



WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit
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Yellow Fever Outbreak in Africa

The current yellow fever outbreak in Africa was first detected in Luanda, Angola in December 2015.

Yellow fever

Yellow fever, which is a viral haemorrhagic disease is transmitted by infected mosquitoes of *Aedes* and *Haemogogus* species. Yellow fever virus is an Arbo virus of the genus *Flaviviridae*. Monkeys are the primary reservoir of yellow fever.

Depending on the breeding pattern of the vector, three types of transmission cycles can be identified. In sylvatic or jungle yellow fever, the disease transmits between monkeys via mosquitoes that breed in the wild. In intermediate yellow fever, mosquitoes that breed both in the wild as well as around households, spread the disease among both monkeys and humans. This is the most common type of transmission cycle seen in outbreaks which occur in Africa. In urban yellow fever, the disease transmission occurs in heavily populated areas with high mosquito density.

Incubation period of yellow fever is 3 to 6 days. There can be several clinical outcomes. Some infected people remain asymptomatic. Some can develop symptomatic illness consisting of fever, muscle pain, prominent backache, headache, loss of appetite, nausea and vomiting which resolves after 3 to 4 days. However, the remaining portion of infected people can go into a toxic phase after the initial symptomatic phase. In the toxic phase, along with high fever, abdominal pain and vomiting occur. Several other systems—

Liver and Kidney also get involved and patients develop jaundice, dark urine and bleeding manifestations. Nearly half of the patients who enter the toxic phase die after 7 to 10 days.

No specific antiviral drug is available to treat yellow fever. However, supportive care which includes prevention and treatment of dehydration, controlling fever, prevention and treatment of liver and kidney failure and prevention and treatment of secondary bacterial infections improve the outcome. The two main preventive measures for yellow fever are preventing mosquito bites and vaccination.

Burden

A number of countries, 34 in Africa and 13 in central and south America are either endemic for yellow fever or have regions which are endemic for yellow fever. During 2013, 84, 000 to 170,000 severe yellow fever cases and 29,000 to 60,000 deaths were reported.

Outbreak in Africa

The current yellow fever outbreak has two main sources— Angola and Uganda. Disease occurrence in these countries are independent from each other. However, China, Democratic Republic of Congo (DRC) and Kenya have reported imported cases from Angola. Apart from that, Brazil, Colombia, Peru and four other African countries have also reported cases.

Although yellow fever is endemic in Angola, this is the first outbreak which has occurred after 28 years. This outbreak is urban in nature and

WEEKLY EPIDEMIOLOGICAL REPORT SRI LANKA 2016

Contents

Page

1. <i>Leading Article – Yellow Fever Outbreak in Africa</i>	1
2. <i>Summary of selected notifiable diseases reported –(13th – 19th August 2016)</i>	3
3. <i>Surveillance of vaccine preventable diseases & AFP –(13th – 19th August 2016)</i>	4

shows extensive local transmission. In fact, the DRC got affected through local transmission of the infection from Angola. In the initial stage where the cases started to report in DRC, most of the cases were from an area which shares borders with Angola.

Uganda started to report cases from January 2016. By April, there were 30 suspected cases with high fever and haemorrhagic signs. Mean age of the affected individuals was 23 and majority were males. However, none of them had travelled outside the country thus reflecting the independent origin of the outbreak in Uganda.

Although this outbreak is not a public health emergency of international concern, it remains a serious public health event.

Current situation

As of 11th August 2016, Angola has reported 3922 suspected cases of yellow fever with 369 deaths in the current outbreak. Case Fatality Rate (CFR) among suspected cases is 9.4%. From the above suspected cases, 879 were laboratory confirmed as yellow fever. Out of them, 119 died with a CFR of 13.5%. However, no new cases were reported from Angola since 23rd June.

DRC has reported 2357 suspected cases where 73 were confirmed as yellow fever. Out of the confirmed cases 16 died with a CFR of 21.9%.

Response

Surveillance and risk assessment is a major component of the response to yellow fever outbreaks. New cases and new areas of involvement can be effectively identified through surveillance. Rapid transmission of this data to decision makers allow implementation of strategies to contain the outbreak.

Vaccination, which is the most important measure to prevent yellow fever is an essential component of the response. Yellow fever vaccine is relatively safe where adverse events are rare. After 30 days of vaccination, it produces effective immunity in 99% of vaccine recipients. Immunity is life long. Therefore it is important to increase vaccine production and increase release of the vaccine. Fractional doses of the vaccine is also given as an outbreak control measure in settings where vaccine supply is poor.

Mass vaccination is essential in outbreak control and vaccination of travellers is important where the risk of international spread of the disease is high. Strict border control measures are also adopted to reduce international spread.

Apart from this, effective clinical management of cases is important to contain the outbreak. Vector surveillance, reducing mosquito breeding sites and prevention of mosquito bites are also essential to reduce disease transmission.

Proper risk communication based on scientific evidence which goes in line with the local context is an integral part of this response. This will allow more community involvement and address of misconceptions.

Sources

World Health Organization official web site

Compiled by Dr. S.A.I.K. Sudasinghe of the Epidemiology Unit

**Table 1 : Water Quality Surveillance
Number of microbiological water samples July 2016**

District	MOH areas	No: Expected *	No: Received
Colombo	15	90	75
Gampaha	15	90	NR
Kalutara	12	72	NR
Kalutara NIHS	2	12	NR
Kandy	23	138	NR
Matale	13	78	NR
Nuwara Eliya	13	78	NR
Galle	20	120	84
Matara	17	102	0
Hambantota	12	72	NR
Jaffna	12	72	120
Kilinochchi	4	24	43
Manner	5	30	NR
Vavuniya	4	24	21
Mullatvu	5	30	26
Batticaloa	14	84	0
Ampara	7	42	0
Trincomalee	11	66	20
Kurunegala	29	174	98
Puttalam	13	78	NR
Anuradhapura	19	114	53
Polonnaruwa	7	42	20
Badulla	16	96	161
Moneragala	11	66	73
Rathnapura	18	108	39
Kegalle	11	66	NR
Kalmunai	13	78	NR

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

Table 1: Selected notifiable diseases reported by Medical Officers of Health 13th - 19th Aug 2016 (34th Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human 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	289	11952	2	119	1	8	0	44	3	30	4	180	0	7	1	28	0	0	5	326	2	40	0	0	88	10
Gampaha	109	4737	2	102	0	11	0	20	0	26	2	236	0	12	1	31	0	1	1	279	0	33	0	7	53	67
Kalutara	63	2611	1	76	0	8	0	27	1	26	4	334	0	7	1	21	0	0	0	195	1	59	0	0	79	93
Kandy	80	2968	4	124	0	15	1	15	4	33	0	93	4	70	0	42	0	0	4	138	0	32	0	8	83	96
Matale	14	679	0	46	0	1	0	11	0	4	0	70	1	18	0	14	0	1	0	27	0	48	0	17	77	100
NuwaraEliya	10	326	2	71	1	2	4	48	14	29	2	43	1	58	0	31	0	0	6	100	0	32	0	0	92	100
Galle	34	1503	3	112	0	8	0	6	0	8	0	204	1	77	0	7	0	0	10	224	1	32	0	3	75	95
Hambantota	7	594	1	44	0	1	0	3	0	54	1	87	2	50	7	55	0	0	5	173	0	14	8	234	92	100
Mataru	23	879	0	91	0	13	0	6	0	35	2	138	2	40	2	27	0	0	4	133	0	19	3	152	94	94
Jaffna	34	1659	7	194	1	4	2	66	0	51	2	12	3	577	0	8	0	0	5	137	4	45	0	1	100	100
Kilinochchi	2	66	0	31	0	0	0	34	0	5	0	13	0	24	0	0	0	0	0	10	0	10	0	0	25	75
Mannar	0	106	3	21	0	4	0	20	1	8	0	9	0	38	0	0	0	0	0	7	0	1	0	0	80	100
Vavuniya	5	195	0	11	0	3	1	76	0	31	0	12	0	10	0	6	0	0	0	23	0	8	0	6	100	100
Mullaitivu	4	148	0	23	0	2	0	17	0	39	0	23	0	6	0	2	0	0	0	15	1	7	1	5	60	100
Batticaloa	7	413	5	224	0	0	5	36	0	91	1	38	0	5	0	10	0	0	3	78	1	11	0	1	86	93
Ampara	1	192	0	37	0	1	0	0	1	21	0	25	0	0	1	9	0	0	2	111	0	4	0	5	29	71
Trincomalee	5	335	0	49	0	2	0	11	0	24	2	28	0	23	0	32	0	1	1	126	1	11	0	5	67	83
Kurunegala	28	1932	3	241	1	11	0	1	0	13	0	122	1	32	0	19	0	2	9	237	1	44	0	63	90	90
Puttalam	8	851	1	63	0	4	1	6	0	0	1	35	1	60	0	2	0	1	1	64	3	38	0	3	69	85
Anuradhapura	12	518	0	61	0	3	0	5	0	26	3	238	0	24	0	15	0	0	0	180	0	32	1	170	53	74
Polonnaruwa	2	354	0	27	0	4	0	10	0	13	0	83	0	1	0	2	0	0	1	87	0	14	2	98	86	100
Badulla	12	582	0	94	0	13	0	8	0	24	1	106	2	80	2	99	0	0	2	163	3	148	0	3	53	82
Monaragala	4	297	0	46	0	1	0	3	0	10	0	154	3	98	3	113	0	2	0	52	0	18	0	33	64	100
Ratnapura	26	2226	2	278	1	28	0	24	0	23	4	408	2	28	9	114	0	0	2	156	1	111	0	1	50	83
Kegalle	20	1077	2	68	0	18	1	27	0	47	1	148	0	23	2	20	0	0	3	234	2	40	0	2	82	100
Kalmune	2	403	2	65	0	3	0	5	0	43	1	15	0	0	0	3	0	4	3	67	0	18	0	0	54	85
SRILANKA	801	37603	40	2318	5	168	15	529	24	714	31	2854	23	1368	29	710	0	12	67	3342	21	869	15	817	74	90

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 19th August, 2016. Total number of reporting units 339. Number of reporting units data provided for the current week: 311. C** -Completeness
A = Cases reported during the current week. B = Cumulative cases for the year.

Table 2: Vaccine-Preventable Diseases & AFP

13th - 19th Aug 2016 (34th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2016	Number of cases during same week in 2015	Total number of cases to date in 2016	Total number of cases to date in 2015	Difference between the number of cases to date in 2016 & 2015
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	01	00	00	00	00	01	01	03	01	49	49	0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Mumps	00	01	01	02	00	01	00	00	01	06	04	275	255	+7.8%
Measles	00	00	00	00	00	00	00	00	00	00	64	312	1927	-83.8%
Rubella	00	00	00	00	00	00	00	00	00	00	00	07	07	0%
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Tetanus	00	00	00	00	00	00	00	00	00	00	01	07	14	-50%
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Japanese Encephalitis	01	00	00	00	00	00	00	00	00	01	00	13	07	-85.7%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	01	46	59	-22.0%
Tuberculosis	90	29	18	01	10	20	07	00	27	202	121	6263	6550	-4.3%

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

Influenza Surveillance in Sentinel Hospitals - ILI & SARI								
Month	Human					Animal		
	No Received	ILI	SARI	Infl A	Infl B	Pooled samples	Serum Samples	Positives
July	9745	36	13	0	11	686	446	0

Source: Medical Research Institute & Veterinary Research Institute

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