BirEx JOURNAL
Budapest International Research in Exact Sciences
Medical, Biological, Argiculture, Engineering
Science and other related areas
e-ISSN : 2655-7827
p-ISSN : 2655-7835
http://www.bircu-journal.com/index.php/birex

Determinants of Complete Basic Immunization in Children Aged 12-23 Months in Indonesia

Nur Najikhah[1], Nurjannah[2], Mudatsir[3], Said Usman[4], Irwan Saputra[5]
[1,2,3,4,5]*Department of Public Health, Faculty of Medicine, Universitas Syiah Kuala, Indonesia*

Abstract: *Complete basic immunization is an effort to prevent disease outbreaks by carrying out complete immunizations with a predetermined schedule and dose, complete basic immunization coverage is one of the five priority health issues in Indonesia, complete basic immunization coverage in Indonesia in 2018 has decreased by 57, 9%, compared to 2013 which was 59.2%. This study identifies the problem of decreasing complete basic immunization coverage based on maternal, child and socio-economic determinants. This study aims to identify the relationship and distribution of complete basic immunization mapping based on maternal age, place of delivery, number of ANC, the child, child's gender, parent's education, parent's occupation and place of residence. Research Methods: The method used is cross-sectional with a total sampling of 6849 respondents. Statistical analysis used was chi square test and logistic regression test was performed using SPSS 24 and thematic maps were generated by ArcGIS. The results of the chi-square test found that there was a relationship between place of delivery, number of ANC, th child, parents' education, parents' occupation, place of residence with complete basic immunization ($p \leq 0.05$), had no relationship between maternal age and gender with complete basic immunization ($p \geq 0.05$), based on logistic regression test the number of ANC was obtained with ($p \leq 0.05$) and based on the mapping of immunization coverage of the third highest category in Central Java, West Nusa Tenggara and East Kalimantan. While the three lowest categories are in the DI Yogyakarta, West Kalimantan and Papua regions. The most dominant factor associated with complete basic immunization is the number of ANC.*

Keyword: *spatial; determinant; complete basic immunization*

I. Introduction

Health is a very important element of the quality of life in national development. The national health system has established that the goal of health development is to increase awareness, willingness, and ability to live healthy for everyone so that a high degree of public health can be realized - high human resources, as an investment for socially and economically productive development (Health Law No. 36 of 2009) (Hasibuan, S. et al. 2020).

Immunization is one of the global health efforts and also one of the best health investments to save millions of lives every year, immunization can prevent 2-3 million deaths every year caused by diseases: diphtheria, tetanus, pertussis, polio and measles by carrying out basic immunizations, namely : HB-0, BCG, DPT-HB, Polio and Measles. However, despite these advances there are still nearly 20 million babies each year who do not have adequate access to immunization (World Health Organization (WHO), 2019b).

Based on data from the World Health Organization (WHO) in 2019, globally, 5.7 million babies in the world did not get complete immunizations. Based on the type of basic immunization coverage according to WHO data, the lowest immunization coverage was HB-0 immunization which was obtained as much as 43%, but the polio immunization coverage obtained in the western region was the highest at 84% and the lowest was in Africa, namely 6% while globally the coverage of polio immunization has a fairly good immunization

coverage reaching 82%. WHO also stated that of 19.7 million children under one year did not receive complete basic immunization, 60% came from 10 middle or lower middle economic countries, with complete basic immunization coverage found in Angola 53.8%, Brazil 87.9 %, Congo, 59.8%, 46.4%, Pakistan 62.4% and the Philippines 57.2% and Indonesia is one of the countries with a middle economy and also an ASEAN state, which obtained immunization coverage in the ASEAN part of which, Malaysia was 98.4%, Singapore 94, 4%, Thailand 95%, Brunei Darussalam 98.8%, Vietnam 70.8%, Laos 66.4%, Myanmar 88.2%, Cambodia 86.2% and the Philippines 57.2%, Indonesia and the Philippines are countries with middle and lower middle economies (World Health Organization (WHO), 2019a).

Based on Riskesdas data in 2018 nationally, complete basic immunization coverage decreased by 57.9% compared to the previous year, namely in 2013 it was obtained as much as 59.2%. Based on each type of basic immunization in 2013 the lowest proportion of DPT-HB immunization was 75.6%, then there was a slight difference followed by polio immunization as much as 77%, HB-0 immunization as much as 79.1% measles immunization 82.1% and the highest coverage of BCG immunization is 87.6%. Whereas in 2018 the lowest proportion was also found in DPT-HB immunization, which was 61.3%, then there was a slight difference in the coverage of polio immunization, which was 67.6%, measles immunization was 77.3%.

Based on Riskesdas data in 2018, the history of immunization in children aged 12-23 months was 72.1% and based on the determinants of complete basic immunization, namely the maternal determinants obtained at the place of delivery, the highest was in health facilities as many as 79.6%, and mothers who gave birth at home obtained as many as 16.9% and mothers who performed ANC at least 4 times during pregnancy obtained as many as 74.1%, while the determinants of children were found in the sex of the child. women have a higher proportion as much as 58.7% while in men as much as 57.2%, on socio-economic determinants the highest parental education is found in parents with high school education as much as 61.9% while the lowest is in adults parents who do not go to school are 50.3%, the highest proportion of complete basic immunizations in Indonesia is found in parents who work as civil servants/police/TNI/BUMN/BUMD, which is 68.5%, while the lowest is fisherman as many as 42,0% and also based on the highest place of residence, urban areas were found to be 61.5%, while rural areas were 53.8% (Indonesian Health Research and Development Agency, 2018).

Based on the data above, it was found that the coverage of basic immunization was not as expected, in the sense that the provision of basic immunization was still in the poor category. Efforts that have been made globally to increase coverage of complete basic immunization are: helping all countries to make immunization a priority, which means WHO sets national targets and plans by allocating adequate human and financial resources, providing support to communities to understand that immunization is a rights and responsibilities, develop plan to ensure everyone gets immunized, strengthen the immunization system increase funding for immunization and ensure a vaccine supply system (World Health Organization (WHO), 2019b).

Efforts are being made nationally to increase the coverage of complete basic immunization, namely through the Healthy Indonesia Approach with a Family Approach (PIS-PK) program, in this program efforts are made through promotive and preventive measures by conducting home visits to complete immunization status and providing information or counseling on parents, empowering the community through cadres at posyandu and cross-sectoral involvement to provide outdoor services (Gianyar, 2020).

Based on the data and efforts that have been made to increase the coverage of complete basic immunization, it can be concluded that although there are programs related to increasing complete basic immunization coverage, the provision of complete basic immunization is still in the poor category, as evidenced by complete basic immunization coverage being one of the 5 priority health issues. In this case, the researcher wants to identify the problem of decreasing

complete basic immunization coverage based on the determinants of complete basic immunization, namely maternal determinants, child determinants and socio-economic.

Determinants of complete basic immunization using secondary data, namely Raw data from Riskesdas in 2018 and mapping with spatial analysis in the territory of Indonesia, then based on the Riskesdas questionnaire, several determinants of maternal, child and socio-economic determinants were found which were in line with research conducted by Antai in In 2010 and Russo in 2015 the determinants of the mother were obtained, including: maternal age, Antenatal Care and place of delivery, while the determinants of the child were found: gender, child th child and child immunization records, in socio-economic terms obtained: parental education, parental occupation and residence (Antai, 2010; Russo et al., 2015).

II. Review of Literature

2.1 Immunization

Immunization is the origin of the word immune, namely immune or resistant, which means immune or resistant to a disease, but not necessarily immune or resistant to other diseases. Immunization is also an effort made to actively increase immunity against a disease, so that if exposed to the disease you do not experience illness or only mild illness (Ministry of Health of the Republic of Indonesia, 2014a).

Complete basic immunization is an effort to prevent the spread of certain diseases, namely diseases that can be prevented by immunization (PD3I) including Hepatitis B, Tuberculosis, Diphtheria, Pertussis, Tetanus, Polio and Measles which are part of complete basic immunization (Ministry of Health of the Republic of Indonesia, 2014b) .

In 2017 WHO set a theme for the immunization-related campaign, namely “Together we can make vaccines work for everyone” with the hashtag #VaccinesWork which aims to increase public awareness of the importance of complete basic immunization (World Health Organization (WHO), 2017).

2.2. Aim

Immunization aims to stimulate (stimulate) the individual's immune system so that it can produce antibodies so that it can fight infection certain diseases by weakening the antigens that have been obtained from immunization, one of which is basic immunization (Ministry of Health of the Republic of Indonesia, 2014a).

Basic immunization aims to protect a person from the occurrence of a disease that can be prevented by immunization (PD3I). Based on the 2017 Minister of Health, it was found that immunization in Indonesia aims to reduce morbidity, disability and mortality rates caused by diseases that can be prevented by immunization (PD3I), specifically on basic immunization aims to achieve several targets, including: the RPJMN target of 93 % and UCI, which is at least 80% in all villages/kelurahan in Indonesia. (Minister of Health Regulation, 2017)

III. Research Method

This study uses an analytical research design to determine the relationship between two variables with an observational approach as an observation, because this study uses available secondary data and the variables used are collected at the same time.

IV. Discussion

This research was conducted by Riskesdas on children aged 12-23 months in Indonesia in 2018, this data was obtained through the Indonesian data management laboratory in March 2021 with a total sample of 6,849 respondents. In this study there were 8 independent variables

consisting of three determinants, namely: maternal determinants, child determinants and socio-economics. Maternal determinants consist of: maternal age, place of delivery, number of ANC. The determinants of the child consist of: the th child, gender and socioeconomic consisting of: parents' education, parents' occupation and place of residence, as well as one dependent variable, namely: complete basic immunization. The results of this study consist of statistical analysis: univariate, bivariate and multivariate and spatial analysis, as follows:

4.1 Univariate Analysis

Unvaried analysis is an analysis conducted to determine the frequency distribution of each independent and dependent variable. The results of the univariate analysis are as follows:

Table 1. Frequency Distribution of Complete Basic Immunization Determinants in Children aged 12-23 Months in Indonesia (n= 6849)

Variable	*f*	%
Mother's Age		
40 years	596	8.7
30-39 years old	3266	47.7
29 years old	2897	43.6
Total	6849	100
Number of ANC		
0 times	546	8.0
1-3 times	1248	18.2
4 times	5055	73.8
Total	6849	100
Place of Delivery		
Home/non-health facilities	1875	27.4
Medical facility	4974	72.6
Total	6849	100
Child Gender		
Man	3543	51.7
Woman	3306	48.3
Total	6849	100
What order do you come in your family-		
5-next	1025	15.0
3-4	2831	41.3
1-2	2993	43.7
Total	6849	100
Parental Education		
Basic education	2224	32.5
Middle education	3705	54.1
Higher education	920	13.4
Total	6849	100
Parents' job		
Does not work	158	2.3
Farmers/Fishermen/Labourers/Drivers/ PRT	3700	54.0
Private employee/Entrepreneur	2523	36.8
PNS/TNI/POLRI/BUMN/BUMD	468	6.8

Total	6849	100
Residence		
Rural	4137	60.4
Urban	2712	39.6
Total	6849	100
Complete Basic Immunization		
Incomplete	5658	82.6
Complete	1191	17.4
Total	6849	100

Data source: Indonesian Data Management Laboratory (Riskesdas 2018)

Based on socio-economic determinants, it was found that parents with the most secondary education were 54.1%, but in parental occupations, the most parents worked as farmers/fishermen/laborers/drivers/domestic workers were 54.0% and parents and children who lived more in rural areas, namely 60.4% compared to parents and children living in urban areas. So it was found that incomplete basic immunization had the highest proportion, namely 82.6%.

4.2 Bivariate Analysis

The results of the bivariate analysis in this study are as follows:

a. Maternal Age Relationship with Complete Basic Immunization

Table 2. Relationship of Maternal Age with Complete Basic Immunization in Children aged 12-23 Months in Indonesia (n= 6849)

Mother's Age	**Immunization Base**				**Total (%)**	**OR**	**95 % CI**	***P-Value***
	Incomplete	**%**	**Complete**	**%**				
40 years	481	80.7	115	19.3	596 (100)		-	
30-39 years old	2706	82.9	560	17.1	3266 (100)	0.86	0.69 - 1.08	0.434
29 years old	2471	82.7	516	17.3	2987 (100)	0.87	0.70 - 1.10	
Total	5658	82.6	1191	17.4	6849 (100)		-	

Data source: Indonesian Data Management Laboratory (Riskesdas 2018)

Based on the results of statistical analysis, it was found that mothers aged 30-39 years were 1.16 times less likely to carry out complete basic immunization for their children compared to mothers aged 40 years and maternal age category 29 years 1.14 times tend not to carry out complete basic immunization compared to mothers who aged 40 years with a significant p-value = 0.434, which means that there is no relationship between maternal age and complete basic immunization in children aged 12-23 months in Indonesia.

b. Relationship between ANC Number and Complete Basic Immunization

Table 3. Relationship of Maternal Age with Complete Basic Immunization in Children aged 12-23 Months in Indonesia (n= 6849)

Mother's Age	Immunization Base				Total (%)	OR	95 % CI	*P-Value*
	Incomplete	%	Complete	%				
40 years	481	80.7	115	19.3	596 (100)		-	
30-39 years old	2706	82.9	560	17.1	3266 (100)	0.86	0.69 - 1.08	0.434
29 years old	2471	82.7	516	17.3	2987 (100)	0.87	0.70 - 1.10	
Total	5658	82.6	1191	17.4	6849 (100)		-	

Data source: Indonesian Data Management Laboratory (Riskesdas 2018)

Based on the results of statistical analysis, it was found that mothers aged 30-39 years were 1.16 times less likely to carry out complete basic immunization for their children compared to mothers aged 40 years and maternal age category 29 years 1.14 times tend not to carry out complete basic immunization compared to mothers who aged 40 years with a significant p-value = 0.434, which means that there is no relationship between maternal age and complete basic immunization in children aged 12-23 months in Indonesia

c. Relationship between ANC Number and Complete Basic Immunization

Table 4. Relationship between ANC Number and Complete Basic Immunization in Children aged 12-23 Months in Indonesia (n= 6849)

AmountANC	Immunization Base				Total (%)	OR	95 % CI	*P-Value*
	No Complete	%	Complete	%				
0 times	530	97.1	16	2.9	546 (100)		-	
1-3 times	1120	89.7	128	10.3	1248 (100)	3.79	2.23 - 6.43	0.000
4 times	4008	79.3	1047	20.7	5055 (100)	8.65	5.29 - 14.3	
Total	5658	82.6	1191	17.4	6849 (100)		-	

Data source: Indonesian Data Management Laboratory (Riskesdas 2018)

Based on the results of statistical analysis, it was found that mothers who performed ANC 1-3 times 3.79 were more likely to carry out complete basic immunizations for their children compared to Mother who did not do ANC at all and mothers who did ANC 4 times 8.65 times more likely to carry out complete basic immunization for their children compared to mothers who did not do ANC with a significant p-value = 0.000, which means there is a relationship between the number of ANC with complete basic immunization in children aged 12-23 months in Indonesia.

d. Sex Relationship with Complete Basic Immunization

Table 5. Relationship of Sex with Complete Basic Immunization in Children aged 12-23 Months in Indonesia (n= 6849)

Child Gender	Immunization Base				Total (%)	OR	95 % CI	*P-Value*
	Incomplete	%	Complete	%				
Man	2922	82.5	621	17.5	3543 (100)	-		
Woman	2736	82.8	570	17.2	3306 (100)	0.98	0.87 - 1.11	0.774
Total	5658	82.6	1191	17.4	6849 (100)	-		

Data source: Indonesian Data Management Laboratory (Riskesdas 2018)

Based on the results of statistical analysis, it was found that female children were 1.02 times more likely not to have complete basic immunizations compared to male children with a significant p-value = 0.774, which means that there is no sex relationship with basic immunization. Complete in children aged 12-23 months in Indonesia.

e. The Relationship of the Third Child with Complete Basic Immunizations

Table 6. Relationship of the Child with Complete Basic Immunization in Children Aged 12-23 Months in Indonesia (n= 6849)

What order do you come in your family-	Immunization Base				Total (%)	OR	95 % CI	*P-Value*
	Incomplete	%	Complete	%				
5-next	872	85.1	153	14.9	1025 (100)	-		
3-4	2355	83.2	476	16.8	2831 (100)	1.15	0.95 - 1.40	0.011
1-2	2431	81.2	562	18.8	2993 (100)	1.32	1.08 _ 1.60	

Total	5658	82.6	1191	17.4	6849 (100)	-

Data source: Indonesian Data Management Laboratory (Riskesdas 2018)

Based on the results of statistical analysis, it was found that children with a birth order of 3-4, 1.15 times more likely to have complete basic immunizations compared to children with a birth order of 5th - onwards and children with a birth order of 1-2 were 1.32 times more likely Complete basic immunization was carried out with a significant p-value = 0.011, which means that there is a relationship between the th child and complete basic immunization in children aged 12-23 months in Indonesia.

f. Relationship between Parental Education and Complete Basic Immunization

Table 7. Relationship between Parental Education and Complete Basic Immunization in Children aged 12-23 Months in Indonesia (n= 6849)

Education Parent	**Immunization Base**				**Total (%)**	**OR**	**95 % CI**	***P-Value***
	No Complete	**%**	**Complete**	**%**				
Educationbase	1916	86.2	308	13.8	2224 (100)	-		
Education medium	3028	81.7	677	18.3	3705 (100)	1.39	1.20 – 1.61	0.000
Educationtall	714	77.6	206	22.4	920 (100)	1.79	1.47 – 2.18	
Total	5658	82.6	1191	17.4	6849 (100)	-		

Based on the results of statistical analysis, it was found that parents with secondary education were 1.39 times more likely to carry out complete basic immunization for their children compared to parents with basic education and parents with higher education were 1.79 times more likely to carry out complete basic immunizations for their children with a significant p-value = 0.000, which means that there is a relationship between parental education and complete basic immunization in children aged 12-23 months in Indonesia.

g. Parental Employment Relationship with Complete Basic Immunization

Table 8. Relationship between Parental Occupation and Complete Basic Immunization for Children Aged 12-23 Months in Indonesia (n= 6849)

Parents' job	**Immunization Base**				**Total (%)**	**OR**	**95 % CI**	***P-Value***
	No Complete	**%**	**Complete**	**%**				
Does not work	134	84.8	24	15.2	468 (100)	-		

Farmer/Nela-yan/Labourer/ Driver/PRT	3112	84.1	588	15.9	2523 (100)	1.05	0.68 – 1.64	
Private employee/ Wira-private	2063	81.8	460	18.2	3700 (100)	1.24	0.80 – 1.95	0.000
PNS/TNI/POLRI/BU-MN/BUMD	349	74.6	119	25.4	158 (100)	1.90	1.18 – 3.08	
Total	5658	82.6	1191	17.4	6849 (100)	-		

Data source: Indonesian Data Management Laboratory (Riskesdas 2018)

Based on the results of statistical analysis, it was found that parents who have jobs as farmers/fishermen/laborers/drivers/domestic workers are 1.05 times more likely to carry out complete basic immunizations for their children, parents with jobs as private employees/entrepreneurs are 1.24 times more likely to do basic immunizations. Complete basic immunization for their children and parents who work as PNS/TNI/POLRI/BUMN/BUMD are 1.5 times more likely to carry out complete basic immunization for their children, these three categories compared to parents who do not work, with a significant p-value = 0.000.

h. Relationship between Residence and Complete Basic Immunization in Children Aged 12-23 months

Table 9. Relationship of Residence with Complete Basic Immunization in Children aged 12-23 Months in Indonesia (n= 6849)

The placeStay	**Immunization Base**				**Total (%)**	**OR**	**95 % CI**	***P-Value***
	No Complete	**%**	**Complete**	**%**				
Rural	3476	84.0	661	16.0	2712 (100)	-		
Urban	2182	80.5	530	19.5	4137 (100)	1.27	1.13 - 1.45	0.000
Total	5658	82.6	1191	17.4	6849 (100)	-		

Data source: Indonesian Data Management Laboratory (Riskesdas 2018)

Based on the results of statistical analysis, it was found that parents and children living in urban areas were 1.27 times more likely to have children with complete basic immunization compared to parents and children living in rural areas with a significant p-value = 0.000, which means that there is a place living with complete basic immunization in children aged 12-23 months in Indonesia.

4.3 Mother's Age

The results of this study are supported by research conducted by bengue in 2017 in Senegal, West Africa, it was found that maternal age was not associated with complete basic immunization (Mbengue et al., 2017). Rakhmanindra states that age cannot influence actions, experiences and decision making, because age does not always support a person to do something, including in efforts to prevent a disease from occurring such as immunization (Rakhmanindra & Puspitasari, 2019).

4.4 Place of Delivery

This study showed that there was a relationship between place of delivery and complete basic immunization and it was also found that mothers who gave birth in health facilities were 2.72 times more likely to carry out complete basic immunizations compared to mothers who gave birth at home/non-health facilities.

This study is in accordance with research conducted by Dharma in 2017 it was found that there was a relationship between the place of delivery and complete basic immunization (Dharma & Budyanra, 2017).

4.5 Number of ANC

In this study it was found that there was a relationship between the number of ANC with complete basic immunization and mothers who performed ANC 1-3 times 3.79 were more likely to carry out complete basic immunization for their children, also mothers who performed ANC 4 times 8.65 times were more likely to immunize complete baseline, both categories were compared with mothers who did not perform ANC at all.

4.6 Gender

This study shows that there is no relationship between gender and complete basic immunization and children who are female are 1.02 times more likely to not carry out complete basic immunizations compared to children who are male.

This is in accordance with research conducted by Srhestha in Nepal in 2018 it was found that the sex of the child had no relationship with immunization status, this happened because there were no social differences between children with male and female sex, which was accompanied by the presence of awareness and advocacy related to gender equality between men and women (Shrestha et al., 2016), and also supported by Mbegue in 2017 which stated that female children 1.01 times did not carry out complete basic immunization compared to boys -male (Mbengue et al., 2017).

4.7 What order do you come in your family

This study shows that there is a relationship between the th child with complete basic immunization and it is also found that birth order is 3-4, 1.15 times more likely to have complete basic immunization and children with the order of birth order births 1-2 were 1.32 times more likely to have complete basic immunization, both categories compared to the 5th birth order onwards.

4.8 Parental Education

This study shows that there is a relationship between Parental Education and complete basic immunization, it is found that secondary education is 1.39 times more likely to carry out complete basic immunization for children and parents with higher education are 1.79 times more likely to carry out complete basic immunization in children, both this category is compared with parents who have basic education.

4.9 Parents' job

This study shows that there is a relationship between parental occupation and complete basic immunization and it is found that parents who have jobs as farmers/fishermen/laborers/drivers/domestic workers are 1.05 times more likely to carry out complete basic immunizations for children, parents with jobs as employees private sector/entrepreneurs 1.24 times more likely to carry out complete basic immunization for children, parents who work as civil servants/TNI/POLRI/BUMN/BUMD 1.90 times more likely to carry out complete basic immunization in children, these three categories compared to parents which doesn't work.

4.10 Residence

This study shows that there is a relationship between residence and complete basic immunization, it is also found that parents and children living in urban areas are 1.27 times more likely to have children with complete basic immunizations compared to parents and children living in rural areas.

4.11 The Most Dominant Factor

The most dominant factor in this study was the number of ANC with a category 4 times with an OR value of 8.65, which means that parents who did ANC 4 times 8.65 times tended to carry out complete basic immunization for their children compared to the same parents absolutely no ANC.

The use of ANC is to monitor the health and pregnancy of the mother, to ensure fetal growth and development, to detect early abnormalities that occur or complications that may occur during pregnancy, to prepare the mother for childbirth, to undergo the postpartum period and to prepare for the role of motherhood (Ministry of Health, 2018a).

V. Conclusion

The results of this study have answered the research objectives, namely:

1. There is no relationship between maternal age and complete basic immunization in children aged 12-23 months in Indonesia
2. There is a relationship between place of delivery and complete basic immunization in children aged 12-23 months in Indonesia
3. There is a relationship between the number of ANC and complete basic immunization in children aged 12-23 months in Indonesia
4. There is no relationship between child sex and complete basic immunization in children aged 12-23 months in Indonesia
5. There is a relationship between Child Ke- and complete basic immunization in children aged 12-23 months in Indonesia
6. There is a relationship between parental education and complete basic immunization for children aged 12-23 months in Indonesia
7. There is a relationship between parental occupation and complete basic immunization for children aged 12-23 months in Indonesia
8. There is a relationship between maternal age and complete basic immunization in children aged 12-23 months in Indonesia
9. The most dominant factor in determining complete basic immunization is the number of ANC

References

Acharya, P., Kismul, H., Ali Mapatano, M., & Hatløy, A. (2019). Correction: Individual- and

community-level determinants of child immunization in the Democratic Republic of Congo: A multilevel analysis (PLoS One (2018) 13:8 (e0202742) DOI: 10.1371/journal.pone.0202742). PLoS ONE, 14(1), 1–4. https://doi.org/10.1371/journal.pone.0211299

Adedire, E. B., Ajayi, I., Fawole, O. I., Ajumobi, O., Kasasa, S., Wasswa, P., & Nguku, P. (2016). Immunisation coverage and its determinants among children aged 12-23 months in Atakumosa-west district, Osun State Nigeria : a cross-sectional study. BMC Public Health, 1–8. https://doi.org/10.1186/s12889-016-3531-x

Adedokun, S. T., Uthman, O. A., Adekanmbi, V. T., & Wiysonge, C. S. (2017). Incomplete childhood immunization in Nigeria : a multilevel analysis of individual and contextual factors. 1–10. https://doi.org/10.1186/s12889-017- 4137-7

Antai, D. (2010). Migration and child immunization in Nigeria : individual- and community-level contexts.

Badan Penelitian dan Pengembangan Kesehatan RI. (2018). Laporan Nasional Riset Kesehatan Dasar. Kementrian Kesehatan RI, 1–582.

Badan Perencanaan Pembangunan Daerah Kalimantan Barat. (2019). Profil Pembangunan Kalimantan Barat. Satker 05.

Badan Pusat Statistik. (2020). Hasil Sensus Penduduk. Bps.Go.Id, 27, 1–52. https://papua.bps.go.id/pressrelease/2018/05/07/336/indeks-pembangunan- manusia-provinsi-papua-tahun-2017.html

Bafdal, N., Amaru, K., & Paraeira, P. B. M. (2011). Buku Ajar Sistem Informasi Geografis.

Budiman, R. (2017). Analsis Spasial Fasilitas Pelayanan Kesehatan Masyarakat terhadap Permukiman di Kota Blitar.

Compaore, W. I. C. Z., Ekouevi, D. K., Komlanvi, F. A. G., Sewu, E. K., Blatome, T., Gbadoe, A. D., Agbèrè, D. A., & Atakouma, Y. (2019). Immunization coverage and factors associated with incomplete vaccination in children aged 12 to 59 months in health structures in Lomé. BMC Research Notes, 1–7. https://doi.org/10.1186/s13104-019-4115-5

Dahlan, M. S. (2019). Statistik untuk Kedokteran dan Kesehatan.

Dharma, Y., & Budyanra. (2017). Determinants of Full Basic Immunization Achievement in Children Age 12-35 Months in Aceh.

Dinas Kesehatan. (2019). Profil Kesehatan Provinsi Jawa Tengah 2018.

Dinas Kesehatan DI Yogyakarta. (2019). Profil Kesehatan DIY Tahun 2019.

Dinas Kesehatan Yogyakarta, 53(9), 159.

Dirjen Kesehatan Masyarakat Kemkes RI. (2020). Rencana Aksi Program 2020- 2024. Jurnal Ilmiah Teknosains, 2(1/Mei), 1–33.

Ekouevi, D. K., Gbeasor-komlanvi, F. A., Yaya, I., Zida-compaore, W. I., Boko, A., Sewu, E., Lacle, A., Ndibu, N., Toke, Y., & Landoh, D. E. (2018). Incomplete immunization among children aged 12 – 23 months in Togo : a multilevel analysis of individual and contextual factors. 1–10.

Etana, B., & Deressa, W. (2012). Factors associated with complete immunization coverage in children aged 12-23 months in Ambo Woreda, Central Ethiopia. BMC Public Health, 12(1), 1. https://doi.org/10.1186/1471-2458-12-566

Fatiregun, A. A., & Okoro, A. O. (2012). Maternal determinants of complete child immunization among children aged 12-23 months in a southern district of Nigeria. Vaccine, 30(4), 730–736. https://doi.org/10.1016/j.vaccine.2011.11.082

Gianyar, D. I. K. A. B. (2020). Implementasi Pis-Pk Untuk Mendukung Terwujudnya Indonesia Sehat.

Hafid, W., Martini, S., & Devy, S. R. (2016). Determinant Factor Status In Infants Are Fully Immunized In The Konang And Geger Clinic. 38–45.

Han, K., Zheng, H., Huang, Z., Qiu, Q., Zeng, H., Chen, B., & Xu, J. (2014). Vaccination

coverage and its determinants among migrant children in Guangdong, China. BMC Public Health, 14(1), 1–8. https://doi.org/10.1186/1471-2458-14-203

Hasibuan, S. et al. (2020). Relationship of Family Income and Family Support with Maternal Reference in Pregnant Women in Pantai Cermin BEmONC, Langkat District, 2019. Budapest International Research and Critics Institute-Journal (BIRCI-Journal). P. 486-493.

Hijani, R., Nauli, F. A., & Zulfitri, R. (2015). Hubungan Pengetahuan Ibu Tentang Imunisasi Dasar terhadap Kelengkapan Imunisasi dasar di Posyandu Wilayah Kerja Puskesmas Pembina Plaju Palembang. 40. http://repository.um-palembang.ac.id/id/eprint/178/1/SKRIPSI88- 1704051318.pdf

Hikmayati, D. M., Rahman, F., & Rahayu, A. (2013). Hubungan antara Tingkat Pendidikan Ibu dengan Kelengkapan Status Imunisasi Dasar pada Balita di Desa Melayu Ilir. Journal of Chemical Information and Modeling, 53(9), 1689–1699.

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), 1–11. https://doi.org/10.1186/s12889-018-5193-3

Huvaid, S. U., Yulianita, Y., & Mairoza, N. (2020). Faktor-faktor yang Berhubungan dengan Pemberian Imunisasi Campak pada Balita. Jurnal Riset Hesti Medan Akper Kesdam I/BB Medan, 4(2), 83. https://doi.org/10.34008/jurhesti.v4i2.139

Kementerian Kesehatan Republik Indonesia. (2014a). Buku ajar Imunisasi. In Kementerian Kesehatan RI. https://www.kemkes.go.id/article/view/19093000001/penyakit-jantung- penyebab-kematian-terbanyak-ke-2-di-indonesia.html

Kementerian Kesehatan Republik Indonesia. (2014b). Situasi Dan Analisa Imunisasi (pp. 1–8).

Kementerian Kesehatan Republik Indonesia. (2018). HASIL UTAMA RISKESDAS 2018.

Kementerian Kesehatan Republik Indonesia. (2019). Profil Kesehatan Indonesia. https://doi.org/10.1136/jcp.40.5.591-b

Kementerian kesehatan RI. (2018a). Pentingnya Pemeriksaan Kehamilan (ANC) di Fasilitas Kesehatan.

Kementerian kesehatan RI. (2018b). Profil Keluarga Sehat Provinsi Nusa Tenggara Timur. Pusat Perencanaan Dan Pendayagunaan Sdm Kesehatan Badan Pengembangan Dan Pemberdayaan Sdm Kesehatan Kementerian Kesehatan Ri 2018, 2018. http://202.70.136.161:8107/114/2/Profil KS Provinsi NTT Tahun 2018.pdf

Kementerian Kesehatan RI Badan Penelitian dan Pengembangan. (2018). Hasil Utama Riset Kesehatan Dasar. Kementrian Kesehatan Republik Indonesia, 1–100. http://www.depkes.go.id/resources/download/info-terkini/hasil- riskesdas-2018.pdf

Kementerian PPN. (2015). Profil singkat provinsi: Kalimantan Timur. 13–16.

Khan, J., Shil, A., & Mohanty, S. K. (2019). Hepatitis B vaccination coverage across India: Exploring the spatial heterogeneity and contextual determinants. BMC Public Health, 19(1), 1–14. https://doi.org/10.1186/s12889-019-7534-2

Kibreab, F., Lewycka, S., & Tewelde, A. (2020). Impact of mother's education on full immunization of children aged 12-23 months in Eritrea: population and health survey 2010 data analysis. BMC Public Health, 20(1), 267. https://doi.org/10.1186/s12889-020-8281-0

Krishna, D., Mohd Zulkefli, N. A., Md Said, S., & Mahmud, A. (2019). Sociodemographic and health care factors in determining immunization defaulters among preschool children in Petaling District, Selangor: A cross- sectional study in Malaysia. BMC Public Health, 19(1), 1–11. https://doi.org/10.1186/s12889-019-7561-z

Lim, K. K., Chan, Y. Y., Noor Ani, A., Rohani, J., Siti Norfadhilah, Z. A., & Santhi, M. R. (2017). Complete immunization coverage and its determinants among children in Malaysia: findings from the National Health and Morbidity Survey (NHMS) 2016. Public Health, 153, 52–57. https://doi.org/10.1016/j.puhe.2017.08.001

Lumbantoruan, D., & Simanjuntak, L. (2017). Penyakit-penyakit Kesehatan Republik Indonesia tahun 2009 juga menyebutkan bahwa campak masih Child Immunization (UCI), yaitu cakupan Penyebab ketidaklengkapan imunisasi di (2011) adalah keyakinan orangtua mengenai merupakan salah satu wilayah Kabupat.

Machsun, M., & Susanti, Y. A. (2018). Analisis Faktor-Faktor Yang Berhubungan Dengan Status Imunisasi Dasar Lengkap Pada Bayi Di Desa Mangunrejo Kecamatan Ngadiluwih Kabupaten Kediri Tahun 2018. Preventia : The Indonesian Journal of Public Health, 3(2), 148. https://doi.org/10.17977/um044v3i2p148-152

Makamban, Y., & Salmah, U. (2014). Faktor yang Berhubungan dengan Cakupan Imunisasi Dasar LEngkap pada Bayi di Wilayah Kerja Puskesmas antara Kota Makassar.

Mappadang, R. V., Langi, F. L. F. G., & Pinontoan, O. R. (2020). Determinan Status Imunisasi Dasar Pada Anak Balita 12-59 Bulan di Indonesia. 1(1), 15–22.

Mbengue, M. A. S., Sarr, M., Faye, A., Badiane, O., Camara, F. B. N., Mboup, S., & DIeye, T. N. (2017). Determinants of complete immunization among senegalese children aged 12-23 months: Evidence from the demographic and health survey. BMC Public Health, 17(1), 1–9. https://doi.org/10.1186/s12889-017-4493-3

Melaku, M. S., Nigatu, A. M., & Mewosha, W. Z. (2020). Spatial distribution of incomplete immunization among under-five children in Ethiopia: Evidence from 2005, 2011, and 2016 Ethiopian Demographic and health survey data. BMC Public Health, 20(1), 1–22. https://doi.org/10.1186/s12889-020-09461-3

Nirwansyah, A. widhi. (2017). Dasar Sistem Informasi Geografis.

Noh, J., Kim, Y., Akram, N., Yoo, K., Park, J., Cheon, J., Dae, Y., Id, K., & Stekelenburg, J. (2018). Factors affecting complete and timely childhood immunization coverage in Sindh, Pakistan ; A secondary analysis of cross- sectional survey data. 1–15.

Notoadmodjo, S. (2010). Metodelogi Penelitian. Rineka Cipta.

Peraturan Menteri Kesehatan. (2017). Penyelenggara Imunisasi. 4, 9–15.

Prayogo, A., Adelia, A., Cathrine, C., Dewina, A., Pratiwi, B., Ngatio, B., Resta, A., Sekartini, R., & Wawolumaya, C. (2016). Kelengkapan Imunisasi Dasar pada Anak Usia 1 – 5 tahun. Sari Pediatri, 11(1), 15. https://doi.org/10.14238/sp11.1.2009.15-20

Prihanti, G. S., Rahayu, M. P., & Abdullah, M. N. (2016). Faktor – Faktor Yang Mempengaruhi Status Kelengkapan Imunisasi Dasar Diwilayah Kerja Puskesmas Kota Kediri. Saintika Medika, 12(2), 120. https://doi.org/10.22219/sm.v12i2.5276

Putri, D. S. K., Utami, N. H., & Nainggolan, O. (2016). Hubungan Kesinambungan Pemanfaatan Pelayanan Kesehatan Maternal Dengan Pemberian Imunisasi Lengkap Di Indonesia. Jurnal Kesehatan Reproduksi, 7(2), 135–144. https://doi.org/10.22435/kespro.v7i2.4966.135-144

Rakhmanindra, L., & Puspitasari, N. (2019). Hubungan Antara Karakteristik Ibu Dengan Kelengkapan Imunisasi Dasar Di Puskesmas Wonokusumo Kota Surabaya. The Indonesian Journal of Public Health, 14(2), 174. https://doi.org/10.20473/ijph.v14i2.2019.175-186

Russo, G., Miglietta, A., Pezzotti, P., Biguioh, R. M., Bouting Mayaka, G., Sobze,

M. S., Stefanelli, P., Vullo, V., & Rezza, G. (2015). Vaccine coverage and determinants of incomplete vaccination in children aged 12-23 months in Dschang, West Region, and Cameroon: A cross-sectional survey during a polio outbreak. BMC Public Health, 15(1), 1–11. https://doi.org/10.1186/s12889- 015-2000-2

Saifudin, N. (2015). Analisis Spasial Dan Pemodelan Faktor Risiko Kejadian Difteri Di Kabupaten Blitar.

Sandila, R., Arya Satya, A., Sulastri, L., Arif, M., Alfana, M., & Listyaningsih, U. (2020). Analisis Kesehatan Provinsi Papua. October. https://doi.org/10.13140/RG.2.2.25205.40161

Shrestha, S., Shrestha, M., Wagle, R. R., & Bhandari, G. (2016). Predictors of incompletion of

immunization among children residing in the slums of Kathmandu valley, Nepal: A case-control study. BMC Public Health, 16(1), 1–9. https://doi.org/10.1186/s12889-016-3651-3

Sugiyono. (2017). Metode Penelitian Kuantitatif dan Kualitatif. Bandung; Alfabeta.

Sumantri, S. H., Supriyatno, M., Sutisna, S., & Widana, I. D. K. K. (2019). Sistem Informasi Geografis Kerentanan Bencana

Triana, V. (2016). Faktor Yang Berhubungan Dengan Pemberian Imunisasi Dasar Lengkap Pada Bayi Tahun 2015. Jurnal Kesehatan Masyarakat Andalas, 10(2), 123. https://doi.org/10.24893/jkma.v10i2.196

World Health Organization (WHO). (2017). World Immunization Week. World Health Organization (WHO). (2019a). Immunization Coverage.

World Health Organization (WHO). (2019b). Vaccines and Immunization. https://www.who.int/health-topics/vaccines-and-immunization

Yoga, I. made E. S., & Widarsa, I. ketut T. (2021). Analisis Structural Equation Modeling Kinerja Sistem Informasi dan DAta Imunisasi Bali Tingkat Puskesmas dengan Model Delone dan Mclean. 8(1), 1–15.