WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit
Ministry of Health

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WEEKLY EPIDEMIOLOGICAL REPORT - SRI LANKA - 2014

Smallpox

Background

The Variola Virus causes smallpox which was one of the most dreadful diseases in the world in the pre-vaccine era. According to some health experts, infection with variola virus was responsible for more deaths than all other infectious diseases combined over the centuries.

The Agent/ Variola Virus

The Variola Virus is a double-stranded DNA virus in the *Poxviridae* family and the *Orthopoxvirus* genus. This virus only infects humans and it is the main reason why it was able to be eradicated.

Small pox

Smallpox is a serious, contagious, and sometimes fatal infectious disease. There is no specific treatment for smallpox disease, and the only prevention is vaccination. The pox part of smallpox is derived from the Latin word for "spotted" and refers to the raised bumps that appear on the face and body of an infected person.

There are two clinical forms of smallpox.

- Variola major is the severe and most common form of smallpox, with a more extensive rash and higher fever. There are four types of variola major smallpox:
  1. Ordinary - the most frequent type accounting for 90% or more of cases
  2. Modified - mild and occurring in previously vaccinated persons
  3. Flat
  4. Hemorrhagic

  Historically, variola major has an overall fatality rate of about 30%. However, flat and hemorrhagic smallpox usually are rare and fatal.
- Variola minor is a less common presentation of smallpox and a much less severe disease, with death rates historically of 1% or less.

Current situation

Smallpox outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination programme. The last case of smallpox in Sri Lanka was reported in 1972 and the last known natural case in the world was in Somalia in 1977. Since then, naturally occurring cases were not reported except the laboratory accident in 1978 in England, which killed one person and caused a limited outbreak. The World Health Organization (WHO) officially declared the global eradication of smallpox in 1979.

Transmission

The virus is transmitted via respiratory droplets of the infected person and also can spread through direct contact with infected bodily fluids or contaminated objects such as bedding or clothing. Rarely, smallpox has been spread by virus carried in the air in enclosed settings such as buildings, buses and trains.

Humans are the only natural hosts of variola. Smallpox is not known to be transmitted by insects or animals and no carrier state is seen.
The virus initially infects the cells in the respiratory tract and then spreads to lymph nodes. It enters the bloodstream in about 3-4 days. After an incubation period is 7 to 17 days, symptoms appear.

Symptoms

Symptoms of smallpox include

- high fever, fatigue, headache, body ache and occasionally vomiting
- Mouth sores and blisters that spread the virus into the throat.
- Two to five days later, the characteristic smallpox rash develops. It follows a predictable pattern beginning as flat, round lesions primarily on the face and forearms. These then evolve into deep, pustules in the entire body including palms and soles.

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- The pustules crust over, usually in the second week of the disease. The scabs formed; fall off in the third week of the disease resulting in disfiguring scars. Blindness due to scarring can result from blisters formed in the area of eyes.
- Smallpox during pregnancy often results in miscarriage or stillbirth.

A person with smallpox is sometimes contagious with the onset of fever (prodrome phase), but the person becomes most contagious with the onset of rash. At this stage the infected person is usually very sick and not able to move around in the community. The infected person is contagious until the last smallpox scab falls off. In the first two to three days of the rash, smallpox can be confused with chickenpox (varicella zoster).

History of the Virus

Variola virus infections were described in Asia during the 1st century, in Europe and Africa around 700 A.D., and in Central, South, and North America during the 16th and 17th centuries. The disease burden was heavy as about one-fourth of people who got infected had died and many were left blind or disfigured.

Smallpox vaccine

Smallpox vaccine is the first successful vaccine developed in the world and it was introduced by Edward Jenner in 1798. He observed that milkmaids who had previously caught cowpox did not later catch smallpox.

He showed that inoculated cowpox virus which is a virus related to variola but not as virulent, protected a person against smallpox. He took pus from the lesions on the hands of a diary maid and inoculated to a person. That person was later challenged with smallpox and had no response.

The word "vaccine" is derived from Variolae Vaccinae (i.e. smallpox of the cow), the term devised by Jenner to denote cowpox and used in the long title of his Inquiry into the *"Variolae Vaccinae"* known as the Cow Pox.

Vaccination was first used in print by Jenner's friend, Richard Dunning in 1800. Initially, the terms vaccine/vaccination referred only to smallpox, but in 1881 Louis Pasteur proposed that to honour Jenner, the terms be widened to cover the new protective inoculations being introduced.

Contribution of World Health Organization (WHO)

The World Health Organization (WHO) initiated a world-wide smallpox eradication programme in 1966. Various activities were carried out including vaccination campaigns and posters to publicize the disease and to support programme activities aiming at eradication of smallpox.

Before 1967, smallpox vaccine was given to large numbers of people who had not been exposed to smallpox. This mass vaccination strategy helped protect people from smallpox, but it was not sufficient to eradicate the disease.

In 1967, a different plan was used. It involved finding people who were exposed to an infected person and the exposed person and people he or she has been in contact, were given the vaccine. This is called ring vaccination. This approach created a "ring" of vaccinated people around the people who were infected with smallpox and this approach could stop the spread of the disease.

Surveillance programmes reported cases and also collected morbidity and mortality data for better understanding of the disease and the effectiveness and duration of immunity from vaccines.

After variola virus was eliminated from the world, routine vaccination against smallpox among the general public was stopped because it was no longer considered necessary for prevention.

Current status of Variola Virus

The WHO informed its member states on 25th November, about the preparation for the 134th session of the Executive committee and the 67th World Health Assembly to be held in 2014 and in particular of the discussion on the timing of the destruction of the variola virus. It is currently held in two repository laboratories which are Centers for Disease Control and Prevention, Atlanta, Georgia, United States and the Russian State Centre for Research on Virology and Biotechnology, Koltsovo, Novosibirsk Region, Russian Federation.

The events with anthrax in 2001 at United States have led to heighten concern of variola virus as an agent of bioterrorism. Among those agents identified by the Centers for Disease Control and Prevention (CDC), smallpox is among the most dangerous Class A bioterrorist threats. This is because of the ease of transmission of this agent, the lack of immunity in the population at large to this agent and rapidity of spread. A vaccine directed against smallpox is available but it is also associated with significant adverse events. Further, no antiviral drug has proven efficacious to treat the disease. Therefore, the U.S. government has taken precautions for dealing with a smallpox outbreak including a stockpiling of smallpox vaccines.

Treatment and Prevention

There is no proven treatment for smallpox. Scientists are currently researching new treatments. No antiviral drug has proven efficacious for therapy of human disease, although one licensed drug named 'cidofovir' has shown in-vitro activity. Patients with smallpox may be helped by intravenous fluids, medicine to control fever or pain and antibiotics for any secondary bacterial infections that may occur.

One of the best ways to prevent smallpox is through vaccination. If given to a person before exposure to smallpox, the vaccine can completely protect them. Vaccination within 3 days after exposure will prevent or greatly lessen the severity of smallpox in most people. Vaccination 4 to 7 days after exposure likely offers some protection from disease or may decrease the severity of disease. Vaccination will not protect smallpox patients who already have a rash.

Currently, the smallpox vaccine is not widely available to the general public. However, the smallpox vaccine is there in the United States in the event of a smallpox emergency.

Sources

Emergency Preparedness and Response for Small pox (CDC) available from *http://emergency.cdc.gov/agent/smallpox/prep/cdc-prep.asp*

Smallpox: a potential agent of bioterrorism, available from *http://www.ncbi.nlm.nih.gov/pubmed/12615298*

The Smallpox Eradication Programme (WHO) available from *http://www.who.int/features/2010/smallpox/en/*

Compiled by Dr. H. A. Shanika Rasanjalee of the Epidemiology Unit

Table 1: Selected notifiable diseases reported by Medical Officers of Health 15th – 21st Feb 2014 (08th Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Chickenpox		Meningitis		Leishmani-asis		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	182	1793	3	24	0	2	0	16	8	134	2	21	0	0	1	5	0	0	6	55	0	9	0	3	**69**	**31**
Gampaha	64	836	4	28	0	1	1	10	3	7	6	40	1	3	3	18	0	2	9	83	0	17	0	1	**73**	**27**
Kalutara	37	388	3	24	1	2	1	10	0	41	4	54	0	0	1	3	0	0	4	47	3	14	0	0	**77**	**23**
Kandy	10	123	2	21	0	1	0	4	0	0	0	7	3	16	2	16	0	0	4	37	1	6	0	1	**83**	**17**
Matale	5	51	1	15	1	1	0	3	0	0	0	11	0	2	1	14	0	0	0	6	0	3	0	1	**69**	**31**
NuwaraEliya	6	35	4	37	0	1	0	6	0	6	0	0	2	13	0	5	0	0	1	17	1	4	0	0	**77**	**23**
Galle	1	144	1	19	0	2	0	0	1	3	0	28	0	12	0	0	0	0	3	47	0	8	0	1	**25**	**75**
Hambantota	11	68	0	11	0	3	0	6	0	0	3	25	3	21	0	3	0	0	8	39	0	11	10	45	**100**	**0**
Matara	8	78	2	16	0	1	1	16	0	5	1	11	1	15	0	6	0	0	5	40	1	17	2	15	**100**	**0**
Jaffna	25	215	12	88	0	1	7	52	3	21	0	4	23	178	0	4	0	0	2	29	1	9	0	0	**92**	**8**
Kilinochchi	1	17	1	46	0	0	1	7	0	0	0	0	0	9	0	0	0	0	0	1	0	3	0	4	**50**	**50**
Mannar	1	3	3	8	0	7	0	16	0	0	0	3	0	13	0	1	0	0	0	1	1	1	0	1	**100**	**0**
Vavuniya	5	17	0	12	0	0	2	2	0	2	0	3	2	2	0	0	0	0	0	4	0	2	0	0	**100**	**0**
Mullaitivu	0	31	0	9	0	0	0	5	0	5	0	5	0	3	0	0	0	0	0	2	0	2	0	4	**40**	**60**
Batticaloa	15	84	6	58	0	0	3	9	0	11	0	3	0	1	0	2	0	0	0	6	0	1	0	0	**79**	**21**
Ampara	4	32	1	12	0	0	0	0	0	4	0	5	1	3	0	1	0	1	1	18	0	0	1	2	**86**	**14**
Trincomalee	5	74	0	6	0	1	0	0	0	0	0	4	0	1	0	0	0	0	0	9	0	1	0	0	**75**	**25**
Kurunegala	16	229	0	17	1	7	0	5	0	1	2	24	6	19	0	6	0	0	6	76	0	14	2	31	**56**	**44**
Puttalam	2	118	0	8	0	0	0	1	0	5	4	21	1	12	0	1	0	0	6	22	1	1	0	1	**38**	**62**
Anuradhapura	7	97	1	23	0	0	0	0	0	1	2	21	1	14	0	0	0	0	3	45	1	12	2	56	**79**	**21**
Polonnaruwa	0	60	0	10	0	1	0	0	0	0	0	8	0	0	0	1	0	0	0	17	0	1	0	15	**0**	**100**
Badulla	14	94	4	16	0	1	0	1	0	0	2	11	0	10	2	10	0	0	2	19	2	14	0	0	**88**	**12**
Monaragala	8	41	0	17	0	0	0	0	0	27	4	21	7	22	1	12	0	0	1	14	0	5	0	2	**73**	**27**
Ratnapura	4	121	0	26	0	2	0	3	0	4	0	52	0	19	1	61	0	0	0	30	0	4	0	8	**56**	**44**
Kegalle	15	127	6	25	0	2	0	8	0	1	4	26	3	13	1	16	0	0	1	52	3	13	0	1	**91**	**9**
Kalmune	4	23	4	28	0	0	0	3	0	6	0	1	0	0	0	0	0	0	2	24	0	1	0	0	**54**	**46**
SRILANKA	**450**	**489**	**58**	**604**	**3**	**36**	**16**	**183**	**15**	**284**	**36**	**409**	**54**	**401**	**13**	**185**	**0**	**3**	**64**	**740**	**15**	**173**	**17**	**192**	**70**	**30**

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 21th February , 2014 Total number of reporting units 337 Number of reporting units data provided for the current week: 239 C**-Completeness

A = Cases reported during the current week. **B** = Cumulative cases for the year.

Table 2: Vaccine-Preventable Diseases & AFP

15th – 21st Feb 2014(08th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2014	Number of cases during same week in 2013	Total number of cases to date in 2014	Total number of cases to date in 2013	Difference between the number of cases to date in 2014 & 2013
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	01	00	00	00	00	00	00	01	01	03	00	12	10	+20%
Diphtheria	00	00	00	00	00	00	00	00	00	00	-	00	-	%
Mumps	01	01	00	01	01	01	00	00	02	07	15	136	216	-37.1%
Measles	29	04	19	01	02	08	07	03	06	79	09	728	46	+1482.6%
Rubella	00	00	00	00	00	00	00	00	00	00	-	01	-	%
CRS**	00	00	00	00	00	00	00	00	00	00	-	00	-	%
Tetanus	00	00	00	00	00	00	00	00	00	00	01	02	03	-33.3%
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	-	00	-	%
Japanese Encephalitis	02	00	00	00	00	00	01	00	00	03	-	16	-	%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	02	08	09	-11.1%
Tuberculosis	61	33	38	15	27	54	14	08	25	275	187	1803	1440	+25.2%

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

Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them

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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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