

## The Factors Related to Occurrence of ARI (Acute Respiratory Infection) on Pre-School Children in Working Area of Kairatu Public Health Center, Western Part of Seram Regency 2016

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### Abstract

ARI (Acute Respiratory Infections) is one of the most diseases that lead to death in the world and also in Indonesia specifically. A lot of children of preschool age experience ARI in working area of Kairatu Puskesmas. This study aims to figure out the factors related to occurrence of ARI (Acute Respiratory Infection) on pre-school children in working area of Kairatu Puskesmas (Public Health Center), western part of Seram regency. This research is analytic descriptive study using cross sectional method. The sampling technique of this research using cluster sampling, then obtained a sample of 96 people respondents consisted of patients of preschool children. The collecting of the data is from questionnaire filling, interview and observation. Then the data is analyzed using SPSS applying statistical tests with the significance level of 0.05. The results obtained that the significance value of mother's education is ( $p = 0.006$ ) residential density ( $p = 0.028$ ) types of floor ( $p = 0.507$ ) ventilation ( $p = 0.302$ ) family behavior ( $p = 0.023$ ). From these results it can be concluded that the type of floor and ventilation does not have a significant relationship to the occurrence of ARI while the mother's education, residential density and family behavior has a relationship with ARI occurrence.

**Keywords:** ARI, Preschool Children, Mother's Factor, Environmental Factors, Family Factor

### I. INTRODUCTION

Acute Respiratory Infections (ARI) is the process of acute infection lasts for 14 days, caused by microorganisms and attack one part or more of the bronchial tube, ranging from the nose (upper tract) to the alveoli (down tract) (widoyono 2011). Acute respiratory infection (ARI) is a disease that often occurs on children. Its incidence in terms of age is estimated 0.29 cases per child / year in developing countries and 0.05 cases per child year in developed countries. It shows that there are 156 million of new cases per year in the world where 151 million cases (96.7%) occur in developing countries. Most cases occur in India (43 million), China (21 million) and Pakistan (10 million) Bangladesh, Indonesia and Nigeria respectively 6 million cases (Ministry of health, 2012). ARI (Acute Respiratory Infection) is an infection of upper and lower respiratory tract as well as the problem of infection in the upper respiratory tract is laryngitis, sinusitis, influenza (virus), nasopharynx, rhinitis, epligotitis, ear infection, mucous membranes swollen and the exclusion of mukopurulent serous exudate or often say a cold. ARI is easy to attack the children mainly brought the age of five. (Ministry of Health, 2012). ARI stands for Acute Respiratory Infection and was introduced in 1984 after the discussion of National in a workshop in Cipanas. ARI is a term of English while in Indonesia we call it ISPA (Infeksi Saluran Pernapasan Akut). ARI is a disease that affects one part or more of the bronchial tube from the nose (upper tract) to the alveoli (down tract) including adneksanya tissue, such as sinuses, middle ear and pleural cavity. ARI generally lasts 14 days. The signs and symptoms of ARI such as cough, earache, sore throat, influenza, bronchitis, and sinusitis (Arbatasiah. 2015). Children under five or preschool children is the age where they are very active, wanted to know every form that is seen by them, happy splashing, playing outside the home, and doing a lot of things, yet their appetite tends to decrease. Children during preschool age is also already familiar with a variety of games and wanted to play with friends outside their home, so that with the variety of activities like that, yet decreasing in appetite and nutrient that is not fully absorbed, will make their condition are vulnerable to disease, especially infectious (Namira. S, 2013). According to WHO ARI is one of the most common causes of children death in developing countries. ARI causes four of the fifteen millions estimation of the death of children under five every year. In America there are two to three million cases of pneumonia per year with an average death rate of 45,000 people. In Indonesia pneumonia is the third cause of death after cardiovascular diseases and tuberculosis. Low socio-economic factors are the cause of the high mortality rate. (WHO 2012). The data of Maluku province since 2009 described that ARI was a major diseases in health centers of Maluku province with the number of 27%. In 2010 it still became the first major disease with 31.02% and in 2011 increased 38.43%, in 2012 ARI remain listed first with the number of 269 879 cases (47.88%). (Health Department of Maluku Prvince, 2013). In 2015 the number of patients with respiratory diseases in western part of Seram regency were the highest of 11 sub districts and of 17 health centers there were 18.057 cases of ARI (Annual Report of the Health Service, western part of Seram regency 2015). Based on data obtained from a beginning survey in public health center of Kairatu in 2013 was 510, while from 2014 as many as 402, in 2015 were 352 whereas from January 2016 until May were 200 people (Public Health Center Data of Kairatu)

## II. METHOD

This research is an analytic descriptive study applying cross sectional approach. The research was conducted in Kairatu village, western part of Seram regency on August 1st to September 1st, 2016. The population in this study are 383 using Cluster technique sampling, then obtained a sample of 96 respondents consisting of patients of preschool children.

### A. Data collection

Data collection techniques in this research are questionnaire, interview and observation done by home to home.

### B. Processing of Data

After data collection is done and obtained, the researcher then conduct the data processing includes several parts: editing, coding and tabulating. The next procedure is data analysis using SPSS. The analysis of the data uses Univariate and Bivariate analysis applying Chi-Square statistical tests with significance ( $\alpha = 0.05$ ).

## III. RESULTS

### A. General Characteristics of Respondents

**Table 1.** Distribution of Respondents Frequency in terms of age in Kairatu Public Health Center Western Part of Seram Regency 2016

Age	Frequency	Percent %
> 20	30	31.2
= 30	8	8.3
< 40	58	60.4
Total	96	100.0

Table 1 shows that from 96 respondents, mostly are at age <40 years namely 58 people (60.4%) and the least is the 30 years namely 8 people (8.3%).

### B. Distribution of respondents in terms of education level of mother.

**Table 2.** The distribution of respondents in terms of variable of education level of mother in Kairatu Public Health Center Western Part of Seram Regency 2016

Education of mother	Frequency	Percent%
Low	73	76.0
High	23	24.0
Total	96	100.0

Table 2 shows that from 96 respondents those who have low education as many as 23 people (24.0%) and those who are educated as many as 73 people (76.0%).

### C. The distribution of respondents in terms of the density of residence

**Table 3.** Distribution of respondents based on the variable of density of residence in Kairatu Public Health Center Western Part of Seram Regency 2016

Density of residence	Frequency	Percent %
TMS	67	69.8
MS	29	30.2
Total	96	100.0

Table 3 shows that from 96 respondents, the rooms of residential density which are not qualified as many as 67 people (69.8) and qualified as many as 29 people (30.2).

### D. The distribution of respondents in terms of types of floor

**Table 4.** Distribution of respondents based on the types of floor variable in Kairatu Public Health Center Western Part of Seram Regency 2016

Type of floor	Frequency	Percent%
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TMS	18	18,8
MS	78	81,2
Total	96	100.0

Table 4 shows that from 96 respondents, those who have types of floor which are not qualified as many as 18 people (18.8%) and qualified are 78 people (81.2%).

#### E. Distribution of respondents by ventilation

**Table 5.** The distribution of respondents by variable of ventilation in Kairatu Public Health Center Western Part of Seram Regency 2016

Ventilation	Frequency	Percent %
TMS	32	33.3
MS	64	66.7
Total	96	100.0

Table 5 shows that from 96 respondents, those who have ventilation which not qualified as many as 32 people (33.3%) and qualified as many as 64 people (66.7%).

#### F. Distribution of respondents by behavioral factors

**Table 6.** Distribution of respondents by variable of behavioral factors in Kairatu Public Health Center Western Part of Seram Regency 2016

Behavioral factors	Frequency	Percent %
TMS	32	33.3
MS	64	66.7
Total	96	100.0

Table 6 shows that from 96 respondents those who are less behaved are 68 people (70.8%) and well behaved as many as 28 people (29.2%).

#### G. Distribution of respondents by occurrence ARI

**Table 7.** The distribution of respondents by variable of occurrence of ARI in Kairatu Public Health Center Western Part of Seram Regency 2016

Occurrence of ARI	Frequency	Percent %
Suffer of ARI	32	33.3
Not suffer of ARI	64	66.7
Total	96	100.0

Table 7 shows that from 96 respondents who are suffering ARI as many as 32 people (33.5%) and those who are not as many as 64 people (66.5%).

#### H. The relationship of education level of mother and ARI occurrence on preschool children

**Table 8.** the relationship of education level of mother and ARI occurrence on preschool children in Kairatu Public Health Center Western Part of Seram Regency 2016

Education of mother	ARI occurrence				Total	P (sig)
	Suffer of ARI		Not suffer of ARI			
	(n)	%	(n)	%	(N)	%
Low	41	42.7	32	33.3	73	76.0
High	20	20.8	3	3.1	23	24.0
Total	61	63.5	35	36.5	96	100

Based on the Chi Square statistical test obtained p value = 0.006, this shows that there is a significant relationship between education of mother and ARI occurrence in public health center Kairatu western part of Seram regency 2016.

**I. The relationship of residence density and ARI occurrence on preschool children**

**Table 9.** The relationship of residence density and ARI occurrence in in public health center Kairatu western part of Seram regency 2016

Residence density	ARI occurrence				Total	P (sig)	
	Suffer of ARI		Not suffer of ARI				
	(n)	%	(n)	%	(N)	%	
TMS	38	39.6	29	30,2	67	69.8	0.028
MS	23	24.0	6	6.2	29	30.2	
Total	61	63.5	35	36.5	96	100	

Based on the Chi Square statistical test obtained p value = 0.028, this shows that there is a significant relationship between residential density and ARI occurrence in public health center Kairatu western part pf Seram regency 2016.

**J. The rrelationship of floor type and ARI occurrence on preschool children**

**Table 10.** The relationship of floor type with ARI occurrence on preschool children in Kairatu Public Health Center Western Part of Seram Regency 2016

Floor type	ARI occurrence				Total	P (sig)	
	Suffer of ARI		Not suffer of ARI				
	(n)	%	(n)	%	(N)	%	
TMS	11	11.5	7	7.3	18	18.8	0,507
MS	50	52.1	28	29.2	78	81.2	
Total	61	63.5	35	36.5	96	100	

Based on the Chi Square statistical test values obtained p = 0.507, this shows that there is no significant relationship between floor type and the occurrence of ARI in public health center Kairatu western part of Seram regency 2016

**K. The relationship of ventilation and ARI occurrence on preschool children**

**Table 11.** The relationship of ventilation and ARI occurrence on preschool children in Kairatu Public Health Center Western Part of Seram Regency 2016

Ventilati on	ARI occurrence				Total	P (sig)	
	Suffer of ARI		Not suffer of ARI				
	(n)	%	(n)	%	(N)	%	
TMS	22	22.9	10	10.4	32	33.3	0.302
MS	39	40.6	25	26.0	64	66.7	
Total	61	63.5	35	36.5	96	100	

Based on the Chi Square statistical test obtained p value = 0.302, this shows that there is no significant relationship with the occurrence ventilation ARI in Puskesmas Kairatu District of West Seram regency Kairatu 2016.

**L. The relationship between behavioral factors and ARI occurrence on preschool children**

**Table 12.** The relationship between behavioral factors and ARI occurrence on preschool children in Kairatu Public Health Center Western Part of Seram Regency 2016

Behavior al factor	ARI occurrence				Total	P (sig)	
	Suffer of ARI		Not suffer of ARI				
	(n)	%	(n)	%	(N)	%	
Less	48	50.5	20	20.8	68	70,8	0,023
Good	13	13.5	15	15.6	28	29.2	
Total	61	63.5	35	36.5	96	100	

Based on the Chi Square statistical test obtained p value = 0.023, this shows that there is a significant relationship between behavioral factors and ARI occurrence in public health center Kairatu western part of Seram regency 2016

#### IV. DISCUSSION

##### **A. *The relationship between education of mother and ARI occurrence on preschool children***

Based on the Chi Square statistical test obtained p value = 0.006, this shows that there is a significant relationship between education of mother and ARI occurrence in public health center Kairatu western part of Seram regency 2016. This study is in line with a research conducted by Nani Rusdawati hasan (2012)) entitled The factors associated with ARI occurrence of toddler in working area of Health UPTD (unified service unit) Eastern Luwuk, Banggai regency Central Sulawesi province with p value= 0.040, indicating that there is a significant relationship between factors related to the ARI occurrence of toddlers in Health UPTD Eastern Luwuk, Banggai regency Central Sulawesi province. Research conducted by Supratini (2011), showed that there is a relationship between education and ARI occurrence on preschool children, where mothers who did not complete elementary school, graduated from elementary school and junior high school are more at risk affected ARI on their children than high school graduate and the next high school.

##### **B. *The relationship of residential density and ARI occurrence on preschool children***

Based on the Chi Square statistical test obtained p value = 0.028, this shows that there is a significant relationship between residential density and ARI occurrence in public health center Kairatu, western part of Seram regency 2016. This study is in line with research conducted by Embriowati Catiyas (2012) entitled the factors associated with the ARI incidence on toddlers in Gombang sub district Kebumen regency, Central Java with p value = 0.029, this shows that there is a significant relationship between factors related to ARI occurrence on toddlers in Gombang sub district Belita Kebumen, regency Central Java. Research conducted by the King (2012) also showed a significant relationship between residential density and the death of bronkopneumonia on toddlers, condition of residence density can increase pollution factor at home. Yet it mentioned that air pollution, social, and education give a high correlation on these factors.

##### **C. *The relationship between floor type and ARI occurrence on preschool children***

Based on the Chi Square statistical test obtained p value = 0.507, this shows that there is no significant relationship between type of floor and ARI occurrence in public health center Kairatu, western part of Seram regency 2016. Type of house floor is a type of flooring used in rural areas homes. A good type of floor is a waterproof floor (ceramics, cement and tiles), conversely a not good floor is a kind of no waterproof floor, Notoatmodjo, 2010). The results are consistent with previous studies conducted by Sinaga (2012), which stated that there is no significant relationship between floor type and ARI occurrence on toddlers in Gombang sub district, Kebumen regency, Central Java.

##### **D. *The relationship between ventilation and ARI occurrence on preschool children***

Based on the Chi Square statistical test obtained p value= 0.302, this shows that there is no significant relationship between ventilation and ARI occurrence in public health center Kairatu, western part of Seram regency 2016. Smoke that is generated from mosquito repellent can cause air pollution coming from inside the house (indoor). The air pollution could be diameter dust particles 2,5u (PM2.5) and diameter dust particles 10 u (PM 10) that cause ARI (Indonesia Health Ministry 2011). The results are consistent with previous studies conducted by Namira (2012), who stated that there was no significant relationship between ventilation and ARI occurrence on toddlers aged 0-5 years who live in a residential home due to the disaster of Merapi cold lava in Salam sub district Magelang district.

##### **E. *The relationship between behavioral factors and ARI occurrence on preschool children***

Based on the Chi Square statistical test obtained p value= 0.023, this shows that there is a significant relationship between behavioral factors and ARI in public health center Kairatu, western part of Seram regency 2016. A research conducted by Fidiani (2011) showed that there is a significant relationship between family behavior and ARI occurrence that the toddlers with poor behaviour of family are at risk to have ARI 3.38 times greater than the good behavior of family. This study is in line with research conducted by Nani Rusdawati hasan (2012)) entitled the factors associated with ARI occurrence on toddlers in working area of Health UPTD ( Unified Service Unit) Eastern Luwuk, Banggai regency Central Sulawesi province with p value = 0.050, meaning there is a relationship between factors associated to ARI occurrence on toddlers in working area of Health UPTD Eastern Luwuk Banggai regency Central Sulawesi province

## V. CONCLUSIONS AND RECOMMENDATIONS

### A. Conclusion

Based on the results discussion on factors associated to ARI occurrence on pre-school children in public health center Kairatu, western part of Seram regency, it can be concluded as follows: The results of mother's education statistical test using Chi Squares shows that:  $p = 0.006$  (0.05) so  $H_0$  is rejected. It means that there is a relationship between maternal education and ARI occurrence on preschool children in public health center Kairatu western part of Seram regency 2016.

1. Statistical test of environmental factors results using Chi square shows that:
  - a.  $p = 0.028$  (0.05), so  $H_0$  is rejected, it means that there is a relationship between residential density and ARI occurrence on pre-school children in Kairatu Public Health Center Western Part of Seram Regency 2016.
  - b.  $p = 0.507$  (0.05), so  $H_0$  is accepted meaning there is no relationship between the type of floor and ARI occurrence on preschool children in Kairatu Public Health Center Western Part of Seram Regency 2016.
2. Statistical test results using the Chi-square shows that value of  $p = 0.302$  (0.05), so  $H_0$  is accepted meaning there is no relationship between ventilation and ARI occurrence on preschool children in Kairatu Public Health Center Western Part of Seram Regency 2016.
3. The results of the behavioral factors statistical test using chi square shows that:  $p = 0.023$  (0.05) so  $H_0$  is rejected it means that there is a relationship between behavioral factors and ARI occurrence on pre-school children in Kairatu Public Health Center Western Part of Seram Regency 2016.

### B. Suggestion

Suggestions could be delivered based on the results of this study such as:

#### 1. Kairatu Public Health Center:

In order to provide counseling related to ARI (eg family behaviors of smoking, the use of cooking fuel, the use of burned anti-mosquito and PHBS). Re- activate the Promkes officers to conduct health education regarding factors related to the occurrence of ARI especially physical environmental factors of houses, air pollution in houses, and behavior which causes ARI to the community to form a community awareness and willingness to change their behavior and a healthier home environment.

#### 2. Community / Family:

From the results of this study it is expected add the insight to the society/ families who have preschool children in order to pay more attention to their children, because children under five or preschool children is the age where they are very active, wanted to know every form that is seen by them, happy splashing, playing outside the home, and doing a lot of things, yet their appetite tends to decrease. Thus, it is expected to the community to involve in the efforts on preventing the disease of Acute Respiratory Infection.

#### 3. Further Research:

This study examined only a small portion of risk factors that cause ARI occurrence on preschool children. It is hoped that the next researcher to develop this research with other risk factors, the research design, sampling with different methods in order to get more perfect and better results.

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