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FACTORS RELATED TO THE INCIDENCE OF MEASLES IN CHILDREN AGED 12 – 59 MONTHS IN THE WORKING AREA OF THE TIRTAYASA HEALTH CENTER, SERANG REGENCY IN 2023

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Abstract
This thesis aims to determine the factors related to the incidence of measles in the working area of the Tirtayasa Health Center, Serang Regency in 2023. The variables used consisted of independent variables consisting of: child factors (gender, measles immunization status, nutritional status, complete basic immunization status, status of high-dose vitamin A supplements), maternal factors (education level, level of knowledge, employment status, attitude), father factors (education level, employment status), environmental factors (occupancy density, house ventilation) and economic socialization factors (family income). The sample was mothers who had children aged 12 months to 59 months as many as 100 people and data was collected by distributing questionnaires. The results showed factors that were not associated with the incidence of measles: the sex of the child with a Pvalue of 0.427, the status of high-dose vitamin A supplementation with a Pvalue of 0.982, the employment status of the mother with a Pvalue of 0.950, and the employment status of the father with a Pvalue of 0.878. While the factors that are significantly related to the1 incidence of measles include: measles immunization status with Pvalue 0.000, nutritional status with Pvalue 0.026, maternal education level with Pvalue 0.000, maternal knowledge level with Pvalue 0.017, maternal attitude with Pvalue 0.006, father's education level towards with a Pvalue of 0.044, a density of a house with a Pvalue of 0.02, home ventilation with a Pvalue of 0.035 and family income against the incidence of measles Pvalue of 0.001. In accordance with the results of the study, the researchers' suggestions are: puskesmas officers to increase counseling, puskesmas to collaborate with other parties to improve the living environment and explore other variables for further researchers.

Keywords: Gender, Immunization Status, Attitude, Education, Occupation, Density, Ventilation.

1. Introduction

Based on data from the Indonesian Ministry of Health, as many as 3,341 cases of measles have been confirmed in laboratories throughout 2022. This number increased by 2,431% compared to the previous year and experienced outbreaks of 55 measles outbreaks in 34 regencies/cities in 12 provinces, this was due to the low immunization coverage for children, especially during the COVID19 pandemic, complete basic immunization coverage in 2022 reached 97.9%, while specifically for measles immunization reached 91.7%. (Ministry of Health of the Republic of Indonesia, 2022)

Banten Province in 2022 has seen an increase in measles cases and measles outbreaks in 4 districts / cities of the total of all districts / cities are 8 districts / cities, districts / cities that experience outbreaks including: Serang City, Serang Regency, Lebak Regency and Pandeglang Regency (Banten Provincial Health Office, 2022).

Serang Regency is the district that experienced the highest outbreak cases in 2016 and outbreaks occurred again in 2022. The incidence of outbreaks in 2016, as many as 42 events with a total of 674 cases with 2 deaths (Case Fatality Rate / CFR 0.003). The 2022 measles outbreak in Tirtayasa District is the first case in the last 4 years found as many as 40 measles suspects and 5 people confirmed measles. (Health Office of Serang District, 2022) .

2. Theoretical Background

Children aged 5-9 years are the population with the most measles. Most (90%) children who get measles are children who do not have immunity. The child's immunity to the disease is acquired through immunization. Vaccines used in immunization programs will only be effective in providing immunity that has an impact on reducing disease if they meet two requirements, namely quantity city and quality. The quantity in the form of coverage is high (>95%) and the quality is maintained according to standards including cold chain handling. The operational strategy of achieving high and equitable coverage is in the form of UCI (Universal Child Immunization) achievement. Infants with incomplete immunization status in villages that do not reach UCI may pose an increased chance of an extraordinary incidence of an immunization-preventable disease (PD3I) (Budioro, 2001)

The measles program in Indonesia aims to achieve the global target of measles elimination by 2026 by ensuring that measles surveillance has been carried out sensitively and adequately to meet the target of finding non-measles (discarded rate) of at least 2/100,000 population. Sensitive and adequate surveillance means being able to detect health events or other surveillance objects precisely, both on the accuracy of diagnosis, completeness of case reports, and timeliness of incident detection. Sensitive also means being able to detect outbreaks precisely.

3. Methods

The type of research used in this study is quantitative research which aims to determine the factors associated with the incidence of measles in children aged 12-59 months in the working area of the Tirtayasa Health Center, Serang Regency in 2023. Research design with a cross sectional approach.

4. Results and Discussion

4.1 Univariate Analysis

Research that has been conducted by distributing questionnaires to 100 respondents who have children aged 12 months to 59 months in Lontar Village and Sujung Village in the working area of the Tirtayasa Health Center obtained according to the results of univariate analysis can be shown as follows:

Table 1. Frequency Distribution based on research variables

Variable Type	Variable	Category	Sum (frequency)	(%)
Dependent Variables	Incidence of Measles	Sick It doesn't hurt	17 83	17% 83%
Independent Variable	Child Factors			
	Gender	Man Woman	47 53	47% 53%

	Measles Immunization Status	No Immunizations Immunized	25 75	25% 75%
	Nutritional Status	Less/bad Good	6 94	6% 94%
	Complete basic immunization	Incomplete Complete	36 64	36% 64%
	High-dose vitamin A supplementation status	Not up to standard Standard compliant	38 62	38% 62%
	Maternal Factor			
	Education Level	Low ≤ Junior High School High > Junior High School	35 65	35% 65%
	Level of knowledge	Less Good	29 71	29% 71%
	Employment Status	Work Does not work	37 67	37% 67%
	Mother's attitude	Not good Good	38 62	38% 62%
	The Father Factor			
	Education Level	Low ≤ Junior High School High > Junior High School	40 60	40% 60%
	Employment Status	Does not work Work	25 75	25% 75%
	Environmental Factors			
	Occupancy Density	Not Eligible Qualify	37 63	37% 63%
	Occupancy Ventilation	Not Eligible Qualify	39 61	39% 61%
	Socioeconomic Factors			
	Family income	Less < 1,500,000 Enough ≥ 1,500,000	22 78	22% 78%
	Total		100	100%

The variables used in this study were child factors: measles incidence, sex, measles immunization status, nutrition status, complete basic immunization, high-dose vitamin A supplementation status, maternal factors: mother's education level, mother's level of knowledge, mother's employment status, mother's attitude, father's factors: father's education level, father's employment status, occupancy, environmental factors: house ventilation and socioeconomic factors: family income. From the child factor there were 17 measles sufferers where most of the female sex as many as 17 children (53%), most of them had been immunized 75 (75%), almost all were well nourished 94 (94%) and

most got high dose vit A 62 (62%), from the maternal factor known maternal education most were high school graduates or more 65 (65%), most mothers were well informed 71 (71), Most mothers are not working 67 (67%) and most mothers are good 62 (62%). From the facto, it is known that most of the fathers have a high school education or more 60 (60%) and work 75 (75%). From environmental factors, it is known that most residential houses meet the requirements of 63 (63%) and are ventilated according to the requirements of 61 (61%), while from socioeconomic factors, it is known that most families have sufficient income 78 (78%).

4.2 Bivariate Analysis

The analysis in this study using bivariate analysis aims to determine the relationship of independent variables with dependent variables using existing statistics and data scales. The test used is a statistical test of Chi-square with a confidence level (CI) of 95% and a meaning level of 0.05 following the results of bivariate analysis below:

Table 2. The relationship between children's factor variables on the incidence of measles in the working area of the Tirtayasa Health Center, Serang Regency in 2023

Variable	Incidence of Measles						P value	OR	CI 95%
	Sick		It doesn't hurt		Total				
	n	%	n	%	N	%			
Gender									
Man	6	12,8	41	87,2	47	100	0,427	0,559	0,189-1,652
Woman	11	20,8	42	79,2	53	100			
Sum	17	17	83	83	100	100			
Measles Immunization Status									
Not Immunization	12	48	13	52	25	100	0,000	12,923	3,894-42,884
	5	6,7	70	93,3	75	100			
Sum	17	17	83	83	100	100			
Nutritional Status									
Support	3	50	3	50	6	100	0,026	5,714	1,046-31,219
Not Supported	14	14,9	80	85,1	94	100			
Sum	17	17	83	83	100	100			
Status IDL									
Incomplete	12	33,3	24	66,7	36	100	0,003	5,900	1,875-18,561
Complete	5	7,7	59	92,2	64	100			
Sum	17	17	83	83	100	100			
Vitamin A									
Incompatible	7	18,4	31	81,6	38	100	0,982	1,174	0,405-3,401
Appropriate	10	16,1	52	83,9	62	100			
Sum	17	17	83	83	100	100			

From the table above, it can be seen from 100 the number of respondents who are sick, mostly in girls as many as 11 children (20.8%) while those who are not sick are more in girls 42 children (79.2%). Statistically, it is stated that there is no significant relationship between the sex of children and the incidence of measles in the working area of the

Tirtayasa Health Center in 2023 with a P Value of 0.427 and shows that girls have a 0.56 times chance of getting measles with an OR value of 0.559.

From the table above, it can be seen from 100 the number of respondents who are sick, mostly in children who are not immunized, 12 children (48.0%), while those who are not sick are mostly in children who are immunized 70 children (93.3%). Statistically, it is stated that there is a significant relationship between the status of children's measles immunization against the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.000 and shows that children who are not immunized have a 12.9 times chance of getting measles with an OR value of 12,923.

From the table above, it can be seen from 100 the number of respondents who are sick, mostly in children with good nutrition, 14 children (14.9%), while those who are not sick are mostly in children who are well nourished, 80 children (85.1%). Statistically, it is stated that there is a significant relationship between the nutritional status of children and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.026 and shows that children who are not malnourished / poor have a 5.7 times chance of getting measles with an OR value of 5.714.

From the table above, it can be seen from the 100 number of respondents who are sick, mostly in children whose immunization status is incomplete, 12 children (33.3%), while those who are not sick, most of the children are fully immunized, 59 children (92.2%). Statistically, it is stated that there is a significant relationship between the complete basic immunization status of measles incidence in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.003 and shows that children who are not fully immunized have a 5.9 times chance of getting measles with an OR value of 5,900.

From the table above, it can be seen from the 100 number of respondents who are sick, mostly in children who give Vit A according to the standard of 10 children (16.1%), while those who are not sick are mostly in children who give Vit A according to the standard of 52 children (83.9%). Statistically, it is stated that there is no significant relationship between the status of giving Vit A to the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.982 and shows that children who do not meet the standard have a 1.1 times chance of getting measles with an OR value of 1.174.

Table 3. The Relationship Between Maternal Factor Variables and Measles Incidence in the Working Area of the Tirtayasa Health Center, Serang Regency in 2023

Variable	Incidence of Measles						P value	OR	CI 95%
	Sick		It doesn't hurt		Total				
	n	%	n	%	N	%			
Education									
Low	14	40	21	60,0	35	100	0,000	13,778	3,602-52,700
Tall	3	4,6	62	95,4	65	100			
Sum	17	17,0	83	83,0	100	100			
Knowledge									
Less	9	31,0	20	69,0	29	100	0,017	3,544	1,20-10,40
Good	8	11,3	63	88,7	71	100			
Sum	17	17	83	83	100	100			
Work									
Work	5	15,2	28	84,8	33	100	0,950	0,818	0,262-2,554
Not Working	12	17,9	55	82,1	67	100			

Sum	17	17	83	83	100	100			
Attitude Not Good Good	 12 5	 31,6 8,1	 26 57	 68,4 91,9	 38 62	 100 100	0,006	5,262	1,680-16,480
Sum	17	17,0	83	83,0	100	100			

From the table above, it can be seen from the 100 number of respondents who are sick, mostly in children whose mother's education level is low, 14 children (40.0%), while those who are not sick are mostly in children whose mother's education level is high, 62 children (95.4%). Statistically, it is stated that there is a significant relationship between maternal education and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.000 and shows that children with low maternal education levels are 13.8 times more likely to get measles with an OR value of 13,778.

From the table above, it can be seen from 100 respondents who are sick, most of whom are less than 9 children (31.0%) while those who are not sick are mostly in children whose mother's knowledge is high, 63 children (88.7%). Statistically, it is stated that there is a significant relationship between maternal knowledge of measles incidence in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.017 and shows that children with low maternal knowledge are 3.5 times more likely to get measles with an OR value of 3.544.

From the table above, it can be seen from 100 the number of respondents who are sick, mostly in non-working mothers 12 children (17.9%), while those who are not sick are mostly in mothers who do not work 55 children (82.1%). Statistically, it is stated that there is no significant relationship between maternal work and measles incidence in the work area of the Tirtayasa Health Center in 2023 with a P Value of 0.950 and shows that children whose mothers work have a 0.8 times chance of getting measles with an OR value of 0.818.

From the table above, it can be seen from the 100 respondents who are sick, mostly in the attitude of mothers who are not good, 12 children (31.6%), while those who are not sick are mostly in the attitude of good mothers 57 children (91.9%). Statistically, it is stated that there is a significant relationship between mothers' attitudes towards measles incidence in the work area of the Tirtayasa Health Center in 2023 with a P Value of 0.006 and shows that children whose mother's attitude is not good are 5.3 times more likely to get measles with an OR value of 5.262.

Table 4. The relationship between paternal factor variables and the incidence of measles in the working area of the Tirtayasa Health Center, Serang Regency in 2023

Variable	Incidence of Measles						P value	OR	CI 95%
	Sick		It doesn't hurt		Total				
	n	%	n	%	N	%			
Education Low Tall	 11 6	 64,7 35,3	 29 54	 34,9 65,1	 40 60	 40,0 60,0	0,044	3,414	1,145-10,177
Sum	17	17,0	83	83,0	100	100,0			
Work Not Working Work	 4 13	 16,0 17,3	 21 62	 84,0 82,7	 25 75	 25,0 75,0	0,878	0,98	0,267-3,093
Sum	17	17,0	83	83,0	100	100			

From the table above, it can be seen from 100 the number of respondents who are sick, mostly in children with a low father's education level of 11 children (64.7%), while those who are not sick are mostly in children with a high father's education level of 54 children (65.1%). Statistically, it is stated that there is a significant relationship between father's education and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.044 and shows that children with low father's education are 3.4 times more likely to get measles with an OR value of 3.414.

From the table above, it can be seen from the 100 number of respondents who are sick, mostly in children whose fathers work 13 children (17.3%), while those who are not sick are mostly in children whose fathers work 62 children (82.7%). Statistically, it is stated that there is no significant relationship between the father's work and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.878 and shows that children whose father's education does not work have a 0.9 times chance of getting measles with an OR value of 0.98.

Table 5. The relationship between environmental factor variables on the incidence of measles in the working area of the Tirtayasa Health Center, Serang Regency in 2023

Variable	Incidence of Measles						P value	OR	CI 95%
	Sick		It doesn't hurt		Total				
	n	%	n	%	N	%			
Density									
Not Fulfilling Requirements	11	29,7	26	70,3	37	100	0,002	4,019	1,34-12,04
Qualify	6	9,5	57	90,5	63	100			
Sum	17	17,0	83	83,0	100	100			
Ventilation									
Not Fulfilling the Requirements	11	28,2	28	71,8	39	100	0,035	3,601	1,20-10,7
Qualify	6	9,8	55	90,2	61	100			
Sum	17	17,0	83	83,0	100	100			

From the table above, it can be seen from the 100 number of respondents who are sick, most of the occupancy density does not meet the requirements of 11 children (29.7%), while those who are not sick are mostly in children whose occupancy density meets the requirements of 57 children (90.5%). Statistically, it is stated that there is a significant relationship between occupancy density and measles incidence in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.002 and shows that children whose occupancy density does not meet the requirements have a 4.09 times chance of getting measles with an OR value of 4.019.

From the table above, it can be seen from the 100 number of respondents who are sick, most of the occupancy ventilation does not meet the requirements of 11 children (28.2%), while those who are not sick are mostly in children whose residential ventilation meets the requirements of 55 children (90.2%). Statistically, it is stated that there is a significant relationship between residential ventilation and measles incidence in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.035 and shows that children whose residential ventilation does not meet the requirements have a 3.6 times chance of getting measles with an OR value of 3.601.

Table 6. The relationship between socioeconomic variables and the incidence of measles in the working area of the Tirtayasa Health Center, Serang Regency in 2023

Variable	Incidence of Measles						P value	OR	CI 95%
	Sick		It doesn't hurt		Total				
	n	%	n	%	N	%			
Income									
Less	9	52,9	8	47,1	17	17,0	0,001	6,058	1,974-18,591
Enough	13	15,7	70	84,3	83	83,0			
Sum	22	22,0	78	78,0	100	100			

From the table above, it can be seen from the 100 number of respondents who are sick, most of their family income is enough 13 children (15.7%), while those who are not sick most of their family income is enough 70 children (84.3%). Statistically, it is stated that there is a significant relationship between family income and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.001 and shows that children whose family income is less likely to be 6.0 times more likely to get measles with an OR value of 6.058.

4.3The relationship between sex and the incidence of measles

Based on the results of this study, it shows that statistically there is no significant relationship between the sex of children and the incidence of measles in the work area of the Tirtayasa Health Center in 2023 with a P Value of 0.427.

Research in line with Anggraeni's research (Lestari et al, 2016), that is, statistically there is no relationship between the sex of children and the incidence of measles p=0.087, is also in line with research (Isu, 2013) which states statistically the sex risk factor is not meaningful, which means that there is a protective risk with the incidence of measles with sex p=0.484.

Gender is not one of the risk factors for measles incidence. Measles can be suffered by men and women depending on the immune system of each individual because each individual has different immunity. Individuals with weakened immune systems will be a group that is more susceptible to measles.

4.4. The relationship between measles immunization status and measles incidence

Based on the results of this study, it shows that statistically there is a significant relationship between the status of children's measles immunization against the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.000 and shows that children who are not immunized have a 12.9 times chance of getting measles with an OR value of 12,923.

This study is in line with research conducted by Mariati (2012) in Banyumas Regency saying that there is a significant relationship between measles immunization status and the incidence of measles, data there is a relationship between immunization status and measles incidence (p = 0.000).

The findings in the field of many children who have not received measles immunization, especially in Lontar Village and in Sujung Village, respondents who were sampled showed that out of 100 children there are still 25 children who have not received measles immunization, possibly due to lack of knowledge of mothers, working mothers or other factors.

Measles immunization is one of the basic immunization components required by the government, to protect children from diseases that can cause disability to death at an early age (Hafidz, 2014). In Indonesia until now, measles prevention is carried out by providing measles vaccination regularly, which is given to infants aged 9-15 months. This vaccine is administered subcutaneously as much as 0.5 ml.

There are various ways that can be done to increase the coverage of child immunization above, namely increasing the active role of health workers in an effort to increase maternal and family knowledge about measles. Increase the active role of health cadres in motivating mothers and families to immunize infants.

4.5 The relationship between children's nutritional status and the incidence of measles

Based on the results of this study, it shows that statistically there is a significant relationship between the nutritional status of children and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.026 and shows that children who are not malnourished / poor have a 5.7 times chance of getting measles with an OR value of 5.714

This study is in line with the results of research from Ingridara (2017) with the results of research on children with malnutrition status who experienced measles as much as 10% (p = 0.728). Children with malnutrition status experience less immune formation after late measles immunization compared to children with normal nutritional status Children with good nutritional status are not easily exposed to measles because their immunity is supported by the fulfillment of good nutrition so that children are not susceptible to infection. Children with poor nutritional status will be susceptible to measles infection because poor nutritional status conditions can generally reduce the function of the immune system in the body so that children are susceptible to infection because the immune system in the body is not formed completely. Malnutrition is a global cause of immunodeficiency, so malnourished children are unable to respond effectively to vaccines. Malnutrition can disrupt a person's immunological system by damaging the integrity of the mucosal barrier and impairing the function of the innate and adaptive immune systems. Damage to the mucosal barrier can cause pathogens to enter the body easily. Impaired function of the innate immune system is characterized by a decrease in the number of dendrite cells needed to present antigens to the adaptive immune system, impaired neutrophil function and a decrease in levels of complement proteins that are all needed to fight infectious agents. Disruption of adaptive immune system function causes disruption of thymus gland function which plays a role in maturation of T cells so that the function of T cells becomes disrupted.

4.6 Relationship of Complete Basic Immunization Status with Measles Incidence

Based on the results of this study, it shows that statistically there is a significant relationship between the complete basic immunization status of measles incidence in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.003 and shows that children who are not fully immunized have a 5.9 times chance of getting measles with an OR value of 5,900.

This study is in line with research conducted by Mariati (2012) in Banyumas Regency saying that there is a significant relationship between measles immunization status and the incidence of measles, data there is a relationship between immunization status and measles incidence (p = 0.000). Infants are said to have received complete basic immunization if they have received immunization BCG, DPT I-III, polio I-IV, hepatitis

B I-III, and measles. This immunization is done for a person to get immunity in his body and immunity in the group. So as to prevent and minimize the exposure of an infectious disease caused by a virus. If a person is not carried out complete basic immunization, he will be susceptible to disease, one of which is measles.

4.7 Association of high-dose vitamin A supplementation status with measles incidence

Based on the results of this study, it shows that statistically there is no significant relationship between the status of giving Vit A to the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.982 and shows that children who do not meet the standard have a 1.1 times chance of getting measles with an OR value of 1.174.

This study is not in line with research from Tri Budi Yanti (2014) which states there is a relationship between giving vitamin A and the incidence of measles (p = 0.001). Vitamin A supplementation regulates the antibody response to measles and increases total lymphocytes. Children with acute measles infection and receiving high-dose vitamin A supplementation (60 mg RE) had significantly high IgG and measles virus response and high lymphocyte circulation during follow-up, compared to children receiving placebo (Semba et al, 2007). Vitamin A supplementation given simultaneously with the measles vaccine causes an antibody effect against measles when maternal antibodies are also present. In infants aged 6 months in Indonesia, administration of vitamin A (30 mg RE) at the time of immunization with Schwarz titre standard measles vaccine interfered with seroconversion to measles in infants who received maternal antibodies, and significantly reduced the incidence of measles (Semba et al, 2007).

4.8 The relationship between maternal education level and the incidence of measles

Based on the results of this study, it shows that statistically there is a significant relationship between maternal education and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.000 and shows that children with low maternal education levels are 13.8 times more likely to get measles with an OR value of 13,778.

This research is in line with research from Hilda Irianti (2017) where the results showed p value = 0.000. The level of education of parents, will have an impact on the selection of health services for their family members, the higher the level of education will be the more selective parents will be in choosing the best health services for their family members, this of course will also affect the health status of their members.

4.9 The relationship between maternal knowledge level and measles incidence

Based on the results of this study, it shows that statistically there is a significant relationship between maternal knowledge of the incidence of measles in the work area of the Tirtayasa Health Center in 2023 with a P Value of 0.017 and shows that children with low maternal knowledge are 3.5 times more likely to get measles with an OR value of 3.544.

This study is in line with research from Ifda Ruhana (2023) which states that there is a relationship between maternal knowledge and the risk of measles in the West Labuhan Haji region with a value of p = 0.004. Mother's knowledge about measles, especially in big cities, is certainly very high, the amount of information that is very easy to obtain also affects mothers' knowledge about measles.

The high knowledge of mothers about measles should be compared to the incidence of measles, the higher the mother's knowledge of measles will increase maternal awareness about the importance of keeping children from suffering from measles, one of which is done for example by immunizing their children.

4.10 The relationship between maternal employment status and the incidence of measles

Based on the results of this study, it shows that statistically there is no significant relationship between mothers' work and the incidence of measles in the work area of the Tirtayasa Health Center in 2023 with a P Value of 0.950 and shows that children whose mothers work have a 0.8 times chance of getting measles with an OR value of 0.818.

This study is in line with the results of research from Nadia Ingridara (2017) with the results of research on children with malnutrition status who experienced measles as much as 10% (p = 0.238). Parents who work outside the home, will automatically let their children in the care and supervision of others for some time according to their busyness, the busier the child's parents will be the more time the child will spend under the supervision of others whether it's other family members or hired people.

However, not all working parents neglect their children's rights including the right to health, many mothers take time to work for the health of their children, for example taking them to posyandu or to health care facilities to carry out immunizations for their children.

4.11 The relationship between maternal attitudes and the incidence of measles

Based on the results of this study, it shows that statistically there is a significant relationship between mothers' attitudes towards measles incidence in the Tirtayasa Health Center work area in 2023 with a P Value of 0.006 and shows that children whose mother's attitude is not good have a 5.3 times chance of getting measles with an OR value of 5.262.

The results of this study are in line with Lianasari (2018) with a p value of 0.009. Attitude is a person's opinion or assessment of the environment and its relationship to health (Natasha et al, 2013). According to Notoadmodjo (2010) Before people adopt a new behavior, a sequential process occurs within a person, namely: awareness, interest, evaluation (considering the good and bad effects of the stimulus on him), Trial (starting to try new behaviors), adoption (subjects have be had new behaviors according to knowledge.

A person's positive attitude is not necessarily manifested in positive actions, and vice versa. The findings of past researchers stated that the relationship between attitude and behavior is very weak and even negative and other studies say that the relationship is positive (Natasha et al, 2013).

4.12 The relationship between your education level and the incidence of measles

Based on the results of this study, it shows thatstatistically there is a significant relationship between father's education and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.044 and shows that children with low father's education have a 3.4 times chance of getting measles with an OR value of 3.414. This research is in line with research from Hilda Irianti (2017) where the results showed p value = 0.000.

Education is all efforts made consciously and planned through formal and non-formal institutions to develop the quality of resources in order to have personality, intelligence, skills and self-control that can be utilized by the environment to improve the standard of living, so that they become effective and efficient resources (Ministry of National

Education, 2003). The higher a person's level of education, the better his knowledge and understanding of life including understanding of health (Pratiwi, 2012), so it is important for a woman who acts as a mother to be highly educated because a woman will be the first education for her child including determining the right health services for her child.

4.13 Father's Employment Relationship with Measles Incidence

Based on the results of this study, it shows that statistically there is no significant relationship between the father's work and the incidence of measles in the work area of the Tirtayasa Health Center in 2023 with a P Value of 0.878 and shows that children whose father's education does not work have a 0.9 times chance of getting measles with an OR value of 0.98.

This study is in line with the results of research from Nadia Ingridara (2017) with the results of research on children with malnutrition status who experienced measles as much as 10% (p = 0.238). A working father will affect the family income obtained, so that balanced nutritional consumption can be fulfilled, as well as good environmental sanitation conditions. However, based on the results of the study, most of the respondents affected by measles with their father's employment status were working as many as 13 people.

4.14 The relationship of occupancy density with measles incidence

Based on the results of this study, it shows that statistically there is a significant relationship between occupancy density and measles incidence in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.002 and shows that children whose occupancy density does not meet the requirements have a 4.09 times chance of getting measles with an OR value of 4.019.

The results of this study are not in line with research from Amanda Yuliana Harahap (2013) with the results of the study there was no effect of house occupancy density with the incidence of camak in Hutaimbaru Village, Sulumun District, Padang Regency with a value of P = 0.680. The density of occupancy in the house according to the Decree (Ministry of Health of the Republic of Indonesia, 1999) concerning housing health requirements, one person occupies a minimum house area of 8m2. With these criteria, it is expected to prevent disease transmission and launch activities. The state of a dense residence can increase the pollution factor in the house. The bedroom area is at least 8m2 and is recommended not for more than 2 people, each house must have a part of the room that suits its function, determination of the shape, size and number of rooms needs to pay attention to the minimum standard number of rooms. A residential house must have rooms, namely bedrooms, living rooms, dining rooms, kitchens, bathrooms and latrines. Overcrowding can have negative effects on physical and mental health. The spread of disease in densely populated houses will be faster than houses that are not dense.

4.15 The relationship of home ventilation with the incidence of measles

Based on the results of this study, it shows that statistically there is a significant relationship between residential ventilation and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.035 and shows that children whose occupancy ventilation does not meet the requirements have a 3.6 times chance of getting measles with an OR value of 3.601.

This is in line with research from Amanda Yuliana Harapap (2013) entitled The Relationship of Home Environment and Immunization Status to the Incidence of Measles

Cases in Children and Toddlers in Hutaimbaru Village, Barumun District, Padang Lawas Regency in 2013 with results using the Fishers Exact test with a value of p = 0.011 or there is a significant relationship between home ventilation and measles incidence.

Ventilation is the process of providing air or deploying air to or from the room either naturally or mechanically. It should be noted here that the ventilation system must be maintained so that the air does not stagnate or turn again, must flow. This means that in the room of the house there must be a way in and out of the air. Based on the Decree of the Minister of Health of the Republic of Indonesia No.829 / Menkes / SK / VII / 1999 concerning healthy house regulations stipulates that the area of permanent natural ventilation is more than one equal to 10% of the floor area of the house, while it is not eligible if less than 10% of the floor area of the house.

4.16 The relationship of family income with the incidence of measles

Based on the results of this study, it shows that statistically there is a significant relationship between family income and the incidence of measles in the working area of the Tirtayasa Health Center in 2023 with a P Value of 0.001 and shows that children whose family income is less likely to be 6.0 times more likely to get measles with an OR value of 6.058. The results of this study are in line with Lianasari (2018) with a p value of 0.007.

Income is the amount of money that one or more family members receive from their labor. In general, income is defined as input obtained from all activities including income obtained without doing any activities (Randi, 2013). A person's economic provision is related to a person's ability to finance health services. A person may know the importance of health but due to cost constraints the person decides not to get the health services he needs. Low family income will be a consideration for mothers not to immunize their children. Another impact is that mothers prefer to work to help family income so that the time to bring immunized children is reduced (Mulyanti, 2013).

5. Conclusion

Based on the results of this study, it shows that there is a relationship between child factors (measles immunization status, nutritional status and complete basic immunization status), maternal factors (education level, level of knowledge, attitude), father factors (education level), environmental factors (occupancy density, house ventilation) and economic socialization factors (family income) with the incidence of measles in children aged 12-59 months in the working area of the Tirtayasa Health Center, Serang Regency in 2023. However, there is no relationship between child factors (sex and status of high-dose vitamin A supplements), maternal factors (employment status) and father factors (employment status) with the incidence of measles in children aged 12-59 months in the working area of the Tirtayasa Health Center, Serang Regency in 2023.

For Tirtayasa Health Center officers to further improve counseling and implementation of measles immunization considering the large number of children who have not received measles immunization, thus increased measles immunization coverage and reaching Universal Child Immunization (UCI) villages.

It is necessary to collaborate with other parties, such as social services to be able to improve the environment and proper living so as to prevent the transmission of measles.

For other researchers, to be able to dig deeper into various possible variables so that better and accurate research results are obtained.

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