STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

Description of Measles Epidemiology in the City of Kediri in 2014 – 2017 (Case Study of Data Case Based Measles Surveillance / CBMS at Kediri City Health Office)

Abdul Faqih, Mateus Sakundarno
Diponegoro University, Indonesia
afaqih56@gmail.com

ABSTRACT
Measles is a highly contagious disease caused by viruses and transmitted through coughing and sneezing. Symptoms of measles are high fever, spotting redness of the skin (rash) is accompanied by coughing and / or runny nose and / or conjunctivitis. In 2017 the highest measles incidence in the City of Kediri was the age group less than 15 years, namely 71.6 per 100.000 population. In addition to immunization coverage low in 2016, CBMS achievements in the last four years were also still below target, is a factor that is thought to affect the high incidence of measles in the City of Kediri. This study aims to describe the epidemiology of measles in Kediri City in the year 2014 - 2017. This research is an observational descriptive study. Population at this research is CBMS data in the City of Kediri Health Office in 2014 - 2017. Samples from this study all confirmed cases of measles laboratory. The results of the study found the incidence of measles in the City of Kediri in the period of 2014 up to 2017 according to age group, the average measles occurs in the class aged 0-4 years, according to sex, the average proportion of measles occurs in the sex men, according to immunization status, the average proportion of measles occurs in not immunization status, according to the location, the incidence of measles is high at the level of population density height, and according to the month of occurrence, occurred in the range from October to April. Description measles epidemiology according to person, place, and time, in accordance with theory and research before hand.

Keywords: Epidemiology, measles, CBMS data, Kediri

Received July, 25, 2019; Revised August 24, 2019; Accepted September 13, 2019

STRADA Jurnal Ilmiah Kesehatan, its website, and the articles published there in are licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

BACKGROUND

Measles is a highly contagious disease caused by a virus and transmitted through coughing and sneezing. Symptoms of measles are high fever, spotting redness of the skin (rash) is accompanied by coughing and / or runny nose and / or conjunctivitis, but it is very dangerous if accompanied by complications of pneumonia, diarrhea, meningitis and can even cause death.

Every year through surveillance activities more than 11.000 suspected cases are reported measles, and laboratory confirmation results showed 12–39% of which were measles definitely (lab confirmed) while 16–43% is definite rubella. The last four years (years 2014 to 2017) measles cases were around 48.913 cases. The amount it is estimated that it might be lower than the actual figure in the field, considering still the number of measles cases that have not been / have not been reported, especially from health services private sector and the lack of complete surveillance reports of measles cases.

In Indonesia, during the last four years the highest cases of measles occurred in the year 2017 as many as 15.104 cases of suspected measles with Incidence Rate of 5.75 per 100.000 population, and there were deaths due to measles of 14 cases reported from Bali Province 13 cases and Lampung Province 1 case so that the death rate / Case Fatality Rate (CFR) of 0,09%. Most cases of measles were reported from East Java Province 3.547 cases.3 The city of Kediri is one of the cities in East Java with an incident measles is quite high in 2017, namely 191 suspected measles, and as many as 58 positive cases of measles confirmed by the laboratory,4 and are incidents highest in the last four years.

Various efforts have been made by the government in an effort to reduce the incidence measles cases include the first dose of measles immunization in infants aged 9-11 month, second dose measles immunization in grade 1 elementary school / Immunization Month School Children, and the Measles Rubella (MR) immunization campaign in August-September 2017 for the entire island of Java. Besides immunization, it is also carried out measles surveillance based on individual cases / Case Based Measles Surveillance (CBMS) with serological examination of suspected cases of measles (suspect). The results of routine measles immunization coverage for infants aged 9-11 months in Kediri City from the year 2014 to 2017 the average target has been reached ≥90%, only in 2106 still below the target of 85,1%, immunization coverage in the School Child Immunization Month and the Measles Rubella (MR) immunization campaign have reached the target of ≥90%. Data CBMS coverage in 2014 amounted to 53,85%, in 2015 amounted to 44,19%, in 2016 amounted to 36,35%, and in 2017 amounting to 46,07%, the CBMS target for the last four years has not yet reached the target should be ≥80%. In 2017 was the highest measles incident in the City Kediri is an age group of less than 15 years which is 71.6 per 100,000 population. In in addition to low immunization coverage in 2016, CBMS achievements in the last four years also below the target, a factor that is thought to affect the height of the case measles in the City of Kediri.

OBJECTIVE

This study aimed to describe the epidemiology of measles in Kediri City in the year 2014 - 2017.

METHODS

This research is an observational descriptive study. Population in the study this is CBMS data / all measles suspects who reported to the Health Office City of Kediri through the

DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

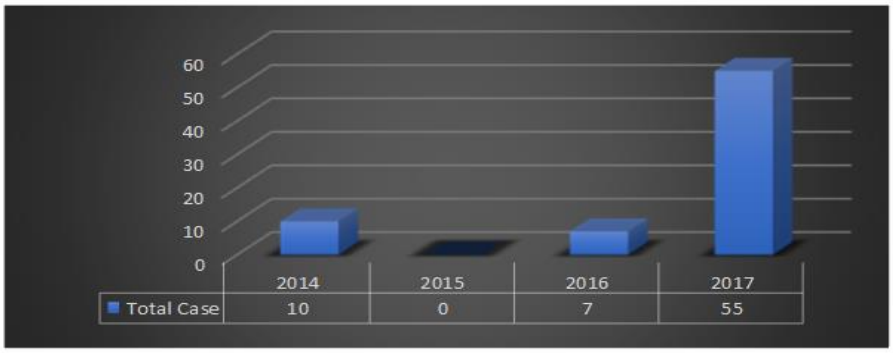
Surveillance and Immunization section in 2014 - 2017. Samples from the study this is 72 cases of confirmed measles confirmed by the laboratory measles, namely in 2014 as many as 10 cases of measles, in 2015 there were no (0) cases measles, and in 2016 there were 7 cases of measles, and in 2017 there were 55 cases measles.

The dependent variable is the number of measles events. The independent variable is age, type sex, place, immunization status, and time (month). The instrument used is the result CBMS used to analyze measles case data. Implementation method which is used is processing and analyzing CBMS data in the Surveillance and Immunization Section of Disease Prevention and Control. Data that has been obtained then the data structure, data entry, and data analysis are made.

The analysis used is univariate, univariate analysis on the variable person is used to see and describe the frequency distribution and incidence of measles cases age group, gender, and immunization status. Univariate analysis on place variables used to see cases of measles in the influence of geographical conditions. Univariate analysis the time variable is used to see the trend in the month of the case.

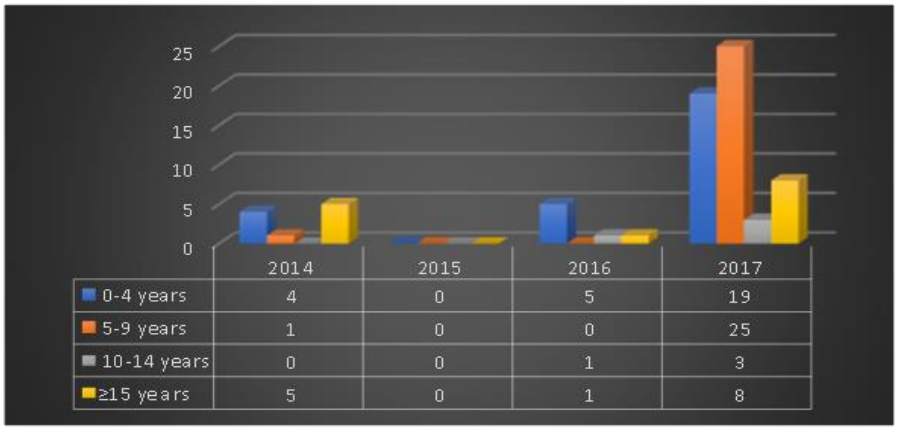
RESULTS

Measles Distribution In 2014 - 2017



Based on the results of the study, the incidence of measles in the City of Kediri in the period the time of 2014 to 2017 fluctuated / up and down, in 2014 as many as 10 cases (13,9%), 2015 fell with no cases, and in 2016 increased to 7 cases (9,7%), and in 2017 there was an increase in cases of measles which is quite high at 55 cases (76,4%)

Measles Distribution Based on Age Group



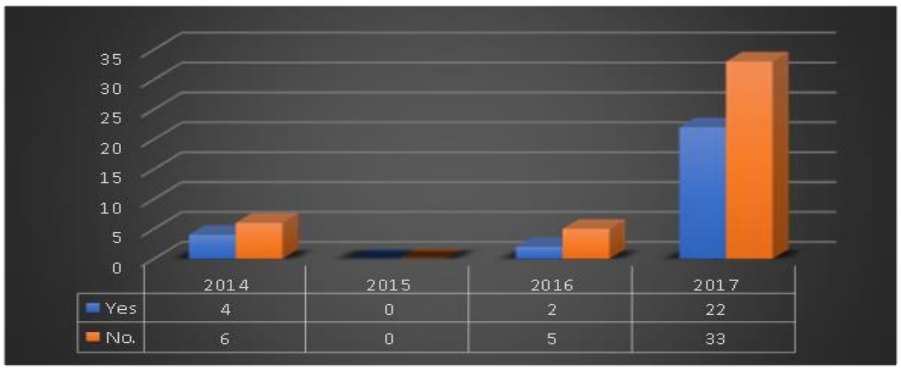
STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

Based on research, the incidence of measles in the City of Kediri in the period of the year 2014 to 2017 according to age group, in 2014 up to 2016 often occurs in groups aged 0-4 years, in 2014 as many as 4 cases (40,0%), in 2015 there were no cases, and in 2016 there were 5 cases (71,4%). Whereas year 2017 mostly occurs in the age group of 5-9 years, which is 25 cases (45,5%). Or average the incidence of measles in the City in the period 2014 to 2017 according to age group, which occurs in the age group 0-4 years as many as 28 cases (38,9%).

Measles Distribution Based on Gender and Place

Based on the research, the proportion of measles incidence in the City of Kediri in the period 2014 to 2017 according to sex, in 2014 arrived with 2016 more prevalent in female sex, in 2014 7 cases (70,0%), 2015 there were no cases, and in 2016 there were 4 cases (57,2%). Whereas in 2017 many occur in male sex, namely 36 cases (65,5%). Or the average proportion of measles in the City of Kediri in the period time from 2014 to 2017 based on sex, is more common in types male sex as many as 42 cases (58,3%).
Whereas the proportion of measles occurrences in Kota Kediri in the period of 2014 up to 2017 according to location, on average it is more common in sub-district in suburbs namely Pesantren sub-district 32 cases (44,4%), Mojoroto sub-district 26 cases (36,1%), then Kota sub-district 14 cases (19,5%). The incidence of measles is high in high population density.

Measles Distribution Based on Immunization Status



Based on the research, the proportion of measles incidence in the City of Kediri in the period from 2014 to 2017 according to immunization status, the majority was obtained the proportion of measles patients with non-immunization status, in 2014 amounted to 60,0%,

DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

year 2015 had no cases, 2016 amounted to 71,4%, and in 2017 amounted to 60,0%. So that the average proportion of measles events in the period 2014 to year 2017 according to immunization status, that is, with non-immunization status of 61,1%.

Distribution of Measles Incidence Rate (IR) Based on Age Group Per 100,000 Population

Age Group	2014			2015			2016			2017		
	Pop. At. Risk	Case Measles	IR	Pop. At. Risk	Case Measles	IR	Pop. At. Risk	Case Measles	IR	Pop. At. Risk	Case Measles	IR
0-4 years	22.999	4	17,4	22.513	0	-	22.667	5	22,1	22.829	19	83,2
5-9 years	22.217	1	4,5	21.662	0	-	21.812	0	-	21.964	25	113,8
10-14 years	20.134	0	-	20.583	0	-	20.726	1	4,8	20.873	3	14,4
≥15 years	212.904	5	2,3	215.246	0	-	216.773	1	0,5	218.337	8	3,7
	278.254	10	3,6	280.004	0	-	281.978	7	2,5	284.003	55	19,4

Based on research, the rate of incidence / Incidence Rate of measles in the City of Kediri in the period of 2014 to 2017 according to age group, year 2014 to 2016 often occurs in the age group 0-4 years, in 2014 amounting to 17,4 per 100.00 population, in 2015 there were no cases, and in 2016 amounted to 22,1 per 100.000 population. Whereas in 2017 the incidence / measles incidence rate is according to age group, most occur in the age group 5-9 years which is equal to 113,8 per 100.000 population.

Distribution of Measles Incidence Rate (IR) Based on Gender and Place Per 100.000 population in 2014

Sub-district	Male (M)			Female (F)			∑ (M+F)		
	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR
Kota	41.232	1	2,4	43.818	3	6,8	85.050	4	4,7
Pesantren	40.160	1	2,5	41.149	1	2,4	81.309	2	2,5
Mojoroto	57.092	1	1,8	54.803	3	5,5	111.895	4	3,6
	138.484	3	2,2	139.770	7	5,0	278.254	10	3,6

In 2015

Sub-district	Male (M)			Female (F)			∑ (M+F)		
	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR
Kota	41.532	0	-	44.050	0	-	85.582	0	-
Pesantren	40.453	0	-	41.367	0	-	81.820	0	-
Mojoroto	57.508	0	-	55.094	0	-	112.602	0	-
	139.493	0	-	140.511	0	-	280.004	0	-

STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

In 2016

Sub-district	Male (M)			Female (F)			∑ (M+F)		
	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR
Kota	28.728	0	-	57.456	1	1,7	86.184	1	1,2
Pesantren	27.466	3	10,9	54.932	1	1,8	82.398	4	4,9
Mojoroto	37.800	0	-	75.598	2	2,6	113.398	2	1,8
	93.994	3	3,2	187.986	4	2,1	281.980	7	2,5

In 2017

Sub-district	Male (M)			Female (F)			∑ (M+F)		
	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR
Kota	43.280	6	13,9	45.523	3	6,6	88.803	9	10,1
Pesantren	41.381	17	41,1	41.608	9	21,6	82.989	26	31,3
Mojoroto	56.948	13	22,8	57.263	7	12,2	114.211	20	17,5
	141.609	36	25,4	144.394	19	13,2	286.003	55	19,2

Based on research, the rate of incidence / Incidence Rate of measles in the City of Kediri in the period of 2014 to 2017 the highest in 2017 is amounting to 19,2 per 100.000 population. The incidence / Incidence Rate of measles in the City of Kediri in the period of the year 2014 to 2017 according to gender, 2014 is more happening in women that is equal to 5,0 per 100.000 population, in 2015 there were no cases. Whereas 2016 to 2017 is more prevalent in men, namely in 2016 amounted to 3,2 per 100.000 population, and in 2017 amounted to 25,4 per 100.000 population.

While the incidence / Incidence Rate of measles in the City of Kediri in the period the time of 2014 to 2017 by place, the highest 2014 is at Kota sub-district, followed by Mojoroto sub-district, then Pesantren sub-district, 2015 there were no cases, while 2016 until 2017, the highest occurred sub-districts in the suburbs, namely the Pesantren sub-district, followed by the Mojoroto sub-district, then Kota sub-district.

Distribution of Measles Incidence Rate (IR) Based on Immunization Status

Status Immuni Zation	2014			2015			2016			2017		
	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR	Pop. At Risk	Case Measles	IR
Yes	278.254	4	1,4	280.004	0	-	281.980	2	0,7	286.003	22	7,7
No		6	2,2		0	-		5	1,8		33	11,5
Total		10	3,6		0	-		7	2,5		55	19,2

Based on research, the rate of incidence / Incidence Rate of measles in the City of Kediri on period of 2014 to 2017 according to immunization status, obtained the majority of the proportion of measles sufferers with no immunization status, in 2014 amounted to 2,2 per 100.000 population, in 2015 there were no cases, and in 2016 amounted to 1,8 per 100.000 population, as well as 2017 amounting to 11,5 per 100.000 population.

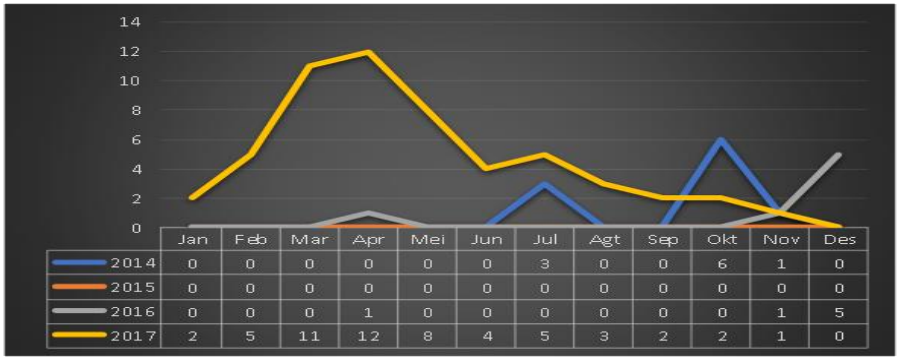
STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

Distribution of Measles Case Fatality Rate (CFR) Based on Age Group

Age Group	2014			2015			2016			2017		
	Case Measles	Death	CFR	Case Measles	Death	CFR	Case Measles	Death	CFR	Case Measles	Death	CFR
0-4 years	4	0	0	0	0	0	5	0	0	19	0	0
5-9 years	1	0	0	0	0	0	0	0	0	25	0	0
10-14 years	0	0	0	0	0	0	1	0	0	3	0	0
≥15 years	5	0	0	0	0	0	1	0	0	8	0	0
Total	10	0	0	0	0	0	7	0	0	55	0	0

Based on research, mortality / Case Fatality Rate of measles in the City of Kediri in the period of 2014 to 2017 amounted to 0, because during the year 2014 until 2017 there were no deaths caused by measles.

Measles Distribution Based on the Month of the Incident



Based on research, the incidence of measles in the City of Kediri in the period of the year 2014 to 2017 according to the month of events, 2014 was the highest in the month October as many as 6 cases (60,0%), in 2015 there were no cases, 2016 was the highest in December there were 5 cases (71,4%), and 2017 was the highest in April 12 cases (21,8%).

DISCUSSION

Based on the results of the study, the incidence of measles in the City of Kediri in the period of the year 2014 to 2017 occurs on average age group 0-4 years. As is maternal antibodies, in general, children will be protected from measles for some month, and antibodies will decrease after the child is 6-9 months old, which causes the child become susceptible to measles. An infection with high levels of the virus sometimes can exceed the level of protection from maternal antibody so the child can be attacked measles at the age of 3-4 months. These results are in accordance with Nurani research (2012), case measles in the city of Cirebon in general the incidence of measles is high under the age group less from 5 years each year, but in areas with high and even immunization coverage tend to shift to older age groups.

The incidence of measles in the City of Kediri in the period 2014 to year 2017 according to gender, the average occurs in male sex. This is according to Sitanggang's research (2010) states the proportion of measles cases with male sex 29 cases (55,8%) were greater than

DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

female sex as many as 23 cases (44,2%), which is likely because male antibodies are broadly lower than women. So that men have a high chance of getting measles, but overall there were no differences in the incidence and rate of fatality of measles both women and men.
The incidence of measles in the City of Kediri in the period 2014 to year 2017 according to immunization status, the average proportion of measles is not immunized. Measles is a disease that can be prevented by immunization. Measles immunization intended to provide active immunity against measles. The vaccine can protect the body from infection and have important effects in epidemiological diseases. And this very necessary to reduce the high rate of morbidity and mortality in cases measles. This is in accordance with the study of Meilani (2013) which mentions immunization status is a risk factor for the incidence of measles with a p value : 0.001 with a large risk to get measles 24.375 times greater in respondents who were not immunized.
The incidence of measles in the City of Kediri in the period 2014 to year 2017 according to the scene, the incidence of measles is high at the level of population density which is high, namely in the Pesantren sub-district with a density of 3.471 and Mojoroto sub-district with a density level of 4.587, while Kota sub-district with a density of 5.959. Houses with a solid category are at risk of children will get measles 41.250 times more than non-dense house occupants. Measles transmission through droplets and can spread quickly at the time the appearance of the rash on the first and second day. This is in accordance with the Nurani study (2012) citing the high incidence of measles in Kesambi sub-district in the period of the year 2004, 2005, 2007 and 2009 it is estimated that the high population density is equal to 8.827,30.
The incidence of measles in the City of Kediri in the period from October to April. October is the beginning of the rainy season, and April is the end from the rainy season. Where in the rainy season the air humidity is high enough so that allowing the immune system to be weaker. This is in accordance with the Purwandini research (2013) mentions measles outbreaks from 2010 to 2012 measles cases are often high in December - April, which is the month rainy season

CONCLUSION

Based on the results of the study, the incidence of measles in the City of Kediri in the period of the year 2014 to 2017 according to age group, the average measles occurs in age group 0-4 years, according to sex, the average proportion of measles occurs in the type male sex, according to immunization status, the average proportion of measles occurs at not immunization status, according to the scene, the incidence of measles is high at the level of density high population, and according to the month of occurrence, occurred in the range from October to April.

ACKNOWLEDGE

A big thank you to the Head of the City Health Office Kediri, dr. H. Fauzan Adhima, M.Kes and Field of Disease Prevention and Control staff, especially the Surveillance Section and Immunization for assistance and permission in this study

DOI: 10.30994/sjik.v8i2.189
ISSN: 2252-3847 (print); 2614-350X (online) Vol.8 No.2. November 2019. Page.80-88

REFERENCES

Giarsawan, N. Factors Affecting Measles in the Work Area Tejakula I Health Center, Tejakula sub-district, Buleleng Regency in 2012. J. Health. Environment. 2, (2014).

Kediri City Health Office. C1 Routine and Outbreaks Report 2017. (2018).

Kediri City Health Office. CBMS Coverage Report. (2018).

Kediri City Health Office. Child Immunization Month Immunization Coverage Report School. (2018).

Kediri City Health Office. Measles Rubella Campaign Immunization Coverage Report 2017. (2018).

Kediri City Health Office. Routine Immunization Coverage Report. (2018).

Kediri City Regulation No. 11 of 2002 concerning Changes in the Status of the Village Become Kelurahan. (2002).

Meilani, RRIB Factors Affecting Measles Occurrence at the Purwosari Health Center Kudus Regency. MAIN EDUCATION J. Nursing and Health. Bro. STIKES CENDEKIA UTAMA KUDUS 2, (2013).

Nurani, DS et al. Epidemiological Picture of Case Measles in Cirebon City Year 2004-2011 (Case Study of Measles Epidemiological Surveillance Data at the Health Office City of Cirebon). J. Kesehat. Bro. 1, (2012).

Proverawati and Andhini. Immunization and Vaccination. (Nuha Offset, 2010).

Purwandini, HRS Description of Epidemiology of Measles Cases in Extraordinary Events Measles in Serang Regency in 2010 - 2012. FKM UI (2013).

Regulation of the Republic Indonesia Helth Minister No. 1501 / Menkes / Per / X / 2010, concerning Types of Infectious Diseases Certain Which Can Cause Outbreaks and Countermeasures. (2010).

RI Ministry of Health. Current Measles and Rubella Status in Indonesia. (2017).

RI Ministry of Health. Indonesia Health Profile 2017. (2018).

RI Ministry of Health. Technical Guidelines for Measles Surveillance. (2012).

RI Ministry of Health. Technical Guidelines for Measles Surveillance. (2012).

RI Ministry of Health. Technical Guidelines for the Rubella Measles Immunization Campaign. (2017).

Sitanggang, RA. Epidemiological Overview of Measles Events in Ciputat Health Center. (2012).