



# WEEKLY EPIDEMIOLOGICAL REPORT

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## Prevention of oncovirus-related cancers - a low-hanging fruit of oncology Part I

*This is the first article of a series of 2 articles on the "Prevention of oncovirus-related cancers - a low-hanging fruit of oncology".*

The roots of cancer awareness extend to approximately 3000 BC when it was initially documented, but it wasn't until a century ago that scientists started comprehending the profound influence of infectious diseases on different types of cancer. Unlike infectious diseases, which can often be effectively treated with antibiotics or antiviral medications without causing subsequent harm, cancers present formidable challenges once they have developed. The unique characteristics of cancer, such as uncontrolled cell growth and the ability to invade surrounding tissues, make it a complex and multifaceted medical condition that requires specialized and often aggressive therapeutic approaches. However, as some cancers result from infections, particularly by human tumour viruses, there is a noteworthy opportunity for preventing these cancers by preventing infectious agents by altering risk behaviours and implementing prophylactic or therapeutic vaccination strategies. The imperative lies in addressing these modifiable factors to curtail the incidence of virus-induced cancers and, consequently, advance public health initiatives. As infection-related cancers contribute to an estimated 15% to 20% of global cancer cases, emphasizing the crucial role of preventing infections to prevent certain cancers[1]. Among the infection-causing cancers viruses are the major microbial culprits, while Helicobacter pylori, a type of bacteria, plays a role in stomach cancers, while helminths are often causal in bladder and gall bladder cancers.

Certain viruses contribute to the development of cancer in people worldwide and can play a role in cancer mainly in two ways: by causing chronic inflammation and activating a cancer-causing gene. First is, Chronic inflammation which is triggered by conditions like hepatitis C virus (HCV) infection, which can cause tissue damage and contribute to the development of Hepatocellular carcinoma (HCC). In this process, inflammation leads to increased production of mutagenic compounds, higher mutation rates, genetic instability, unchecked cell growth, and enhanced immune evasion. The second mechanism is viruses have the potential to instigate cancer by forming associations with host proteins, exploiting moments of immune system vulnerability to proliferate, and commandeering the replication processes of human cells. What distinguishes human tumour viruses from their counterparts is their unique ability to infect host cells without inducing immediate lethality. This distinctive trait grants human tumour viruses the capacity to foster persistent infections

The connection between viral infections and cancer has been studied extensively, and several viruses have been identified as oncogenic. The human papillomavirus (HPV) is a well-known example linked to cervical, anogenital, laryngeal and oral cancers. Hepatitis B (HBV) and C (HCV) viruses are associated with HCC, and Epstein-Barr virus (EBV) is linked to several lymphomas and nasopharyngeal carcinoma. Human T-cell Lymphotropic Virus (HTLV -1) is linked to the development of adult T-cell leukaemia/lymphoma (ATLL) and Kaposi's Sarcoma Herpesvirus (KSHV) is associated with Kaposi's sarcoma, a cancer that often affects the skin and mucous membranes.

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Merkel cell virus (MCV) which is suspected to cause the majority of cases of Merkel cell carcinoma, a rare but aggressive form of skin cancer. Human immunodeficiency virus (HIV) does not cause cancer directly, researchers believe it increases the risk of cancer by damaging the immune system, which reduces the body’s defenses against other oncoviruses. It can enable other oncoviruses to cause cancer. HIV-associated cancers include Kaposi sarcoma, non-Hodgkin’s and Hodgkin’s lymphoma and cancers of the anus, liver, mouth, throat and lung. Understanding these connections has not only advanced knowledge of cancer development but has also led to the development of vaccines and targeted therapies to prevent and treat virus-induced cancers.

**History and epidemiology of oncoviruses**

In 1911, virologist Frances Peyton Rous achieved a significant breakthrough at the Rockefeller Institute for Medical Research. His pioneering work involved establishing a link between a virus and cancer in chickens. Through a revolutionary experiment, Rous transferred extracts devoid of bacteria and cells from a cancerous chicken's breast lump to a healthy chicken. Remarkably, the previously healthy chicken developed breast cancer, highlighting the transformative nature of Rous's findings. In recognition of this pivotal discovery, Frances Peyton Rous was awarded the Nobel Prize in Physiology or Medicine in 1966 for his identification of tumour-inducing viruses. There are seven human tumour viruses identified with strong causal links to human cancers: EBV, HBV,HPV, HTLV-1,HCV,KSHV,and MCV.

**References**

- [1] M. E. McLaughlin-Drubin and K. Munger, “Viruses associated with human cancer,” *Biochim. Biophys. Acta - Mol. Basis Dis.*, vol. 1782, no. 3, pp. 127–150, 2008, doi: 10.1016/j.bbadis.2007.12.005.
- [2] B. G. Bajaj, M. Murakami, and E. S. Robertson, “Molecular biology of EBV in relationship to AIDS-associated oncogenesis.,” *Cancer Treat. Res.*, vol. 133, pp. 141–162, 2007, doi: 10.1007/978-0-387-46816-7\_5.
- [3] A. Virzi, A. A. R. Suarez, T. F. Baumert, and J. Lupberger, “Oncogenic signaling induced by hcv infection,” *Viruses*, vol. 10, no. 10, pp. 1–21, 2018, doi: 10.3390/v10100538.
- [4] J. Lupberger and E. Hildt, “Hepatitis B virus-induced oncogenesis,” vol. 13, no. 1, pp. 74–81, 2007.
- [5] S. Mohanty and E. W. Harhaj, “Mechanisms of oncogenesis by HTLV-1 tax,” *Pathogens*, vol. 9, no. 7, pp. 1–28, 2020, doi: 10.3390/pathogens9070543.
- [6] K. Münger *et al.*, “Mechanisms of Human Papillomavirus-Induced Oncogenesis,” *J. Virol.*, vol. 78, no. 21, pp. 11451–11460, 2004, doi: 10.1128/jvi.78.21.11451-11460.2004.
- [7] C. Casper *et al.*, “KSHV (HHV8) vaccine: promises and potential pitfalls for a new anti-cancer vaccine,” *npj Vaccines*, vol. 7, no. 1, 2022, doi: 10.1038/s41541-022-00535-4.
- [8] M. M. Ahmed, C. H. Cushman, and J. A. Decaprio, “Merkel cell polyomavirus: Oncogenesis in a stable genome,” *Viruses*, vol. 14, no. 1, pp. 1–14, 2022, doi: 10.3390/v14010058.

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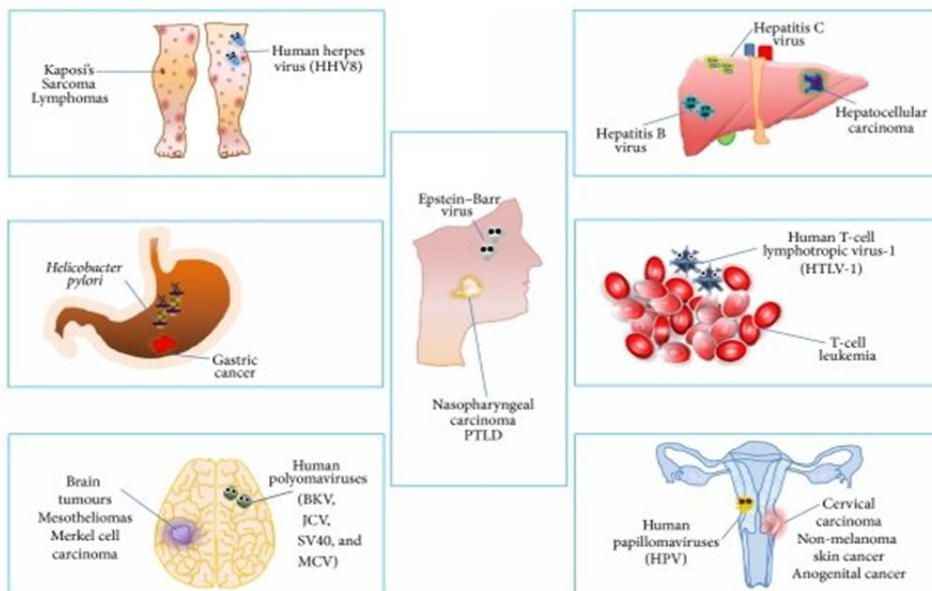


Table 1: Selected notifiable diseases reported by Medical Officers of Health 21st- 27th Oct 2023 (43rd Week)

RDHS	Dengue Fever		Dysentery		Encephalit		Enteric Fever		Food Poi-		Leptospirosis		Typhus		Viral		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	167	12182	0	15	0	14	0	2	0	12	10	303	0	0	0	0	6	0	0	13	314	2	41	1	7	42	100
Gampaha	178	12212	0	21	1	17	0	12	3	13	22	544	0	10	0	17	0	0	8	270	4	118	1	44	11	100	
Kalutara	345	24394	0	36	1	31	0	14	3	25	32	847	0	10	0	23	0	0	21	584	6	159	2	51	34	100	
Kandy	185	6829	2	39	0	3	0	10	2	23	5	281	3	64	0	4	0	2	10	284	4	28	4	31	90	100	
Matale	61	1527	0	4	0	3	0	1	0	29	0	134	0	14	0	7	0	0	2	63	0	9	12	296	28	100	
NuwaraEliya	2	255	5	150	0	5	0	3	0	49	6	159	0	68	0	5	0	0	9	185	1	32	0	3	62	100	
Galle	81	2631	0	47	0	13	0	6	3	36	17	839	0	72	0	2	0	1	10	333	0	27	0	3	39	100	
Hambantota	7	1307	3	14	0	3	0	1	0	9	11	295	0	68	0	9	0	0	2	139	0	19	15	575	32	100	
Matara	19	1744	0	25	0	9	0	1	1	20	14	495	0	34	0	6	0	2	2	285	1	22	3	180	58	100	
Jaffna	24	2156	8	114	0	2	0	12	0	36	1	13	5	523	1	7	0	2	5	171	0	18	0	2	69	93	
Kilinochchi	3	94	0	12	0	0	0	1	0	16	0	8	0	7	0	0	0	0	0	19	0	2	0	0	43	100	
Mannar	3	89	0	6	0	0	0	1	0	0	0	37	0	6	0	1	0	0	1	3	0	9	0	1	55	100	
Vavuniya	4	168	0	11	0	1	0	0	0	25	1	31	0	9	0	2	0	0	1	29	0	13	0	10	19	100	
Mullaitivu	2	125	0	15	0	1	0	4	0	12	0	38	0	7	0	1	0	0	0	19	0	2	0	8	29	100	
Batticaloa	16	2202	4	184	0	9	0	5	0	18	4	93	0	1	0	8	0	3	4	123	2	40	0	1	68	100	
Ampara	6	240	1	10	0	1	0	1	0	64	1	122	0	2	0	2	0	0	2	88	0	56	0	12	15	100	
Trincomalee	8	2026	0	25	0	1	0	1	0	69	2	70	0	15	1	4	0	0	2	75	0	29	0	7	31	100	
Kurunegala	1	1706	0	69	1	11	0	0	0	1	0	57	0	1	0	0	0	0	6	155	1	40	0	0	53	100	
Puttalam	74	2822	3	49	0	16	0	1	0	7	21	388	0	17	1	14	1	3	7	486	3	192	15	516	30	100	
Anuradhapur	27	2951	5	42	0	3	0	1	0	2	5	94	0	8	0	1	0	0	4	106	3	78	0	19	29	100	
Polonnaruwa	8	704	1	15	0	1	0	1	0	9	3	258	0	32	0	4	0	2	0	223	0	45	19	614	31	100	
Badulla	3	542	1	16	0	6	0	1	0	11	2	164	0	7	1	14	0	0	3	82	0	18	0	389	38	100	
Monaragala	41	1095	2	40	0	5	0	0	0	44	2	317	0	55	1	90	0	0	7	178	2	48	0	40	67	100	
Ratnapura	11	669	0	24	0	6	0	0	0	8	4	486	1	38	0	33	0	1	4	69	0	76	1	167	31	100	
Kegalle	19	2018	6	53	0	18	0	3	0	51	42	1143	1	28	0	18	0	2	8	207	1	139	8	185	37	100	
Kalmune	48	2843	0	25	0	2	0	2	0	17	20	649	0	42	0	6	0	0	7	417	3	86	1	40	35	100	
<b>SRILANKA</b>	<b>1035</b>	<b>65450</b>	<b>42</b>	<b>1053</b>	<b>2</b>	<b>154</b>	<b>0</b>	<b>71</b>	<b>9</b>	<b>600</b>	<b>201</b>	<b>7797</b>	<b>10</b>	<b>1130</b>	<b>5</b>	<b>271</b>	<b>1</b>	<b>19</b>	<b>128</b>	<b>4817</b>	<b>29</b>	<b>1283</b>	<b>80</b>	<b>3153</b>	<b>43</b>	<b>99</b>	

Source: Weekly Returns of Communicable Diseases (esurveillance.epid.gov.lk). T=Timeliness refers to returns received on or before 27th Oct, 2023 Total number of reporting units 358 Number of reporting units data provided for the current week: 355 C\*\*=Completeness\*

**Table 2: Vaccine-Preventable Diseases & AFP**

**21<sup>st</sup>– 27<sup>th</sup> Oct 2023 (43<sup>rd</sup> Week)**

Disease	No. of Cases by Province									Number of cases during current week in 2023	Number of cases during same week in 2022	Total number of cases to date in 2023	Total number of cases to date in 2022	Difference between the number of cases to date in 2023 & 2022
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	02	00	00	00	01	01	00	00	02	00	79	67	17.9 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	00	00	00	01	01	00	02	00	01	05	01	201	75	168 %
Measles	10	01	01	04	00	01	01	00	00	18	01	655	20	3175 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	08	00	0 %
CRS**	00	00	00	00	00	00	00	00	00	00	00	02	00	0 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	06	05	20 %
Neonatal Tetanus	01	00	00	00	01	00	00	00	00	02	00	00	00	0 %
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	00	02	01	100 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	07	01	600 %
Tuberculosis	117	31	05	06	09	06	10	12	34	230	144	7725	5511	40.1%

**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

**Take prophylaxis medications for leptospirosis during the paddy cultivation and harvesting seasons.**

**It is provided free by the MOH office / Public Health Inspectors.**

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](mailto: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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