WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health & Indigenous Medical Services

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Identified complications of COVID-19 Part II

Septic shock was reported in 4% to 8% of patients. Septic shock indicates profound circulatory, cellular, and metabolic deterioration causing persistent hypotension despite adequate fluid replacement. It is associated with a greater risk of mortality than with sepsis alone.

The criteria for overt Disseminated Intravascular Coagulation which was induced by sepsis was met in 71% of COVID-19 patients. They revealed longer Prothrombin Time and activated partial thromboplastin time. Levels of fibrin-related markers (D-dimer and fibrin degradation product) were significantly higher suggesting a secondary hyperfibrinolysis condition in critically ill patients. The fibrinogen level was also significantly lower in patients. Development of DIC results when monocytes and endothelial cells are activated to the point of cytokine release following injury, with the expression of tissue factor and secretion of the von-Willebrand factor. Circulation of free thrombin, uncontrolled by natural anticoagulants, can activate platelets and stimulate fibrinolysis. Venous thromboembolism also has been reported with sever COVID-19 which is associated with poor prognosis.

In the middle and late stages of the disease, patients often develop secondary bacterial or even fungal infections. This was reported in 6% to 10% of patients.

Dysfunction of other organs, primarily kidney failure was reported in 3% to 8% of patients who had elevated Blood Urea Nitrogen, serum creatinine, or albuminuria.

Current evidence suggests that more than one-third of severe patients experienced various neurological complications such as Acute Hemorrhagic Necrotizing Encephalopathy (AHNE) and acute cerebrovascular diseases (ischemic stroke, cerebral haemorrhage) who died later from respiratory failure. Neurological complications manifest with Central Nervous System symptoms (headache, dizziness, impaired consciousness, ataxia, acute cerebrovascular disease, and epilepsy) and Peripheral Nervous System (PNS) symptoms (hypogeusia, hyposmia, and neuralgia). AHNE is a rare complication of COVID-19 and has been related to intracranial cytokine storms, which result in a blood-brain-barrier breakdown, but without direct viral invasion or para infectious demyelination. This can be diagnosed by CT and MRI brain images. Patients with neurological complications have a poor prognosis.

Rhabdomyolysis (skeletal muscle injury) was reported as a late complication in one case report. Rhabdomyolysis is a life-threatening complication that manifests with myalgia, fatigue, myoglobinuria, and acute renal failure. It is confirmed by elevated creatinine kinase levels.

Acute liver failure in 14% to 53% of patients have also been reported to occur during the disease in severe cases. Those patient's AST and ALT levels were markedly elevated which is accompanied by slightly elevated serum bilirubin levels and GGT. Serum Albumin is decreased in severe cases. Collateral liver damage from virally induced cytotoxic T cells and the induction of a dysregulated innate immune response is a more probable explanation for the association between deranged liver markers and COVID-19

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disease severity. The liver injury occurred in COVID-19 patients may be due to the damage to bile duct cells, by the virus infection, which adversely affects liver regeneration and immune response. A recent study conducted in Shanghai, China, reported that similar to the situation in SARS, antibiotics such as macrolides or quinolone, anti-virals such as lopinavir/ritonavir and steroids which are widely used for the treatment are all potential causes of liver injury during COVID-19. However, clinically significant liver injury is uncommon.

Mild pancreatic injury (defined as elevated serum amylase or lipase levels) also has been identified as a complication of COVID-19 patients. However, it is unknown whether this is a direct viral effect or due to the harmful immune response that occurs in some patients.

Retrospective reviews of pregnant women with COVID-19 found that women appeared to have fewer adverse maternal and neonatal complications. Adverse effects on the newborn including fetal distress, premature labour, respiratory distress, thrombocytopenia, and abnormal liver function have been reported. However, there is currently no evidence of vertical transmission in pregnant women who developed COVID-19 pneumonia. As of Feb 4, 2020, no maternal deaths have been reported but miscarriage (2%), intrauterine growth restriction (10%) preterm birth (39%), pre-eclampsia, premature rupture of the membrane and stillbirth have been reported.

The disease can be even fatal due to complications of this infection. The risk of death was primarily associated with age, underlying chronic diseases, and the median interval from the appearance of initial symptoms to dyspnea. In this pandemic, Case Fatality Rate is estimated at approximately 3%, which is lower than that of another two widely contagious zoonotic coronavirus diseases, MERS-CoV (35%) and SARS-CoV (10%).

Based on available information to date and clinical expertise, the following patient categories are more likely to develop COVID-19 and are at increased risk of developing serious illness leading to poorer outcomes.

- Adults aged 65 years and older
- Those of any age with certain underlying pre-existing medical problems, particularly if not well controlled, such as cardiovascular disease with complications, diabetes, hypertension, renal failure especially stages IV, V or those on dialysis, or liver disease, chronic respiratory disease, moderate to severe uncontrolled asthma, people of any age with severe obesity (Body Mass Index ≥40)
- People who are immunocompromised including those who are on cancer treatment or systemic steroids or post solid organ or stem cell transplants.

Patients with underlying cardiovascular diseases often demonstrated heart failure. Middle-aged and elderly patients with underlying comorbid systemic diseases are more susceptible to respiratory failure, are more frequently critically ill and may have a poorer prognosis whereas healthy, young adult patients were less susceptible to severe disease. People with certain disabilities might experience higher rates of chronic health conditions that put them at higher risk of getting complications of COVID-19 and serious illness. Adults with disabilities are three times more likely to have heart disease, stroke, diabetes, or cancer than adults without disabilities. Pregnant women are at a particularly high risk of 2019-nCoV infection because they are in a special state of immune suppression. Physiologic adaptive changes during pregnancy (e.g., diaphragm elevation, increased oxygen consumption, and oedema of respiratory tract mucosa) render them intolerant to hypoxia.

As there is currently no effective drug against the novel CoV, people who have cough, fever and difficulty breathing must seek medical care early to reduce the risk of developing a more complicated infection. Patients can present with complications with or without respiratory symptoms and the clinicians should be vigilant enough to detect those cases.

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Table 1: Selected notifiable diseases reported by Medical Officers of Health 28th– 03rd April 2020 (14th 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	2	2686	0	13	0	4	0	4	0	14	0	57	0	0	0	2	0	0	3	142	0	14	0	0	**59**	**96**
Gampaha	4	1597	0	3	0	0	0	4	0	19	0	37	0	1	0	1	0	0	0	190	0	8	0	17	**52**	**90**
Kalutara	15	921	0	5	0	4	0	3	0	1	3	97	0	7	0	1	0	0	6	144	0	9	0	0	**60**	**85**
Kandy	6	1084	1	7	0	1	0	7	0	6	0	15	1	37	0	3	0	0	4	97	0	14	0	25	**63**	**99**
Matale	2	432	0	3	0	2	0	1	0	4	0	16	0	2	0	2	0	1	0	34	0	1	2	122	**58**	**100**
NuwaraEliya	1	129	1	11	0	0	0	0	0	0	2	15	1	40	0	2	0	0	1	44	0	6	0	0	**23**	**100**
Galle	1	940	1	11	0	8	0	2	0	12	0	159	1	21	0	1	0	0	1	184	0	15	0	2	**59**	**83**
Hambantota	0	255	0	4	0	0	0	1	0	37	0	53	0	13	0	2	0	0	1	100	0	8	0	231	**75**	**92**
Matara	0	351	0	7	0	3	0	0	0	0	0	81	0	4	0	6	0	0	0	68	0	5	0	117	**50**	**68**
Jaffna	17	1722	0	35	0	0	2	16	0	16	0	10	7	433	0	0	0	1	7	66	1	4	0	0	**34**	**93**
Kilinochchi	1	104	3	19	0	0	0	3	0	0	0	6	0	17	0	0	0	0	0	4	0	4	0	4	**64**	**100**
Mannar	0	117	0	0	0	0	0	1	0	0	0	3	0	1	0	0	0	0	0	1	0	3	0	0	**42**	**93**
Vavuniya	2	228	0	4	0	0	0	3	0	0	0	30	0	1	0	0	0	0	1	11	0	3	0	1	**59**	**100**
Mullaitivu	1	62	0	4	0	0	0	3	0	1	0	10	0	3	1	1	0	1	0	2	0	0	0	5	**41**	**76**
Batticaloa	24	1983	2	38	0	2	0	0	0	4	0	13	0	0	0	0	0	1	8	63	0	9	0	1	**62**	**97**
Ampara	0	279	0	8	0	1	0	0	0	0	0	22	0	0	0	1	0	0	1	64	0	8	0	4	**63**	**100**
Trincomalee	18	2134	0	4	0	0	0	0	0	1	0	11	0	2	0	0	0	0	0	64	0	5	0	0	**51**	**88**
Kurunegala	1	645	0	5	0	4	0	2	0	29	0	54	0	10	0	1	0	0	0	225	0	8	0	153	**56**	**90**
Puttalam	0	331	0	6	0	1	0	2	0	1	0	15	0	9	0	0	0	1	4	58	0	16	0	2	**66**	**92**
Anuradhapur	1	306	0	8	0	1	0	2	0	19	0	114	0	12	0	1	0	1	0	92	0	16	0	81	**55**	**86**
Polonnaruwa	1	182	0	4	0	0	0	0	0	0	1	55	0	0	0	12	0	0	2	68	0	8	1	87	**64**	**97**
Badulla	3	357	0	8	0	2	0	2	0	3	0	101	0	17	0	6	0	0	4	92	0	15	0	4	**60**	**99**
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	**0**	**0**
Ratnapura	16	581	0	29	0	11	0	1	0	13	2	270	0	9	1	10	0	0	0	106	3	35	0	38	**51**	**93**
Kegalle	6	351	0	5	0	3	0	1	0	12	0	68	0	16	0	4	0	0	0	100	0	11	0	9	**59**	**97**
Kalmune	5	802	0	25	0	2	0	0	0	1	0	2	0	2	0	0	0	0	3	154	1	12	0	0	**76**	**100**
SRILANKA	**127**	**18579**	**8**	**266**	**0**	**49**	**2**	**58**	**0**	**193**	**8**	**131**	**10**	**657**	**2**	**56**	**0**	**6**	**46**	**2173**	**5**	**237**	**3**	**903**	**57**	**89**

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 03rd April , 2020 Total number of reporting units 356 Number of reporting units data provided for the current week: 261 C**-Completeness

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

Table 2: Vaccine-Preventable Diseases & AFP

28th– 03rd April 2020 (14th 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	00	01	02	09	27	- 64 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	00	00	00	00	00	00	00	00	00	07	05	54	102	- 47.0 %
Measles	00	00	00	01	00	00	00	00	00	01	07	22	56	- 60.7 %
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	04	0 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	- 25 %
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	00	06	07	200 %
Whooping Cough	00	00	00	00	01	00	00	00	00	01	01	03	23	- 86.9 %
Tuberculosis	00	00	00	00	00	00	00	00	00	00	180	1455	2409	- 39.6 %

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

Dengue Prevention and Control Health Messages

Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them free of water collection.

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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