



# WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiological Unit,

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Vol. 35 No. 32

2<sup>nd</sup> – 8<sup>th</sup> August 2008

## Combating Emerging Infectious Diseases - Part II

Part I of this article was published in the last issue of the Weekly Epidemiological Report.

A new type of influenza virus can be bred from a novel recombination of the segmented genome of two parents. This is one of the best examples

of a new virus that can cause an epidemic with amazing pathogenicity and infectivity. The virus may not be destroyed by the conventional antiviral drugs and the available vaccine may not be able to confer immunity against it. Detection of a new virus shall also depend upon the effectiveness of global surveillance systems and capabilities of the hitherto neglected public health laboratories.

The challenge of emerging diseases is here and will remain in the foreseeable future. Dengue fever is one of the most important emerging arbovirus infections in South-East Asia with 1.3 billion people at risk. Infection is spreading to newer areas as evident by the first-time occurrence of this disease in Bhutan in 2004. Currently, nine of the 11 Member States report cases and outbreaks of dengue. The rise of dengue fever in tropical and subtropical areas of the

world is explained by factors such as rapid population growth, expanding water supplies and inadequate refuse disposal facilities.

Though viruses have been in the forefront of the emerging diseases scenario, the response to various bacterial diseases has also become complex because of the resis-

tance acquired by the bacteria against commonly used antimicrobial agents. The magnitude of the antimicrobial resistance crisis is unknown because of the absence of systematic monitoring in developing countries. However, data available from selected institutes in SEAR indicate the enormity of the spectrum and extent of resistance. Gonorrhoea used to respond dramatically to penicillin; now it resists treatment with penicillin and many other antimicrobial agents including ciprofloxacin; chloramphenicol is no longer the drug of choice against typhoid fever; most of the hospital-associated infections are due to multi-resistant strains of commonly encountered bacteria and, in some instances, even the ultimate weapon against bacteria does not work. Vancomycin resistance in *Staphylococcus aureus* and enterococci is a reality in hospitals.

Increasing resistance of the malarial parasite to the commonly used antimalarial drugs has become an important challenge. It is estimated that 400 million people are at risk of contracting drug-resistant malaria. Drug resistance first appeared on the Thai-Cambodia border in 1962 and now affects all countries of the Region with *P. falciparum* transmission.

There are plenty of examples that demonstrate that resistant organisms can rapidly move internationally as became evident with the spread of resistant pneumococcus from Spain to several countries.

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The options are limited. Though there have been significant achievements on several fronts, a lot more need to be done to combat emerging infectious diseases.

### **Factors Influencing Regional Vulnerability**

Infectious diseases have always been closely interwoven with the history of developing countries which are ideal sites for the emergence and propagation of infectious diseases. Poverty, over population, deforestation, urbanization, global warming, ignorance and weak health structures are characteristics of any developing country and ideal settings for the emergence of infectious diseases. The end-result is borne by the health of the people.

### **Demographic factors**

Population pressure is an overarching determinant. A net addition of 77 million people per year occurs in the world. The 11 Member States of SEAR cover only 5% of the global land mass which houses 25% of the global population. In Bangladesh and Maldives, almost 1000 people occupy one square kilometre of land. This high population density carries increased potential for spread of person-to-person disease, greater likelihood of global warming, large number of travellers, increased hunger and malnutrition. More people virtually guarantee extensive urbanization. By 2015, there will be 23 megacities with a population exceeding 10 million each of which seven shall be in SEAR. Most governments and civic authorities have not planned for this population explosion in the cities and are thus ill prepared to provide the necessary basic amenities like water, sanitation, electricity, garbage disposal, communication and transport etc. In Asian countries, 10% of the population is expected to be over 65 years old by 2030. The ageing process is characterized by multiple decrements in host defenses and concomitant increase in susceptibility to emerging infections.

Sharing of syringes by intravenous drug users, unsafe tattooing and skin-piercing practices spread blood-borne viruses such as hepatitis C. Globally, overuse of injections and unsafe injection practices have together caused an estimated 22.5 million hepatitis B virus infections, 2.7 million hepatitis C virus infections and 98,000 HIV infections.

### **Environmental factors**

Safe water and good hygiene are prerequisites for individual as well as public health. Globally, it is estimated that over 1 billion people are without access to improved water supply and about 2.5 billion people lack access to

improved sanitation. In SEAR, though 86% of the population is claimed to have access to improved water supply, the quality and safety of water is often questioned. Water-borne illnesses continue to be a major problem. Almost all the outbreaks of hepatitis E in India have been traced to the piped water that got contaminated by sewage from the pipes carrying sewer. Basic sanitation facilities are weak; more than 880 million population in SEAR lack access to improved facilities for disposal of excreta

### **Animals and human health:**

Human beings have lived closely with animals since time immemorial. But nowhere is this coexistence as intense, continuous and close as in SEAR countries. The close, continuous contact provides frequent exchange of microorganisms between animals and human beings and provides an opportunity for some of the genetically altered organisms to adopt the human body and initiate a new cycle of human-to-human transmission. SARS exemplifies this phenomenon.

Zoonotic infections increase proportionately to the number of animals and the intensity of their contact with human beings. In addition, the demand for meat production has also increased exponentially. Emerging infections can arise from animals and birds (e.g. chickens and H5N1) and seed a pandemic through movements to distant countries through seasonal migrations or trade.

### **Man-made ecological changes:**

Haphazard degradation of the environment, especially in developing countries, is common. Ecosystems all over the world are being destroyed. Deforestation is altering flora and fauna with the resultant deterioration of the environment and providing greater contact to hitherto restricted pathogens. Clearance of forests to build an international airport in Malaysia in the 1990s led to a devastating outbreak of Nipah virus, carried by forest bats fleeing to agricultural lands. Malaria, dengue fever and schistosomiasis have increased in areas wherever artificial water bodies have been created.

**Global warming:** During the last three years, there has been growing consensus about global warming. It now appears quite likely that the earth will be 10 to 40C warmer in the 21st century. This will change the distribution of vectors and enable them to thrive in previously inhospitable areas. At warmer temperatures, parasites develop more rapidly in mosquitoes. Consequently, there will be an increase in the incidence of malaria and dengue fever. Even if effective measures are instituted, it will take many years to negate the effect of global

Table 1: Vaccine-preventable Diseases &amp;

26<sup>th</sup> July -1<sup>st</sup> August 2008(31<sup>th</sup>Week)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	00	01	59	57	+3.5%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	01 VA=1	00	00	00	01 MO=1	00	02	04	66	48	+37.5%
Tetanus	00	01 KD=1	00	00	00	00	00	00	00	01	00	22	21	0.0%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	02	24	27	-11.0%
Tuberculosis	00	10	11	00	11	00	00	17	00	49	203	5179	6124	-15.4%

Table 2: Newly Introduced Notifiable Diseases

26<sup>th</sup> July -1<sup>st</sup> August 2008(31<sup>th</sup>Week)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Chicken-pox	26	05	09	00	08	04	06	09	24	91	49	3373	2138	+57.6%
Meningitis	04 KL=1 CB=2 GM=1	01 KD=1	02 HB=2	00	01 AM=1	07 KR=2 PU=5	01 PO=1	00	03 KG=3	19	10	872	257	+239.3%
Mumps	07	03	06	01	02	05	02	07	08	41	77	1625	1002	+62.2%

Key to Table 1 &amp; 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=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matare, 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.

Table 3: Laboratory Surveillance of Dengue Fever 26<sup>th</sup> July -1<sup>st</sup> August 2008

Samples	Number tested		Number positive *		Serotypes										
					D <sub>1</sub>		D <sub>2</sub>		D <sub>3</sub>		D <sub>4</sub>		Negative		
	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	
Number for current week	06	05	01	02	00	00	01	00	00	01	00	00	00	00	00
Total number to date in 2008	113	124	09	21	00	00	06	08	01	07	00	00	02	00	

**Sources:** Genetech Molecular Diagnostics & School of Gene Technology, Colombo [GT] and Genetic Laboratory Asiri Surgical Hospital [AH]

\* Not all positives are subjected to serotyping.

NA= Not Available.

**Data Sources:**

**Weekly Return of Communicable Diseases:** Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis, Chickenpox, Meningitis, Mumps.

**Special Surveillance:** Acute Flaccid Paralysis.

**National Control Program for Tuberculosis and Chest Diseases:** Tuberculosis.

**Table 4: Selected notifiable diseases reported by Medical Officers of Health  
26<sup>th</sup> July - 1<sup>st</sup> August 2008 (31<sup>th</sup>Week)**

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human-Rabies		Returns Receive %
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Colombo	42	1124	08	119	01	08	02	66	00	69	06	271	00	02	04	82	00	00	100
Gampaha	13	650	07	118	00	14	00	34	00	67	07	258	00	05	02	91	00	03	64
Kalutara	12	335	04	224	00	09	00	44	00	18	04	320	00	02	02	29	00	01	92
Kandy	07	163	11	203	00	05	01	42	01	53	07	299	00	69	02	94	00	01	84
Matale	01	77	01	150	00	02	00	35	00	04	03	595	00	01	00	22	00	00	58
Nuwara Eliya	02	19	08	174	00	02	00	193	00	110	00	35	00	35	01	87	00	01	92
Galle	04	75	11	124	00	12	01	13	00	43	07	232	01	12	00	06	00	03	82
Hambantota	01	65	02	66	00	05	01	07	00	11	01	69	02	65	01	09	00	00	100
Matara	07	184	01	126	00	10	03	26	02	06	03	226	04	137	02	11	00	01	82
Jaffna	00	52	02	93	00	02	00	217	00	10	00	00	00	148	00	30	00	00	75
Kilinochchi	00	00	00	14	00	00	00	01	00	00	00	02	00	00	00	01	00	00	00
Mannar	00	25	00	14	00	06	03	121	00	00	00	00	00	01	01	13	00	00	50
Vavuniya	01	11	00	40	00	02	00	05	00	13	00	05	00	01	00	04	00	00	75
Mullaitivu	00	00	00	06	00	00	00	12	00	12	00	00	00	01	00	08	00	00	00
Batticaloa	00	85	08	81	00	03	00	20	00	19	00	04	00	01	00	81	00	05	82
Ampara	00	26	00	214	00	00	00	06	01	01	00	17	00	00	00	07	00	00	43
Trincomalee	00	174	01	69	00	00	00	12	00	12	00	28	00	15	00	12	00	00	100
Kurunegala	04	249	02	161	00	13	01	41	01	14	08	190	02	20	00	50	00	04	72
Puttalam	02	269	08	59	00	08	01	132	00	26	02	28	00	32	00	27	00	03	89
Anuradhapur	00	109	02	56	00	09	00	09	00	06	00	219	00	10	01	12	00	02	79
Polonnaruwa	00	58	02	84	00	01	00	21	00	07	00	54	00	01	00	18	00	00	57
Badulla	01	62	13	319	00	04	01	94	00	13	00	32	03	94	05	92	00	01	87
Monaragala	00	49	03	275	00	02	00	29	00	114	01	86	04	76	01	29	00	00	82
Ratnapura	02	204	06	219	01	25	01	42	01	44	01	123	00	74	00	44	00	00	88
Kegalle	12	304	03	226	00	24	02	49	01	03	06	214	00	50	05	414	00	01	100
Kalmunai	01	31	04	197	00	02	00	09	00	14	00	00	00	02	00	21	00	00	69
<b>SRI LANKA</b>	<b>112</b>	<b>4400</b>	<b>107</b>	<b>3431</b>	<b>02</b>	<b>168</b>	<b>17</b>	<b>1280</b>	<b>07</b>	<b>689</b>	<b>56</b>	<b>3307</b>	<b>16</b>	<b>854</b>	<b>27</b>	<b>1294</b>	<b>00</b>	<b>27</b>	<b>79</b>

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 9 August, 2008 Total number of reporting units =238. Number of reporting units data provided for the current week:

PRINTING OF THIS PUBLICATION IS FUNDED BY THE UNITED NATIONS CHILDREN'S FUND (UNICEF).

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@slt.net.lk.

**ON STATE SERVICE**

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