

## Factors Influence of Acute Respiratory Infection Incidence to Child Under Five Years in Timika Jaya Health Primary Mimika District

Endang Gainau<sup>1</sup>, A.L. Rantetampang<sup>2</sup>, Arry Pongtiku<sup>3</sup>, Anwar Mallongi<sup>4</sup>

<sup>1</sup>Magister Program of Public Health, Faculty of Public Health, Cenderawasih University, Jayapura.

<sup>2,3</sup>Lecturer of Master Program in Public Health. Faculty of Public Health, Cenderawasih University, Jayapura

<sup>4</sup>Environmental Health Department, Faculty of Public Health, Hasanuddin University, Makassar.

Corresponding Author: Anwar Mallongi

### ABSTRACT

**Background:** Acute Respiratory Infection is a health problem that can cause death in infants. Various factors are caused by age of children under five, nutritional status, immunization status, education, ventilator, smoking habits in the home and the use of mosquito repellent.

**Objective** of the study: Evaluate what factors are related to the incidence of ARI in Timika jaya Health Center, Mimika District, Papua Province.

**Research Methods:** Descriptive analytical cross sectional study design. The population of all under-fives and a sample of 79 under-fives was random sampling. Data were obtained using a questionnaire and analyzed using chi square and regression binary logistic.

**Results:** Factors related to the incidence of ARI in infants at Timika Jaya Community Health Center were nutritional status (p-value = 0,000; RP = 5,471; CI95% = (3,022 - 9,904), status of immunization of infants (p-value = 0,001; RP = 2,992; CI95 % = (1,633 - 5,481), maternal education (p-value = 0,019; RP = 2,318; CI95% = (1,221 - 4,402), ventilation area (p-value = 0,000; Rp = 0,048; CI95% = (0, 012 - 0.188), as soon as the kitchen (p-value = 0.007; RP = 2,594; CI95% = (1,375 - 4,896), habit of using mosquito repellent (p-value = 0,000; Rp = 4,642; CI95% = (2,600 - 8,285 ) ARI for toddlers in Timika Jaya Community Health Center is under five years old (p-value = 0.208; RP = 1,944; CI95% = (0, 973 - 3,884). Compilation, immediate kitchen and habit of using mosquito repellent.

**Keywords:** Acute, Respiratory, Infection, Child

### 1. INTRODUCTION

In 2015 based on WHO data more than 1.3 million children died because of pneumonia, most of them were under 3 years old and almost 99% of these deaths were in developing countries and data for cases of ARI in India 30, 1 % China 21, 2%, Pakistan 39, 4% and in Indonesia 32, 10% of these cases occur where access to health care facilities and treatment is out of reach or inactive for many children (WHO, 2016). According to Blum (1981) cited by Notoatmodjo (2011) that public health is influenced by four namely environmental factors, behavioral factors, health service factors and genetic factors. Host factors that can increase the susceptibility of ARI diseases such as under five factors (low birth weight age, immunization status and nutritional status) maternal factors; education, work and behavior, (Maryunani, 2013; Mallongi, et.al. 2014;2016).

The Indonesian Ministry of Health in 2017 reported under five mortality or AKABA of 27 per 1000 live births (BPS, 2017). The cause of death of children under five is due to ARI (7.60%) with the incidence of ARI nationally in infants (57.84%). The incidence of ARI in Papua Province in 2017 as a whole reached 31% (Indonesian Ministry of Health, 2017). Based on the results of the 2013 Riskesdas report, ARI occupies the highest prevalence of under-fives, namely more than 35%. Data on ISPA cases in 2014 were 27.17% of cases and 2015 were 6.64% of cases in toddlers. The prevalence of ARI also tends

to occur higher in the group of mothers with the lowest level of maternal education and income level. The occurrence of ARI in infants is influenced by several factors, namely the nutritional status, behavior and density of residents and maternal characteristics such as mother's age, level of education and knowledge of the mother (Ministry of Health, 2012).

ARI, especially pneumonia in Papua, is included in the top 10 diseases and ranks seventh after influenza disease, clinical malaria, Falcifarum malaria, Malariavivax, Diarrhea and Malaria mix. and in 2014 as many as 0, 75% of cases. In 2015, 0, 69% of cases in toddlers, in 2016, as many as 0, 53% of cases in infants (Papua Provincial Health Office, 2017). Data obtained from the Mimika Regency Health Office where toddlers suffering from ARI in 2014-2016 ranked first in the top 10 most diseases in Mimika Regency, with ARI incidence in 2014 of 2, 54% of cases. In 2015, there were 3, 38% of cases. In 2016 there were 1, 82% of cases (Papua Provincial Health Office, 2017)

Based on data from Disease that can be obtained from the Timika Jaya Community Health Center in Mimika Regency, that the last 3 years is a data of the top 10 diseases, one of which is ARI disease which ranked first, in 2014, the number of children suffering from ARI 5, 16%, in 2015, 6, 21%, 2016, 6, 36% and in 2017, from January to March, 79 cases suffered from ISPA. With a population of 10,875 people, per 1,000 populations consisted of 368 mothers of children under five in Timika Jaya Health Center. Based on the explanation above, I was interested in conducting a study on "Factors related to the incidence of ARI in infants in Timika Jaya Health Center working area of Mimika District Health Office in 2018"

## 2. MATERIALS AND METHODS

### 2.1 Types of Research

This research is an analytical study with a cross sectional study design, where data is collected at the same time simultaneously.

Research methods are carried out with the aim of knowing the relationship of the situation objectively (Natoatmodjo, 2012).

### 2.2 Location and time of Research

The research location at the Timika Jaya Community Health Center in Mimika Regency was conducted for a month in October 2018 - November 2018.

### 2.3 Population and Samples

#### 1. Population

The population in this study were all research objects or objects under study (Natoatmodjo 2010) The population in this study were all mothers who had children under five with the number of health center data in August - September 2018 as many as 368 mothers of children under five in the work area of Timika Jaya District Health Center Mimika in 2018 "

#### 2. Samples

The sample is a portion of the population that is considered representative (Notoatmodjo, 2012). The sample size in this study is a sample of the population of researchers using the Slovin formula with about 79.

## 3. RESULTS

### 3.1 Bivariate Analysis

#### a. Age relationship of toddlers with ARI in infants

Table 1. Age relationship of toddlers with ARI incidence in infants at Timika Jaya Health Center

No	Age	ARI incidence in infants				Number	
		ARI		No ARI		n	%
		n	%	n	%		
1	≤ 12 month	5	55,6	4	44,4	9	100
2	> 12 month	20	28,6	50	71,4	70	100
Total		25	31,6	54	68,4	79	100
p-value = 0, 208; RP = 1,944; CI95% = (0, 973 – 3,884)							

Based on Table 4.3, it shows that of 9 toddlers aged <12 months there were 5 people (55.6%) with ARI and not ARI as many as 4 people (44.4%). Whereas 70 people aged >12 months were 20 people (28.6%) with ARI and not ARI as many as 50 people (71.4%). The results of the chi square test obtained p-value = 0.208 >0.05. This means that there is no relationship between the age of children under five to the incidence of ARI in infants at Timika Jaya

Health Center. Prevalence ratio test results (RP) = 1,944; CI95% = (0, 973 - 3,884) with a lower value not including 1 which means that the age of a toddler is not a risk factor for the incidence of ARI.

**b. The relationship of nutritional status of children with the incidence of ARI in infants**

Table 2. Relationship between nutritional status of children with ARI in infants at Timika Jaya Health Center

No	Infant Nutrition	ARI incidence in infants				Number	
		ARI		Not ARI		n	%
		n	%	n	%		
1	Less	15	88,2	2	11,8	17	100
2	Good	10	16,1	52	83,9	62	100
Total		25	31,6	54	68,4	79	100

*p-value* = 0,000; RP = 5,471; CI95% = (3,022 - 9,904)

Based on Table 2, it shows that of the 17 children under five with malnutrition status as many as 15 people (88.2%) with the incidence of ARI and not ARI as many as 2 people (11.8%). While from 62 children under five with good nutritional status as many as 10 people (16.1%) with the incidence of ARI and not ARI as many as 52 people (83.9%). The results of the chi square test obtained *p-value* = 0,000 <0,05. This means that there is a correlation between the nutritional status of children under five years of ISPA in infants at Timika Jaya Health Center. The prevalence ratio test results (RP) = 5.471; CI95% = (3,022 - 9,904) which means that the nutritional status of children under five is less likely to have ARI events 5,471 times higher than toddlers with good nutritional status.

**c. Relationship between toddler immunization status and the incidence of ARI in infants**

Table 3. Relationship between immunization status of toddlers and the incidence of ARI in infants at Timika Jaya Health Center

No	Infant immunisation status	ARI incidence in infants				Number	
		ARI		Not ARI		n	%
		n	%	n	%		
1	Mot complete	13	61,9	6	38,1	21	100
2	Complete	12	20,7	46	79,3	58	100
Total		25	31,6	54	68,4	79	100

*p-value* = 0, 001; RP = 2,992; CI95% = (1,633 - 5,481)

Based on Table 3, it shows that of the 21 children under five with incomplete

immunization status as many as 13 people (61.9%) with the incidence of ARI and not ARI by 6 people (38.1%). While from 58 people with complete immunization status as many as 12 people (20.7%) with ARI incidence and not ARI as many as 46 people (79.3%). The results of the chi square test obtained *p-value* = 0.001 <0.05. This means that there is a relationship between immunization status of infants to the incidence of ARI in infants at Timika Jaya Health Center. Prevalence ratio (RP) = 2,992; CI95% = (1,633 - 5,481) which means that the immunization status of incomplete toddlers is likely to have ARI incidence 2,992 times higher than toddlers with complete immunization status.

**d. Relationship between mother's education and the incidence of ARI in infants**

Table 4. Relationship between mother's education and the incidence of ARI in infants at Timika Jaya Health Center

No	Mother education	ARI incidence in infants				Number	
		ARI		Not ARI		n	%
		n	%	n	%		
1	Low	14	50	14	50	28	100
2	High	11	21,6	40	78,4	51	100
Total		25	31,6	54	68,4	79	100

*p-value* = 0, 019; RP = 2,318; CI95% = (1,221 - 4,402)

Based on Table 4 shows that of the 28 mothers of children with low education as many as 14 people (50%) with the incidence of ARI and not ARI as many as 14 people (50%). While from 51 mothers of children with high education as many as 11 people (21.6%) with the incidence of ARI and not ARI as many as 40 people (78.4%). The results of the chi square test obtained *p-value* = 0.019 <0.05. This means that there is a relationship between maternal education and the incidence of ARI in infants at Timika Jaya Health Center. The prevalence ratio (RP) = 2.318; CI95% = (1,221 - 4,402) which means that the education of mothers who have low childbirth is at risk of ARI by 2,318 times higher than under-educated mothers.

**e. Relationship between ventilation in the house and the incidence of ARI in infants**

**Table 5. Relationship between Ventilation Area in the house and the incidence of ARI in infants in Timika Jaya Health Center**

No	Ventilation	ARI incidence in infants				Number	
		ARI		Not ARI		n	%
		n	%	n	%		
1	Not meet requirement	2	3,9	49	96,1	51	100
2	Meet requirement	23	82,1	5	17,9	28	100
Total		25	31,6	54	68,4	79	100

*p-value* = 0,000; *RP* = 0,048; *CI95%* = (0, 012 - 0,188)

Table 5, shows that of 51 people with extensive ventilation did not meet the requirements as many as 2 people (3.9%) with the incidence of ARI and not ARI as many as 49 people (96.1%). Whereas from 28 people who had extensive ventilation fulfilled the requirements as many as 23 people (82.1%) with the incidence of ARI and not ARI as many as 5 people (17.9%). The results of the chi square test obtained *p-value* = 0,000 <0,05. This means that there is a broad relationship of ventilation to the incidence of ARI in infants at Timika Jaya Health Center. The prevalence ratio (*RP*) = 0.048; *CI95%* = (0, 012 - 0.188) does not include 1 which means that the extent of home ventilation is not a risk factor for the incidence of ARI in infants.

#### **f. Kitchen Smoke Relationships in the home environment with the incidence of ARI in infants**

**Table 6. The Relationship of Kitchen Smoke in the home environment with the incidence of ARI in infants in Timika Jaya Health Center**

No	Kitchen Smoke	ARI incidence in infants				Number	
		ARI		Not ARI		n	%
		n	%	n	%		
1	Yes	14	53,8	12	46,2	26	100
2	Not	11	20,8	42	79,2	53	100
Total		25	31,6	54	68,4	79	100

*p-value* = 0,007; *RP* = 2,594; *CI95%* = (1,375 - 4,896)

Based on Table 6, it shows that of the 26 people exposed to kitchen smoke as many as 14 people (53.8%) with the incidence of ARI and not ARI as many as 12 people (46.2%). While from 53 people who were not exposed to kitchen smoke as many as 11 people (20.8%) with the incidence of ARI and not ARI as many as 42 people (79.2%). The results of the chi square test obtained *p-value* = 0.007 <0.05. This means that there is a relationship of kitchen smoke to the

incidence of ARI in infants in Timika Jaya Health Center. Prevalence ratio test results (*RP*) = 2,594; *CI95%* = (1,375 - 4,896) with a value that means that toddlers who are exposed to kitchen smoke as much as 2,594 times higher are likely to have an ARI event than toddlers who are not exposed to kitchen fumes.

#### **g. The relationship between the habit of using mosquito repellent and the incidence of ARI in infants**

**Table 7. The relationship between the habit of using mosquito repellent and the incidence of ARI in infants in Timika Jaya Health Center**

No	habit of using mosquito repellent	ARI incidence in infants				Number	
		ARI		Not ARI		n	%
		n	%	n	%		
1	Yes	14	82,4	3	17,6	17	100
2	Not	11	17,7	51	82,3	62	100
Total		25	31,6	54	68,4	79	100

*p-value* = 0,000; *RP* = 4,642; *CI95%* = (2,600 - 8,285)

Based on Table 7, it shows that of the 17 people with the habit of using the mosquito repellent drug as many as 14 people (82.4%) with the incidence of ARI and not ARI as many as 3 people (17.6%). While from 62 people who did not use the mosquito repellent as many as 11 people (17.7%) with the incidence of ARI and not ARI as many as 51 people (82.3%). The results of the chi square test obtained *p-value* = 0,000 <0,05. This means that there is a relationship between the habit of using mosquito repellent against ISPA in infants in Timika Jaya Health Center. Prevalence ratio (*RP*) = 4,642; *CI95%* = (2,600 - 8,285) with a value that means that the habit of using mosquito repellent 4.642 times higher is likely to have an ARI event than there is no habit of using mosquito repellent.

## **4. DISCUSSION**

### **4.1 Relationship between the age of a toddler and the incidence of ARI in infants**

The results of the study were obtained from the results of statistical tests that there was no relationship between the age of children under five to the incidence of ARI in infants in Timika Jaya Community Health Center,

Mimika Regency ( $p\text{-value} = 0.208 > 0.05$ ). This research is in line with the previous one conducted by Fibrila (2015) in Lampung Province revealing that underage is not related to the incidence of ARI. Balitas <12 months old were 55.6% with ARI and non-ARI cases and children with ARI at age > 12 months were 28.6% with ARI and not ARI 50 people (71.4%) and from results prevalence ratio test (RP) = 1,944; CI95% = (0, 973 - 3,884) with a lower value not including 1 which means that the age of a toddler is not a risk factor for the incidence of ARI.

A number of large studies have shown that the incidence of respiratory diseases by viruses has increased in infants and early childhood and continues to decline with age. The highest incidence of ISPA is at the age of 6-12 months (Maryunani, 2013). In this study, the absence of a relationship was caused by the presence of other factors that more strongly influenced the age of toddlers, such as exposure to kitchen fumes and mosquito repellent. Research conducted by Oktaviani (2017) revealed that age is an actor that influences the incidence of pneumonia is age and pneumonia occurs in children under five with young age <36 months. In this study there is a discrepancy with the inner theory Maryunani's book (2013) explained that children under the age of 2 years have a higher risk of getting ARI than older children. This is due to children under the age of 2 years immunity is not perfect and the respiratory tract is relatively narrow. There is a mismatch between the research and the theory that is possible because of the limited number of samples and the limited time of the study

#### **4.2. The relationship of nutritional status of children with the incidence of ARI in infants.**

The results of the study were obtained from the results of statistical tests that there was a relationship between nutritional status of children under five years of ARI in infants in Timika Jaya Health Center ( $p\text{-value} = 0,000 < 0,05$ ).

Previous research conducted by Widia (2017) revealed that the nutritional status of children under five is related to the incidence of ARI due to the lack of nutritional status that causes a lack of endurance for children under five. Toddlers are a group of people who are vulnerable to malnutrition, in this group experiencing a cycle of growth and development that requires nutrients that are greater than other age groups so that toddlers are the easiest to suffer from nutritional disorders. The incidence of malnutrition is like an iceberg phenomenon where the incidence of malnutrition can cause death. In the case of malnutrition, it will be more susceptible to infection due to decreased immunity against invading pathogens. Good growth and adequate immunological status will also produce good health (Parii, 2014).

Toddlers with malnutrition status as much as 88.2% with ARI incidence and as much as 16.1% with ARI incidence in infants with good nutritional status. This shows that the lack of nutritional status is high with the incidence of ARI. The prevalence ratio test results (RP) = 5.471; CI95% = (3,022 - 9,904) which means that the nutritional status of children under five is less likely to have ARI events 5,471 times higher than toddlers with good nutritional status.

According to Maryunani (2013), ARI is more common in toddlers, this may be closely related to the problem of the baby's immune system that is still not too strong compared to adults. In a state of good nutrition, the body has enough ability to defend itself against infectious diseases. Whereas if the state of nutrition becomes bad, then the body's immune reaction will decrease so that the body's ability to defend itself against infection will decrease. This event is caused by the process of formation of antibodies that are disturbed or inhibited and eventually the production of these antibodies will decrease. This decrease results in the body being more vulnerable or susceptible to infection. So the condition of malnutrition and the incidence of ARI often

work together and foster a poor prognosis.

Culture guides people in how to behave and fulfill their basic biological needs, including the need for food. Culture also determines when a person can and should not consume food (known as taboo), although not all things that are taboo make sense and are good in terms of health. Not a few things are taboo is a good thing when viewed from health, one example is toddlers who are taboo to eat sea fish because it is feared will cause worms. In fact, in terms of health, the opposite applies; eating fish is very good for toddlers because it has a protein that is needed for growth. There are 3 groups of community members who usually have restrictions on certain foods, namely toddlers, pregnant women, and nursing mothers (Sulistyaningish, 2011).

This research is in line with the research conducted by Watopa (2015) in Waropen District that there is a cultural relationship between family eating and children's nutritional status. The culture of eating is lacking, namely the mother does not provide children with certain dietary foods that are believed, Mother follows the child's willingness to eat which is not as diverse as eating rice with soy sauce only, Mother gives children solid food in children who are easily satisfied. In addition, mothers do not provide certain foods, even though mothers know that food is beneficial for children. While the good mother's eating culture, mothers choose foods that are cheap and healthy and diverse. A culture of eating that is less at risk of under five nutrition status. This is evident from the prevalence ratio test of 4.964 times higher compared to mothers who have a good family eating culture. There are interesting things in Papua, in general, people still place sago and sweet potatoes as the main choice of staple food for the Papuan people. Anthropologists, view eating habits as a whole complex of kitchen-related activities, hobbies, and dislike of a type of food, popular proverbs, beliefs, prohibitions and superstitions related to production, preparation of food processing and

consumption of food as main categories of culture (Mapandin, 2006). According to Kristianto (2013), the culture of feeding children under five occurs because mothers and families have beliefs that are based on cultural aspects, so the mother decides to provide food in accordance with the cultural conditions.

The Lani and Dani tribes occupy the Mimika Regency, which is a new regency which is the result of the expansion of Jayawijaya Regency. Mimika Regency occupies the western part of the Baliem Valley. The Mimika Regency area consists of hilly areas, steep ravines, high mountains up to 2,500 meters above sea level (asl). Such topographic conditions are like natural isolation which is the cause of this region's underdevelopment. The shape of the grooving Mimika land makes it difficult to make road. The livelihoods of the Lani people are farming, the crops they plant are cassava (Mimika District Health Office, 2017).

Daily life of the Lani people is obtained through the results of cultivation, hunting and raising pigs. Their food is sweet potatoes, taro, sugar cane, bananas, vegetable candles, sweet potato leaves, beans. Women who work are farmed. His work is gardening, red fruit, oranges, pineapple, alpuket, banana, corn and hunting. Food given to babies is sweet potatoes, taro and bananas (Somantri, 2008). Sweet potatoes and pork for the Lani tribe are a source of basic needs in various ways, so children have a variety of foods

The role of Pukesmas officers can increase maternal knowledge through the role of posyandu when toddlers are weighed by providing counseling about giving balanced gzii intake so that mothers' knowledge increases and influences the provision of nutrition to their children.

#### **4.3 Relationship between toddler immunization status and the incidence of ARI in infants**

The results of the study were obtained from the results of statistical tests that there was a relationship between

immunization status of toddlers on the incidence of ARI in infants in Timika Jaya Health Center (p-value = 0.001 <0.05). This research is in line with previous research conducted by Oktaviani (2017) in the Teluknaga District Health Center, Tangerang Regency, revealing the same thing that incomplete immunization status is associated with the incidence of ARI in infants.

Provision of immunization is one attempt to establish an antibody system in the human body. Antibodies formed from immunization require time to function. Completeness of immunization can help the formation of antibodies optimal is expected to suppress the development of the disease does not become more severe if exposed to ARI. Infants and toddlers who have had measles and survivors will get natural immunity against pneumonia as a complication of measles. Most ARI deaths come from the type of ARI that develops from diseases that can be prevented by immunization (Maryunani, 2013). Toddlers with incomplete immunization status were 61.9% with ARI incidence and as many as 20.7% with complete immunization. Prevalence ratio (RP) = 2,992; CI95% = (1,633 - 5,481) which means that the immunization status of incomplete toddlers is likely to have ARI incidence 2,992 times higher than toddlers with complete immunization status.

Paying attention to the problem of complete immunization status with the incidence of ARI in infancy is a period of growth of each body system. This condition certainly causes toddlers vulnerable to infection. Factors that support children who are not susceptible to infection are to increase immunity through immunization. Thus, the importance of basic immunization for children, so the role of puskesmas officers in providing counseling to mothers so that their children get immunizations for children under five whose immunization is not complete.

#### **4.4 Relationship between mother's education and the incidence of ARI in infants**

The results of the study were obtained from the results of statistical tests that there was a relationship between maternal education on the incidence of ARI in infants in Timika Jaya Health Center (p-value = 0, 019 <0.05). This is in line with the research conducted by Chandra (2017), stating that maternal education is one of the influencing factors behavioral prevention of ARI. There is a positive relationship between the level of education with ARI prevention behavior, the higher the education level of the respondent, the proportion of respondents' good actions better.

Mothers of children under five with low education as much as 50% with the incidence of ARI and as many as 21.6% of mothers with high education their children experience the incidence of ARI. The prevalence ratio (RP) = 2.318; CI95% = (1,221 - 4,402) which means that the education of mothers who have low childbirth is at risk of ARI by 2,318 times higher than under-educated mothers. Mother's education is closely related to family health. Mothers generally play a role in maintaining the health of infants and toddlers. All efforts are made so that the baby remains healthy. Therefore maternal education is very important in maintaining the health of infants and toddlers. A well-educated mother will have sufficient insight in maintaining the health of her baby and child. Efforts to prevent ARI can be carried out by Timika Jaya Community Health Center officers by increasing counseling efforts to mothers, so that low-educated mothers can understand how to care for the family, especially care for babies and babies.

#### **4.5 The relationship between the extent of ventilation and the incidence of ARI in infants**

The results of the study were obtained from the results of statistical tests that there was a relationship between

smoking habits in the home to the incidence of ARI in infants in Timika Jaya Health Center (p-value = 0,000 <0,05). The results of this study are in line with the research conducted by Sofia (2017), revealing that toddlers who live at home with smokers in homes are more susceptible to ARI. The number of smokers will be proportional to the number of sufferers of health problems. Cigarette smoke will increase the risk for toddlers to get ARI attacks. The area of home ventilation of respondents who did not meet the requirements was 3.9% with the incidence of ARI and as much as 82.1%. The area of ventilation of houses of respondents who qualified for the incidence of ARI. The prevalence ratio (RP) = 0.048; CI95% = (0, 012 - 0.188) does not include 1 which means that the extent of home ventilation is not a risk factor for the incidence of ARI in infants.

Ventilation is the process of providing air or air flow to or from the room both naturally and mechanically. The function of ventilation can be described as supplying clean air, namely air containing optimum oxygen levels for breathing. Free the room air from smells, smoke or dust and other pollutants by air dilution. Supply heat so that the body heat loss is balanced. Supply heat due to loss of heat from the room and buildings. Removing excess hot air caused by body radiation, conditions, evaporation or external conditions. Disabling the air temperature evenly (Maryunani, 2013). This can occur in homes with poor ventilation and the kitchen is located in a house united with a bedroom, a room where babies and toddlers play. This is more likely because babies and toddlers are at home with their mothers longer, so the pollution dose will certainly be higher. Mother's prevention of ARI can be done by reminding family members who smoke so that they do not smoke at home or stop smoking in addition to harming health as well as detrimental to the family economy because they simply throw away money that is not useful.

#### **4.6 Relationship of kitchen smoke in the home environment with the incidence of ARI in infants**

The results of the study obtained from the results of statistical tests there is a relationship between the habit of burning garbage in the home environment to the incidence of ARI in infants in Timika Jaya Health Center (p-value = 0.007 <0.05). The results of this study are in line with the research conducted by Sofia (2017), revealing that family habits of burning waste are more susceptible to ARI disease. The smoke of burning trash has a detrimental effect on health such as lung cancer, asthma, tuberculosis, cataracts, heart disease, babies born with low body weight, blindness, and even affect children's brain abilities (Maryunani, 2013).

Exposure to kitchen smoke, especially from wood burning and the like, and air pollution to improve environmental hygiene can be done for example by providing good ventilation in the house, maintaining cleanliness, and using protective masks to reduce exposure to pollution (Sigalingging, 2013).

Residential Health Requirements especially ventilation according to the Decree of the Minister of Health of the Republic of Indonesia Number: 829 / Menkes / SK / VII / 1999 that the area of permanent natural ventilation or ventilation is at least 10% of the floor area. With good ventilation, allowing fresh air to easily enter the house and dirty air pollution (smoke) can come out, so that the incidence of ARI will decrease (Marhamah, 2013; Edowai, 2018; Linggar, 2019)

Toddlers exposed to kitchen smoke were 53.8% with ARI events and as many as 20.8% were not exposed to kitchen fumes with ARI events. Prevalence ratio test results (RP) = 2,594; CI95% = (1,375 - 4,896) with a value that means that toddlers who are exposed to kitchen smoke as much as 2,594 times higher are likely to have an ARI event than toddlers who are not exposed to kitchen fumes.

According to Smith (2016), that kitchen smoke as the main cause of health problems is caused by incomplete combustion. having the same impact as cigarettes is even more dangerous because the amount of smoke is very large. The compound produced is like burning a thousand cigarettes every hour. Prevention efforts can be carried out by the family so as not to burn waste and should dispose of garbage in a place that has been provided by the government.

#### **4.7. The relationship between the habit of using mosquito repellent in a home environment and the incidence of ARI in infants**

The results of the study were obtained from the results of statistical tests that there was a relationship between the habit of using mosquito repellent against the incidence of ARI in infants in Timika Jaya Health Center (p-value = 0,000 <0,05). The results of this study are in line with the research conducted by Sofia (2017), revealing that the habit of using mosquito repellents is susceptible to ARI disease.

Toddlers whose parents have the habit of using mosquito repellent drugs as much as 82.4% with ARI incidence and as much as 17.7% with ARI events. Prevalence ratio (RP) = 4,642; CI95% = (2,600 - 8,285) with a value that means that the habit of using mosquito repellent 4.642 times higher is likely to have an ARI event than there is no habit of using mosquito repellent.

Smoke from mosquito coils is dangerous for health, research found lung damage caused by one insect repellent was the same as damage caused by 100 cigarettes. ExistenceDDVP content (dichlorovynil dimetyl phosfat), a substance that is dangerous if continuously exposed for a long period of time will cause nerve damage, respiratory problems and trigger cancer. other than that the chemical content contained in insect repellent can reduce enzyme activity so that there is a bad influence towards heart and reproduction (Dahniar, 2011).

Families who use insect repellent so that exposure to infants often occurs resulting in many infants suffering from ARI. Though insect repellent is very dangerous for health. The active ingredients contained in insect repellent are very dangerous and can interfere with human health. CO<sub>2</sub> is an invisible, but deadly gas. The existence of an active ingredient in insect repellent, being dangerous is at a small concentration, this gas no smell (Sofia, 2017). The use of mosquito repellent that is incorrect, can endanger health. How far the impact depends on the type, amount, age and mixtures? Infants and toddlers can be said to be vulnerable to insect repellent. This can happen because his organs are not perfect, his endurance is not good and the cough reflex is not good. More dangerous effects will also occur in children who are allergic and have asthma talent. Therefore the family can replace the use of mosquito repellent using safer anti-mosquito, such as the use of mosquito nets.

#### **4. CONCLUSION**

1. There is no relationship between the age of children under five to the incidence of ARI in infants in Timika Jaya Health Center (p-value = 0.208; RP = 1,944; CI95% = (0, 973 - 3,884))
2. There is a correlation between the nutritional status of children under five years of ISPA in infants at Timika Jaya Health Center. (p-value = 0,000; Rp = 5,471; CI95% = (3,022 - 9,904))
3. There is a relationship between immunization status of children under five to ISPA in infants in Timika Jaya Health Center (p-value = 0.001; RP = 2.992; CI95% = (1,633 - 5,481)).
4. There is a relationship between mother's education on the incidence of ARI in infants in Timika Jaya Health Center (p-value = 0.019; RP = 2.318; CI95% = (1,221 - 4,402)).
5. There is a broad relationship of ventilation to the incidence of ARI in toddlers at Timika Jaya Health Center (p-

value = 0,000; RP = 0,048; CI95% = (0, 012 - 0,188).

6. There is a relationship of kitchen smoke to the incidence of ARI in infants in Timika Jaya Health Center (p-value = 0.007; RP = 2.594; CI95% = (1,375 - 4,896)

7. There is a relationship between the habit of using mosquito repellent against ISPA in infants in Timika Jaya Health Center (p-value = 0,000; RP = 4,642; CI95% = (2,600 - 8,285)

## REFERENCES

- Anwar Mallongi., Teknik Penyehatan Lingkungan, 2014. Smart Writing, Yogyakarta, Indonesia
- Anwar Mallongi, Pengelolaan Limbah Padat Perkotaan., 2015. MS. Writing Revolution
- Azwar A, ((2013). *Pengantar Administrasi Kesehatan*. Edisi Ketiga. Binarupa Aksara, Tangerang.
- BKKBN, 2006. *Petunjuk Pelaksanaan Kekuarga Berencana*. BKKBN, Jakarta
- Dahniar AR. (2011). *Pengaruh Asap Obat Nyamuk Terhadap Kesehatan dan Struktur Histologi Sistem Pernafasan*. J Kedokt Syiah Kuala. 2011;11(1):52-59.
- Deki Ogetai, A.L. Rantetampang, Agus Zainuri, Anwar Mallongi, 2018. The Affecting Productivity of Work Staff at Sub Health Ministry Sub, Province Mimika, International Journal of Science and Healthcare Research, Vol.3; Issue: 2; April-June 2018
- Dinkes Provinsi Papua, 2017. *Profil Kesehatan Papua*. Dinkes Prov. Papua.
- Dinkes Kabupaten Mimika, 2017. *Profil Kesehatan Kabupaten Mimika*. Dinkes Prov. Papua.
- Edowai N, Rantetampang AL, Msen Y et.al. Factors influencing with malnutrition pregnant at Tigi district Deiyai regency. International Journal of Science & Healthcare Research. 2018; 3(4): 245-256.
- Fritje Linggar, A.L. Rantetampang, Rosmin Tingginehe, Anwar Mallongi. The factors influencing defecation behavior in toilet Pasca community led total sanitation at Wamesa sub district Manokwari Selatan district. International Journal of Science & Healthcare Research. 2019; 4(1): 88-99.
- Hasmi. (2016). *Metode Penelitian*. In Media, Jakarta.
- Kemenkes RI. (2012). *Profil Kesehatan Indonesia*. diakses 20 Januari 2019 dari [www.kemendes.kemkes.go.id](http://www.kemendes.kemkes.go.id).
- Kemenkes RI (2013). *Petunjuk Teknis Penganggulangan Penyakit Menular*. Jakarta: Kemenkes RI.
- Marhamah. (2013). *Faktor Yang Berhubungan Dengan Kejadian ISPA Pada Anak Balita Di Desa Bontongan Kabupaten Enrekang*. Diakses 23 Maret 2015 dari <http://www.unhas.co.id>.
- Notoatmodjo, S. (2011). *Kesehatan Masyarakat, Ilmu dan Seni*. Rineka Cipta, Jakarta.
- Notoatmodjo, S. (2012). *Metode Penelitian Kesehatan*. Rineka Cipta, Jakarta.
- Notoatmodjo, S. (2014). *Kesehatan Masyarakat, Ilmu dan Seni*. Edisi Revfiiis 4. Rineka Cipta, Jakarta.
- Oktaviani I (2017). Faktor - Faktor Yang Berhubungan Dengan Kejadian Pneumonia Pada Balita di Puskesmas Kecamatan Teluknaga Kabupaten Tangerang. Jurnal Komunikasi Kesehatan Vol.VIII No.1 Tahun 2017.
- Parrung E, Rantetampang AL, Msen Y, Mallongi A. The factors affecting by leadership and motivation working health employee at public health centre Kotaraja Jayapura city. International Journal of Science & Healthcare Research. 2018; 3(4): 132-140.
- Riskesdas 2007. *Riset Kesehatan Dasar Nasional tahun 2007*. Balitbang, Kemenkes RI, Jakarta.
- Riskesdas 2010. *Riset Kesehatan Dasar Nasional tahun 2010*. Balitbang, Kemenkes RI, Jakarta.
- Sigalingging (2013). *Karakteristik Penderita Penyakit Pneumonia Pada Anak Di Ruang Merpati II Rumah Sakit Umum Herna Medan*.diakses 23 Maret 2015 dari <http://www.udarma.co.id>.
- Sofia (2017). *Faktor Risiko Lingkungan Dengan Kejadian ISPA Pada Balita di Wilayah Kerja Puskesmas Ingin Jaya Kabupaten Aceh Besar*. Jurnal AcTion: Aceh Nutrition Journal, Mei 2017; 2(1): 43-50
- Smith KR (2012). *Asap Kayu Bakar dan smapah Lebih Berbahaya dari Membakar Ribuan Rokok. Tips Kesehatan. Nikmatnya gaya hidup sehat*. <http://tipskesehatanlengkap.com/asap->

- kayubakar-lebih-berbahaya-dari-membakarribuan-rokok. Published 2016. diakses 2 November 2018.
- Wayne I, Rantetampang AL, Msen Y, Mallongi A. Factors related to hiv/aids transmission by people with hiv/aids in Dogiyai district Papua province. International Journal of Science & Healthcare Research. 2018; 3(4): 91-98.
  - WHO. (2016). *Pneumonia and Diarrhea Progress Report 2015*. www.who.co.id. diunduh 20 Februari 2018.
  - Watopa E (2015). *Hubungan Pengetahuan Ibu Dan Budaya Makan Dengan Pemberian Makanan Pendamping ASI Anak Usia 6-24 Bulan di Puskesmas Urei Faisei Kabupaten Waropen*. Skripsi Uncen Jayapura.
  - WHO (2016). *Pneumonias & Diarrhea*. <http://www.who.int.com>. diakses 20 Agustus 2018.

How to cite this article: Gainau E, Rantetampang AL, Pongtiku A et.al. Factors influence of acute respiratory infection incidence to child under five years in Timika Jaya health primary Mimika district. International Journal of Science & Healthcare Research. 2019; 4(1): 315-325.

\*\*\*\*\*