WEEKLY EPIDEMIOLOGICAL REPORT

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Epidemiology of Chikungunya

Chikungunya is a viral disease. The illness was observed for the first time in 1952 in Tanzania. The name comes from the local dialect, Swahili which means "that which bend up" for stooped walk, reflecting the physic of a person suffering from the disease. It resembles Dengue and is reported mainly from Africa, South-East Asia including India and Pakistan. It occurs principally during the rainy season. Chikungunya outbreaks typically result in large numbers of cases but deaths are rarely encountered.

EPIDEMIOLOGY: Chikungunya is caused by an Arborvirus, belongs to the genus *Alphavirus* under the *Togaviridae* family. The virus is transmitted to human by infected *Aedes* mosquitoes, *Aedes albopictus* mainly in the rural area and *Aedes aegypti* in the urban area. The urban outbreaks are sporadic but explosive in nature. It then disappears and reappears at irregular intervals. Aedes albopictus is a treehole mosquito in natural rural areas, however in urban areas too, the mosquitoes breed around bush vegetation in gardens. Larval habitats are mostly in small collections of water. Its ecological flexibility allows it to colonise in many types of man-made sites too in urban regions. It may reproduce in flower pots, bird baths, soda cans and abandoned containers and natural water receptacles. The addition of decaying leaves from neighbouring trees produces chemical conditions similar to tree holes, which provide an excellent substrate for breeding. A. albopictus naturally establishes and survives throughout non-urbanised areas lacking any artificial containers, raising additional public health concerns due to the inability to effective elimination of these natural breeding sites especially in the rural areas.

In some parts of Africa, Chikungunya virus was isolated from zoophilic mosquitoes. It suggests that the virus circulates in rodents and cattle in the region. Virus was also obtained from a squirrel, chiroptera, and ticks (*Alectorobius sonrai*), as well as the presence of antibodies specific for Chikungunya virus in rodents and birds, support the assumption that secondary wild cycles exist in animals. The existence of such cycles could contribute to maintaining of the virus in an endemic region in Africa. In a study in Africa, the transmission cycle of Chikungunya virus is characterized by a periodicity of occurrence with silence intervals of 3–4 years. The disease is endemic in most of the sub-Saharan Africa, southern India and Pakistan, Southeast Asia, Indonesia and Philippines. Malaysia reported the first outbreak in 1999 which was detected in Myammar immigrants. However the antibody to Chikungunya was detected in 51 people of the urban area near Kuala Lumpur in 1960s. It occurs principally during the rainy season.

In early 2006, WHO reported Chikungunya outbreaks in islands of Indian Ocean i.e. Maldives, Mauritius, Madagascar, Mayotte, Seycelle and La Reunion Islands; as well as the coastal regions of India. In the last quarter of 2006 and the 1st quarter of 2007 there was an outbreak of Chikungunya in Sri Lanka involving mainly the districts of Colombo, Puttalam Kalmunai and Mannar.

CLINICAL MANIFESTATION : The incubation period of the disease is 2 to 4 days

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The symptoms is less severe and fewer in children than adults. Infected patients manifest an acute debilitating illness, most often characterized by fever, severe joint pain and rash. It is characterized by a rapid transition from a state of good health to the illness. Temperature rises abruptly as high as 40^{0}C (typically in children) and is often accompanied with shaking chills. After a few days fever may subside.

Patients also have maculopapular rash mostly in trunk. Rash characteristically appears on the 1st day of illness, but the onset may be delayed. It usually arises as a flush over the face and neck, which evolves to a maculopapular or macular form with pruritis. It later spreads to the trunk, limbs, palms and soles in that order of frequency. Petechial skin lesions can also be seen.

Migratory polyarthritis (commonly swelling and redness) occurs in 70 % of the cases and mainly affects the small joints. Pain is most intense on waking up in the morning. Chikungunya patients typically avoid movements as much as possible. Joints may swell without significant fluid accumulation. These symptoms may last from 1 week to several months and are accompanied by myalgia or muscle pain.

They may also manifest photophobia, anorexia, nausea, conjunctival injection, fatigue and abdominal pain. "Silent" Chikungunya infections (infections without illness) do occur; but how commonly this happens is not yet known.

The acute illness usually last for 5 to 7 days. Chikungunya has not been reported causing severe haemorrhagic manifestation or death. Older patients usually continue to suffer recurrent joint pain and effusion for several years. The persistent arthralgic forms were first described in 1980 in South Africa. A retrospective study done in 1983, on proven cases of Chikungunya infection identified this region in the last 3 years noted 87.9 % were completely cured, 3.7 % had stiffness or a moderate embarrassment in an episodical way, 2.8% had persistent articular stiffness without pain and 5.6 % had painful and stiff articulations in a persistent way. These patients with persistent arthritis had high level of antibody against the Chikungunya virus.

As with dengue, West Nile fever, o'nyong-nyong fever and other arboviral fevers, some patients with Chikungunya have prolonged fatigue lasting several weeks. Co-circulation of dengue fever in many areas may mean that chikungunya fever cases are sometimes clinically misdiagnosed as dengue or vice versa. Chikungunya_infection (whether clinical or silent) is thought to confer life-long immunity.

DIAGNOSIS : Chikungunya infection may be mistaken for dengue and / or West Nile disease. Provisional diagnosis is often made based on the clinical features.

Mild leucopenia and relative lymphocytosis, elevated ESR and positive C - reactive protein are seen. A reduction in platelet count and ECG changes may also be seen in complicated cases.

Acute or viraemic phase serum samples collected within 2 to 4 days of onset have yielded positive virus isolates and detection of viral nucleic acids. Paired sera drawn 1 to 3 weeks apart will demonstrate rising antibody titer. Rapid diagnosis can be used to detect Chikungunya antibody (IgM) after 5 days of onset i.e. ELISA, immunofluorescene etc. Reverse transcriptase polymerase chain reaction (RT-PCR) tests may yield diagnoses based on samples without detectable antibodies and may also provide genetic information of the virus.

TREATMENT: The disease is self-limiting. There is no specific treatment or vaccine for Chikungunya; patients are only given symptomatic or supportive treatment. To avoid further transmission, patients who are in the viraemic phase (first 4 days of onset) should be protected from mosquito bites especially from *Aedes* species. *Aedes* mosquito feeding time is during dawn (5.00 am to 8.00 am) and dusk (5.00 pm to 8.00 pm).

PREVENTION : To date, there is no vaccine available for the control and prevention of Chikungunya. The control measures are based on the general measures adopted in the control of mosquito-borne diseases. Hence prevention tips are similar to those for dengue fever:

- Avoid mosquito bites by using mosquito repellants, mosquito coils, protective clothing or mosquito nets .
- Vector control through search and elimination of the potential mosquito breeding sites. These usually are discarded tyres, plastic containers, leaf axils, coconut shells, blocked gutters, bird baths and flower pots.
- Elimination of naturally occurring mosquito breeding sites especially around the immediate household environment. Eg. Water retaining plants, unwanted bushes, tree holes and decaying leaves ect
- Additionally, a person with chikungunya fever should limit their exposure to mosquito bites in order to avoid further spreading of the infection. The person must stay indoors or under a mosquito net.

References

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Centers for Disease Control and Prevention (CDC) , USA Website http://www.cdc.gov/ncidod/dvbid/Chikungunya/chickvfact.htm

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This article was compiled Dr Nihal Abeysinghe- Chief Epidemiologist.

Table 1: Vaccine-preventable Diseases & AFP

5th - 11th April 2008 (15th 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	01 P0=1	00	00	01	00	22	26	-15.3%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	03	00	00	00	00	00	03	02	40	21	+90.5%
Tetanus	00	00	00	00	00	00	00	00	00	00	00	12	10	+20.0%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	11	13	-15.4%
Tuberculosis	112	57	00	22	10	00	24	06	11	252	435	2679	2985	-10.3`%

Table 2: Newly Introduced Notifiable Diseases

5th - 11th April 2008 (15th 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	15	05	10	14	06	08	01	04	13	76	32	1794	955	+87.6%
Meningitis	03 KL=1 CO=2	02 KD=2	04 GL=2 MT=2	00	01 BT=1	03 KR=1 PU=2	00	02 BD=2	02 KG=2	17	00	521	49	+963.3%
Mumps	02	06	03	10	11	07	01	04	08	52	09	720	309	+133.0%

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=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.

Table 3: Laboratory Surveillance of Dengue Fever

5th - 11th April 2008 (15th Week)

Samples	Number tested		Number positive *		Serotypes									
					D_1		D_2		D_3		D_4		Negative	
	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH
Number for current week	06	05	00	03	00	00	00	01	00	02	00	00	00	00
Total number to date in 2008	65	29	05	09	00	00	02	03	01	02	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

5th - 11th April 2008 (15th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephal -itis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Human-Rabies		Re-turns Re-ceive
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	14	559	01	51	00	07	01	46	00	57	08	137	00	01	03	48	00	01	**69**
Gampaha	12	359	01	51	00	05	00	22	00	65	08	106	00	02	00	44	00	01	**57**
Kalutara	14	184	04	115	00	06	01	35	01	16	20	125	00	02	01	16	00	00	**92**
Kandy	03	78	02	75	01	03	00	17	00	30	03	69	02	37	04	64	00	00	**56**
Matale	02	37	04	88	00	00	00	16	00	02	07	173	00	01	00	13	00	00	**58**
Nuwara Eliya	00	06	02	66	01	01	01	84	00	107	00	12	02	29	03	57	00	01	**77**
Galle	00	39	02	42	00	08	00	10	00	42	03	115	00	08	00	04	01	03	**47**
Hambantota	02	43	01	30	00	03	00	05	00	06	05	39	07	41	00	04	00	00	**91**
Matara	06	84	04	63	00	03	01	20	00	02	12	123	04	72	00	04	00	01	**82**
Jaffna	02	36	02	45	00	01	07	151	03	05	00	00	03	111	00	17	00	00	**63**
Kilinochchi	00	00	00	02	00	00	00	00	00	00	00	01	00	00	00	01	00	00	**25**
Mannar	00	20	00	07	00	06	00	86	00	00	00	00	00	00	00	09	00	00	**00**
Vavuniya	00	10	00	13	00	01	00	01	00	06	00	02	00	00	00	02	00	00	**25**
Mullaitivu	00	00	00	01	00	00	00	05	00	00	00	00	00	00	00	04	00	00	**00**
Batticaloa	01	63	00	24	01	02	00	08	00	17	00	01	00	01	05	55	00	05	**73**
Ampara	00	07	01	75	00	00	00	02	00	00	00	07	00	00	00	01	00	00	**29**
Trincomalee	05	141	01	30	00	00	01	06	02	03	00	07	00	10	00	08	00	00	**50**
Kurunegala	03	169	02	116	02	09	02	20	00	10	03	25	00	14	01	19	00	03	**44**
Puttalam	08	185	01	35	00	02	00	41	02	17	00	03	03	18	00	17	00	02	**67**
Anuradhapur	01	88	02	27	00	04	00	08	00	04	04	35	00	09	00	07	00	00	**32**
Polonnaruwa	00	30	02	36	00	01	00	16	01	05	11	21	00	00	01	13	00	00	**71**
Badulla	00	22	01	124	00	03	00	43	00	01	00	10	03	49	01	51	00	01	**73**
Monaragala	00	25	06	75	00	01	00	20	00	15	05	34	00	48	00	09	00	00	**91**
Ratnapura	00	94	00	79	00	18	00	36	00	42	00	51	00	50	03	32	00	00	**19**
Kegalle	08	112	05	159	00	15	02	19	00	00	06	51	02	31	09	207	00	00	**73**
Kalmunai	01	14	01	62	00	02	00	04	00	06	00	00	00	01	00	11	00	00	**46**
SRI LANKA	**82**	**2405**	**45**	**1491**	**05**	**101**	**16**	**721**	**09**	**458**	**95**	**1147**	**26**	**535**	**31**	**717**	**01**	**18**	**58**

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 19 April , 2008 Total number of reporting units =290. Number of reporting units data provided for the current week: 176

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