WEEKLY EPIDEMIOLOGICAL REPORT

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Health impacts of climate change

Introduction

Climate change refers to any significant change in measures of climate mainly temperature, precipitation and wind that last long even for decades. It is a global challenge that does not respect national borders. Certain human activities have also been identified as significant causes of recent climate change, often referred to as global warming.

Water vapour, carbon dioxide, methane, nitrous oxide, ozone and chlorofluorocarbon are collectively called as primary greenhouse gases (GHG). Atmospheric concentrations of those GHGs are determined by the balance between sources which includes emissions of the gases from human activities and natural systems and the removal of the gases from the atmosphere by conversion to a different chemical compound. They form only a small percentage of the overall atmosphere, yet play an important role in trapping the heat required for life on Earth, by absorbing and emitting radiation within the thermal infrared range to create a 'greenhouse effect'. However, trapping extra heat (i.e. increased GHG emission) leads to global warming, which refers to the rise in average temperature near Earth's surface. Proactive adaptation and mitigation strategies are needed to protect the human and other eco-systems from prolong effects of global warming which is called as climate change.

Environment impact of climate change

Environmental consequences of climate change, such as extreme heat waves, rising sea-levels, melting glaciers, changes in precipitation resulting in flooding and droughts, intense hurricanes, and degraded air quality, affect directly and indirectly the physical, social, and psychological health of humans.

Health impact of climate change

Climate change will have a strong impact on human health.

Heat related morbidity and mortality

The recorded temperature in the world in February 2016 was the hottest at 1.3 degrees Celsius followed by February 2017's temperature which was 0.20^{0}C cooler than the previous year. Prolonged exposure to extreme heat can cause heat exhaustion, heat cramps, heat stroke, and death, as well as exacerbate preexisting chronic conditions, such as various respiratory, cerebral, and cardiovascular diseases. These serious health consequences usually affect more vulnerable populations such as the elderly, children, and those with existing cardiovascular and respiratory diseases. Socioeconomic factors, such as economically disadvantaged and socially isolated individuals, are also at risk from heat-related burdens. Hot working environments may decrease the ability to carry out physical tasks at outdoors, yet have direct implication on physical and psychological wellbeing. Moreover it might have direct effect on productivity through exposure of workers to heat stress.

Asthma, Respiratory Allergies and Airway Diseases

Climate change is anticipated to affect air quality through several pathways. Some of these pollutants can directly cause respiratory disease or exacerbate existing conditions in susceptible populations, such as children or the elderly. Some of the impacts that climate change can have the respiratory system include the chest pain, coughing, throat irritation and lung inflammation. Those symptoms occurred due to increase ground level ozone, CO2 concentration and fine particle concentrations.

Cancer

Increased exposure to toxic chemicals, known or suspected to cause cancer, that are released into the environment following heavy rainfall or flooding. Also, depletion of ozone leads to an increase in Ultra Violet (UV) exposure and temperature, leading to increase the risk of skin cancer and cataracts. Alternatively, an increase in exposure to UV radiation can lead to elevated levels of Vitamin D, which has been associated with a decreased risk of some types of cancer. It is said that decline in air quality and rise in

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concentrations of certain air pollutants increases the risk of lung cancer.

Cardiovascular Disease and stroke

Extreme cold and extreme heat directly affect the incidence of cardiovascular diseases such as chest pain, stroke, and cardiac dysrhythmia (irregular heart beat). The elderly and isolated individuals are at the greatest risk for cardiovascular disease and stroke when triggered by temperature extremes. Also, increased ozone formation due to higher temperatures harms pulmonary gas exchange and causes stress on the heart that lead to myocardial infarction.

Food borne Diseases and Nutrition

Extreme weather events and changes in temperature and precipitation can damage or destroy, produces and interrupt the transportation and delivery of food. Recent experience in heavy flood in 2016 affected to most parts of Sri Lanka destroy yield heavily.

Mental health

Climate change affects the psychological wellbeing of a person indirectly, and can be some of the most disturbing effects in terms of human suffering. Extreme weather and other climate related events ranges from acute traumatic stress to chronic mental disorders, such as depression, post-traumatic stress disorder, sleep difficulties, social avoidance, irritability, and drug or alcohol abuse.

Vector borne and zoonotic diseases

Vector borne and zoonotic diseases are infectious diseases whose transmission involves animal hosts or vectors. Changes in temperature and precipitation directly affect the vector borne and zoonotic diseases pathogen-host interaction. The rapid spread of vector-borne diseases such as dengue and malaria, has been attributed to a warmer climate favouring the build-up of harmful vectors.

Waterborne diseases

Climate change is likely to increase diarrheal disease incidence worldwide. High temperature, water scarcity and water abundance due to floods may linked to increased diarrheal diseases.

Adaptation and mitigation of climate change

Certain adverse health effects can be minimized or avoided with sound mitigation and adaptation strategies. Mitigation refers to actions being taken to reduce greenhouse gas emissions and to enhance the sinks that trap or remove carbon from the atmosphere. Adaptation refers to actions being taken to lessen the impact on health and the environment due to changes that cannot be prevented through mitigation. Appropriate mitigation and adaptation strategies will positively affect both climate change and the environment, and thereby positively affect human health. Some adaptation activities will directly improve human health through changes in public health and health care infrastructure.

To avoid the worst effects of climate change, we need to dramatically reduce global carbon emissions. But we must also prepare for the significant and unavoidable consequences of carbon emissions such as increasing temperatures, shifting precipitation patterns, ocean acidification, sea level rise and the increasing intensity and frequency of extreme weather events. To address climate change, countries adopted the Paris Agreement on 12th December 2015. The Agreement entered into force shortly thereafter, on 4th November 2016. In the agreement, all countries agreed to work to limit global temperature rise to well below 2^0 C.

There are important measures can be adopted by individuals to mitigate carbon footprint at household level includes improve public awareness about conserving energy, educate them on use of maximum benefit of natural light and ventilation, change their behaviours favouring to switch off fans and lights in unoccupied rooms, replacing incandescent or florescent bulbs with energy efficient (LED) bulbs, using energy efficient equipment and maintaining all equipment well, repairing equipment in short run, waste segregation and add solar panels to the roof if possible.

Sources

National Institute of Environment Health Sciences (2017). *Health impact of climate change.* Available on: https://www.niehs.nih.gov/research/programs/geh/climatechange/health_impacts/World Health Organization, Fact sheet –*climate change and health*, 2016. Available on: http://www.who.int/mediacentre/factsheets/fs266/en/

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Table 1 : Water Quality Surveillance
Number of microbiological water samples March 2017

District	MOH areas	No: Expected *	No: Received
Colombo	15	90	81
Gampaha	15	90	06
Kalutara	12	72	NR
Kalutara NIHS	2	12	22
Kandy	23	138	NR
Matale	13	78	37
Nuwara Eliya	13	78	42
Galle	20	120	123
Matara	17	102	49
Hambantota	12	72	27
Jaffna	12	72	136
Kilinochchi	4	24	19
Manner	5	30	0
Vavuniya	4	24	47
Mullatvu	5	30	65
Batticaloa	14	84	49
Ampara	7	42	33
Trincomalee	11	66	0
Kurunegala	29	174	113
Puttalam	13	78	54
Anuradhapura	19	114	19
Polonnaruwa	7	42	34
Badulla	16	96	123
Moneragala	11	66	73
Rathnapura	18	108	30
Kegalle	11	66	20
Kalmunai	13	78	63

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

Table 1: Selected notifiable diseases reported by Medical Officers of Health 08th – 14th April 2017 (15th 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	332	8097	0	32	0	1	0	12	0	5	0	25	0	1	0	6	0	0	2	122	0	12	0	1	**75**	**81**
Gampaha	389	5400	0	15	0	10	1	12	0	8	0	23	0	6	0	6	0	1	1	93	0	15	0	4	**20**	**60**
Kalutara	152	2203	0	21	1	3	1	4	0	18	12	89	1	3	0	1	0	0	2	200	3	38	0	0	**86**	**100**
Kandy	41	932	0	31	0	3	2	3	0	0	0	17	1	52	1	7	0	1	2	109	0	14	0	3	**61**	**91**
Matale	13	415	0	8	0	0	0	0	0	0	0	18	0	1	0	4	0	0	1	17	0	24	0	2	**46**	**92**
NuwaraEliya	10	137	0	9	0	1	2	10	0	0	0	12	0	51	1	5	0	0	1	52	1	19	0	0	**62**	**77**
Galle	16	1930	0	17	0	5	0	5	0	9	2	69	0	20	0	0	0	1	1	116	0	18	0	0	**44**	**80**
Hambantota	32	973	0	14	1	4	0	6	0	15	0	16	0	23	0	6	0	1	2	84	0	10	0	125	**33**	**92**
Matara	50	1276	0	15	1	6	0	0	0	2	1	28	0	11	0	3	0	1	4	69	0	2	0	41	**100**	**100**
Jaffna	96	2208	7	92	1	7	2	17	0	28	1	20	3	325	0	4	0	0	12	118	1	20	0	0	**79**	**100**
Kilinochchi	11	199	0	6	0	0	0	3	0	0	0	2	0	9	0	2	0	0	0	0	0	0	0	3	**25**	**50**
Mannar	8	354	0	4	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	4	0	0	0	0	**60**	**80**
Vavuniya	24	330	0	7	0	0	0	12	0	2	0	14	0	3	0	1	0	0	0	17	0	0	0	7	**100**	**100**
Mullaitivu	3	101	2	4	0	0	0	3	1	1	0	7	0	3	0	1	0	1	0	3	0	5	0	2	**40**	**80**
Batticaloa	269	1976	0	46	0	8	0	9	0	5	1	9	0	0	0	4	0	0	3	75	0	13	0	1	**57**	**86**
Ampara	10	191	0	9	0	1	0	1	0	0	0	6	0	1	0	2	0	0	0	65	0	9	0	2	**14**	**100**
Trincomalee	190	3756	1	5	0	1	0	3	2	3	0	7	0	7	0	7	0	0	1	51	2	12	0	1	**46**	**77**
Kurunegala	103	1521	0	24	0	0	0	0	0	2	0	34	1	19	1	6	0	0	7	226	1	17	1	43	**52**	**93**
Puttalam	36	626	0	17	0	1	0	1	0	0	0	6	0	10	0	1	0	0	0	71	0	14	0	1	**57**	**86**
Anuradhapu	24	636	0	14	0	1	0	1	0	3	0	26	0	9	0	7	0	0	1	128	0	21	6	106	**47**	**84**
Polonnaruw	23	1300	0	8	0	4	0	5	0	0	0	13	0	3	0	1	0	0	0	86	0	6	0	44	**14**	**57**
Badulla	14	251	1	35	0	4	0	5	0	1	2	25	2	19	1	17	0	1	5	102	2	60	0	6	**41**	**88**
Monaragala	28	565	0	17	0	3	0	0	0	2	3	44	1	56	0	11	0	0	0	35	0	20	0	4	**82**	**91**
Ratnapura	20	360	0	68	1	46	0	4	0	4	1	148	0	14	0	26	0	0	1	139	1	72	0	0	**39**	**67**
Kegalle	56	1461	2	18	0	4	0	3	0	14	1	19	1	30	0	5	0	0	0	89	2	29	0	4	**64**	**91**
Kalmune	42	939	1	19	0	4	0	1	8	16	0	3	0	0	0	0	0	0	2	88	0	4	0	0	**46**	**92**
SRILANKA	**2007**	**38137**	**14**	**555**	**5**	**117**	**8**	**121**	**11**	**138**	**24**	**680**	**10**	**678**	**4**	**133**	**0**	**7**	**48**	**2159**	**13**	**454**	**7**	**400**	**54**	**86**

Source: Weekly Returns of Communicable Diseases (WRCD). *T=Timeliness refers to returns received on or before 14th April , 2017 Total number of reporting units 337 Number of reporting units data provided for the current week: 298C**-

Table 2: Vaccine-Preventable Diseases & AFP

08th – 14th April 2017 (15th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2017	Number of cases during same week in 2016	Total number of cases to date in 2017	Total number of cases to date in 2016	Difference between the number of cases to date in 2017 & 2016
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	01	00	00	00	00	00	00	00	00	01	27	17	58.8%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Mumps	01	00	00	00	00	02	00	00	00	03	03	90	123	- 26.8%
Measles	00	00	00	00	00	00	00	00	00	00	02	95	217	- 56.2%
Rubella	00	00	00	00	00	00	00	00	00	00	00	05	05	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	00	06	02	200%
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	21	00	0%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	05	23	- 78.2%
Tuberculosis	51	04	00	01	02	06	05	02	14	85	289	2220	2667	- 10.6%

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	Total Tested	Infl A	Infl B	Pooled samples	Serum Samples	Positives
March	12192	1497	614	62	1316	1127	0

Source: Medical Research Institute & Veterinary Research Institute

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ON STATE SERVICE

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