and qualitative methods with System Dynamic analysis, this article concludes that (i) The opportunity for Indonesia's vaccine diplomacy to the Indo-Pacific is 44% and (ii) The simulation results for all parameters have the opportunity to increase Indonesia's progress in the Indo-Pacific except for the parameters of cooperation with exceptional actors' vaccine. The challenges for Indonesia's Covid-19 vaccine diplomacy to the Indo-Pacific come from the United States, India, Japan, Australia and Singapore.

Keywords: Vaccine Diplomacy, Indo-Pacific, Indonesia, Biopharma

INTRODUCTION

Covid-19 has hit the Indo-Pacific Region. The population in the Indo-Pacific Region represents more than half of the world's human population, with a total world population of around eight billion people; the Asia-Pacific region alone, which is part of the Indo-Pacific, already has a population of around 4.3 billion people (UNFPA, 2022). Therefore, the threat of transmission of the Covid-19 virus is a severe issue in this region. In addition, some countries in the Indo-Pacific region have high population levels, such as Indonesia, the United States (US) and India (United Nations, 2022). This condition certainly makes the Indo-Pacific region considerably influence the world economy and politics.

In November 2022, around 640 million were recorded from 195 countries around the world confirmed Covid-19, with an estimated death toll exceeding 6.6 million. Of these, the US and India are in position. The two countries with the most cases are the US, with more than 99 million confirmed cases and 1.1 million deaths. Meanwhile, India has more than 44.6 million

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confirmed cases and more than 530 thousand deaths (Worldometer, 2022). The data illustrates the seriousness of the threat of Covid-19, especially in the Indo-Pacific region. Without coordinated handling in the region, it will not be easy to control the spread of Covid-19 worldwide. Countries in the East Asia and Pacific region were among the worst countries affected at the start of the Covid-19 pandemic. High poverty rates exacerbate the impact of Covid-19 on the region. In addition, the people in this area are also dominated by informal sector workers, migrants and daily workers who have low economic resilience, especially in dealing with Covid-19. On a broader scale, the Covid-19 pandemic has disrupted the integrated economic chain in the Asian region. The economic chain in question is trade integration between China, Japan, South Korea, Singapore, Malaysia, Thailand, Cambodia, Bangladesh, Myanmar, and Indonesia, resulting in substantial economic losses for these countries (UNDP, 2020).

In addition to the severe economic impact due to the drastic reduction in the mobility of people and goods during the Covid-19 pandemic in the Indo-Pacific region, secondary impacts exist on access to health services, education and gender gaps (Keck, 2021). Food security is also a serious threat during the Covid-19 pandemic in the Indo-Pacific region; farmers and fishermen in the region, such as Indonesia, the Philippines, Timor-Leste, Papua New Guinea, and other Pacific island countries, find it challenging to carry out activities due to various policies that the aim is to minimize the spread of the virus. Covid-19 harms the food supply chain from the national to the global level, potentially harming global food security both in the short and long term (ACIAR, 2020). The Covid-19 vaccine is an effort to reduce the spread of Covid-19. Several countries in the Indo-Pacific have produced vaccines for Covid-19, namely: the United States, India, Australia and Singapore.

United States of America

In the context of the capability to produce a Covid-19 vaccine, the United States (US) produces two types of vaccines: Moderna and Pfizer. Although, Pfizer's vaccine cannot be claimed to be purely US property because Biontech has contributed from Germany. This is different from Chinese vaccines, which were created without the interference of other countries. Then in the context of the capability to distribute vaccines, until October 31, 2022, the US has promised to donate 1.1 billion doses of Covid-19 vaccines worldwide. Of these, 227 million doses have been administered, 430.5 million have been successfully delivered but have yet to be administered, and 442.2 million have not been delivered (Bown, 2022). Compared to China's contribution with the same variable, namely the number of vaccine doses given to countries worldwide, China is still superior to around 73 million vaccine doses.

India

India's ability to manufacture vaccines has high competitiveness during the Covid-19 pandemic. India's growth in the vaccine segment remains stable despite the impact of Covid-19 on streamlining and optimizing manufacturing processes. Over the last two decades, major pharmaceutical companies have invested heavily in increasing their manufacturing capabilities, meeting enormous global and domestic demand. Hence, India has emerged as a dominant force

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in vaccines for diseases like measles, Bacillus Calmette-Guérin (BCG), and Diphtheria, Tetanus and Pertussis (DPT). For example, India accounts for almost 90% of the global demand for measles vaccine. The growth resulted in Indian dominance, with 65-70% of the World Health Organization (WHO) vaccine requirements sourced from India. India now supplies around 60% of the global demand for vaccines. Biology and formulations, including vaccines, account for 77.5% of India's pharmaceutical export portfolio. During the pandemic, leveraging India's dynamic vaccine manufacturing ecosystem provided vaccines to 1.4 billion people and served the world community by supplying 242 million people at low prices to 101 countries (Sharma, 2022).

Serum Institute of India Ltd. is the most prominent vaccine company in the world that will produce 200 million stocks of the Covid-19 vaccine by 2022 (Sanjai, 2022). Apart from that, there is also Covaxin, India's original Covid-19 vaccine developed and manufactured by Bharat Biotech in collaboration with the Indian Council of Medical Research (ICMR) - National Institute of Virology (NIV). This vaccine was developed using the Whole-Virion Inactivated Vero Cell derivative platform technology. Inactivated vaccines do not replicate and therefore do not cause pathological effects. These vaccines contain dead viruses, incapable of infecting people but still capable of instructing the immune system to mount a defensive reaction against infection (Bharat Biotech, 2022).

Australia

Biopharmaceutical Company CSL manufactures the AstraZeneca vaccine in Australia. The Australian government has temporarily approved the AstraZeneca vaccine for use in its country on 15 February 2021. In 2021 Australia secured 53.8 million of these vaccines, with 3.8 million imported and 50 million produced domestically (Commonwealth of Australia, 2022). In addition, Australia is currently still dependent on partnerships with international vaccine manufacturers to secure most vaccine supplies, including Pfizer and Moderna. Australia also has several research institutes and a development and contract manufacturing organization (CDMO) that will produce domestic vaccine manufacturing candidates. Australia also has ambitions to become a country with high vaccine production capabilities and high competitiveness globally by 2030 (Arthur, 2022).

Singapore (2023)

The COVID-19 vaccine company from Germany, BioNTech SE, and Pfizer Inc, are working with the Singapore government to build facilities for their vaccine production in Singapore. This is the company's first vaccine production location in the Asian region and is a production center for Asia-Pacific. The vaccine production facility is planned to be fully operational in 2023 (Pisharody & Sharma, 2022). In addition, a pharmaceutical company from France also plans to build a vaccine production facility in Singapore with a total investment value of US$474 million. It is estimated to be operational in 2026. The success of the collaboration carried out by Singapore is influenced by various factors such as the potential for sound economic growth, good infrastructure, process efficiency, friendly taxes, and a strategic location for each Asian market (Medina, 2021). The existence of a Covid-19 vaccine is closely

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related to the fight for hegemony between the United States and China. The incessant "China Threat" narrative campaigned by the U.S. has increased in the last decade. This action confirms the magnitude of the capability possessed by China, which threatens the status quo of the U.S. as the only superpower in a unipolar international system. As a first step towards superpower status, China aims for absolute domination in the Indo-Pacific region (Mourdoukoutas, 2019). From the global economic dimension, China's threat to the U.S. appears through the Belt and Road Initiative (BRI), which has succeeded in getting the U.S. to respond through several securitization measures (U.S. Embassy Jakarta, 2022). China's threat to U.S. dominance continues to dimensions of health security, especially in procuring the Covid-19 vaccine.

In terms of the number of countries receiving donations, the influence of the U.S. is still less than that of China. 48 countries have received U.S. vaccine donations, with the majority coming from countries in the Sub-Saharan Africa region with 188 million vaccine doses. This number was lost to countries that received Chinese vaccine donations, which spread to 90 countries. Except in Sub-Saharan Africa, US vaccine donations reached 4 countries in the Indo-Pacific region, including Indonesia, Cambodia, Fiji and Kiribati, in the amount of 39.1 million doses. Suppose the U.S. can only distribute Covid-19 vaccine donations second only in the region. In that case, it is different from China, which has reached four regions: Latin America, Africa, Asia Pacific, and Europe (Bridge Consulting, 2022).

Apart from that, there are also analysis results which say that the U.S. and China have yet to succeed in gaining dominance in the Indo-Pacific region related to the Covid-19 issue. The various failures of the U.S. and China in tackling Covid-19 in their respective countries are the main factors that make the two countries lack hegemony in the Indo-Pacific region. In addition, the success of other countries in the Indo-Pacific region in tackling Covid-19 nationally is a challenge for the U.S. and China in expanding their influence in the region. Collective efforts through cooperation are the right way to solve non-traditional security issues. That is what countries in the Indo-Pacific region have done to make them less dependent on the U.S. and China (deLisle, 2021).

Apart from the hegemony problems of China & the United States, the ability to develop a Covid-19 vaccine allows producing countries to develop networks globally, including Indonesia. In November 2022, the Indonesian government officially launched a Covid-19 vaccine called Indovac, produced by Biopharma. Indovac is a Covid-19 vaccine from Indonesia produced by Biopharma. Has received an emergency use permit from the Food and Drug Supervisory Agency (BPOM) on September 24 2022, for primary vaccination doses one and two for people over 18. Indovac has also received halal certification from the Indonesian Ulema Council. The vaccine launch was carried out in Bandung by President Joko Widodo on October 13, 2022. During the clinical trial, Indovac had good results against the Covid-19 variants of Wuhan, Delta and Omicron. As for the initial stage, Biopharma targets to produce 20 million doses of the Indovac vaccine (Anna, 2022).

In the early stages of developing the Indovac vaccine, Biopharma is working with the Baylor College of Medicine laboratory in Houston, Texas. Phase one (safety), phase two (efficacy), and phase three (efficacy) clinical trials were conducted in Bandung, involving 175,360 and

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4,050 volunteers, respectively. In testimony bridging with a comparison vaccine with an efficacy of over 80 per cent, the Indovac vaccine is proven to be non-inferiority. This means that IndoVac has better effectiveness than the comparator vaccine. In October 2022, Biopharma was working to meet the target of a shortfall of 6.9 million Indovac first doses, which must be available by the end of 2022 for immediate distribution throughout Indonesia. This target is to meet the need for domestic booster vaccines in Indonesia. Tri Husodo, 2022). Can Indonesia expand its influence in the Indo-Pacific by doing Vaccine Diplomacy? This article aims to explain the opportunities and challenges of Indonesia's vaccine diplomacy during the COVID-19 pandemic in the Indo-Pacific region.

Vaccine Diplomacy

Vaccine diplomacy can be better understood within the broader conceptual category of medical diplomacy, a term coined in 1978 by Peter Bourne, special assistant to the president on health matters. Bourne (1978) argues that health and medicine can be essential in improving international relations because specific humanitarian issues, especially health, can become a basis for establishing dialogue and bridging diplomatic barriers. Some examples of medical diplomacy activities are the cooperation between the US and Russia to fight polio. The Cuban state implements medical diplomacy as a foreign policy instrument. As well as the sending of medical equipment and personnel assistance from country to country, affected natural disasters include the 1960 Chile earthquake and the 2014 Ebola outbreak in West Africa (Bier & Arceneaux, 2020) (Gomez, 2014) (Groll, 2013).

In recent years, medical diplomacy has developed into a field of study better known as global health diplomacy, motivated by a growing awareness that more and more health problems and their political, social and economic implications are broad and transcend national borders so that action is required. On a global scale to ensure public safety (Kickbusch, Silberschmidt, & Buss, 2007). In another sense, the state cannot move alone in dealing with health issues (Cooper, 2003).

However, global health diplomacy continues to develop its conceptual meaning towards interdependence, cooperation and mutual benefit. The conceptualization of health diplomacy leads to three things. The first is core diplomacy, namely formal negotiations between and between countries. The second is multi stakeholder diplomacy, a negotiation between countries and other actors, not necessarily leading to a binding agreement. The third is informal diplomacy, which is the interaction between international public health actors and their counterparts in the field, including officials of the host country, non-governmental organizations, private sector companies and the public (Katz, Kornbelt, Arnold, Lief, & Fischer, 2011).

Hotez (2014) defines vaccine diplomacy as covering almost all aspects of global health diplomacy that depend on the use or delivery of vaccines and includes the critical work of Gavi, the Vaccine Alliance, and elements of WHO, the Gates Foundation, and other international organizations. Gavi, the Vaccine Alliance was founded in 2000 to bring together the public and private sectors and partners of UNICEF and WHO to create equal access to vaccines in poor

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countries. Furthermore, Hotez (2014) observes that the practice of vaccine diplomacy has existed since the discovery of the vaccine itself, such as the incident of how the British doctor Edward Jenner's smallpox vaccine was sent to France for successful smallpox inoculation during the war between England and France in the early 1800s. Supporting Hotez's statement, Shakeel (2019) defines vaccine diplomacy as a branch of global health diplomacy that promotes the use and delivery of vaccines to achieve larger global health goals and joint foreign policy goals. Shakeel and colleagues' account is based on the WHO-led 2016–2017 multilateral polio eradication program in Pakistan, which involved multiple actors, including Pakistan's Ministry of Health, Regulation and Coordination and donors and technical partners US CDC, World Bank, and UK Department of Health. International Development (DFID), and Japan International Cooperation Agency (JICA).

Hotez (2014) further identifies vaccine science diplomacy as part of vaccine diplomacy. Vaccine science diplomacy, which represents a hybrid characteristic of global health diplomacy and science diplomacy, refers to the joint development of vaccines and related technologies, with the leading actor usually being a scientist. In some cases, scientists may come from two or more ideologically conflicting countries or countries actively engaged in hostile acts, as seen in the case of Jenner's smallpox vaccine. Hotez's definition of vaccine science diplomacy follows Katz's (2011) global health diplomacy framework, specifically the category of informal global health diplomacy based on scientific interaction peer-to-peer along with elements of science diplomacy in which the representative country projects power through its scientific prowess and reputation (Hotez, 2014), especially when other forms of dialogue or diplomacy are blocked (Ruffini, 2019). However, Katz's (2011) conceptualization of global health diplomacy does not consider the uniqueness of vaccines, especially in the context of a globally debilitating pandemic. Hotez (2014) rightly argues that an underlying theme of vaccine diplomacy and vaccine science diplomacy is that vaccines are different from other medical or public health interventions.

In summary, the definition and conceptualization of vaccine diplomacy before Covid-19 (Hotez, 2014; Kelman, 2019; Shakeel et al., 2019) as an instrument of conflict resolution, when viewed together with the framework of Katz et al. (2011) to explain global health diplomacy, ignoring nation-state factors and elements of competition that are displayed in the current Covid-19 vaccine diplomacy race. Ontologically, China's vaccine diplomacy does not follow the conceptualization of pre-Covid vaccine diplomacy within the limited framework of multilateral conflict resolution. The conceptual tension between mutual benefit and self-interest becomes clear when we apply the lens of nation branding, which Anholt (2015) has written as a metaphor to describe how effectively individual nation-states compete with each other for favorable perceptions, be it through exports, government, tourism, investment, culture and heritage, and in this case a Covid-19 vaccine. Meanwhile, Lee (2021) argues that post-Covid-19 vaccine diplomacy refers more to soft power countries, particularly China. In this regard, China will not give up its efforts to project influence through its national vaccine. The advantages of soft power and institutional and social-ecological factors that motivate China's vaccine diplomacy have been firmly established. Although China announced plans to provide its vaccine to Covax, three Chinese vaccine manufacturers signed up to join the initiative Covax

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to incorporate their dose of 10 million doses by 2021, this does not prevent China from continuing to exercise soft power through vaccines outside the framework Covax. The vaccine diplomacy race is far from over as China faces increasing competition from Russia, India and the US, which face increasing pressure to react to Chinese vaccine diplomacy outside the framework Covax.

METHOD

This article uses a descriptive qualitative method with secondary data sources from news from the official website, government and private sector reports, and journal articles. Analysis using System Dynamics to predict opportunities & challenges for Indonesia's vaccine diplomacy in the Indo-Pacific. The built model is as follows:

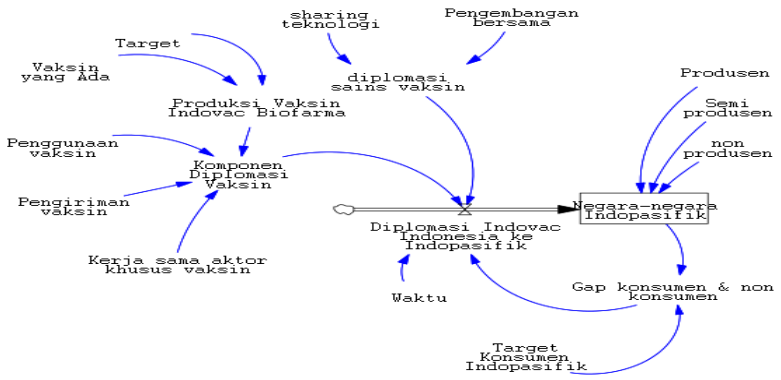

Figure 1: Indonesia's Vaccine Diplomacy Model to the Indo-Pacific

Table 1: Details of the Elements of Indonesian Vaccine Diplomacy Modeling in the Indo-Pacific

Variable	Parameter
Country Category	**Vaccine Manufacturer:** United States, India, Indonesia
	Semi-manufacturer: Australia, Singapore
	The non-product: Bangladesh, Bhutan, Brunei, Cambodia, Fiji, Japan, Laos, Malaysia, Maldives, Myanmar, Nepal, New Zealand, PapuaNew Guinea, Philippines, Sri Lanka, Taiwan, Thailand, Timor Leste, Vietnam
Components of vaccine diplomacy	Vaccine production
	Vaccine use
	Vaccine delivery
	Vaccine-specific actor cooperation
Vaccine science diplomacy	Joint Development
	Technology sharing

Indo-Pacific region

The Indo-Pacific is an imaginary region map that has recently had an advantageous position for international relations actors. Similar to limiting territorial other regions, there are different

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understandings among actors in defining the Indo-Pacific region. In general geospatial terms, the Indo-Pacific has a definition of the interconnected space between the Indian Ocean and the Pacific Ocean. The area under discussion ranges from the east coast of Africa to the west coast of the United States, although with varying definitions depending on each actor and geographic position within the area covered. In a more functional understanding, the linkages and dependencies in the region between the two oceans are products of the dynamics of globalization and trade. The Indo-Pacific region has the most important sea routes in the world. Countries with dense populations trigger high energy demand and create global interests and political and economic centers (Das, 2019).

Four countries are considered to dominate the Indo-Pacific region. The four countries are the United States (US), Japan, India, and Australia. Furthermore, these four countries carried out an informal quadrilateral security dialogue initiative called Quadrilateral Security Dialogue. Therefore, these four countries have the term "Quad". As for ASEAN, a regional organization in the middle of the Indo-Pacific region, it has its views regarding the region, which are written in the "ASEAN Outlook on the Indo-Pacific". Of the five actors mentioned, three definitions are related to the Indo-Pacific. This difference occurs between the US, Japan-India-Australia, and ASEAN (Yansim, 2020).

The indo-Pacific region gained popularity when former US Secretary of State Hillary Clinton used the term in 2010 in her speech. Meanwhile, Australia was the first country to refer to Indo-Pacific in the official 2013 Defense White Paper document, which listed the term 58 times. Then in the 2017 Foreign Policy White Paper, there is a more specific definition regarding the Indo-Pacific region. According to Australian calculations, the Indo-Pacific extends from the eastern Indian Ocean to the Pacific, connected by Southeast Asia, home to nine of Australia's major trading partners (Galloway, 2021).

Regarding health security issues in this region, Australia is one of the countries that have initiatives to accommodate these issues. This can be seen from The Australian Government's Indo-Pacific Center for Health Security, established on 8 October 2017. This effort is a renewal of the Australian Government's efforts to strengthen regional pandemic preparedness, which began in 2005 under the government of John Howard in the form of the Asia-Pacific Strategy for Emerging Infectious Diseases (APSED) (Kamradt-Scott, 2018). With funding of $300 million from 2017-2022, The Australian Government's Indo-Pacific Center for Health Security is working to deliver evidence-based planning and policies to help prevent epidemics, strengthen early detection capacities, and support rapid and effective national and international outbreak responses (Australian Aids, 2022). In the context of Covid-19, this program has a role in supporting Australia's regional Covid-19 response. This effort began in 2020 to assist partner Australia in developing and implementing a national Covid-19 response plan, focusing on laboratory strengthening, surveillance, disease impact modeling, medical supplies and health emergency response training. This program also supports Australia's Covid-19 vaccine access to countries in the Pacific and Southeast Asia, with funding of $623 million until mid-2023. By mid-2022, Australia had distributed nearly 50 million Covid-19 vaccines to partner countries (Australian Aids, 2022).

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Soft Power Indonesian Vaccine Diplomacy

Over time, countries in the Indo-Pacific region are trying to break away from dependence on vaccines. One of them is what Indonesia is doing by trying to develop vaccines independently. As a result, Indonesia has now succeeded in producing its local vaccine called Indovac, which has obtained an emergency use permit. In addition, another type of vaccine made in Indonesia is named inavasc also ready to be distributed. The vaccine, which has another name, the red and white vaccine, is just waiting for an emergency use permit promised to be issued in early October 2022 (Kemensetneg Public Relations, 2022).

Since the beginning of the Covid-19 pandemic, Indonesia has carried out various types of vaccine diplomacy efforts in order to secure domestic vaccine stocks. Various types of efforts, such as through cooperation, both bilateral and multilateral. Indonesia has generally tried to procure vaccines through business, grants and collaboration schemes (Wangke, 2021). Meanwhile, the primary argument used by Indonesia in the early days of its Covid-19 vaccine diplomacy efforts was that health is the right of all human beings (Setiawan, Affinity, & Tanjung, 2022). However, all of these efforts have one factor that can complicate Indonesia's steps in fulfilling its national interests, particularly concerning the threat of Covid-19. This factor is a dependency because, in this case, Indonesia is still dependent on countries producing the Covid-19 vaccine.

With the presence of Indovac as a Covid-19 vaccine that is produced independently, Indonesia's vaccine diplomacy strategy has the potential to change for the better. Apart from avoiding dependence on producing countries, with its capabilities in the production sector, Indonesia can use vaccines as an instrument of soft power. Vaccines can help grow the image of Indonesia in a positive direction, such as by using vaccines for diplomatic goodwill in the context of humanitarian assistance (Bier & Arceneaux, 2020). Moreover, vaccine diplomacy is an exciting instrument to project soft or co-optation power, described by Nye (2008) as the ability to influence others to obtain desired results through attraction without coercion or payment.

In line with the potential for Indonesia's vaccine diplomacy explained previously, PT Biofarma, together with the Ministry of Health, continue to conduct studies to explore the possibility of the Indovac vaccine so that it can be given to children. Together with the Indonesian Ministry of Health, PT Biofarma has also held talks with WHO, looking at the possibility of Indovac being used for international donations to African countries with low vaccination coverage, such as Nigeria, Zimbabwe and Kenya (Tri Husodo, 2022). Biofarma supports Indonesia's vaccine diplomacy capability in developing Indonesian-produced vaccines.

PT Bio Farma is an Indonesian state-owned pharmaceutical company founded by the Dutch East Indies government on August 6, 1980. This company is the only vaccine manufacturer for humans in Indonesia and Southeast Asia's most prominent vaccine producer. In 2018, in order to welcome Indonesia as the Organization of Islamic Cooperation (OIC) Center of Excellence (CoE), Bio Farma has prepared concrete steps as a cooperation mechanism between OIC member countries (Bio Farma, 2022). Meanwhile, the OIC CoE is essential in supporting vaccine research and development and the availability of biotech products that are more

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efficient in anticipating unpredictable disease outbreaks (Arief, 2018). Basically, Bio Farma as a vaccine CoE provides its own potential for Indonesia, such as the opportunity to promote pharmaceutical products and encourage the independence of pharmaceutical products within the OIC framework. Another potential is encouraging collaboration between OIC countries to fulfill Indonesia's national interests (Iswati, Sari, Rezasyah, 2022). These two potentials can affect the hegemony of the power of the COVID-19 vaccine diplomacy in the Indo-Pacific region. The change in the hegemony of the strength of vaccine diplomacy can occur because Indonesia's capability in producing and distributing the COVID-19 vaccine through Bio Farma has increased the number of vaccine-producing countries in the Asia-Pacific region.

Opportunities & Challenges of Indonesian Vaccine Diplomacy in the Indo-Pacific Region

Indonesia can carry out vaccine diplomacy in the Indo-Pacific Region with the Indovac vaccine as soft power diplomacy. Based on the Dynamic analysis system, the vaccine diplomacy carried out by Indonesia can add one country every year. Under these conditions, by 2030, it is estimated that 11 out of 24 countries (about 46%) will be in the Indo-Pacific and will use the Indovac vaccine. The biggest challenges come from (i) countries that produce the Covid-19 vaccine, namely: the United States and India, and (ii) countries that are working with other countries to develop the Covid-19 vaccine, namely: Australia and Singapore.

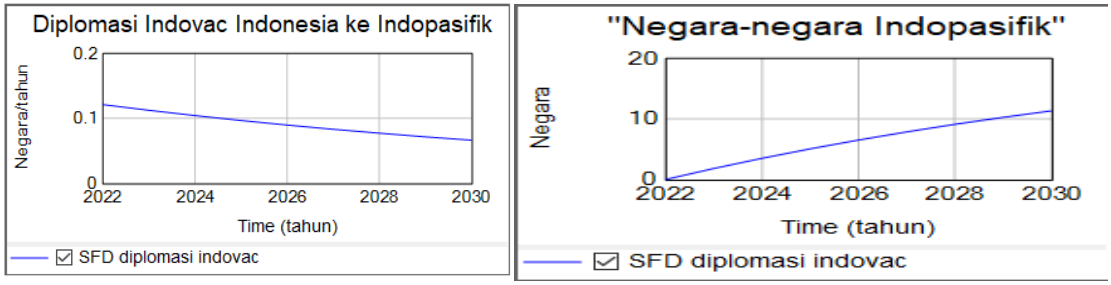

Figure 3: Indovac Vaccine Diplomacy Simulation in the Indo-Pacific Region

Suppose Indonesia develops vaccine science diplomacy through joint development of the Covid-19 vaccine and technology sharing. In that case, it is estimated that by 2030 there will be 17 countries (68%) will use the Covid-19 vaccine made by Indonesia. Joint development of vaccines is added by cooperating with 1 vaccine Development Company and, at the same time, sharing technology. While developing the Indovac vaccine, Indonesia collaborates with the Baylor College of Medicine laboratory in Houston, Texas, United States. In addition to sharing technology and vaccine development, this collaboration provides joint market opportunities in the Indo-Pacific. For this reason, it is better to add one partner in vaccine development with partners in the Indo-Pacific Region because it is also aimed at opening up a common market in addition to improving technology and supply of vaccines.

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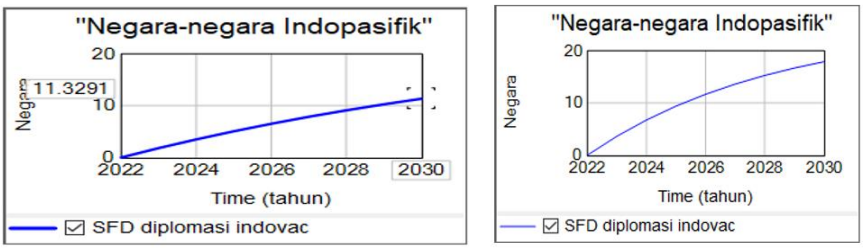
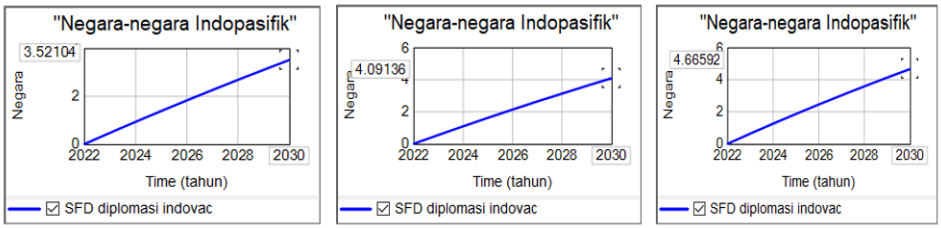


(i) early (ii) 2x

Figure 4: Parameter Simulation for Vaccine Science Diplomacy Development

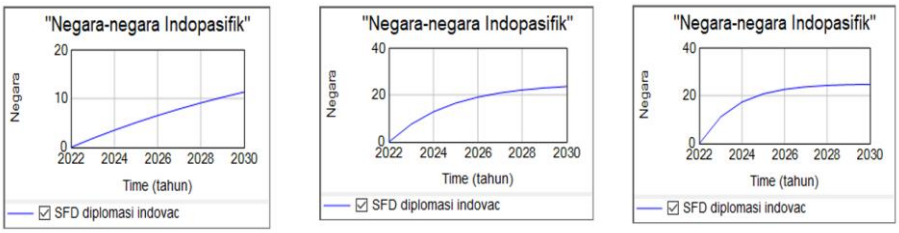
Another effort that can be made to increase consumer countries in the Indo-Pacific is to increase the availability of vaccines. Figure 5 below shows the simulation results of increasing vaccine production to provide vaccine stock/availability by adding 2 to 3 times. The simulation results show that if the availability of vaccines is increased up to 3 times, it will add 3 to 5 consuming countries. This addition is understandable because countries that will become consumers will certainly consider vaccine stocks from producers to ensure the continuous availability of vaccines.



(i) early (ii) 2x (iii) 3x

Figure 5: Parameter Simulation of Vaccine Production Addition

In the aspect of vaccine diplomacy, if the parameter of vaccine use is increased, the number of consuming countries in the Indo-Pacific will increase. Based on the simulation, all countries in the Indo-Pacific will use vaccines made in Indonesia if their use is increased by 10x (see figure ii). The subsequent increase will be stagnant, but the distribution of vaccines to countries in the Indo-Pacific will be faster. For example, if vaccine use is increased to 11x, distribution to all regions can be achieved in 2025.



(i) early (ii) 10x (iii) 11x

Figure 6: Parameter Simulation of Vaccine Use

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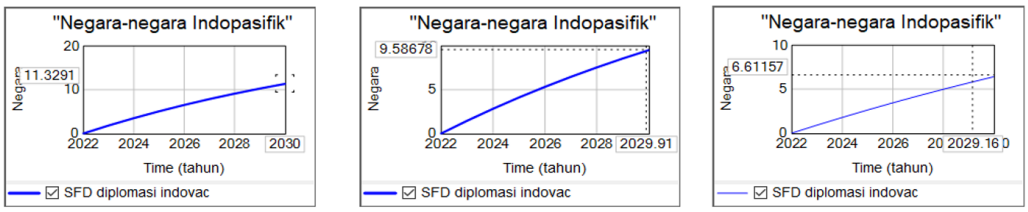
In the parameters of vaccine delivery, a two-fold increase will increase consumers in the country Indo Pacific up to 18 countries. Distribution to all regions will be achieved if the increase is made up to 4x.

(i) early **(ii) 2x** **(iii) 4x**

Figure 7: Simulation of Vaccine Delivery Parameters

Regarding cooperation between actors specifically dealing with Covid-19, Indonesia has collaborated with GAVI, COVAX, WHO and UNICEF. The simulation results from this collaboration will be able to distribute the Indovac vaccine to 11 countries in the Indo-Pacific. The consuming countries will decrease if cooperation is increased by adding 1 actor. If you add 1 actor, the consumer countries will drop to 9. If you add 2 actors, it will decrease to 7, and so on with the simulation results. This decline is understandable. For example, if Indonesia increases cooperation, the vaccines produced will be sent to the OI countries operating so that stocks for consumption in the Region Indo Pacific will decrease.



(i) early **(ii) +1** **(iii) +2**

Figure 8: Parameter Simulation Cooperation between Special Actors Covid-19

CONCLUSION

Indonesia has an excellent opportunity to develop vaccine diplomacy in the Indo-Pacific region. This is supported by several aspects, namely: (i) the category of countries in the Indo-Pacific Region, (ii) the vaccine diplomacy component, including parameters: vaccine use, vaccine delivery, cooperation with vaccine-specific partners, and vaccine production, and iii) vaccine science diplomacy in the form of joint development and sharing of vaccine technology.

Indonesia's opportunity to carry out vaccine diplomacy to Indo-Pacific countries is 46%, targeting countries that have not produced the Covid-19 vaccine itself, namely: Bangladesh, Bhutan, Brunei, Cambodia, Fiji, Japan, Laos, Malaysia, Maldives, Myanmar, Nepal, New Zealand, Papua New Guinea, Philippines, Sri Lanka, Taiwan, Thailand, Timor Leste, Vietnam.

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If Indonesia conducts vaccine science diplomacy with other vaccine companies, Indonesia's target will increase by 68%. If the availability of vaccines is multiplied up to 3x, it can increase consumer countries between 3-5 countries. Distribution across the region is possible If vaccine use is increased by 10x or vaccine delivery is increased by up to 4x. If vaccine use is increased by more than 10x, it will speed up distribution time throughout the Indo-Pacific. The challenge for Indonesia's vaccine diplomacy to the Indo-Pacific comes from vaccine-producing countries: the United States, India, Australia and Singapore, and if Indonesia cooperates with extraordinary actors in Covid-19.

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