WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health, Nutrition & Indigenous Medicine

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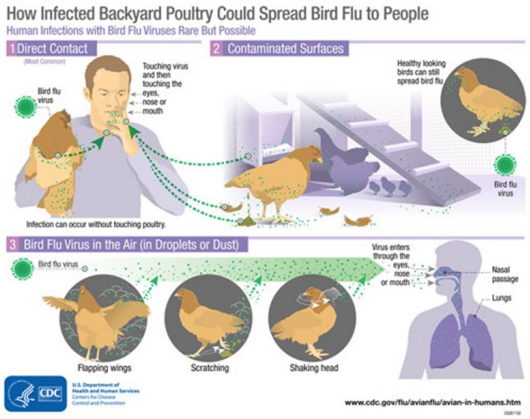
Influenza Part I

This is the first of a series of 3 articles

nfluenza is an acute respiratory illness that affects the global population periodically. It is caused by infection with a negative sense RNA virus, which typically manifests as seasonal epidemics and sporadic pandemics. In temperate climates, **seasonal epidemics** occur mainly during the winter months, when low temperatures and low humidity favours transmission. In tropical regions, influenza may occur throughout the year, causing outbreaks more irregularly with minimum temperature, maximum rainfall and hours of sunshine affecting seasonality.

Pandemics occur at irregular intervals. In the past 100 years, four pandemics have been reported with the 1918 influenza A H1N1 pandemic being the most deadly with >40 million reported deaths. The influenza A H2N2, H3N2 and H1N1 viruses respectively caused the 1957, 1968 and 2009 influenza pandemics. The 2009 pandemic influenza A H1N1 virus was antigenically distinct from the previous influenza A H1N1 viruses (E.g. 1977 IAV H1N1) and therefore replaced the previous strains resulting in a pandemic

Zoonotic human infections are rare. They usually occur in limited numbers in a specific geographical area (eg. avian H5N1 and H7N9 and the so-called swine H3N2 variant viruses). The influenza A virus strains of avian and swine origin are mainly responsible for these, and only rare occasions of human-to-human transmission of these virus strains are reported. Bird flu, or avian flu, is an infectious type of influenza A that spreads among birds while influenza of swine origin is a respiratory disease of pigs caused by type A influenza viruses that cause influenza outbreaks in pigs. The illustration below



demonstrates the mechanisms of zoonotic transmission of Bird flu.

Influenza viruses have four species, types A, B, C and D. Of these, influenza A and B are responsible for seasonal epidemics, while only type A is known to have given rise to pandemics.

- Influenza A virus (IAV) is sub-typed based on combinations of viral surface proteins haemagglutinin (H) and neuraminidase (N). Birds are the primary reservoir while mammals also are infected. In humans, IAV affects all age groups but is known to cause disproportionately severe illness in vulnerable groups such as the elderly, the very young and those with chronic health issues. According

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to WHO sources the currently circulating IAVs are subtype A(H1N1) and A(H3N2) viruses.

- Influenza B virus (IBV) is not sub-typed but is classified into lineages such as the currently circulating B/Yamagata and B/Victoria lineages. It mainly affects humans but can be seen in mammals such as seals, horses, dogs, and pigs as pigs too.
- Influenza C virus (ICV) is seen in humans but is detected less frequently. It mainly affects children and is usually asymptomatic or mild and therefore does not present public health importance. Influenza C virus also affects dogs, cattle etc.
- Influenza D virus (IDV) primarily affects cattle and is not known to infect or cause illness in people.

The circulating influenza viruses evolve through two processes; antigenic drift and antigenic shift. **Antigenic drift** is when an influenza virus's antigens change gradually with acquired mutations in the H or N gene. This occurs in all influenza species but is most common in IAV, especially in the H protein. Antigenic drift produces novel influenza strains that can evade pre-existing antibody-mediated immunity. It is the main cause of seasonal variation of influenza strains, which results in the requirement that flu vaccines are updated annually using the circulating antigen surveillance data.

An **antigenic shift** occurs when influenza virus antigens (commonly H protein) undergo a sudden, drastic change, usually through reassortment of genome segments among antigenically different virus strains (of the same genus/ type) that infect the same cell, producing hybrid progeny. This is very common among IAVs and is the mechanism responsible for the initiation of strains capable of human-to-human transmission and pandemics.

Epidemiology

In a typical year, influenza viruses infect 5–15% of the global population, causing 3–5 million cases of severe illness annually, accounting for 290,000–650,000 deaths. The reported number of influenza cases is usually much lower than the actual number of cases. During seasonal epidemics, it is estimated that about 80% of otherwise healthy people who have a cough or sore throat have the flu. Approximately 30–40% of people hospitalized for influenza develop pneumonia, and about 5% of all severe pneumonia cases in hospitals are due to influenza, which is also the most common cause of ARDS in adults.

In industrialized countries, most deaths associated with influenza occur among people aged 65 years or older. Epidemics can result in high levels of worker/school absenteeism and productivity losses. Clinics and hospitals can be overwhelmed during peak illness periods. The effects of seasonal influenza epidemics in developing countries are not fully known, but research estimates that 99% of deaths in children less than 5 years of age with influenza-related lower respiratory tract infections are found in developing countries

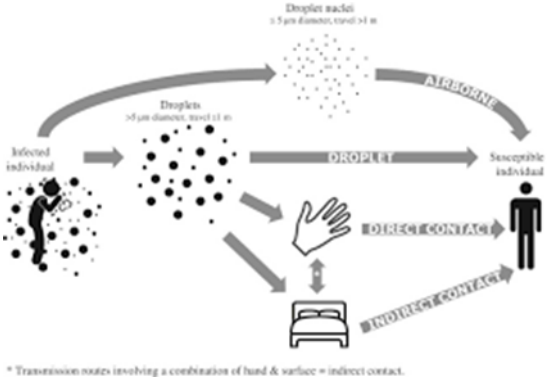
Pregnant women, children under 59 months, the elderly, individuals with chronic medical conditions (such as chronic cardiac, pulmonary, renal, metabolic, neuro-developmental, liver or hematologic diseases) and individuals with immunosuppressive conditions (such as HIV/AIDS, receiving chemotherapy or steroids, or malignancy) are at **greater risk of severe disease or complications** when infected.

Health care workers are at high risk of acquiring influenza virus infection due to increased exposure to the patients. They are also capable of inadvertently infecting vulnerable individuals.

Transmission

Human-to-human transmission of influenza virus mainly occurs via droplets created

when infected individual coughs or sneezes. When an immunologically susceptible person inhales the contaminated aerosol, infection occurs if the virus is not neutralized by secretory antibodies and the virus invades airway and respiratory tract cells causing illness. Seasonal influenza spreads easily, with the rapid transmission in crowded areas (e.g.: schools and nursing homes). The virus can also be spread by hands contaminated with influenza viruses (surface contact) and the virus is known to survive on contaminated surfaces (fomites etc.).



The incubation period of influenza is 2 days long on average but may range from 1 to 4 days in length. Viral shedding occurs at the onset of symptoms or just before the onset of illness (0-24 hours) and continues for 5 to 10 days. Young children may shed the virus longer, placing others at risk of contracting the infection. In highly immuno-compromised persons, shedding may persist for weeks to months.

Compiled by :

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to be continued ...

Table 1: Selected notifiable diseases reported by Medical Officers of Health 16th– 22nd Apr 2022 (16th Week)

RDHS	Dengue Fever		Dysentery		Encephaliti		Enteric Fever		Food Poi-		Leptospirosis		Typhus		Viral Hep-		Human		Chickenpox		Meningitis		Leishmania-		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	13	2514	0	2	1	2	0	0	0	5	5	34	0	0	1	2	0	0	1	10	0	3	0	1	**9**	**99**
Gampaha	84	2059	0	4	0	0	0	0	0	6	8	36	0	0	1	3	0	1	1	10	0	4	1	7	**4**	**72**
Kalutara	92	906	0	4	0	0	0	1	1	6	9	100	0	2	0	1	0	1	2	24	0	10	0	0	**4**	**100**
Kandy	39	616	0	3	0	0	0	0	1	4	2	25	0	11	0	4	0	0	1	18	0	2	0	2		**96**
Matale	9	148	0	0	0	0	0	0	0	0	2	19	0	2	0	1	0	0	1	8	0	1	7	142	**15**	**100**
NuwaraEliya	6	59	1	8	0	0	0	0	0	0	1	19	0	7	0	0	0	0	0	8	0	0	0	0	**9**	**100**
Galle	72	799	2	3	0	0	0	0	0	0	4	126	0	6	0	1	0	0	0	25	0	9	0	0	**7**	**100**
Hambantota	36	268	0	23	0	0	0	0	0	0	4	56	0	15	0	1	0	0	2	14	1	4	10	164	**11**	**100**
Matara	42	303	1	5	0	0	0	0	0	0	5	55	0	5	0	1	0	0	3	10	0	3	16	102	**18**	**100**
Jaffna	84	1205	0	9	0	2	0	38	2	16	1	17	12	343	1	4	1	2	1	44	0	4	0	0	**50**	**88**
Kilinochchi	2	50	0	4	0	0	0	0	0	11	1	2	0	6	0	0	0	0	0	3	0	0	0	1	**30**	**100**
Mannar	1	143	0	1	0	0	0	0	0	0	1	11	0	2	0	1	0	0	3	3	1	14	0	0	**23**	**81**
Vavuniya	0	43	0	0	0	1	1	2	0	0	3	9	0	1	0	0	0	0	0	5	0	0	0	0	**2**	**81**
Mullaitivu	2	27	0	2	0	0	0	2	2	3	3	12	0	3	0	0	0	0	0	3	0	0	0	1	**23**	**100**
Batticaloa	38	447	1	32	0	5	0	0	12	17	0	15	0	0	0	1	0	0	0	5	0	16	0	1	**30**	**100**
Ampara	7	53	0	6	0	1	0	0	0	0	3	32	0	1	0	1	0	0	2	24	0	6	0	7	**6**	**100**
Trincomalee	90	524	0	20	0	0	0	1	0	2	1	7	2	3	0	4	0	0	2	8	0	2	0	0	**19**	**92**
Kurunegala	24	1061	0	6	0	1	0	0	0	1	3	31	1	13	0	0	0	0	1	27	3	12	13	168	**5**	**100**
Puttalam	26	854	0	0	0	0	0	0	0	0	0	7	0	3	0	0	0	0	0	3	0	10	1	4	**11**	**92**
Anuradhapur	7	143	0	7	0	0	0	1	3	5	7	74	0	14	0	2	0	1	1	18	2	14	11	177	**5**	**87**
Polonnaruwa	4	46	0	3	0	0	0	0	0	1	0	42	0	0	0	0	0	0	2	4	0	2	1	131	**8**	**88**
Badulla	10	383	1	5	0	0	0	0	0	5	9	79	5	15	8	42	0	0	1	19	1	7	0	7	**6**	**100**
Monaragala	10	113	0	5	0	0	0	4	0	2	3	105	1	11	0	19	0	0	2	21	1	13	2	45	**6**	**100**
Ratnapura	72	714	4	17	0	5	0	1	0	15	14	225	0	7	1	10	0	0	2	26	1	13	5	79	**7**	**95**
Kegalle	39	454	0	4	0	2	0	1	0	4	8	135	0	7	0	2	0	0	1	28	0	15	0	9	**5**	**100**
Kalmune	36	282	0	18	0	0	0	0	0	4	1	4	0	1	0	0	0	0	2	12	1	11	0	0	**25**	**100**
SRILANKA	**96**	**14214**	**10**	**191**	**1**	**19**	**1**	**51**	**21**	**107**	**98**	**1277**	**21**	**478**	**12**	**10**	**1**	**5**	**31**	**380**	**11**	**175**	**67**	**1048**	**12**	**95**

Source: Weekly Returns of Communicable Diseases (esurvillance.epid.gov.lk). T=Timeliness refers to returns received on or before 22nd Apr , 2022 Total number of reporting units 361 Number of reporting units data provided for the current week: 341 **C****-Completeness

Table 2: Vaccine-Preventable Diseases & AFP

16th - 22nd Apr 2022 (16th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2022	Number of cases during same week in 2021	Total number of cases to date in 2022	Total number of cases to date in 2021	Difference between the number of cases to date in 2022 & 2021
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	02	00	00	00	02	02	29	19	52.6 %
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	00	00	13	34	- 61.7 %
Measles	00	00	00	00	00	00	00	00	00	00	00	10	06	66.6 %
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	01	00	00	00	00	01	00	03	01	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	01	00	0 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	01	00	0 %
Tuberculosis	00	19	08	14	30	22	00	12	14	154	24	2419	2022	19.6 %

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

NA = Not Available

Number of Malaria Cases Up to End of April 2022,

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All are Imported!!!

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**

ON STATE SERVICE

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