WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit
Ministry of Health

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Vol. 40 No.25 **15th – 21th June 2013**

SRI LANKA- 2013 WER

Measles (Part I)

This is the first in a series of two articles on Measles

Background

Measles is a highly contagious disease caused by the measles virus. In 1980, before widespread vaccination, measles caused an estimated 2.6 million deaths each year. Approximately 158 000 people died from measles in 2011 (mostly children under the age of five) despite the availability of a safe and effective vaccine.

Measles is caused by a virus in the paramyxovirus family. The measles virus normally grows in the cells that line the back of the throat and lungs. Measles is a human disease and is not known to occur in animals.

The disease

After an incubation period of 8–12 days, measles begins with increasing fever (to 39℃-40.5° C) and cough, coryza and conjunctivitis. Symptoms intensify over 2–4 days before the onset of rash and peak on the first day of rash. The rash is usually first noted on the face and neck, appearing as discrete erythematous patches 3–8 mm in diameter. The lesions increase in number for 2 or 3 days, especially on the trunk and the face, where they frequently become confluent. Discrete lesions are usually seen on the distal extremities, and with careful observation, small numbers of lesions can be found on the palms of 25%–50% of those infected. The rash lasts for 3 –7 days and then fades in the same manner as it appeared, sometimes ending with a fine desquamation that may go unnoticed in children who bathe daily. An exaggerated desquamation is commonly seen in malnourished children. Fever usually persists for 2 or 3 days after the onset of the rash and the cough may persist for as many as 10 days.

Koplik's spots usually appear 1 day before the onset of rash and persist for 2 or 3 days. These bluish-white, slightly raised, 2 to 3 mm-diameter lesions on an erythematous base appear on the buccal mucosa, usually opposite the first molar, and occasionally on the soft palate, conjunctiva and vaginal mucosa. Koplik's spots have been reported in 60%–70% of persons with measles but are probably present in most persons who develop measles. An irregular blotchy enanthema may be present in other areas of the buccal mucosa. Photophobia from iridocyclitis, sore throat, headache, abdominal pain and generalized mild lymphadenopathy are also common.

Measles is transmitted by the respiratory route. Infectivity is greatest in the 3 days before the onset of rash and 75%–90% of susceptible household contacts develop the disease. The early pre-rash symptoms are similar to those of other common respiratory illnesses and affected persons often participate in routine social activities, facilitating transmission. Numerous outbreaks of disease in highly vaccinated populations occur when children in the first few days of illness attend sporting events as participants or spectators, especially indoor events such as basketball tournaments. Outbreaks also occur when ill children are brought to a doctor's office or emergency room for evaluation for fever, irritability, or rash

Mild, Modified and atypical measles infections

Milder forms of measles occur in children and adults with pre-existing partial immunity. Infants who have low levels of passively acquired maternal antibody and persons who receive blood products that contain antibody often have subclinical infections or minimal symptoms that may not be diagnosed as measles. Vaccination protects >90% of recipients against disease, but after exposure to natural measles, some vaccinees develop boosts in antibody associated with mild symptoms and may have rash with little or no fever or nonspecific respiratory symptoms. People with inapparent subclinical measles virus infections are not known to transmit measles virus to contacts.

Atypical measles occurred in children who received formalin-inactivated (killed) measles vaccine that was in use in 1960s in the United

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States. These children developed high fever, a rash that was most prominent on the extremities and often included petechiae, and a high rate of pneumonitis. Recent studies in monkeys indicate that this illness was caused by antigen-antibody immune complexes resulting from incomplete maturation of the antibody response to the vaccine

Complications

Measles virus infects multiple organ systems and targets epithelial, reticulo-endothelial and white blood cells, including monocytes, macrophages and T lymphocytes. Pathological studies of children dying during acute measles have found multinucleated giant cells typical of measles virus infection throughout the respiratory and gastrointestinal tracts and in most lymphoid tissues. Measles virus infection leads to a decline in CD4 lymphocytes, starting before the onset of rash and lasting for up to 1 month and resulting in suppression of delayed-type hypersensitivity as measured by anergy to skin test antigens, including tuberculosis antigen. Whether measles predisposes to reactivation of latent Mycobacterium tuberculosis infections has been a subject of debate.

Complications from measles have been reported in every organ system. Many of these complications are caused by disruption of epithelial surfaces and immunosuppression.

Respiratory Complications

Otitis media

Otitis media is the most common complication reported. Presumably, inflammation of the epithelial surface of the eustachian tube causes obstruction and secondary bacterial infection. Lower rates of otitis media are noted with increasing age, most likely a function of the increasing diameter of the eustachian tube and the decreasing risk of obstruction.

Laryngotracheobronchitis

Laryngotracheobronchitis or "measles croup" is found in children hospitalized with measles. The majority of affected children were <2 years old. In one-third to one-half of such cases, culture of samples from the trachea yields positive results for bacterial pathogens, with a purulent exudate and evidence of secondary bacterial tracheitis, pneumonia or both. The most commonly cultured organism is Staphylococcus aureus, although Streptococcus pneumoniae, Haemophilus influenzae, Pseudomonas aeruginosa, Escherichia coli and Enterobacter species have also been identified.

Pneumonia

Measles infects the respiratory tracts of nearly all affected persons. Pneumonia is the most common severe complication of measles and accounts for most measles-associated deaths. Pneumonia maybe caused by measles virus alone, secondary viral infection with adenovirus or HSV, or secondary bacterial infection. Measles is one cause of Hecht's giant cell pneumonia, which usually occurs in immuno-compromised persons but can occur in otherwise normal adults and children. Studies that included culture of blood, lung punctures or tracheal aspirations revealed bacteria as the cause of 25%–35% of measles-associated pneumonia. S. pneumoniae, S. aureus and H. influenzae were the most commonly isolated organisms. Other bacteria (e.g.Pseudomonas species, Klebsiella pneumoniae, and E. coif) are less common causes of severe pneumonia associated with measles.

Pneumomediastinum and mediastinal emphysema have been reported. Some children have the clinical pattern of bronchiolitis. Because viral cultures are not always done, the possibility of co-infection with other respiratory viruses cannot be ruled out.

Measles pneumonia in immunocompromised patients.

Among immunocompromised persons, diffuse progressive pneumonitis caused by the measles virus is the most common cause of death. These patients may first have typical measles with pneumonia, or they may have a nonspecific illness without rash followed by pneumonitis without a rash. In general, signs of pneumonitis develop in the 2 weeks after the first onset of symptoms. Other patients have had reappearance of rash and pneumonitis after long intervals following "classical" measles.

Source-The Clinical Significance of Measles, A Review, available from *http://jid.oxfordjournals.org/content/189/Supplement_1/S4.full*

Compiled by Dr. Madhava Gunasekera of the Epidemiology Unit

Table 3 : Water Quality Surveillance
Number of microbiological water samples - May / 2013

District	MOH areas	No: Expected *	No: Received
Colombo	12	72	78
Gampaha	15	90	106
Kalutara	12	72	NR
NHIS	2	12	27
Kandy	23	138	17
Matale	12	72	NR
Nuwara Eliya	13	78	04
Galle	19	114	NR
Matara	17	102	0
Hambantota	12	72	23
Jaffna	11	66	123
Kilinochchi	4	24	19
Manner	5	30	34
Vavuniya	4	24	38
Mullatvu	4	24	0
Batticaloa	14	84	24
Ampara	7	42	0
Trincomalee	11	66	35
Kurunegala	23	138	138
Puttalam	9	84	9
Anuradhapura	19	114	73
Polonnaruwa	7	42	26
Badulla	15	90	70
Moneragala	11	66	67
Rathnapura	18	108	06
Kegalle	11	66	74
Kalmunai	13	78	0

* No of samples expected (6 / MOH area / Month)
NR = Return not received

to be continued

Table 4: Selected notifiable diseases reported by Medical Officers of Health 08th - 14thMay 2013 (24th Week)

RDHS	Dengue Fever		Dysentery		Encephaliti		E Fever		F Poisoning		Leptospiros		T Fever		V Hepatitis		H Rabies		Chickenpox		Meningitis		Leishmaniasis		WRCD %	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	T*	C**
Colombo	130	3933	0	87	0	11	3	61	1	19	0	121	0	5	2	40	0	0	2	229	1	27	0	0	**85**	**15**
Gampaha	63	1702	2	71	2	11	0	22	1	22	9	188	0	11	2	111	0	0	1	90	2	52	3	5	**93**	**7**
Kalutara	32	815	4	73	3	14	2	44	0	12	14	216	0	1	1	12	0	0	7	152	1	38	0	0	**77**	**23**
Kandy	51	876	7	66	0	6	0	12	0	7	0	40	3	72	1	55	0	0	0	80	0	5	0	2	**96**	**4**
Matale	2	210	4	41	0	1	1	7	0	0	0	33	0	2	0	23	0	0	3	29	0	16	0	2	**46**	**54**
NuwaraEliya	4	120	1	83	0	2	0	5	0	3	1	18	2	42	0	11	0	0	2	47	1	3	0	0	**85**	**15**
Galle	25	401	0	40	1	10	0	2	0	70	1	117	0	24	0	6	0	1	4	147	2	25	0	0	**84**	**16**
Hambantota	6	164	0	23	0	2	0	7	2	11	2	132	0	37	0	64	0	0	4	62	0	14	3	133	**92**	**8**
Matara	3	259	1	36	0	9	1	14	0	27	1	106	1	38	1	111	0	2	7	169	3	34	2	50	**100**	**0**
Jaffna	6	460	7	109	0	5	4	246	1	76	0	6	0	314	0	10	0	0	2	111	1	31	0	0	**83**	**17**
Kilinochchi	0	27	0	13	0	0	0	6	0	2	0	9	0	15	0	0	0	0	0	2	0	6	0	5	**25**	**75**
Mannar	0	55	0	25	0	1	0	52	0	11	0	11	0	16	0	1	0	0	0	11	0	4	0	1	**100**	**0**
Vavuniya	2	45	2	25	0	10	0	6	0	8	2	46	0	2	0	1	0	2	0	18	1	20	0	4	**75**	**25**
Mullaitivu	0	82	0	6	0	1	0	6	0	4	0	23	0	5	0	0	0	2	0	3	0	3	0	8	**40**	**60**
Batticaloa	10	380	12	142	0	3	0	0	0	9	0	23	0	2	0	8	0	0	1	20	0	2	0	0	**86**	**14**
Ampara	2	71	0	44	0	0	0	4	0	2	0	17	0	0	0	2	0	0	2	48	0	7	0	1	**43**	**57**
Trincomalee	1	148	1	37	0	2	0	4	0	1	1	49	1	6	0	3	0	1	4	25	0	2	1	14	**67**	**33**
Kurunegala	58	1896	9	98	0	25	0	26	1	8	6	177	0	17	1	31	0	1	3	206	5	71	1	25	**89**	**11**
Puttalam	10	570	3	29	0	4	0	11	0	35	0	15	0	10	0	1	0	0	2	48	1	11	0	3	**54**	**46**
Anuradhapura	2	329	2	46	0	12	0	3	0	4	3	260	0	15	0	13	0	0	0	91	1	58	2	184	**68**	**32**
Polonnaruwa	7	198	2	39	0	1	0	11	0	0	2	128	0	2	0	19	0	1	2	82	1	10	2	75	**86**	**14**
Badulla	5	228	2	79	0	3	1	10	0	7	0	18	1	41	0	25	0	0	0	71	6	22	0	3	**76**	**24**
Monaragala	1	124	0	50	0	3	0	11	0	18	2	174	0	26	0	46	0	1	1	33	0	10	0	6	**5**	**45**
Ratnapura	22	1061	3	220	0	78	0	29	0	16	1	213	0	18	4	140	0	1	0	83	1	44	0	8	**67**	**33**
Kegalle	25	588	1	39	0	10	0	10	0	4	5	99	2	52	1	129	0	0	2	181	1	59	0	0	**73**	**27**
Kalmune	1	464	2	75	0	1	0	3	0	64	0	4	0	2	0	4	0	0	1	52	0	6	0	1	**38**	**62**
SRI LANKA	**468**	**15206**	**65**	**1596**	**06**	**225**	**12**	**612**	**06**	**440**	**50**	**2243**	**10**	**775**	**13**	**866**	**00**	**12**	**50**	**2090**	**28**	**580**	**14**	**530**	**76**	**24**

Source: Weekly Returns of Communicable Diseases (WRCD).

***T=**Timeliness refers to returns received on or before 14th june , 2013 Total number of reporting units 339. Number of reporting units data provided for the current week: 269** Completeness

A = Cases reported during the current week. **B** = Cumulative cases for the year.**H Rabies***= Human Rabies, **E Fever***=Enteric Fever, **F Poison*** =Food Poisoning, **T Fever***=Typhus Fever, **V Hepatitis***=Viral Hepatitis

Table 1: Vaccine-Preventable Diseases & AFP

08th – 14th May 2013 (24th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2013	Number of cases during same week in 2012	Total number of cases to date in 2013	Total number of cases to date in 2012	Difference between the number of cases to date in 2013 & 2012
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	00	00	01	00	01	01	32	40	- 20.0 %
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Mumps	01	00	01	07	03	05	00	00	02	19	09	763	1995	- 61.8 %
Measles	33	03	17	01	00	04	02	00	09	69	00	696	21	+ 3214.3%
Rubella	00	00	00	00	00	00	00	00	00	00	-	12	-	-
CRS**	00	00	00	00	00	00	00	00	00	00	-	05	-	-
Tetanus	00	00	00	00	00	00	00	00	00	00	00	10	05	+ 100.0 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	-	00	-	-
Japanese Encephalitis	05	00	01	00	00	00	00	00	00	06	-	225	-	-
Whooping Cough	02	00	01	00	00	00	00	00	00	03	00	38	34	+ 11.8 %
Tuberculosis	06	17	28	01	27	13	00	13	02	107	312	3860	4068	- 05.1 %

Key to Table 1 & 2

Provinces: **W**: Western, **C**: Central, **S**: Southern, **N**: North, **E**: East, **NC**: North Central, **NW**: North Western, **U**: Uva, **Sab**: Sabaragamuwa.

RDHS Divisions: **CB**: Colombo, **GM**: Gampaha, **KL**: Kalutara, **KD**: Kandy, **ML**: Matale, **NE**: Nuwara Eliya, **GL**: Galle, **HB**: Hambantota, **MT**: Matara, **JF**: Jaffna, **KN**: Killinochchi, **MN**: Mannar, **VA**: Vavuniya, **MU**: Mullaitivu, **BT**: Batticaloa, **AM**: Ampara, **TR**: Trincomalee, **KM**: Kalmunai, **KR**: Kurunegala, **PU**: Puttalam, **AP**: Anuradhapura, **PO**: Polonnaruwa, **BD**: Badulla, **MO**: Moneragala, **RP**: Ratnapura, **KG**: Kegalle.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Neonatal Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps., Rubella, CRS,

Special Surveillance: AFP* (Acute Flaccid Paralysis), Japanese Encephalitis

CRS =**Congenital Rubella Syndrome

AFP and all clinically confirmed Vaccine Preventable Diseases except Tuberculosis and Mumps should be investigated by the MOH

Dengue Prevention and Control Health Messages

To prevent dengue, remove mosquito breeding places in and around your home, workplace or school once a week.

PRINTING OF THIS PUBLICATION IS FUNDED BY THE WORLD HEALTH ORGANIZATION (WHO).

Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to **chepid@sltnet.lk. Prior approval should be obtained from the Epidemiology Unit before publishing data in this publication**

ON STATE SERVICE

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