WEEKLY EPIDEMIOLOGICAL REPORT

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Flood related health risks (Part I)

This is the first of a series of two articles on Flood related health risks.

Heavy rain falls resulted in flooding and landslides across nine districts in Sri Lanka, recently. This has affected nearly 288 307 people causing 86 deaths. Nearly 10 774 people are displaced. However the epidemiological situation remains stable with no major infectious disease outbreaks. Due to the treatment received number of skin diseases and acute respiratory infections has reduced. Despite this status the health authorities continue to conduct enhanced disease surveillance activities.

Health risks posed by flooding

Generally, a disaster situation like flooding and landslides provides a platform on which many communicable diseases can easily spread and cause disease outbreaks. Mainly water borne diseases as well as vector borne diseases cause huge public health impact.

Apart from that, overcrowding can increase the spread of diseases like measles and *Nisseria meningitides* meningitis.

In selected situations, dead bodies can provide sources of diseases. However, they does not carry a higher risk than living beings in producing disease outbreaks.

Apart from usual communicable disease spread, drowning, injuries, trauma, hypothermia etc are other health risks posed by flooding and land slides.

Water borne diseases

Among the water borne diseases, Typhoid fever, Cholera, Leptospirosis and hepatitis A are common infectious diseases which can spread easily due to congestion of a huge crowd in an environment which is compromised with lack of clean water supply and proper sanitation. The nutritional status of the displaced population, the amount of immunity to vaccine preventable diseases like measles and the access to health care services also contributes to the risk of communicable disease spread. However, the risk of spread of infection is low unless there is significant water source compromisation and/or significant population displacement. As evidence for this, out of 14 massive floods occurred globally between 1970 and 1994, only in Sudan in 1980, a diarrhoeal epidemic was reported as the flood was complicated by population displacement.

If the drinking water sources get contaminated, this provides a portal via which pathogens can spread. However even this happens, the risk of disease spread can be minimized if the possibility of water contamination is recognized early and provision of clean water is made a priority.

Not only through contaminated water ingestion, infections can also spread by surface contact with polluted water causing wound infections, dermatitis, conjunctivitis and ear, nose and throat infections. However, these diseases do not tend to cause outbreaks. But an important infectious disease which is spread by contact of water on skin or mucus membranes and which

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tend to produce outbreaks is Leptospirosis. The risk of Leptospirosis spread increases with increased vector (rodent) population due to environmental changes brought about by the disaster situation. Close proximity between human and rodents due to shared high ground also make the victims more vulnerable.

Vector borne diseases

Vector borne diseases like Dengue, Dengue haemorrhagic fever, Malaria, Yellow fever can cause outbreaks in disasters like flooding. Relationship between flooding and increased risk of vector borne diseases is indirect. Flooding increase the number and range of vector habitats.

Flooding initially washout mosquito breeding sites. But once the overflowed water recedes, it produce stagnant water collections and increase mosquito breeding sites. Heavy rainfall it self can also produce the same effect. Usually there is a lag period of 6-8 weeks after flooding where a Malaria epidemic starts.

During a flood, not only the affected individuals but also emergency workers face the risk of getting vector borne diseases. Other risk factors such as changes in human behavior like temporary pause in disease control activities, overcrowding, increased exposure to mosquitoes while sleeping outside and changes in the vector habitats which promotes mosquito breeding like landslides, deforestation, river damming contributes to the increased risk of vector borne disease spread.

Risks posed by dead bodies

Corpses rarely produce sources of acute infections than survivors because most of the pathogenic organisms do not survive long in the human bodies after death except HIV which can last up to 6 days. Therefore, evidence to support the fact that dead bodies are a source of disease epidemics is lacking. However, special precautions are required in cases like Cholera and haemorrhagic fevers as corpses create a health risk there.

Meanwhile workers who handle dead bodies are exposed to increased risk catching Tuberculosis, gastrointestinal infections like Rota virus diarrhoea, E.coli, typhoid/ paratyphoid fevers, Salmonellosis, Shigellosis, Cholera, Hepatitis A and blood borne infections like HIV, Hepatitis A and B due to several reasons.

Residual air in the lungs can come out or fluid from the lungs can spurt out through nose or mouth while handling dead bodies. By this way Tuberculous bacilli can be aerosolized and enter into a person. Dead bodies usually tend to leak faeces and surviving individual's clothes and other equipment can get soiled and contaminated by them. Dead bodies in water streams can also contaminate drinking water with faeces. This leads to spread of gastrointestinal infections via faeco-oral route. Among the various ways through which people can acquire blood borne infections are non intact skin contacting with blood or body fluids, exposure of the mucus membranes from spurting of blood or body fluids, needle stick injuries and injuries from bone fragments.

Other health risks created by flooding

Not only spread of communicable diseases, there are also other health risks posed by a situation of flooding. Affected individuals as well as health care workers are equally prone for them.

People are prone for injuries and trauma of any sort during a disaster situation which can be physical, thermal, chemical or electrical. They usually occur not in the immediate phase of the disaster but specially when attempting removal of their loved ones or objects after the disaster. Injuries also occur while cleaning up where risk is increased by unstable buildings, electric power cables etc.

However Tetanus is not common after injuries from flooding. Therefore mass tetanus vaccination is not indicated usually. But depending on their Tetanus vaccination history, people with open wound are given Tetanus boosters.

Hypothermia is a possible sequale specially in small children. If they have being trapped in flood waters for a prolonged period or are exposed to rain, the risk of developing hypothermia increases.

Physical disease outcomes are more apparent and easily measurable after a disaster. However, mental health impact posed by disasters like flooding does exist to a more or less equal extend. Disaster situations carry a potential to cause psychological derangement in its victims such as Post Traumatic Stress disorder, depression, irritability, sleeplessness, suicidal ideation etc.

Sources

1. Flooding and communicable diseases fact sheet available at http://www.who.int/hac/techguidance/ems/flood_cds/en/
2. Epidemics after natural disasters available at http://wwwnc.cdc.gov/eid/article/13/1/06-0779_article

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

to be continued...

Table 1: Selected notifiable diseases reported by Medical Officers of Health 14th – 20th May 2016 (21st 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	50	5846	1	56	0	0	1	25	0	19	0	81	0	3	0	15	0	0	0	194	0	22	0	0	**13**	**13**
Gampaha	0	1983	0	33	0	5	0	12	0	5	0	124	0	7	0	16	0	0	0	184	0	20	0	3	**0**	**0**
Kalutara	31	1197	0	36	0	2	0	15	0	15	6	237	0	4	0	12	0	0	4	108	0	32	0	0	**7**	**14**
Kandy	27	843	2	78	2	11	0	9	0	22	0	67	3	48	1	36	0	0	4	73	1	25	0	6	**65**	**100**
Matale	1	162	1	13	0	1	0	9	0	2	1	48	1	11	0	13	0	1	0	20	1	42	0	14	**38**	**92**
NuwaraEliya	2	126	3	45	0	1	2	22	0	13	0	18	6	35	0	17	0	0	2	66	0	23	0	0	**77**	**77**
Galle	17	712	3	33	0	5	0	1	0	2	2	136	1	41	1	5	0	0	11	145	2	23	0	1	**65**	**95**
Hambantota	7	293	0	20	0	1	0	2	0	48	1	62	1	35	1	17	0	0	3	116	2	9	2	145	**92**	**100**
Matara	10	353	6	34	0	3	0	5	0	34	2	85	1	24	0	16	0	0	2	91	1	6	7	111	**100**	**100**
Jaffna	16	1211	4	97	1	3	1	44	0	29	0	8	4	520	0	7	0	0	0	101	2	26	0	1	**83**	**92**
Kilinochchi	1	45	0	21	0	0	0	24	0	4	0	11	0	17	0	0	0	0	0	3	0	7	0	0	**75**	**75**
Mannar	0	79	0	8	0	4	0	13	0	3	0	8	0	35	0	0	0	0	0	7	0	1	0	0	**40**	**100**
Vavuniya	0	146	1	5	0	2	6	19	2	22	0	11	0	8	0	6	0	0	0	16	0	3	0	3	**75**	**100**
Mullaitivu	0	94	0	10	0	0	0	13	0	4	0	21	0	5	0	0	0	0	0	3	1	5	0	4	**80**	**80**
Batticaloa	3	267	3	127	0	0	0	15	0	85	1	26	0	4	0	8	0	0	1	54	0	5	0	1	**50**	**79**
Ampara	0	91	1	14	0	0	0	0	0	13	0	21	0	0	0	6	0	0	0	56	0	1	1	5	**14**	**43**
Trincomalee	2	249	0	25	0	0	0	9	0	23	1	17	1	15	1	29	0	1	4	96	1	7	0	2	**67**	**92**
Kurunegala	43	720	5	96	0	7	0	1	0	6	2	71	0	10	0	15	0	2	3	141	0	25	0	42	**59**	**90**
Puttalam	6	538	2	23	0	2	0	4	0	0	4	30	0	55	0	0	0	0	1	38	0	21	0	0	**46**	**85**
Anuradhapura	7	266	2	30	0	1	0	3	0	20	4	166	0	18	0	11	0	0	3	114	0	16	2	96	**47**	**100**
Polonnaruwa	3	167	0	12	0	2	0	8	0	5	0	52	0	1	0	2	0	0	1	43	0	7	1	65	**57**	**100**
Badulla	6	241	2	48	1	8	0	4	1	18	3	65	1	40	1	69	0	0	2	88	2	92	1	1	**47**	**88**
Monaragala	2	157	2	28	0	1	0	2	0	9	0	132	5	60	6	93	0	2	0	32	0	16	2	19	**82**	**100**
Ratnapura	26	867	1	128	0	16	0	16	0	15	5	213	0	16	0	70	0	0	2	91	1	64	0	1	**61**	**83**
Kegalle	12	557	4	30	0	11	0	15	1	40	6	95	0	12	0	14	0	0	2	158	0	22	0	0	**64**	**91**
Kalmune	3	345	2	36	0	3	0	4	0	34	0	10	0	0	0	2	0	4	0	49	0	12	0	0	**62**	**92**
SRILANKA	**275**	**17555**	**45**	**1086**	**4**	**89**	**10**	**294**	**4**	**490**	**38**	**1815**	**24**	**1024**	**11**	**479**	**0**	**10**	**45**	**2087**	**14**	**532**	**16**	**520**	**56**	**82**

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 20th May, 2016 Total number of reporting units 339 Number of reporting units data provided for the current week: 282 C**-Completeness

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

Table 2: Vaccine-Preventable Diseases & AFP

14th – 20th May 2016 (21st 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	00	00	01	01	21	27	-22.2%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Mumps	00	01	01	00	02	00	00	01	00	05	08	169	161	+5.1%
Measles	00	00	03	00	00	00	00	00	00	03	44	257	992	-74.0%
Rubella	00	00	00	00	00	00	00	00	00	00	00	06	05	+20%
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	00	03	06	-50%
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	00	00	07	-100%
Whooping Cough	00	00	01	00	00	00	00	00	00	01	00	29	31	-6.4%
Tuberculosis	80	03	22	11	10	40	06	12	00	184	210	3785	3845	-1.5%

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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ON STATE SERVICE

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