

Study on Risk Factor of an Extraordinary Measles Disease Incidence in the Working Area of Kualin's Center of Health for Society-The District of Timor Tengah Selatan (TTS)

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Abstract: ***Background:** Coverage high immunization is not a guaranty to avoid an extraordinary incidence of measles. This research is aim to know risk factors which cause extraordinary measles in the working area of Kualin's Center of Health for Society-the TTS District. Primary data from the results of investigation toward extraordinary incidence of measles and interview with respondents as follows; **Methods:** The study is based on a Cross Sectional Study and Spatial Data Analysis with GIS. number of samples as many as 204 respondents which consist of 102 cases which taken from Total Sampling Method and 102 controls which taken with Purposive Sampling Method. **Qualitative Analysis uses Cross Sectional Study and Spatial Data Analysis with GIS. However, observational analytic uses Chi-Square Test. **Results:** This research shows as many 94,5% age <15 years, with percentage of 54,9% males, non immunized 93,1% and 67,5% victims have not had A vitamin. Chi-Square Test, achieved age, A vitamin, immunized status, giving vitamin A, nutrient status, density inhabitants and infectious disease. **Conclusion:** Measles incidence is a very infectious disease and still become an epidemic for school age children or children with age < 15 years as much as 94,6% which dominated by children especially boys/males (52%). Social condition of the society mostly family income as big as 87,7% still under /<Rp. 500.000,- with education level of elementary and junior high school dropout as many as 78,9%. The Attack Rate higher on children who live in the house with residence stuffed (67,6) even though house environment condition has good ventilation (80,4%) and 80,4% lighting level inside room. Risk factor proved has relation with measles incidence is age, family income and history contact.***

Keywords: Risk Factors, Extraordinary Incidence of Measles, Kualin's Center of Health for the Society

1. Foreword

Measles Disease or morbidly/measles in Timor which known as "SERAMPAH" is infectious disease that caused by Paramixoviridae (RNA). It is somewhat morbidly virus easily die because of hot and light¹⁶.

In TTS district, reported measles cases happen regularly three years with number of 351 cases. In 2012 were 50 victims without morbidity in Boking sub-district. Year 2013 (June-September 2013) were 199 cases (CFR = 5,02%), in Nuapin village-Fatumnasi sub-district. Moreover, in January until June 2014 were 102 cases in Nunsunu village, Toineke, Tuafanu and Kiufatu villages working area of Kualin's Center for Health for the Society. Kinds of factors charged become risk factors for measles disease, such as:

- 1) Immunization Coverage for Measles in TTS district during last four years (year 2010 – 2013) is 106,3%, 84,7%, 123,6% and 86,9%.
- 2) Low economic level with number of family density reaches Rp. 251.080 per capita per month.
- 3) Low education level of mothers that is 76,25 % elementary dropout, 21,5% high school and 2, 25% collage.
- 4) House environment condition with inhabitant density is still high.

Risk factors for measles disease were descriptively analyzed. Analytic study done to achieve dependent variable relation (measles disease) and independent variable (social economic, environment condition, age, nutrient status, biography contact, immunization status, none immunized status, children nourishment pattern, infectious disease). This research had been done in 2014.¹⁴

Goal of this research is to know case characteristic (age, sex); health status (immunization status, nutrient status, giving Vitamin A); social condition (education, income); disease story (infectious disease, contact story).¹³

2. Method

The approach was conducted in this study was observational analytical Case-Control Study Design.²³ This design is used to find out the relationship between disease risk factors such as the characteristics of the case i.e. age, gender, immunisation status, nutritional status and administering vitamin A, the social conditions of the economy, education, other infectious diseases and contact history.

Sample; sample cases used in this research 102 respondents. The sample case is taken on the basis of total cases suffering from measles in the wake of the extraordinary Events in the health Kualin. While the sample is 102 respondents amounted to a control which is not the case that neighbors are in suffering from measles.

Sampling techniques: for sample cases done by total sampling , sample control is a family which has no child toddler age 15 years old, the family was not available during the research, not willing to become respondents research and free of rubella. The test used in this study is with a Chi Square¹²

3. Results and Discussion

Respondents Characteristic

Total subject of the research were 204 respondents with number of males is 52% and 48 % of women. A half of

research subjects/victims are in group age of <15 years such as 94,6 % and respondents groups/ parents who are patients with age of > 41 years as many as 41,7%. Sample characteristic related to age and sex can be seen at the following table below.

Table 1: Cases and Control Distribution Based on Respondent Characteristic (age and sex)

No	Characteristic	Case		Control		Quantity	
		n	%	n	%	n	%
1	Sex						
-	Men	50	49	56	54.9	106	52
-	Women	52	51	46	45.1	98	48
2	Age						
	a. Patients						
-	< 15 years	92	90.2	101	99	193	94.6
-	> 15 years	10	9.8	1	0.9	11	5.4
	b. Respondents						
-	< 30 old	20	19.6	20	19.6	40	19.6
-	31-40 old	33	32.4	46	45.1	79	38.7
-	> 41 old	49	48	36	35.3	85	41.7

Source: Processed from Primary Data (2015)

Risk Factor of Measles Incidence

Bivariate analysis was done to see big role of every variable that assumed as risk factor of extraordinary incidence of measles in the working area of Kualin's Center of Health for Society-the TTS district 2014. From results counts crosstabs table achieved role of each variable, such as following table below.

Table 2: Relation of Risk Factor with Measles Disease Incidence Based on Case and Control

NO	Risk Factor	OR	95 % CI		Grade P
1.	Age	0.091	0.011	– 0.725	0.010
2.	Sex	1.266	0.730	– 2.195	0.484
3.	Immunization Status	159.464	55.597	– 457.378	0.000
4.	Nutrient Status	29.798	1.198	– 1.503	0.000
5.	Family income	0.039	0.015	– 0.102	0.000
6.	Education	0.838	0.427	– 0.1644	0.732
7.	Inhabitant density	18.621	7.861	– 44.109	0.000
8.	Ventilation	0.779	0.389	– 1.560	0.597
9.	Lighting	0.883	0.442	– 1.764	0.860
10.	Infectious disease	9.758	5.060	– 18.816	0.000
11.	Biography contact	0.021	0.003	– 0.155	0.000
12.	Vitamin A	39.368	1.293	– 1.691	0.000

Source: Processed from Primary Data 2015

Role of every variable that able cause an extraordinary incidence of measles, such as:

a. Relation of Characteristic Case toward Measles Incidence

1) Age

Infant has ability factor of body immune defeat infectious decrease include fast respond of immune together with the increase of age. One of big changes often happens with the changes of age is *thymic involution*. *Thymus* is a one kind of organ as inhabitance of T cell becomes mature which can function as *limfositto* kill bacteria and help other type of cell inside immune system. With the adding age, many T cells are losing function and ability to fight disease¹⁸

Table 19 above shows that in total percentage big half of measles victims with group age of < 15 years old even with

group of case or control number of sample as many as 193 (94,6%). Therefore, result of statistic test with *Chi-square* test found probability of values (p) = 0,010 and *Odds Ratio (OR)* as many as 0,091 (95% CI; 0,011-0,725). For this, risk factor of age has valuable relationship with measles disease.

Result of this research is equal with the previous research of Cahyani, et al, that found 77,8% susceptible age bigger than non susceptible group age that is 22,8%. Same research was done by Casari (2002) who found enough prove in statistic that there is valuable relationship between susceptible group of age with measles disease incidence (p < 0,025) and has 2,3 times risk higher compare with children with group age that not susceptible. Susceptible group of age if more having risk will be becoming victim of measles because at this age children have already more interacted with their playmate. This case however causes children easily to being infected or transmitting disease by in contact with their playmates.

Statistic test result shows valuable relation between susceptible age group with measles disease (p=0,010) and has 0, 09 times risk bigger to be infected by measles compared with children who are not susceptible to measles disease. It is possible because the decrease of body immune of children after two years of age and have been already more interacted with playmates in which easily infected by disease. Based on observation and interview results, it concluded that 6 months until 15 years old children have had bigger risk to be infected by measles disease because their body immune is very low. This situation happened because mothers preferred to birthing in house and helped by traditional midwives. Because of this big half of children or infants or under five children, do not have measles immunization.¹⁹

2) Sex

Generally, every disease can attack men or women, but some diseases have difference frequency between men and women in which affect also immune status of any person toward disease.²⁰

Research Result shows majority sample with men (52, 0%) from women (48,0%). Statistic test result shows probability values (p) as big as 0,484 and *Odds Ratio (OR)* as big as 1,266 (95% CI; 0,730 – 2,195), so that in statistic risk factor of sex type is not valuable. It means that it has protective risk toward measles disease with sex type.

This research results parallel with research result of¹³ with research design of control case that has resulted and based on sex type, measles victims more on boys. Medically, women's titer antibody is generally bigger than men. However, generally there is no difference incidence and fatalism level of measles disease on boys and girls.

Result analysis shows that even though men have 1, 2 times risk bigger to suffer from measles compare with women, but it has not enough valuable relation statically (p > 0,025). This case probably caused by difference in job, games, life style or habits, ability or diagnostic criteria of some kinds of diseases, genetics or physiologies condition. Therefore, it can be concluded that it has not enough prove to say that there is relation between sex type and measles victims incidence.¹⁵

b. Relation of Health Status toward Measles Incidence

1) Status of Immunization

Measles disease is infectious disease viral acute that easily transmitted so almost this disease has ever infected all children born. Some of whom have not reached five years. Measles immunization is the most effective way of preventing measles disease in the society. Measles disease is complete basic immunization that obliged to be given for 9 months infants. Measles immunization is vaccines that weakened measles disease.¹⁸

Based on analysis data of statistic shows that as many as 95 cases (46,6%) are not immunized, while at control there is 46,1% (94 children) have gotten measles disease. Research Result gained probability values (p) = 0,000 with *Odds Ratio (OR)* value as many as 159.464 (95% CI; 55.597 - 457.378). This case shows that there is valuable relation between immunization statuses with measles incidence.

Result of this research shows that children with status of non immunized has risk or tendency of 159,464 times bigger to suffer from measles compared with immunized children, and statistically shows that there is valuable relation between those with immunization status and those who are not with measles disease incidence ($p = 0,000$).

This research result parallel with research done by Robert F. Mudyiradima in Simbawho says that children who are not vaccinated have more chances as measles disease transmitter in that area. That result also supported by research from the Team of Ditjen P2MPL of the Republic of Indonesia Health Department and Doctoring Faculty of University of Indonesia about extraordinary incidence of measles with cross-sectional design. It was found under five children with status of non-immunized have 5 times risk infected by measles disease compared with the under five children who are immunized. The research of Siagian in Dwi Agus Setya (2012), found 16, 13% children have suffered from measles together with complication.

Result of qualitative research (interview result with respondents) found information that according to Village Regulations, mothers who give birth in their house will be charged Rp. 250.000 – 500.000. The penalty is burdened if it related with income level which average per month < Rp. 500.000. For this, people choose to do not go to the health facilities after the born until mature age of their children. Therefore, it can be concluded that it has enough prove to say that there is valuable relation between immunization statuses and none immunized with measles disease incidence.

2) Nutrient Status

Immunization is very important domain to have good nutrient status. Complete immunization usually produces good nutrient status. As an example, with immunization a child is not easily infected by dangerous disease in which child become healthy, body/healthy and has good food and nutrition pervading. Nutrients that absorbed by the body of under five children used for the growth and results well nutrition status.

⁸Mortality incidence because of measles disease higher at malnutrition condition, but not yet able to be distinguished

between effect of malnutrition toward the emergency of measles disease and effects caused by measles disease toward nutrition which caused the decrease of meal appetite and ability to process the food.

Results of cross table found *Odds Ratio (OR)* as big as 29,798 (CI 95%; 1.198 – 1.503) with probability values (p) = 0.000, means that in statistic factor of nutrient status has valuable relation. If it seen from risk factor of nutrient status appeared that measles disease incidence on children with good nutrition category is 87,3% higher from lack of nutrient (12,7%).

Result of this research with research done by Cahyani et al found outcome of 77,2% measles incidence suffered by children with good nutrition status compare with those who lack of nutrition (12,7%). However, it is different from research done by Pudjadi that found mutual relation between infectious diseases with lack of nutrition caused density toward infectious disease and higher nutrition need of any child. Besides that, research result of Hari Basuki found an indicator prediction of extraordinary measles disease or not risky based on result of immunization evolved ($p=0,028$) and nutrition status evolved ($p=0,070$).

Great risk for measles incidence on children with good nutrition status is $p = 0.000$ (CI 95% 1.198 – 1.503) that shows that children with good nutrition status also have opportunity as big as 29, 8 times higher compare with children who status of lacking nutrition.

Result of observation and interview obtained that most of children with age of 2-4 months (69,8%) have been given additional food in kind of porridge and blended banana or blended corn. Additional food is given to that mentioned age because families' have been implementing such kind of meal pattern, which is "as far as full" to children without concerning nutrition absorbance, Society's low power for market access. None enough nutrition absorbance causes the decrease of body immune and influence measles disease incidence. Therefore, it has enough prove to say that there is valuable relation between nutrition statuses with measles disease incidence because even though children with good nutrient status but can easily infected measles by disease so far if children are not immunized.

3) Giving Vitamin A

Until now lack of vitamin A issue in Indonesia need a serious concern and shows that 50 % under five children in term of sub-clinic are still lacking of Vitamin A. Therefore, half of the most number of under five children in Indonesia endangered of blindness because the lack of vitamin A. In order that children able to optimally grow and improve they need for some vitamins. These vitamins beside absorbed from foods, also can absorbed from all supplements which contain vitamins. One of vitamin needed is vitamin A or what is called retinol. Vitamin A useful to keep moistness and purity of membrane mucosa that enable the eyes to see clearly in the condition that lack of light (afternoon or dusk), and for breast feeding mothers to improve the quality of vitamin A inside breast milk so that ⁹infant will able to absorb enough vitamin A and breast milk.

Children who lack of vitamin A easily infected by disease such as measles, chicken pox, diarrhea, infectious on respiration organs, etc. Now someone suffer from measles, body over uses vitamin A while intake and it absorption decrease. Vitamin A takes role in defending the layer of *epitelentrails* and strengthenscellular immune system² This research results shows that the percentage of children or victims on measles disease whose received vitamin A on case and control is 83,8% higher from those who do not receive vitamin A (16,2%). It found probability (p) = 0.000 with value *Odds Ratio (OR) as big as 39.368* (CI 95%; 1.293 – 1.691). It can be mean that children who have had vitamin A or only have once in a year have 39,36 times risk for measles diseaseincidence compare with children who have not received vitamin A or only have it once in a year. It is because measles diseaseable to decrease serumconcentration inside vitamin A and on children with good nutrition status in which easily infected by measles disease. Therefore, it can be concluded that it has found enough proves about the valuable relation (p < 0,025) between deliverance of vitamin A with measles diseaseincidence.

This research result is differentfrom research done by ⁶ that found children who have not had vitamin A or only has it once in a year will have 1,33 times risk for measles incidence compared with children who have had vitamin A in a year. Deliverance of vitamin A can decrease 1,64 times risk for children who suffer measles compared with children who have had vitamin A in a year ¹² on extraordinary incidence of measles disease in Bogor Districts, found that children who have had high doses of vitamin A have 2,56 times risk compared with children who have had twice of vitamin A for measles diseaseincidence because children who lack of vitamin A will easily infected by disease.¹⁷

c. The Relation of Social Condition with Measles Incidence

1) Family Income

In difficult socio-economic environment, children are easily experience cross infections. Poverty takes responsibility toward disease found on children. It is because poverty decrease parents'capacity to support sufficient nurtured on children health, tending to lack of hygiene, poor diet, and poor education. The relative frequency children from low-income parents three times bigger to have late immunization risk and four times highest caused child mortality compared with parents who have enough income.

This research shows that percentage of family income on case and control is < Rp.500.000,-bigger (87,7%) compared with income ≥ 500.000,- (12,3%). Result of statistic test achieved probability value (p) = 0.000 with 0,039 (CI 95%; 0,427-0,1644) *Odds Ratio (OR)* .

It can be meant that children from low-income parent have 0,039 times risk to suffer measles compared with children from families with enough income. Therefore, in statistic way, family income factor has valuable relation with measles diseaseincidence.⁷

This research result is different with research done by Som in Bengal India who says that there is no relation between family income and measles disease. ¹¹research in Aceh

found level of family income has no valuable relation with measles diseaseincidence. However, it has similarity with research from ⁴ who found that on group case and control there is valuable relation between family income and measles diseaseincidence in which low income affects market or buying ability of the society. That research result supported by research done by ²⁰ who says that family's low income has 1,54 times risk for measles diseaseincidence on children compared with children who come from families with enough income.

2) Level of Education

Generally, the more higher education level more better also knowledge, and more easy to receive information and has much knowledge ¹⁰ Education level is very influential how a person act and search the cause and solution in his/her life. Person with high education usually acted more rational. Therefore, person with good education is easy to receive new ideas. Education also influence the pragmatic thinking pattern and more rational toward habits. Through high education, a person will more easily to receive idea or new issues.¹⁸

Result counting about relation of risk factor of high education toward measles diseaseincidence found that as many 78,9 % persons have low education level (elementary and junior high school), while those who have high education (senior high school and college) are 21,1%. Result of cross table found 0,838 (CI 95%; 0,427 – 0,164) *big Odds Ratio (OR)* with probable value (p) = 0.732. It means that in statistic way, factor of education level does not have valuable relation.

This research result supported by research from ¹²found result that there is valuable relation between education level with basic immunization and measles incidence. Different with research by Som (2002-2004) in Bengal India, education level has valuable relation with measles diseaseincidence. Same also with Basic Health Research/Riskesdas 2010 in Pontianak found the relation of education level with measles diseaseincidence, as an impact of child does not have basic immunization.⁸

This research result shows that there is not enough proves upon relation between education level with measles disease (p = 0,732 bigger from 0,025). Therefore, it can be concluded that in statistic way, education level even though has 0,838 times risk (CI 95%; 0,427 – 0,164) but it is not valuable in statistic way, particularly on children who come high education parents.

d. Relation of House Environment with Measles Disease

1) Dwelling Stuffed

Dwelling stuffed in the house according to the Decree of the Republic of Indonesian Health Minister, (No.829/MENKES/SK/VII/1999) about the requirements for healthy house, dwelling stuffed bad room with minimal large is 8m² and is not suggested to be occupied by 2 persons except children under five years. Based on thecriteria it is hoped to prevent the spreading of disease and accelerate activities.⁵

The transmission of measles disease can happen very fast through air or droplet inhaled through nose and mouth.

Transmissions can happen on the first day until the second day after the appearance of flakes. Person with low body immune will easily infected by measles disease after the contact with the victim of measles. House condition that occupied by many residences or dwelling stuffed higher will easy for the transmission of measles virus or disease compare with house with low dwelling stuffed.¹⁵

More stuffed house residence is faster for the transmission of any disease especially infectious disease through air will be more easy and fast because of the bacteria colony that caused the spreading of disease through droplet (splash of spit) and direct contact.¹⁴

Result of table count relation between dwelling stuffed with measles incidence gain probability of values (p) = 0.000 with 18,621 (CI 95%; 7.861 – 44.109) *Odds Ratio (OR)*. Thus, there is valuable relation.

That research result suitable with the research of⁷ that found relation of dwelling stuffed with risk of measles disease as many as 2,7 times and more compared with living in house with no dwelling stuffed.¹

Analysis result of risk factors toward dwelling stuffed with measles incidence shows that measles incidence with dwelling stuffed 67,6% bigger than non dwelling stuffed/spacious (32,4%). In statistic way, it has proved through relation between dwelling place with measles disease incidence found probability value (p) = 0.000 and 18,621 *Odds Ratio (OR)*. It means that there is a big risk for victims who live in the stuffed house because it will easy to spread measles disease 18,6 times bigger toward those who are not victim of the disease. It is because easy to have contact if inside the house there are measles victims. Thus, it can be concluded that there is valuable relation between dwelling stuffed level with measles disease incidence.¹¹

2) House Ventilation

Ventilation is the process of air circulation inside or from room even naturally or in mechanic way. Ventilation extension is important for any house because is functioned as media to guaranty quality and enough air circulation out and inside room. Lack of ventilation extension can cause fresh air supply inside house not enough and expending of unclear air out of the house also not maximal which cause the quality of air inside the house become unhealthy.

The percentage relation of ventilation with measles disease on case and control shows that generally ventilation that fulfill the requirements/ good is 80,4% bigger from nasty ventilation (19,6%). In statistic way, there is no valuable relation between large ventilation with measles disease (p) = 0,597) with *Odds Ratio (OR)* value as big as 0,779 (CI 95% ; 0,389 – 1,560). It means that with suitable ventilation that fulfill requirements there is small possibility for measles disease incidence.

This result is different with¹² that found relation of ventilation that not fulfill requirements/nasty ($p=0,04$) with OR grade =2,2. It means risk for measles incidence on victims with ventilation that not fulfill requirements is 2,2 times higher from ventilation that fulfill requirements.

Therefore, it can be concluded that there is a big possibility for risk factor of other environment condition that more influential.⁷

Ventilation that fulfill requirement has important role for the process of air circulation inside rooms that give possibility for un moisture inside room and also let in more sun light so that decrease moisture inside room.⁸ This research result shows that there is not enough proves for see relation between ventilation with measles disease (p) = 0,597 > 0,025). Therefore, it can conclude that in statistic way house ventilation even though has 0,779 times (CI 95%; 0,389 – 1,560) risk, however, it's not valuable statistically. It means it becomes protective factor for measles incidence.

3) Lighting

House that more not fulfill requirements as a house more high percentage to infect by infectious disease. It is happen as an effect of lacking sun light to kill germs or disease and cause spreading of disease by sun light beside functions for lighting rooms also is to decrease moisture and dispelling mosquitoes. Therefore, it is better for every house to ordered well windows so that sun light able to shine inside the house.⁹

Research result shows that percentage of risk factor relation of environment condition (lighting) on case and control with measles incidence as big as 80,4% house condition has lighting level in bright category (>60 lux) and as much 19,6% under standard of lighting/dark (< 60 lux). In statistic way, probability value (p) = 0,860 and *Odds Ratio (OR)* grade is 0,883 (CI 95%; 0,442 – 1,764). For this, relation of risk factors measles with measles incidence can be said not valuable but it is one protective factors for measles disease incidence.

This research result is different from research done by¹² that big risk for measles incidence on victims with lack of lighting is 2,2 times high compare with enough lighting.

The research result does not have enough proves for relation between lighting with measles disease (p) = 0,860). Therefore, it can be concluded that in statistical way, lighting even has big risk as 0,883 times (CI 95% ; 0,389 – 1,560) however not proved that it has valuable relation with measles disease incidence.

e. The Relation of Disease Status with Measles Incidence

1) Infectious Disease

In this research appeared that those victim of some infectious diseases on case and control in relation with measles incidence is 42,7% or smaller than those who have not been suffered from disease. The result of cross table test shows that infectious disease is a kind of risk factor for measles disease incidence and has valuable relation. It is signed with probability grade of (p) = 0,000 and 9,758 (CI 95%; 5.060 – 18.816) *Odds Ratio (OR)* .

The research result which has been done shown prove of relation between infectious disease with achievement of probability grade (p) = 0.000) and 9,758 *Odds Ratio (OR)*. It means that children who have been suffered of measles disease with other infectious disease is smaller than those who are not suffer from other infectious disease but have big

as much 9,758 times opportunity to be infected. Therefore, it can be concluded that it has enough prove valuable relation between diseases with measles disease incidence.

2) Contact History

This research found children who have been ever contacting with the victims of measles disease is (16,7%) smaller than those who not been contacting with other victims (83,7%). However, the result of statistic analysis shows valuable relation between contact history with measles incidence with probability grade of $(p) = 0.000$ and *Odds Ratio (OR) = 0,021* (CI 95%; 0.003 – 0,155).

The research of Caesari found that big risk between history contact factor with measles incidence is 3,2 times higher in comparison with victims who have not had history contact with the victim of measles.²¹

On this research appeared that in statistic way there is valuable relation $p = 0,000$ between history contact with measles disease incidence and has 0,021 times opportunity to suffer measles. Therefore, it can be concluded that there is enough prove between contact histories of measles victims with measles disease incidence.

4. Conclusion

Based on research result and discussion above, it can be concluded some points as follows:

- 1) Measles incidence is a very infectious disease and still become an epidemic for school age children or children with age < 15 years as much as 94,6% which dominated by children especially boys/males (52%). That disease exists because of as many 50,5% children have not had immunization even though they have good nutrient status (87,3%) and have had Vitamin A (83,8%). As far as the type of measles disease is very infectious, children who have not had history contact with victims (83,3%) also will easily transmitting infectious to other person if it inserted by other infectious disease such as; diarrhea, fever, infection respiration organs, and pneumonia (42,6%).
- 2) Social condition of the society mostly family income as big as 87,7% still under < Rp. 500.000,- with education level of elementary and junior high school dropout as many as 78,9%. The Attack Rate higher on children who live in the house with residence stuffed (67,6) even though house environment condition has good ventilation (80,4%) and 80,4% lighting level inside room.
- 3) Risk factor proved has relation with measles incidence is age, family income and history contact.
- 4) Most influential risk factor and has peculiarity as protector toward measles incidence at an extraordinary incidence of measles in the working area of Kualin's Center of Health for the Society-the TTS district for period of January-June 2014 is immunized status, vitamin A deliverance, nutrition status, dwelling stuffed level and infectious disease.

5. Recommendations

- a) It is need to rectify the truth of immunization program coverage throughout giving control management and

delivering routine technical guidance toward organizers in Center of Health for Society and Villages level.

- b) It is need feedback, motivation, and reward for officers of the Center of Health for Society and village who have done well task and responsibilities.
- c) It is need for the improvement of immunization services mostly in related areas which potential for measles as far as it still higher population susceptible for measles.
- d) It is need for mapping disease spreading and it risk factors.
- e) It is need training of cold chain for immunization officer in Center of Health for Society and villages midwives.
- f) It is important for villages' government to have persuasive approach toward society for delivering in suitable health facilities.
- g) For the Head of Center of Health for Society,
 - In order to improve socialization for society about diseases that can be prevented with immunization (PD3I) with understandable language.
 - In order to lead follow up research to search other risk factor that related with an extra ordinary of measles disease such as services quality of immunization until lowest level or "posyandu"/post for health integrated services, attitude and behavior of immunization officers, *evicacy* and cold chain vaccine with other method.

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