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Air pollution Part I

This is the first in a series of two articles on Air Pollution

The air in our atmosphere is mostly made up of two gases that are essential for life on Earth: nitrogen and oxygen. However, the air also contains smaller amounts of many other gases and particles. Air quality is a measure of how clean or polluted the air is. Monitoring air quality is important because polluted air can cause harm to our health.

Air quality is measured by the Air Quality Index (AQI). The AQI works like a thermometer, which runs from 0 to 500 degrees. However, instead of showing changes in the temperature, the AQI is a way of showing changes in the amount of pollution in the air. The air quality index uses standardized ambient pollutant concentrations to yield individual pollutant indices. These indices were then weighted and summed to form a single total air quality index. AQI tracks five major air pollutants, namely ground-level ozone, carbon mon-oxide, sulphur dioxide, nitrogen dioxide, airborne particles, or aerosols. Instruments on the ground and satellites orbiting earth collect information about the air quality. Different countries have their own air quality indices, corresponding to different national air quality standards.

U.S. Embassy Colombo installed an air quality monitor in central Colombo and we can get an idea about air quality in Sri Lanka from those data.

Air Quality Index

Air pollution is an upcoming major environmental health risk to the people around the world affecting people in low, middle and high-income countries. There are two types of air pollution: ambient (Outdoor) air pollution and indoor air pollution. The main sources of air pollution are industry and energy supply, dust, agricultural practices, household energy, transport and waste management. The air pollution can cause diseases like stroke, heart disease, lung cancer and both chronic and acute respiratory diseases, including asthma. Every year

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: everyone may experience more serious health effects.
Hazardous	301 to 500	Health warnings of emergency conditions. The entire population is more likely to be affected.

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nearly 7 million deaths are due to exposure to outdoor and household air pollution.

An assessment of the health effects of air pollution and thresholds for health–harmful pollution levels are provided in the WHO Air Quality Guidelines: Global update 2005. Nearly 91% of the world population was living in places where the WHO air quality guidelines levels were not met in 2016. Ambient (outdoor air pollution) in both cities and rural areas was estimated to cause 4.2 million premature deaths worldwide in 2016. Most of those premature deaths occurred in low- and middle-income countries and the greatest number in the WHO South-East Asia and Western Pacific regions. In addition to outdoor air pollution, indoor smoke is a serious health risk for some 3 billion people who cook and heat their homes with biomass, kerosene fuels and coal .

Outdoor Air Pollution

The mortality due to outdoor air pollution is mainly caused by exposure to small particulate matter of 2.5 microns or less in diameter (PM2.5), which causes cardiovascular and respiratory disease, and cancers.

The latest burden estimates reflect the very significant role air pollution plays in cardiovascular illness and death. WHO estimates that in 2016, 58% of outdoor air pollution-related premature deaths were due to ischemic heart disease and strokes, while 36% of deaths were due to chronic obstructive pulmonary disease and acute lower respiratory infections, and 6% of deaths were due to lung cancer. According to the WHO's International Agency for Research on Cancer (IARC)-2013, outdoor air pollution is carcinogenic to humans, with the particulate matter component of air pollution most closely associated with increased cancer incidence, especially lung cancer. An association also has been observed between outdoor air pollution and an increase in cancer of the urinary tract/bladder.

The main sources of air pollution are particulate matter, ozone, nitrogen dioxide and sulphur dioxide. The WHO air quality guidelines-2005 provides threshold limits for these key pollutants of outdoor air. However, most sources of outdoor air pollution are well beyond the control of individuals and demands

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Table 1 : Water Quality Surveillance Number of microbiological water samples May 2020			
District	**MOH areas**	**No: Expected ***	**No: Received**
Colombo	15	90	**NR**
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	**29**
Galle	20	120	**NR**
Matara	17	102	**NR**
Hambantota	12	72	**NR**
Jaffna	12	72	**0**
Kilinochchi	4	24	**0**
Manner	5	30	**0**
Vavuniya	4	24	**22**
Mullatvu	5	30	**NR**
Batticaloa	14	84	**32**
Ampara	7	42	**NR**
Trincomalee	11	66	**NR**
Kurunegala	29	174	**NR**
Puttalam	13	78	**NR**
Anuradhapura	19	114	**NR**
Polonnaruwa	7	42	**0**
Badulla	16	96	**NR**
Moneragala	11	66	**NR**
Rathnapura	18	108	**NR**
Kegalle	11	66	**10**
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 June 2020 (25th Week)

RDHS Division	Dengue Fever A	Dengue Fever B	Dysentery A	Dysentery B	Encephalitis A	Encephalitis B	Enteric Fever A	Enteric Fever B	Food Poisoning A	Food Poisoning B	Leptospirosis A	Leptospirosis B	Typhus Fever A	Typhus Fever B	Viral Hepatitis A	Viral Hepatitis B	Human Rabies A	Human Rabies B	Chickenpox A	Chickenpox B	Meningitis A	Meningitis B	Leishmaniasis A	Leishmaniasis B	WRCD T*	WRCD C**
Colombo	70	3127	1	14	0	5	0	4	0	14	21	152	1	1	0	2	0	0	4	171	1	21	0	1	58	99
Gampaha	27	1885	1	6	0	1	1	5	0	19	17	116	0	1	1	4	0	0	4	211	1	10	1	18	44	100
Kalutara	64	1251	0	6	0	4	1	4	0	4	24	389	1	12	0	2	0	0	6	236	4	24	0	0	51	100
Kandy	121	1643	1	16	0	1	0	7	1	10	15	109	7	65	1	4	0	0	5	128	1	18	5	43	63	100
Matale	4	479	0	5	0	3	0	1	0	6	8	57	0	3	0	3	0	1	0	45	0	2	10	174	64	99
NuwaraEliya	2	130	0	15	0	1	1	1	3	7	9	49	2	61	0	3	0	0	0	64	0	9	0	0	21	100
Galle	9	1095	0	13	0	8	0	2	0	12	9	238	0	24	0	2	0	0	1	211	1	20	0	2	55	67
Hambantota	6	287	1	7	0	1	0	2	0	38	12	123	2	24	0	2	0	0	5	145	4	22	20	340	67	100
Matara	0	352	0	9	0	3	0	0	0	0	0	100	0	4	0	6	0	0	0	68	0	5	0	117	46	42
Jaffna	13	1903	4	55	0	0	1	19	1	20	1	16	6	464	0	1	0	1	0	85	1	7	0	0	31	93
Kilinochchi	5	115	2	30	0	2	1	10	1	8	3	15	1	24	0	1	0	0	1	12	1	9	5	10	65	100
Mannar	1	121	0	0	0	0	0	1	0	0	0	5	0	1	0	0	0	0	0	2	0	3	0	0	39	100
Vavuniya	2	238	0	9	0	0	0	5	0	2	0	36	0	1	0	1	0	0	1	29	0	4	0	1	65	100
Mullaitivu	0	65	0	5	0	0	0	5	0	1	1	14	0	6	0	1	1	2	1	6	0	4	0	5	46	80
Batticaloa	27	2182	3	52	0	3	0	1	0	44	1	22	0	22	3	4	0	1	0	73	0	16	0	1	52	100
Ampara	4	296	1	11	0	2	0	0	0	0	1	75	0	0	0	1	0	0	1	92	1	13	0	4	66	100
Trincomalee	0	2246	3	11	0	0	0	0	0	2	3	24	0	3	0	0	0	0	0	76	0	8	0	0	46	92
Kurunegala	22	717	2	11	0	4	0	2	6	35	25	133	5	18	0	2	0	2	4	267	1	13	24	231	46	100
Puttalam	8	391	1	8	1	4	0	3	0	1	11	40	1	13	0	0	0	1	0	68	3	33	1	3	57	100
Anuradhapur	4	355	1	16	0	1	1	4	0	22	9	164	0	14	1	5	0	1	1	155	1	26	7	120	43	97
Polonnaruwa	8	204	0	5	0	0	0	0	0	5	7	105	0	0	0	14	0	1	4	107	1	11	8	127	66	93
Badulla	13	400	0	10	1	4	0	3	0	3	20	193	6	52	0	10	0	0	2	121	3	26	3	11	59	100
Monaragala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Ratnapura	145	1148	3	50	0	14	0	3	3	22	114	939	4	22	0	13	0	0	2	144	10	66	20	64	48	100
Kegalle	25	516	3	15	0	4	1	3	1	15	20	240	4	30	0	6	0	0	4	131	2	24	3	16	59	100
Kalmune	11	853	3	36	0	3	0	0	0	1	1	13	0	2	0	1	0	0	2	263	0	29	0	1	69	100
SRILANKA	591	21999	30	415	2	68	7	85	16	291	33	3367	40	845	6	86	1	10	48	2910	36	423	10	1288	53	91

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 19th June, 2020 Total number of reporting units 356 Number of reporting units data provided for the current week: 296 **C****-Completeness

Table 2: Vaccine-Preventable Diseases & AFP

13th– 19th June 2020 (25th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2020	Number of cases during same week in 2019	Total number of cases to date in 2020	Total number of cases to date in 2019	Difference between the number of cases to date in 2020 & 2019
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	00	00	00	01	01	01	18	40	- 55 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	03	00	00	01	00	00	00	00	02	06	03	91	178	- 48.8 %
Measles	00	00	00	00	00	00	01	00	00	01	05	31	167	- 83.8 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	00	00	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	03	09	- 66.6 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Japanese Encephalitis	00	01	00	01	00	00	00	00	01	03	00	19	09	111.1 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	05	33	- 84.4 %
Tuberculosis	196	12	28	24	26	41	40	23	47	437	219	2592	4116	- 37.0 %

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.

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

NA = Not Available

Influenza Surveillance in Sentinel Hospitals - ILI & SARI							
Month	Human				Animal		
	No Total	No Positive	Infl A	Infl B	Pooled samples	Serum Samples	Positives
June							
Source: Medical Research Institute & Veterinary Research Institute							

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@sltnet.lk. Prior approval should be obtained from the Epidemiology Unit before publishing data in this publication**

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