The Challenges in the Measles Elimination in the Philippines

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U E R M M M C I

Objectives

- To discuss the current situation of measles in the country.

- To present the challenges as well as the recommendations for the measles elimination for the Philippines.

Outline

- Objectives
- Timelines in the Measles Elimination in WPRO
- Conceptual Framework
- Definitions
- Measles Surveillance Report
- Recommendations of the Regional Verification Committee

Minimum vaccination coverage requested to stop infection transmission

Infection	Mean age of infection	Inter-epidemic perod	Infectious-ness index	Minimum vaccination coverage
Measles	4-5	2	15-17	92-95
Pertussis	4-5	3-4	15-17	92-95
Mumps	6-7	3	10-12	90-92
Rubella	9-10	3-5	7-8	85-87
Diphtheria	11-14	4-6	5-6	80-85
Polio	12-15	3-5	5-6	80-85

Anderson and May, Lancet 1990

Western Pacific Region (WHO)

- Sept. 2012 : Reaffirms the commitment to eliminate measles and rubella control

Participants of the Sixth Annual Meeting of the Regional Verification Commission for Measles Elimination in the Western Pacific
12–15 September 2017
Beijing, China

Conceptual framework

- Absence of endemic transmission in a defined geographical area (e.g., region or country) for a period ≥12 months in the presence of a well-performing surveillance system

- Suspected cases must have field and laboratory investigations
- Classified according to method of confirmation (e.g., laboratory-confirmed or epi-linked)
- Origin on infection (e.g., endemic, imported, import-related)

- Interruption of transmission for at least 3 years
- High quality surveillance
- Genotype evidence of absence of endemic transmission

- Examples:
- Rate of reporting discarded non-measles non-rubella cases at the national level (Target: ≥2 cases per 100 000 population per year)
- Proportion of suspected cases with adequate specimens for detecting acute measles or rubella infection collected and tested in a proficient laboratory (Target: ≥80%)

- Epidemiology of measles, rubella and CRS
- Immunity levels of multiple population cohorts
- Quality of surveillance systems
- Sustainability of the national immunization program
- Molecular epidemiology

Word or Phrase	Definition
Measles or rubella eradication	worldwide interruption of measles or rubella virus transmission in the presence of a surveillance system that has been verified to be performing well
Measles elimination	the absence of endemic measles transmission in a defined geographical area (e.g., region or country) for ≥12 months in the presence of a well performing surveillance system **Note: verification of measles elimination takes place after 36 months of interrupted measles virus transmission**
Rubella elimination	the absence of endemic rubella virus transmission in a defined geographical area (e.g., region or country) for ≥12 months and the absence of CRS cases associated with endemic transmission in the presence of a well performing surveillance system Note: There may be a lag (up to 9 months) in occurrence of CRS cases after interruption of rubella virus transmission has occurred. Evidence of the absence of rubella transmission from CRS cases is needed because CRS cases excrete rubella virus for up to 12 months after birth. **Note: verification of rubella elimination takes place after 36 months of interrupted rubella virus transmission.**

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Word or Phrase	Definition
Endemic measles or rubella virus transmission	the existence of continuous transmission of indigenous or imported measles virus or rubella virus that persists for ≥12 months in any defined geographical area
Endemic measles or rubella case	laboratory or epidemiologically-linked confirmed cases of measles or rubella resulting from endemic transmission of measles or rubella virus.
Re-establishment of endemic transmission	occurs when epidemiological and laboratory evidence indicates the presence of a chain of transmission of a virus strain that continues uninterrupted for ≥12 months in a defined geographical area (region or country) where measles or rubella had been previously eliminated Note: a measles or rubella virus strain is determined by sequencing the WHO standard 450nt region of the N gene for measles and the 739nt of the E1 gene for rubella.
Measles or rubella outbreak in an elimination setting	**a single laboratory confirmed case**

Word or Phrase	Definition
Suspected case of measles or rubella	**a patient in whom a health-care worker suspects measles or rubella infection or a patient with fever and maculopapular (non-vesicular) rash**
Laboratory confirmed measles case or rubella case	A suspected case of measles or rubella that has been confirmed by a proficient laboratory Note: a proficient laboratory is one that is WHO accredited and/or has an established quality assurance programme with oversight by a WHO accredited laboratory
Epidemiologically-linked confirmed measles or rubella case	a suspected case of measles or rubella that has not been confirmed by a laboratory but that was geographically and temporally related with dates of rash onset occurring **between 7 and 21 days apart for measles or 12-23 days for rubella** to a laboratory-confirmed case or (in the event of a chain of transmission) to another epidemiologically confirmed measles case
Clinically-compatible measles case	a case with fever and maculopapular (non-vesicular) rash and one of cough, coryza, or conjunctivitis but for which no adequate clinical specimen was taken and which has not been linked epidemiologically to a laboratory confirmed case of measles or another laboratory-confirmed communicable disease
Clinically-compatible rubella case	a case with maculopapular (non-vesicular) rash and fever (if measured) and one of arthritis/arthralgia or lymphadenopathy but for which no adequate clinical specimen was taken and which has not been linked epidemiologically to a laboratory confirmed case of rubella or another laboratory-confirmed communicable disease

Word or Phrase	Definition
Non-measles non-rubella case	a suspected case that has been investigated and discarded as **a non-measles and non-rubella case** using (a) laboratory testing in a proficient laboratory or (b) epidemiological linkage to a laboratory-confirmed outbreak of another communicable disease that is neither measles nor rubella
Measles vaccine-associated illness	a suspected case that meets all 5 of the following criteria: (i) the patient had a rash illness, with or without fever, but did not have cough or other respiratory symptoms related to the rash; (ii) the rash began 7–14 days after vaccination with a measles-containing vaccine; (iii) the blood specimen, which was positive for measles IgM, was collected 8–56 days after vaccination; (iv) thorough field investigation did not identify any secondary cases; and (v) field and laboratory investigations failed to identify other causes. Alternatively, a suspected case from whom virus was isolated and found on genotyping to be a vaccine strain.
Imported measles or rubella case	a case exposed outside the region or country during **the 7–21 days for measles or 12-23 days for rubella** prior to rash onset and supported by epidemiological or virological evidence, or both. Note: for cases that were outside the region or country for only a part of the 7-21 day interval (12-23 day interval for rubella) prior to rash onset, additional evidence, including a thorough investigation of contacts of the case, is needed to exclude a local source of infection.
Importation-related measles or	a locally acquired infection occurring as part of a chain of transmission originating from an imported case as supported by epidemiological or virological evidence, or both.

Essential criteria for elimination

1. Absence of endemic transmission of measles for a period of 36 months
2. High quality surveillance
3. Genotype evidence supporting interruption of endemic transmission

- All 3 criteria are necessary for verification of elimination at the regional level.
- As some small countries may not have genotyping information prior to interruption of endemic transmission, this criterion is not an absolute requirement for determining whether elimination has been achieved at country level.

Surveillance indicators

Indicator	Description
Timeliness of reporting	Proportion of surveillance units reporting to the national level on time **(Target: ≥80%)** Proportion of countries reporting to their WHO Regional Office on time **(Target: 100%)** Proportion of Regions reporting to WHO Headquarters on time **(Target:100%)** Note: At each level reports should be received on or before the requested date
Reporting rate of discarded non-measles non-rubella cases	Reporting rate of discarded non-measles non-rubella cases at the national level **(Target: ≥2 cases per 100 000 population per year)**
Representativeness of reporting	Proportion of subnational administrative units (e.g., at the province level or its administrative equivalent) reporting at least 2 discarded non-measles non-rubella cases per 100,000 population **(Target: ≥80%)** **Note: if the administrative unit has a population <100 000, then the rate should be calculated by combining data over**

Indicator	Description
Adequacy of investigation	Proportion of all suspected measles and rubella cases that have had an adequate investigation initiated within 48 hours of notification (**Target: aim for 80%)**.
	The numerator is the number of suspected cases of measles or rubella for which an adequate investigation was initiated within 48 hours of notification and the denominator is the total number of suspected measles and rubella cases. Note: An adequate investigation includes collection of all the following data elements from each suspected measles and rubella case; name or identifiers, place of residence, place of infection (at least to district level), age (or date of birth), sex, date of rash onset, date of specimen collection, measles-rubella vaccination status, date of last MR vaccination, date of notification and date of investigation and travel history. Note: Some variables may not be required for cases that are either confirmed as measles by epidemiologic linkage (e.g., date of specimen collection)

Indicator	Description
Laboratory confirmation	Proportion of suspected cases with adequate specimens for detecting acute measles or rubella infection collected and tested in a proficient laboratory **(Target: ≥80%)**. *Note:* Any suspected cases of measles that are not tested by a laboratory and are (a) confirmed as measles by epidemiological linkage or (b) discarded as non-measles by epidemiological linkage to another laboratory-confirmed communicable disease case should be excluded from the denominator of suspected cases. *Note:* Adequate specimens are: a blood sample by venepuncture in a sterile tube with a volume of 5 ml for older children and adults and 1 ml for infants and younger children; dried blood sample, at least 3 fully filled circles on filter paper collection device; oral fluid, sponge collection device should be rubbed along the gum until the device is thoroughly wet (this usually takes one minute). Adequate samples for serology are those collected within 28 days after rash onset.

Indicator	Description
Viral detection	Proportion of **laboratory-confirmed chains** of transmission with samples adequate for detecting measles or rubella virus collected and tested in an accredited laboratory **(Target:≥80%)** The numerator is the number of chains of transmission for which adequate samples have been submitted for viral detection and the denominator is the number of chains of transmission identified. Note: Where possible, samples should be collected from 5–10 cases early in a chain of transmission and every 2-3 months thereafter if transmission continues. For virus isolation, adequate throat or urine samples are those collected within 5 days after rash onset. For virus detection using molecular techniques, adequate throat samples are those collected up to 14 days after rash onset, and adequate oral fluid samples are those collected up to 21 days after rash onset.

Indicator	Description
Timeliness of specimen transport	Proportion of specimens received at the laboratory within 5 days **(Target: ≥80%)**
Timeliness of reporting laboratory results	Proportion of results reported by the laboratory within 4 days of receiving the specimen **(Target: ≥80%)**

Status of verification of measles elimination, WHO Western Pacific Region

Table 2. Status of verification of measles elimination, WHO Western Pacific Region

Country/area	Year verified	2016						2017					
		No. of confirmed cases	Source of infection				% of cases with known source of infection	No. of confirmed cases	Source of infection				% of cases with known source of infection
			Imported	Import-related	Endemic	Unknown / not reported			Imported	Import-related	Endemic	Unknown / not reported	
Australia	2014	99	31	18	0	50	49.5%	82	36	32	0	14	82.9%
Brunei Darussalam	2015	1	1	0	0	0	100.0%	0	-	-	-	-	-
Cambodia	2015	56	0	0	0	56	0.0%	10	0	0	0	10	0.0%
China	-	23 960	0	0	0	23 960	0.0%	4 893	0	0	0	4 893	0.0%
China, Hong Kong SAR	2016	9	1	0	0	8	11.1%	4	3	0	0	1	75.0%
China, Macao SAR	2014	0	-	-	-	-	-	2	0	2	0	0	100.0%
Japan	2015	152	27	97	0	28	81.6%	184	34	135	0	15	91.8%
Lao People's Democratic Republic	-	8	0	0	0	8	0.0%	3	0	0	0	3	0.0%
Malaysia	-	1 577	5	0	1 503	69	95.6%	1 486	5	0	955	526	64.6%
Mongolia	-	3 587	0	2 392	1 195	0	100.0%	9	0	0	9	0	100.0%
New Zealand	2017	104	0	0	0	104	0.0%	14	0	0	0	14	0.0%
Papua New Guinea	-	0	-	-	-	-	-	7	0	0	0	7	0.0%
Philippines	-	74	1	0	20	53	28.4%	123	0	0	23	100	18.7%
Republic of Korea	2014	18	9	9	0	0	100.0%	5	3	0	0	2	60.0%
Singapore	-	140	16	90	0	34	75.7%	59	13	22	0	24	59.3%
Viet Nam	-	36	0	0	0	36	0.0%	85	0	0	0	85	0.0%
Pacific island countries and areas	-	6	0	0	0	6	0.0%	1	0	0	0	1	0.0%
Total		29 832	91	2 606	2 718	24 412	18.2%	6 967	94	191	987	5 695	18.3%

Blue	No measles cases
Green	≥80%
Yellow	60–79%
Red	<60%

Source: Measles and rubella monthly country reports to WHO by 20 December 2017

Status of verification of measles elimination, WHO Western Pacific Region

COUNTRY: PHILIPPINES	2016	2017
No. of Confirmed Cases	74	123
Source of Infection **Imported**	1	0
Source of Infection **Imported-related**	0	0
Source of Infection **Endemic**	20	23
Source of Infection **Not Reported/Unknown**	53	100
% of Cases with Known Source of Infection	28.4%	18.7%
Immunization Coverage: MCV1/MCV2	79/66%	-

Measles surveillance performance indicated by country, and area, WHO Western Pacific Region, 2016-2017 as of 20 December 2017

Table 4. Measles surveillance performance indicators by country and area, WHO Western Pacific Region, 2016–2017 as of 20 December 2017

Country/area	2016				2017			
	Discarded non-measles rate per 100 000 pop	Second level units with ≥ 2 discarded cases per 100 000 pop (annualized)[1]	Suspected cases with adequate investigation	Suspected cases with adequate specimens for laboratory confirmation[2]	Annualized discarded non-measles rate per 100 000 pop	Second level units with ≥ 2 discarded cases per 100 000 pop (annualized)[1]	Suspected cases with adequate investigation	Suspected cases with adequate specimens for laboratory confirmation[2]
	≥ 2	≥ 80%	≥ 80%	≥ 80%	≥ 2	≥ 80%	≥ 80%	≥ 80%
Australia[3]	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data
Brunei Darussalam	2.8	Not applicable	100.0%	100.0%	0.0	Not applicable	100.0%	100.0%
Cambodia	4.2	72.0%	88.3%	99.0%	4.7	80.0%	87.2%	99.0%
China	3.2	77.4%	97.1%	87.9%	2.0	51.6%	97.3%	90.4%
China, Hong Kong SAR	2.5	Not applicable	97.9%	99.5%	0.0	Not applicable	100.0%	100.0%
China, Macao SAR	2.0	Not applicable	100.0%	100.0%	2.7	Not applicable	88.2%	100.0%
Japan	0.7	4.3%	Insufficient data	Insufficient data	0.4	0.0%	Insufficient data	Insufficient data
Lao People's Democratic Republic	7.3	70.6%	98.6%	47.6%	4.2	70.6%	67.8%	68.7%
Malaysia	16.1	93.8%	79.6%	88.6%	19.6	93.8%	83.7%	90.2%
Mongolia	46.4	95.5%	8.0%	14.4%	4.7	13.6%	93.6%	93.6%
New Zealand	1.1	Insufficient data	Insufficient data	Insufficient data	0.4	Insufficient data	Insufficient data	Insufficient data
[redacted]								
Philippines	1.5	17.6%	57.3%	70.2%	1.9	29.4%	30.9%	72.2%
Republic of Korea	0.6	0.0%	92.1%	79.9%	0.5	0.0%	81.3%	96.4%
Singapore	1.6	Not applicable	85.1%	51.8%	1.4	Not applicable	72.6%	71.2%
Viet Nam	1.2	22.2%	56.9%	77.9%	2.6	49.2%	57.9%	77.3%
Pacific island countries and areas[4]	7.8	13.0%	90.1%	89.7%	2.6	13.0%	84.3%	95.2%
Western Pacific Region	3.0	39.0%	70.9%	67.7%	2.1	36.0%	88.3%	88.8%

[1] This indicator is not applicable for countries which have no second-level administrative units

[2] Adequate specimen-defined as blood specimen collected within 28 days of rash onset; or other specimen (throat swab, nasopharyngeal swab, cerebrospinal fluid, urine) collected within 5 days of rash onset; excludes epidemiologically-linked cases.

[3] Reports only confirmed cases

[4] Surveillance performance indicators refer to all the Pacific island countries and areas as one epidemiological block; each country is considered as second level unit

Green	Reached or surpassed target
Yellow	Nearly reached target: 100–1.99 for non-measles suspected case rate; 10.1–25% for percent clinically confirmed cases; 60–79% for other indicators
Red	Substantially below target

Measles surveillance performance indicated by country, and area, WHO Western Pacific Region, 2016-2017 as of 20 December 2017

COUNTRY: PHILIPPINES		2016	2017
Discarded non-measles rate per 100 000 pop	≥2	1.5	-
Second level units with ≥ 2 discarded cases per 100 000 pop [annualized]1	≥ 80%	17.6%	-
Suspected cases with adequate investigation	≥ 80%	57.3%	-
Suspected cases with adequate specimens for laboratory confirmation 2	≥ 80%	70.2%	-
Annualized discarded non-measles rate per 100 000 pop	≥2	-	1.9
Second level units with ≥ 2 discarded cases per 100 000 pop [annualized]1	≥ 80%	-	29.4%
Suspected cases with adequate investigation	≥ 80%	-	30.9%
Suspected cases with adequate specimens for laboratory confirmation 2	≥ 80%	-	72.2%

TABLE 3. MEASLES SURVEILLANCE PERFORMANCE INDICATORS BY REGION, PHILIPPINES, 2016 vs. 2017

REGION	POPULATION 2017	ANNUALIZED MEASLES INCIDENCE RATE Target: <1/1,000,000 Pop.		TIMELINESS & ADEQUACY OF BLOOD Target: ≥80%		TIMELINESS & ADEQUACY OF CASE INVESTIGATION Target: ≥80%		ANNUALIZED SUSPECT MEASLES REPORTING RATE Target: ≥2/100,000 Pop.		ANNUALIZED NON-MEASLES/ NON-RUBELLA REPORTING Target: ≥2/100,000 Pop.		PERCENTAGE OF MEASLES COMPATIBLE Target: <10%	
		2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
I	5,263,258	1.56	0.62	44	73	40	68	3.97	8.31	1.51	4.93	55	25
II	3,595,623	0.57	0.00	80	75	75	72	1.68	1.73	1.28	1.06	20	19
III	11,427,139	0.17	2.48	81	87	77	81	1.25	3.72	0.93	1.96	19	11
IVA	14,659,353	0.86	0.74	74	79	61	70	2.08	4.36	1.32	2.23	23	18
MIMAROPA	3,216,466	0.00	0.00	47	35	42	33	1.86	1.93	0.88	0.71	49	58
V	6,266,652	0.68	0.00	76	67	75	59	1.00	1.11	0.59	0.70	24	28
VI	7,919,887	0.52	0.14	95	91	90	73	3.91	3.97	2.93	2.09	5	6
VII	7,689,735	1.32	0.43	96	88	93	82	1.28	0.81	1.03	0.51	4	11
VIII	4,704,894	0.45	0.00	35	50	33	69	1.76	1.88	0.45	0.49	65	19
IX	3,896,152	3.15	37.80	53	63	47	45	1.91	11.09	0.84	1.18	40	31
X	4,857,342	0.41	0.90	43	42	38	37	6.00	2.96	2.47	0.94	56	57
XI	5,153,130	0.40	0.64	88	97	86	91	1.97	1.82	1.59	0.99	12	2
XII	4,780,211	0.21	0.68	84	91	81	87	1.53	1.87	1.22	1.44	16	7
ARMM	3,896,848	0.56	15.12	26	21	26	18	0.53	10.39	0.08	0.22	74	76
CAR	1,847,347	1.67	0.00	84	69	84	55	4.46	11.04	3.18	4.31	13	28
CRG	2,828,583	1.13	0.39	67	55	67	43	2.30	1.70	1.39	0.73	34	43
NCR	12,918,977	0.45	0.68	76	78	70	70	1.76	2.69	1.11	1.62	19	20
PHL	104,921,597	0.73	2.61	70	69	65	61	2.16	3.74	1.30	1.59	29	27

LEGEND:	<1	≥1	≥80%	<80%	≥80%	<80%	≥2/100,000 Pop.	<2/100,000 Pop.	≥2/100,000 Pop.	<2/100,000 Pop.	<10%
											≤50%
											>50%

THERE IS A MEASLES OUTBREAK

In Davao, Zamboanga City

Republic of the Philippines
OFFICE OF THE CITY HEALTH OFFICER
Zamboanga City

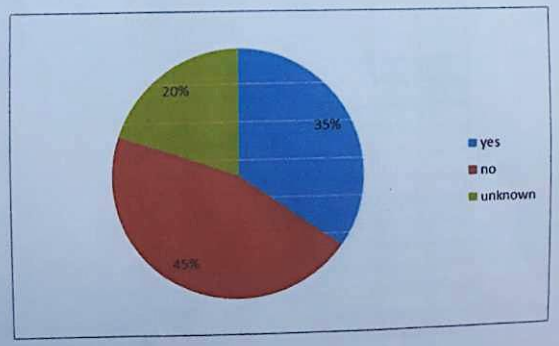
Tel No.(062) 991-3780 Fax No.(062) 991-5421

Figure 2. Distribution of Suspected Measles Cases by Age and Sex (n=101) Zamboanga City, January 1 to February 1, 2018

The above figure shows age range of cases is from less than 1 year old to more than 40 years old with a median age of 2. Forty-nine percent (49%) were males and fifty-one percent (51%) were females. Most of the cases (34) belong to the 1 to 5 years age group.

No deaths were reported.

Figure 3. Suspected Measles Cases by Vaccination Status in Zamboanga City (n=101) January 1 to February 1, 2018



Republic of the Philippines
OFFICE OF THE CITY HEALTH OFFICER
Zamboanga City

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QUINIPUT	1
RECODO	1
STO. NINO	1
SINUBONG	1
TALABAAN	1
TALON-TALON	1
TALUKSANGAY	1
TETUAN	1
TICTAPUL	1
TIGTABON	1

Table 1. Distribution of Suspected Measles Cases in Zamboanga City, as of February 1, 2018 (N=101)

A city wide catch-up immunization was done to children ages 6 months to 59 months old based on the advisory issued by the Department of Health Regional Office IX, which started last September 2017. Table 2 shows that only 14% of the target population was accomplished due to the lack of supply of syringes (both regional and local) and lack of health personnel to conduct the house-to-house catch-up immunization.

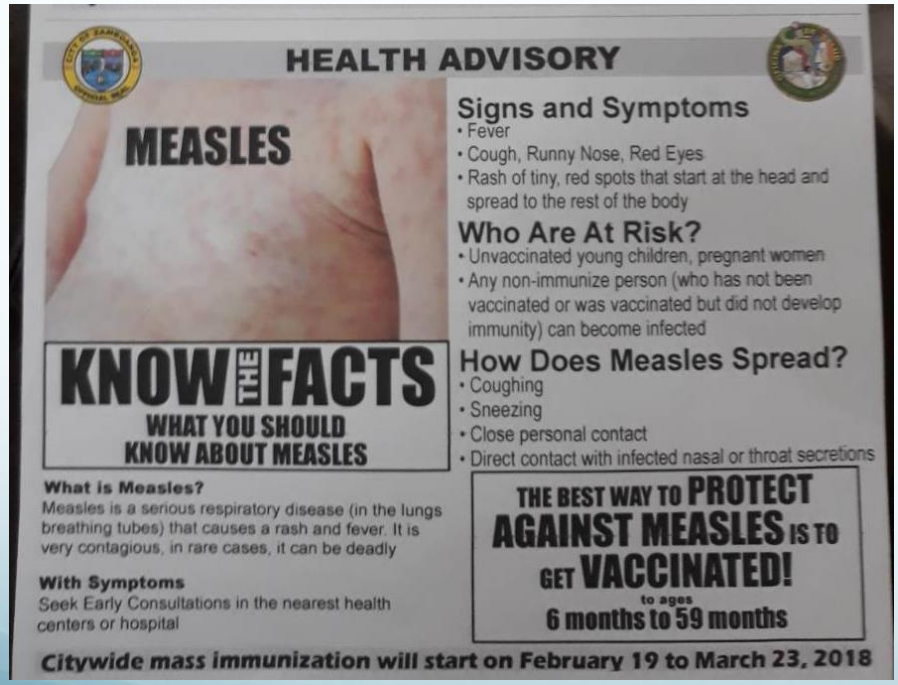
Eligible Population (Target)	Total	% accomplished
121, 947	17,061	14

Table 2. Outbreak Response Immunization to Measles Cases Accomplishment

DISCUSSION:

Measles is an acute highly communicable viral illness and is transmitted through direct contact with nasal or throat secretions of infected persons or by articles freshly soiled with nose and throat secretion. The active surveillance thru case finding is used to detect, investigate, and confirm every suspected measles case in the community in order to prevent potential outbreak. It was noted during interview that majority of the suspected cases did not have any history of vaccination. The only way to prevent the spread of disease in this case is through vaccination and a strong herd-immunity from the community.

IMMUNIZE! IMMUNIZE! IMMUNIZE!



Salamat po!