



Vol 1 No 3 December 2023  
e-ISSN 2988-7283

## Original Research

# Factors Associated with Providing Complete Basic Immunization in Toddlers

Febry Handiny<sup>1\*</sup>, Meysi Neldian Tari<sup>2</sup>, Syalvia Oresti<sup>3</sup>

<sup>1,2</sup>Public Health, Alifah Health Science College, West Sumatera, Indonesia

<sup>3</sup>Nursing, Alifah Health Science College, West Sumatera, Indonesia

\*Email corresponding author: handiny.febry@gmail.com

## Abstract

Complete basic immunization (CBI) in toddlers is a crucial aspect of public health. It can protect children from infections that can kill or disable them. Nevertheless, the CBI is still low in the working area of Lubuk Buaya Public Health Center, standing at 49.7%, while the national target achievement is 95%, indicating a disparity of 45.3%. The purpose of this study was to determine the factors associated with the provision of complete basic immunization to toddlers in Pasia Nan Tigo Village, Lubuk Buaya Public Health Center Working Area. The type of research was quantitative with a cross-sectional design. The researchers conducted the study from March to August 2023. The population of this study were mothers who had toddlers who were residing in Pasia Nan Tigo Village, as many as 105 people. Accidental sampling was used to collect 51 respondents. We obtained data by questionnaire and interview. We analyzed the data using the chi-square test. The result found that 58.8% of respondents did not provide complete basic immunization to toddlers, 64.7% of respondents had a low level of knowledge, 60.8% of respondents did not have available facilities and infrastructure, 62.7% of respondents stated that the role of health workers was not satisfying, and 62.7% of respondents did not get family support. The level of knowledge, availability of facilities and infrastructure, the role of health workers, and family support were associated with the provision of complete basic immunization in toddlers. Knowledge, facilities and infrastructure, health workers, and family support are factors that can influence the provision of complete basic immunization for toddlers. It is expected for the head of the Lubuk Buaya Public Health Center to complete Integrated Healthcare Center tools such as reading materials, brochures, and leaflets so that Integrated Healthcare Center services can motivate cadres to change the mother's behavior.

**Keywords:** Support Family, Immunization Basic, Knowledge, Officer Health, Facilities and Infrastructure

## INTRODUCTION

Immunization is a very cost-effective health strategy that effectively avoids illness, disability, and mortality caused by communicable diseases (Efendi et al., 2020; Hargono et al., 2020). According to data provided by the World Health Organization (WHO), among the 194 nations surveyed, 65 of them have Diphtheria, Pertussis, and Tetanus (DPT) vaccine coverage that falls below the global objective of 90%. By 2022, it is projected that around 21.8 million children, or 1 in 5 globally, would not be vaccinated, putting their lives at risk. Due to limited access to health services and immunization, 14.3 million infants did not receive their initial dose of the diphtheria-tetanus-pertussis vaccine in 2022; an additional 6.2 million are only partially vaccinated. Sixty percent or less of the 20.5 million children reside in the Philippines, Angola, Brazil, the Democratic Republic of the Congo, Ethiopia, India, Indonesia, and Mozambique. Approximately 84 percent of infants globally (110 million) were immunized with three doses of the DTP vaccine in 2022. This immunization program provided protection against potentially fatal infectious diseases. However, these global statistics obscure the substantial disparity between nations of varying income levels, with low-income nations lagging behind. Globally, approximately 1.5 million children die each year from immunization-preventable diseases. Indonesia is a country with a large number of children who have not been fully immunized (World Health Organization, 2023).

The proportion of individuals in Indonesia who have received the CBI has declined since 2020. The national CBI stands at 84.2% in 2021. This number has failed to achieve the aim set in the 2021 Strategic Plan, which was 93.6%. This low coverage is due to services at health facilities being optimized for COVID-19 pandemic control. When viewed by province, there are 6 provinces that can achieve the 2021 Strategic Plan target, namely South Sulawesi, Bali, West Nusa Tenggara, DI Yogyakarta, Banten, and Bengkulu Provinces (Ministry of Health of Republic Indonesia, 2022)

The CBI in West Sumatra experienced a significant decrease from 76.18% in 2020 to 54.11% in 2021. In 2022, there was a slight increase to 59.8%. Nevertheless, it remains below the national benchmark of 95%. According to data from the Annual Performance Report of the West Sumatra Provincial Health Office, the coverage of complete basic immunization in 2021 is 42.80%. This figure has decreased from the previous year, namely, in 2020, when the coverage of complete basic immunization in West Sumatra Province was 62.6%. This happens because health workers are afraid to vaccinate children (targets) because there is a COVID-19 pandemic, and the community is afraid to go to health facilities (to health facilities when sick). Parents do not dare to immunize their children for fear of contracting COVID from health workers (Dinas Kesehatan Kota Padang, 2021).

According to the Padang City Health Agency report, the complete basic immunization coverage in 2021 will be 78.6%. Meanwhile, in 2020, the coverage of complete basic immunization was 62.6%; although this achievement increased from the previous year, it has not yet reached the target. This happens because health workers are afraid to vaccinate children (targets) during the COVID-19 pandemic, people are afraid to go to health facilities (to health facilities when sick), and parents do not dare to immunize their children for fear of contracting COVID from health workers (Padang Health Office, 2021). Based on data from the Padang Health Agency Office from 24 public health centers in Padang in 2021, there are two PHCs with the lowest achievement of complete basic immunization for toddlers, namely Lubuk Buaya PHC (49.7%) and Pegambiran PHC (52%). The Padang City Health Office targets 95% basic immunization for toddlers. From this data, it is known that complete basic immunization for toddlers is still low due to several influencing factors (Padang Health Office, 2021).

A previous study reported that 8 of the 34 provinces had incomplete immunization rates exceeding 50%. Approximately 40% of the 3264 children were incompletely immunized, among whom 45.3% were in urban areas and 54.7% were in rural areas in Indonesia (Hardhantyo & Chuang, 2021). Other research has established that the employment status, educational background, and attitudes of the mother are individual-level risk factors that contribute to child immunization (Chido-Amajuoyi et al., 2018; Farzad et al., 2017). In February 2023, researchers at the Lubuk Buaya Health Center conducted an initial survey and interviewed 10 mothers who have toddlers. The researchers found that out of the 10 mothers interviewed, 6 (60%) had not given complete basic immunization to their children. Among these 6 mothers, 4 (40%) were unaware of the benefits of complete basic immunization, and 5 (50%) did not receive support from their families due to fear of side effects causing fever in their children. 6 mothers (60%) stated the lack of health workers providing information regarding immunization schedules, and 5 mothers (50%) stated the lack of availability of facilities and infrastructure regarding immunization, so that mothers were too lazy to take their children to immunization. This study was to determine factors associated with the provision of complete basic immunization in toddlers.

## **METHODS**

This study was a quantitative study with a cross-sectional research design to determine the factors associated with the provision of complete basic immunization to toddlers. This research was conducted in Pasia Nan Tigo Village, Lubuk Buaya Health Center Working Area, Padang City, West Sumatera. This research was conducted in March–July 2023. The data collection was carried out in June 2023. Primary data was obtained by conducting interviews with respondents using a questionnaire to gather data about factors related to providing complete basic immunization to toddlers, including the mother's level of knowledge, the availability of facilities and infrastructure, the role of health workers, and family support. Secondary data was obtained from looking at the Maternal and Child Book (Buku KIA), Lubuk Buaya Community Health Center Profile, and target data for the Pasia Nan Tigo subdistrict of Lubuk Buaya Community Health Center, the aim of which was to see the provision of complete basic immunization in children. The population in this study were mothers who had toddlers who lived in Pasia nan tigo village, as many as 105 people. The sampling method was determined using the Slovin formula, so the sample consisted of 51 mothers with toddlers. Accidental sampling techniques were used in this study. Univariate analysis is used to see a picture of the variables studied, both independent variables, including level of knowledge, availability of facilities and infrastructure, role of officers, and family support, as well as the dependent variable, namely the provision of basic immunization. Research data is displayed in a frequency distribution. Bivariate analysis is used to see the relationship between two dependent variables and independent variables and to test hypotheses. Data analysis was carried out using the Chi square statistical test to see the relationship between variables using computerization.

## RESULTS

### a. Respondent Characteristics

Based on Table 1, it is known that the respondents to this study were mostly 25–35 years old (66.7%). Based on education, the most respondents are high school graduates, namely 23 people (45.1%). Based on employment status, the most respondents were housewives, namely 42 people (82.4%).

**Table 1.** Frequency Distribution of Respondent Characteristics Based on Age, Education, and Occupation in Pasia Nan Tigo Village, Lubuk Buaya Health Center Working Area

Respondent Characteristics	Frequency	Percentage (%)
<b>Ages</b>		
25-35	34	66,7
35-40	17	33,3
<b>Education</b>		
Not graduated elementary school / Graduated elementary school	5	9,8
Junior high school graduate	12	23,5
High school graduate	23	45,1
Academic / bachelor's degree	11	21,6
<b>Occupation</b>		
Not Working / Housewife	42	82,4
Private Employee/ Self-employed	2	3,9
Civil Servant	7	13,7
<b>Total</b>	<b>51</b>	<b>100,0</b>

*Data Source: Primary Data, 2023*

### b. Description of Respondents Based on Giving Complete Basic Immunization

Based on Table 2, it can be seen from 51 respondents that 30 mothers (58.8%) did not provide complete basic immunization to their toddlers. Out of 51 respondents, 33 mothers of toddlers (64.7%) have low knowledge of basic immunization, 31 mothers of toddlers (60.8%) stated the availability of facilities and infrastructure is not available for basic immunization, 32 mothers of toddlers (62.7%) stated the role of health workers is not good for the provision of basic immunization, and 32 mothers of toddlers (62.7%) did not get family support for basic immunization. Based on table 2, it can be seen from 51 respondents that 30 mothers (58.8%) did not provide complete basic immunization to their toddlers. Out of 51 respondents, 33 mothers of toddlers (64.7%) have low knowledge of basic immunization, 31 mothers of toddlers (60.8%) stated the availability of facilities and infrastructure is not available for basic immunization, 32 mothers of toddlers (62.7%) stated the role of health workers is not good for the provision of basic immunization, and 32 mothers of toddlers (62.7%) did not get family support for basic immunization.

**Table 2.** Frequency Distribution of Respondents Based on Giving Complete Basic Immunization; Knowledge Levels; Availability of Facilities and Infrastructure; Role of Health Workers; Family Support Pasia Nan Tigo Village, Lubuk Buaya Health Center Working Area

Variables	Frequency	Percentage (%)
<b>Basic Immunization Provision Complete</b>		
Incomplete	30	58.8
Complete	21	41.2
<b>Knowledge Level</b>		
Low	33	64.7
High	18	35.3
<b>Availability of Facilities and Infrastructure</b>		
Not Available	31	60.8
Available	20	39.2
<b>Role of health workers</b>		
Not good	32	62.7
Good	19	37.3
<b>Family Support</b>		
Not Supportive	32	62.7
Support	19	37.3
<b>Total</b>	<b>51</b>	<b>100,0</b>

*Data Source: Primary Data, 2023*

b. Factors Associated with Providing Complete Basic Immunization for Children

The results of the analysis show that the proportion of incomplete basic immunizations for toddlers is higher among respondents with a low knowledge level, as many as 25 (75.8%), compared to a high knowledge level of 7 (27.8%). Based on the results of the Chi-square test, the p-value = 0.002 ( $p < 0.05$ ) means that there is a significant relationship between the level of knowledge and the provision of complete basic immunization in toddlers. The proportion of incomplete basic immunizations for toddlers is higher among respondents, with the availability of facilities and infrastructure not being available to as many as 23 (74.2%) compared to the availability of facilities and infrastructure available to 7 (35.0%). Based on the results of the Chi-square test, the p-value = 0.013 ( $p < 0.05$ ) means that there is a significant relationship between the availability of facilities and infrastructure and the provision of complete basic immunization in toddlers. The proportion of incomplete basic immunization for toddlers is higher in respondents with a poor role of health workers, as many as 23 (71.9%), compared to the role of good health workers by 7 (36.8%). Based on the Chi-square test results, the p-value = 0.030 ( $p < 0.05$ ) means that there is a significant relationship between the role of health workers and the provision of complete basic immunization in toddlers. The proportion of incomplete basic immunizations for toddlers is higher in respondents with unsupportive families, as many as 24 (75.0%) compared to respondents who received family support, 6 (31.6%). Based on the Chi-square test, the p-value = 0.006 ( $p < 0.05$ ) means that there is a significant relationship between family support and the provision of complete basic immunization in toddlers.

**Table 3.** Relationship between Level of Knowledge, Availability of Facilities and infrastructure, Role of health workers, Family support and the provision of Complete Basic Immunization in Toddlers in Pasia Nan Tigo Village, Lubuk Buaya Health Center Working Area

Variables	Providing of complete basic immunization for				Total		P-Value
	Incomplete		Complete		f	%	
	f	%	f	%			
<b>Knowledge Level</b>							
High	25	75,8	8	24,2	33		0,002
Low	5	27,8	13	72,2	18	100,0	
<b>Availability of Facilities and Infrastructure</b>							
Not available	23	74,2	8	25,8	31	100,0	0,013
Available	7	35,0	13	65,0	20	100,0	
<b>Role of health workers</b>							
Not good	23	71,9	9	28,1	32	100,0	0,030
Good	7	36,8	12	63,2	19	100,0	
<b>Family Support</b>							
Not supportive	24	75,0	8	25,0	32	100,0	0,006
Support	6	31,6	13	68,4	19	100,0	
<b>Total</b>	30	58,8	21	41,2	51	100 0	

Source: Primary Data, 2023

## DISCUSSIONS

Several studies have investigated the correlation between knowledge level and complete basic immunization. One study conducted in Indonesia found a significant relationship between maternal knowledge and the completeness of providing basic immunization (Rahmaningrum et al., 2020). Another study conducted in Pakistan found a significant relationship between the number of siblings and the knowledge level of parents regarding immunization (Jelly et al., 2023). In addition, a study conducted in Medan City, Indonesia, found that mothers with a high education level were more likely to have high knowledge regarding immunization than mothers with a low education level (Elbert et al., 2023). The same study also found that mothers with low to moderate knowledge regarding immunization were less likely to have completed their child's immunization. These findings suggest that knowledge level plays an important role in the completeness of basic immunization. Improving knowledge and awareness regarding immunization can help increase immunization coverage and prevent the spread of vaccine-preventable diseases. Therefore, it is important to continue educating the public about the importance of immunization and to address any misconceptions or concerns they may have.

Multiple studies have established a correlation between the availability of facilities and infrastructure and the CBI. Here are some key findings from these studies: A study conducted in India found a positive association between the presence of a Urban Health Center (UHC) and the immunization status of children in slums (Ghei et al., 2010). Another study in India found that the infrastructure quality index was positively associated with the completion of seven vaccination outcomes, including full immunization (Summan et al.,

2022). A study in Somalia found that several factors, including the availability of vaccines and health infrastructure, were barriers to achieving full immunization coverage (Mohamud Hayir et al., 2020). A study in Indonesia found that the availability of hospitals and village health posts positively influenced immunization coverage (Holipah et al., 2018). These findings suggest that the availability of facilities and infrastructure plays a significant role in the completion of basic immunization. Improving the quality of health facilities and infrastructure can help increase immunization coverage and prevent the spread of vaccine-preventable diseases. Therefore, it is crucial to invest in and strengthen health facilities and infrastructure to improve immunization rates. The availability of posyandu facilities and infrastructure affects the provision of complete basic immunization to toddlers in Pasia Nan Tigo Village, Lubuk Buaya Health Center working area. The availability of complete infrastructure facilities makes cadres more active in carrying out their duties in posyandu activities. Complete infrastructure also improves health services so that posyandu targets can get good health services and can be healthy, and one of the causes of posyandu facilities and infrastructure is the awareness of cadres in caring for the tools that have been owned by posyandu.

The role of health workers has a significant impact on the completion of basic immunization. Healthcare workers (HCWs) are particularly exposed to and play a role in nosocomial transmission, making them an important target group for vaccination (Haviari et al., 2015). A study in Somalia found that the availability of vaccines and health infrastructure, including the responsibilities of community health workers (CHWs), was a barrier to achieving full immunization coverage (Gibson et al., 2023). In addition, a study conducted in Indonesia revealed a relationship between health workers' support and the completeness of providing basic immunization, emphasizing the influence of health workers on immunization coverage (Rahmaningrum et al., 2020). The Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC) recommend that all healthcare workers should be immune to certain diseases to safeguard their health and protect patients from potential infection (Centers for Disease Control and Prevention (CDC), 2017). Furthermore, community health workers play a vital role in promoting immunization and educating communities about the importance of vaccines (Wallis, 2023). These findings underscore the crucial role of health workers, including healthcare and community health workers, in ensuring the completion of basic immunization and preventing the spread of vaccine-preventable diseases. Health workers for immunization programs are usually sent from the public health center, usually doctors or midwives, more specifically village midwives. Patients or the community assess the quality of good health services as health services that are empathetic, respectful, and responsive to their needs. The services provided must be in accordance with the needs of the community and given in a friendly way when visiting (Wiyono, 2019). The role of health workers has a significant relationship with the provision of complete basic immunization in toddlers. This is because health workers are human resources who are the main support for health services. Health workers should be the closest people who are able to convey all knowledge and maintain good reciprocity. Existing health workers can explain the importance of immunization, carry out routine immunization schedules, and provide intensive counseling to motivate mothers to immunize their children. They can also carry out equity and approaches in immunization services by checking at home if the mother does not go to immunize her child.

The correlation between family support and complete basic immunization has been found to be significant in several studies. A study conducted in Indonesia found a

relationship between family support and the completeness of providing basic immunization (Rahmaningrum et al., 2020). The study revealed that mothers who received support from their families were more likely to have children who completed the immunization process. Another study conducted in Medan City, Indonesia, found that mothers with a high education level were more likely to have high knowledge regarding immunization than mothers with a low education level (Elbert et al., 2023). Since family support can influence a mother's decision-making process and access to healthcare services, it is plausible that family support could also impact the completion of basic immunization. In summary, the correlation between family support and complete basic immunization suggests that family support plays a significant role in ensuring that children receive the necessary vaccinations. Strengthening family support and addressing any barriers to accessing healthcare services can help improve immunization coverage and prevent the spread of vaccine-preventable diseases. A lack of family support makes most mothers in Pasia Nan Tigo Village, Lubuk Buaya Health Center working area, not provide complete immunization to their children. Likewise, on the contrary, some mothers who provide complete basic immunization to children because they get support from their families, especially husbands, mothers, in-laws, and relatives who always provide information about the importance of immunization, remind immunization schedules, are willing to deliver and accompany the mothers to the posyandu.

## CONCLUSIONS

There is a relationship between the mother's knowledge level, the availability of facilities and infrastructure, the role of health workers, and family support for the provision of complete basic immunization to toddlers in Pasia Nan Tigo Village, Lubuk Buaya Health Center Working Area. It is hoped that the head of the Community Health Center will equip the posyandu with tools such as reading materials, brochures, and leaflets so that the posyandu service can motivate cadres to change the behavior of cadre performance for the better and that this posyandu service activity is not just running, but the benefits of this posyandu can be felt by the community. Future researchers should be able to conduct more in-depth research on other factors related to providing complete basic immunization, such as human resources and health services.

## ACKNOWLEDGEMENT

The researcher would like to thank the lecturers and staff of STIKes Alifah Padang. The Padang City Health Office and Lubuk Buaya Health Center for providing data and information related to research, as well as all respondents who have participated during the research data collection process.

## REFERENCES

- Centers for Disease Control and Prevention (CDC). (2017). *Immunization of Health-Care Workers: Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC)*. <https://www.cdc.gov/mmwr/preview/mmwrhtml/00050577.htm>
- Chido-Amajuoyi, O. G., Wonodi, C., Mantey, D., Perez, A., & Mcalister, A. (2018). Prevalence and correlates of never vaccinated Nigerian children, aged 1–5 years. *Vaccine*, 36(46), 6953–6960.



- Dinas Kesehatan Kota Padang. (2021). *Profil Kesehatan Kota Padang Tahun 2021*. Dinas Kesehatan Kota Padang.
- Efendi, F., Pradiptasiwi, D. R., Krisnana, I., Kusumaningrum, T., Kurniati, A., Sampurna, M. T. A., & Berliana, S. M. (2020). Factors associated with complete immunizations coverage among Indonesian children aged 12–23 months. *Children and Youth Services Review*, *108*, 104651. <https://doi.org/10.1016/j.childyouth.2019.104651>
- Elbert, B., Zainumi, C. M., Pujiastuti, R. A. D., Yaznil, M. R., Yanni, G. N., Alona, I., & Lubis, I. N. D. (2023). Mothers' knowledge, attitude, and behavior regarding child immunization, and the association with child immunization status in Medan City during the COVID-19 pandemic. *IJID Regions*, *8*(Suppl), S22-6. <https://doi.org/10.1016/j.ijregi.2023.03.014>
- Farzad, F., Reyer, J. A., Yamamoto, E., & Hamajima, N. (2017). Socio-economic and demographic determinants of full immunization among children of 12–23 months in Afghanistan. *Nagoya Journal of Medical Science*, *79*(2), 179.
- Ghei, K., Agarwal, S., Subramanyam, M. A., & Subramanian, S. V. (2010). Association Between Child Immunization and Availability of Health Infrastructure in Slums in India. *Archives of Pediatrics & Adolescent Medicine*, *164*(3), 243–249. <https://doi.org/10.1001/archpediatrics.2009.277>
- Gibson, E., Zameer, M., Alban, R., & Kouwanou, L. M. (2023). Community Health Workers as Vaccinators: A Rapid Review of the Global Landscape, 2000-2021. *Global Health, Science and Practice*, *11*(1), 1–23. <https://doi.org/10.9745/GHSP-D-22-00307>
- Hardhantyo, M., & Chuang, Y.-C. (2021). Urban-rural differences in factors associated with incomplete basic immunization among children in Indonesia: A nationwide multilevel study. *Pediatrics & Neonatology*, *62*(1), 80–89. <https://doi.org/https://doi.org/10.1016/j.pedneo.2020.09.004>
- Hargono, A., Megatsari, H., Artanti, K. D., Nindya, T. S., & Wulandari, R. D. (2020). Ownership of Mother and Children's Health Book and Complete Basic Immunization Status in Slums and Poor Population. *Journal of Public Health Research*, *9*(2), [jphr.2020.1809](https://doi.org/10.4081/jphr.2020.1809). <https://doi.org/10.4081/jphr.2020.1809>
- Haviari, S., Bénet, T., Saadatian-Elahi, M., André, P., Loulergue, P., & Vanhems, P. (2015). Vaccination of healthcare workers: A review. *Human Vaccines & Immunotherapeutics*, *11*(11), 2522–2537. <https://doi.org/10.1080/21645515.2015.1082014>
- Holipah, Maharani, A., & Kuroda, Y. (2018). Determinants of immunization status among 12- to 23-month-old children in Indonesia (2008–2013): a multilevel analysis. *BMC Public Health*, *18*(1), 288. <https://doi.org/10.1186/s12889-018-5193-3>
- Jelly, P., Jeenwal, N., Wadhwa, N., Kumari, N., Kumari, P., Mathur, P., Yadav, P., Nautiyal, P., Maurya, P., Sarwan, P., & Sharma, R. (2023). Knowledge, Attitude, compliance and barriers of immunization among Parents' of under-five children. *International Journal of Africa Nursing Sciences*, *19*, 100608. <https://doi.org/https://doi.org/10.1016/j.ijans.2023.100608>
- Ministry of Health of Republic Indonesia. (2022). *Indonesia Health Profile 2021*. Ministry of Health of The Republic of Indonesia.
- Mohamud Hayir, T. M., Magan, M. A., Mohamed, L. M., Mohamud, M. A., & Muse, A. A. (2020). Barriers for full immunization coverage among under 5 years children in Mogadishu, Somalia. *Journal of Family Medicine and Primary Care*, *9*(6), 2664–2669. [https://doi.org/10.4103/jfmpe.jfmpe\\_119\\_20](https://doi.org/10.4103/jfmpe.jfmpe_119_20)

- Rahmaningrum, H., Harmayetty, Yasmara, D., & Krisnana, I. (2020). Factors Analysis Related to the Completeness of Providing Basic Immunization in Infant Aged 12 Months. *Medico-Legal Update*, 20(3), 531–537. <https://doi.org/https://doi.org/10.37506/mlu.v20i3.1453>
- Summan, A., Nandi, A., Schueller, E., & Laxminarayan, R. (2022). Public health facility quality and child immunization outcomes in rural India: A decomposition analysis. *Vaccine*, 40(16), 2388–2398. <https://doi.org/10.1016/j.vaccine.2022.03.017>
- Wallis, L. (2023). “*Emotional and Connected*”: *The Role of Community Health Workers in Promoting Immunization*. <https://www.wspha.org/blog--emotional-and-connected---the-role-of-community-health-workers-in-promoting-immunization>
- Wiyono, D. (2019). *Manajemen Mutu Pelayanan Kesehatan Teori Strategi dan Aplikasi*. Airlangga University Press.
- World Health Organization. (2023). *Immunization Coverage*. <https://www.who.int/news-room/fact-sheets/detail/immunization-coverage>