



WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit

Ministry of Healthcare and Nutrition

231, de Saram Place, Colombo 01000, Sri Lanka

Tele: + 94 11 2695112, Fax: +94 11 2696583, E mail: epidunit@sltnet.lk

Epidemiologist: +94 11 2681548, E mail: chepid@sltnet.lk

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Emerging and Re emerging Infectious Diseases

Infectious agents that are potentially capable of causing infectious diseases have threatened human health since the beginning of mankind. Environmental changes that have taken place consequent to either man made or natural causes over the years have, in many ways, initiated the threat to human health or increased the existing threat. Multitude of factors has contributed to emergence of these infectious agents. These factors are linked to increased travel on earth, quick, intense international travel, overcrowding, poor sanitation, changes in handling and processing large quantities of food, increased exposure of humans to disease vectors and reservoirs in nature. On the other hand, in many countries, the deteriorating status of the public health infrastructure makes it unable to cope up with the increased public demand such as sanitation, hygiene, immunization etc. Microbes are also evolving and constantly adopting. These infectious agents like any other living organism are subject to change. Their ability to change will be manifested in their ability to infect new hosts or alteration of their susceptibility to anti microbials currently being used. It reflects their constant struggle to survive in changing environment. Adaptability or survival will be manifested in changes in their response to host's immunity. Changes induced by pathogens are rapid at times or it may be slow in some instances. Some changes are limited to and make an impact in a certain geographic region while others may impact the whole world. This global impact may be facilitated by the rapid spread of agents via modern and rapid transport systems. The very rapid

spread of the **Severe Acute Respiratory Syndrome (SARS)** outbreak from a Chinese doctor to 16 others staying or visiting the same hotel floor in Hong Kong and subsequent international spread leading to 8096 cases in 32 countries during a short period is sound evidence to this effect. Thus, these agents are capable of causing disease in a very short span of time and survive by overcoming barriers which under normal circumstances protect humans from infections.

In the meantime human hosts also have been changing. They have adopted a wide range of unfavourable and risky behaviours such as life style changes, promiscuous behaviour etc. They consume different varieties of new food. New food processing methods have been introduced in the global arena. New treatment methods and diseases have been instrumental in immuno-suppression. This, in turn, has increased the susceptibility of humans to infectious agents. Deforestation which is a man made act makes animals closer to human habitats. It eases the spread of zoonotic diseases which were previously unheard of among humans. Failures in immunization programmes and poor immunogenicity due to host characteristics too contribute to susceptibility of humans to emerging and re-emerging diseases. In some countries, failures in vector control programmes are reported. In others, sanitation systems are disrupted. All these reasons are attributed to resurgence of some diseases and emergence of brand new diseases among humans in the last decade or so.

Historically, diseases were identified based

Contents	Page
1. Leading Article - Emerging and re emerging infectious diseases.	1
2. Surveillance of vaccine preventable diseases & AFP (28 th February - 06 th March 2009)	3
3. Summary of newly introduced notifiable diseases (28 th February - 06 th March 2009)	3
4. Laboratory surveillance of dengue fever (28 th February - 06 th March 2009)	3
5. Summary of selected notifiable diseases reported (28 th February - 06 th March 2009)	4

WEEK SRI LANKA - 2009

on symptoms and signs but not by infectious agents. However, this trend has changed at present and certain infectious agents causing diseases are identified long before they cause apparent infections. The ability to identify the infectious agent before it causes the disease has pushed the world into a new era where it deals with existing threats while anticipating to deal with new sets of different threats.

To understand emerging and re-emerging diseases, it is essential to understand the difference between infection and disease. An infection implies that an infectious agent such as a bacterium or virus has entered a host and multiplies within the host. This may be without signs of disease. Thus a person may be infected with an agent but may not have the disease commonly associated with the infectious agent of concern. However, the disease is capable of being manifested at a later stage as in the case of tuberculosis.

In the recent past, hundreds of new infectious agents have been identified with the help of new techniques. Sophisticated new techniques are invented and promoted every day and with more and more new such techniques, many more new infectious agents will be identified. The key to recognizing these new or emerging infectious agents or the diseases caused by them is through tracking them in surveillance. Surveillance, in this context, implies systematic collection of data pertaining to infectious diseases and their determinants in order to take action for their control. One of the daunting tasks that the public health practitioners will have to face is the timely detection of new diseases before they cause too many problems in terms of morbidity and mortality. As specific objectives of disease control and their foundations for each individual disease vary, accordingly action too may require modifications. When the problem is more widespread, the immediate objective is to bring it under control rather than carrying out a case based surveillance. On the other hand, when the problem is more specific and near elimination or eradication, a case based surveillance may prove to be useful. The same principle may be applied to non communicable diseases as well. Based on the same principle, a case based surveillance for non communicable disease may not deliver much result. District or provincial registry systems will be sufficient to learn what actions should be taken to bring them under control.

A meticulously designed and well implemented surveillance system will detect unusual occurrence of diseases including new or re-emerging diseases. It can document geographic or demographic spread of an outbreak i.e occurrence of cases of a disease in excess of usually expected numbers during a specific time period. It also enables estimation of the magnitude of the problem and further helps describing the natural history of the disease. The factors responsible for emergence of such a disease in relation to time place and person are also identifiable.

There are large scale human population movements in

and out of the country. Livestock industry is thriving and people have contacts with wild animals due to many revenue generating activities and deforestation. Many more other factors that are favourable for emerging and re-emerging diseases are also in operation in the Sri Lankan context. Therefore, some of the emerging infectious diseases caused by new infectious agents are capable of making their presence felt in the island. Eventually, emerging infectious diseases can be an important public health issue. In such an event, there could be a multitude of human health implications due to the disease and the economic consequences of the disease could be devastating to the national economy.

There have been many serious health threats to the country in the last two decades. Fortunately, they have not been able to cause much damage to Sri Lanka. Neither the appearance of cholera O 139 in late 90s nor E coli 157 has not had much impact on the island. In the new millennium, Severe Acute Respiratory Syndrome started to devastate the Far East and then spread to parts of the globe. Still the country was spared. The biggest threat at the moment, avian influenza (H5N1) outbreak which is endemic in the Far East has spread to other continents. It has been reported from neighbouring states of India, Bangladesh and Pakistan. Though Sri Lanka is saved to this moment, planning for preparedness and response is underway to effectively face the problem, if it ever appears in the island.

In the era of information technology, there is a fleet of print and electronic media in the country and there is an intense competition between media companies to provide their customer base with quick sensational news coverage. It does not matter that the disease is not in the country but the mere presence of it in a neighbouring country would be enough to cause a panic. As testified in the case of avian influenza outbreak among birds in India, media concern of the disease led to decreased consumption of chicken and egg striking a severe blow to the industry and the national economy.

Thus, a country needs not only anticipating outbreaks of some kind of an emerging infection but also strengthening its national disease surveillance system. It is the need of the hour to strengthen the aspect of laboratory based surveillance in the national surveillance system. Inability to do so will have implications that are more expensive than the cost of its strengthening. Only modifications of material resources alone cannot help elimination of emerging diseases. An attitudinal change of the citizens, and the leadership role are pivotal at this juncture to successfully prevent the onset of emerging and re-emerging diseases and its implications in Sri Lanka.

This article was compiled by Dr. Nihal Abeyasinghe, former Chief Epidemiologist who is currently attached to the WHO SEAR office, New Delhi.

Table 1: Vaccine-preventable Diseases & AFP

28th February 06th March 2009 (10th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2009	Number of cases during same week in 2008	Total number of cases to date in 2009	Total number of cases to date in 2008	Difference between the number of cases to date in 2009 & 2008
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 GM=1	00	01 GL=1	00	00	00	00	00	00	02	04	13	17	23.5%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	-
Measles	00	02 ML=1 NE=1	00	00	00	00	00	00	00	02	00	30	27	+11.1%
Tetanus	00	00	00	00	00	00	00	00	00	00	00	06	08	-25.0%
Whooping Cough	00	00	01 GL=1	00	00	00	00	00	00	01	00	17	07	+142.8%
Tuberculosis	43	02	01	09	04	19	07	08	06	74	87	1510	1809	-16.52%

Table 2: Newly Introduced Notifiable Disease

28th February 06th March 2009 (10th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2009	Number of cases during same week in 2008	Total number of cases to date in 2009	Total number of cases to date in 2008	Difference between the number of cases to date in 2009 & 2008
	W	C	S	N	E	NW	NC	U	Sab					
Chickenpox	44	16	29	293	03	12	08	05	23	433	108	2142	1099	+94.9%
Meningitis	02 GM=1 KL=1	01 KD=1	04 HB=3 MT=1	00	01	00	03 AP=2 PO=1	01 MO=1	05 RP=4 KG=1	17	25	192	363	-47.1%
Mumps	07	13	04	00	01	03	02	06	03	39	35	365	436	-16.3%
Leishmaniasis	00	00	00	00	00	0	03 AP=3	00	00	03	Not available*	301	Not available*	-

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.
 DPDHS Divisions: CB: Colombo, GM: Gampaha, KL: Kalutara, KD: Kandy, ML: Matala, 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, Whooping Cough, Chickenpox, Meningitis, Mumps.

Special Surveillance: Acute Flaccid Paralysis.

Leishmaniasis is notifiable only after the General Circular No: 02/102/2008 issued on 23 September 2008.

National Control Program for Tuberculosis and Chest Diseases: Tuberculosis.

Table 3: Laboratory Surveillance of Dengue Fever

28th February 06th March 2009 (10th Week)

Samples	Number tested	Number positive	Serotypes *				
			D1	D2	D3	D4	Negative
Number for current week	04	00	00	00	00	00	00
Total number to date in 2009	17	02	00	00	02	00	00

Sources: Genetic Laboratory, Asiri Surgical Hospital

* Not all positives are subjected to serotyping.
 NA= Not Available.

Table 4: Selected notifiable diseases reported by Medical Officers of Health
28th February 06th March 2009 (10th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	26	445	5	42	0	3	1	57	0	7	8	63	0	2	1	16	0	1	85
Gampaha	16	246	2	28	0	5	3	15	0	9	6	51	0	3	1	24	0	0	86
Kalutara	6	119	6	75	0	2	0	17	0	5	8	39	0	0	1	4	0	0	100
Kandy	22	420	6	72	0	1	1	8	2	48	3	53	4	29	0	11	0	0	84
Matale	9	125	1	22	0	0	0	12	0	5	8	115	0	2	0	2	0	1	83
Nuwara Eliya	0	17	9	64	0	0	3	49	0	20	1	15	4	15	2	9	0	0	77
Galle	3	25	5	44	2	5	0	0	0	2	3	42	0	1	0	6	2	2	95
Hambantota	0	36	0	25	0	5	1	2	0	4	2	13	2	22	0	4	0	0	91
Matara	3	148	8	73	0	2	0	4	0	3	2	41	1	43	0	1	0	0	82
Jaffna	0	6	0	24	0	3	0	49	0	19	0	0	0	62	0	4	0	1	0
Kilinochchi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mannar	0	3	1	10	0	0	0	51	0	0	0	0	0	0	0	8	0	0	50
Vavuniya	0	4	2	24	0	0	0	2	0	1	0	2	0	0	0	0	0	0	50
Mullaitivu	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Batticaloa	23	97	1	33	0	6	0	5	0	5	0	2	0	0	0	1	0	1	73
Ampara	8	21	2	8	0	0	0	5	0	0	0	5	0	0		4	0	0	43
Trincomalee	0	41	3	23	0	1	0	0	0	0	0	1	0	3	0	3	0	0	50
Kurunegala	15	179	7	41	0	3	3	14	0	1	2	29	1	40	2	12	0	3	79
Puttalam	10	35	1	31	0	5	0	26	0	0	2	16	0	16	0	2	0	1	89
Anuradhapur	6	26	2	21	0	1	0	1	0	2	4	56	1	14	1	4	0	0	68
Polonnaruwa	1	16	0	10	0	1	1	7	0	3	1	28	0	0	0	2	0	0	86
Badulla	2	19	1	61	0	2	2	13	0	13	1	26	1	18	6	61	0	0	73
Monaragala	0	8	1	13	0	0	0	7	0	2	0	5	1	23	1	12	0	0	73
Ratnapura	1	58	16	131	1	9	0	20	0	1	0	18	0	10	1	6	0	1	67
Kegalle	9	200	0	22	0	1	0	10	0	1	1	22	0	7	6	41	0	1	73
Kalmunai	6	66	4	41	0	1	0	5	0	0	0	2	0	1	0	3	0	0	62
SRI LANKA	166	236	83	94	3	56	15	380	2	15	52	644	15	311	22	240	2	12	73

Source: Weekly Returns of Communicable Diseases (WRCD).

*Dengue Fever / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.

**Timely refers to returns received on or before 06 March, 2009 Total number of reporting units =311. Number of reporting units data provided for the current week: 227

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

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ON STATE SERVICE

Dr. P. PALIHAWADANA
EPIDEMIOLOGIST
EPIDEMIOLOGY UNIT
231, DE SARAM PLACE
COLOMBO 10