WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit
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WEER SRI LANKA 2023

Vol. 50 No. 46 **11th– 17th Nov 2023**

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

This is the third article of a series of 3 articles on the "Prevention of oncovirus-related cancers - a low-hanging fruit of oncology".

Human papillomavirus (HPV)

In 1984, Harald Zur Hausen made a groundbreaking discovery that revolutionized our understanding of cervical cancer. He identified and linked specific strains of the Human Papillomavirus (HPV), namely high-risk HPV genotypes 16 and 18, to the development of cervical cancer. This pivotal milestone not only deepened knowledge but also laid the foundation for the development of vaccines targeting these high-risk HPV types. His pioneering research has played a crucial role in advancing preventive measures against cervical cancer, marking a significant contribution to public health. High-risk HPVs cause about 5% of all cancers worldwide, with an estimated 570,000 women and 60,000 men getting HPV-related cancer each year. Cervical cancer is among the most common cancers and a leading cause of cancer-related deaths in low- and middle-income countries. However, with the target of eliminating cervical cancers between 2059 and 2102, the 73rd World Health Assembly (WHA) accepts a global approach to reduce the median cervical cancer incidence rate by 10% in 2030 as an interim target. The prophylactic vaccines can prevent HPV infections in almost all (99%) cases by the HPV genotypes included in vaccines. Some studies have shown that the prophylactic HPV vaccination was not very effective on persisting HPV infections by the time receiving the vaccination or on already developed HPV-induced carcinomas. There is future hope for therapeutic HPV vaccines for HPV-associated malignancies which are in clinical trials and preclinical studies. Recognition of the value of therapeutic HPV vaccines by the WHO, predominantly aiming for use in LMICs, indicates that the HPV therapeutic vaccine field is rapidly evolving. Hence therapeutic HPV vaccines could be used to treat HR-HPV infection and regress pre-malignant lesions in the near future, in both males and females.

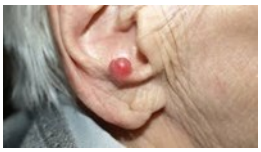
Generally, genital HPV infection is acquired shortly after becoming sexually active. The virus enters into the basal layer of the epithelium via minor trauma, abrasion, and skin-to-skin contact during sexual intercourse. High-risk sexual behaviours such as having multiple sexual partners, engaging in commercial sex or group sex, and involving unprotected penetrative sex especially oral and anal are identified as behavioural risk factors for acquiring HPV infection. Acquisition of genital HPV infection with high-risk HPV genotype and persistence infection are identified as essential prerequisites for the development of HPV-related malignancy. However, all carcinogenic high-risk types would not persist after contracting the infection due to several reasons, such as the virulence of the genotype, development of immunity, factors associated with a healthy life with good nutrition and age[6].

Kaposi sarcoma-associated herpesvirus (KSHV)

Kaposi sarcoma-associated herpesvirus was first isolated from Kaposi sarcoma (KS) lesions in patients with acquired immunodeficiency syndrome (AIDS) by Chang and Moore in 1994 and was later established to be the etiologic agent for KS in several epidemiologically distinct populations. In addition to KS, other malignancies associated with KSHV include primary effusion lymphoma (PEL) and one of the forms of multicentric Castleman disease (MCD) occurring primarily among persons with HIV/AIDS. The onset of the AIDS pandemic in 1981 was heralded by the epidemic of KS, mainly among previously healthy Men sex with men (MSM). It is the major AIDS-related cancer burden, however, has been highest among African populations where, KS rose 10-fold, from 5% to 49% of all adult Ugandan male cancer patients, with the emergence of AIDS. Despite effective anti-retroviral therapies, KS remains the leading cancer among

Contents **Page**

HIV/AIDS patients worldwide. In 2020, over 34,000 cases of KS were estimated globally, all attributable to KSHV. The KSHV can be transmitted via sexual contact and non-sexual routes, such as transfusion of contaminated blood and tissue transplants, or saliva contact. Revisiting the global KSHV cancer burden and epidemiology, as has been done for other viral cancers is needed to guide KSHV vaccine development. However, the unique epidemiology of this virus provides opportunities to prevent its cancers if an effective, inexpensive, and well-tolerated vaccine can be developed and delivered[7].



Merkel cell polyomavirus (MCV)

Merkel cell polyomavirus was initially identified in 2008 in Pittsburgh, Pennsylvania, marking a groundbreaking discovery in viral pathology. It is linked to Merkel cell carcinoma (MCC), a rare yet aggressive skin cancer, MCV is implicated in about 80% of MCC cases. In recent decades, MCC incidence rates have increased worldwide, e.g., in the United States, from 0.15 in 1986 to 0.7/100,000 in 2016. At present, no proper drugs or vaccines are available to treat/prevent the virus infection and stop the emergence of MCC. Risk factors for the development of MCC include male sex, older age (>75 years), fair skin, intense UV exposure, and immunosuppression. Projections suggest that due to ageing populations, an increase in immunosuppressed patients, and enhanced UV exposure, MCC incidence rates will continue to rise. This virus is prevalent, potentially infecting the majority of older children and adults. While commonly found in respiratory secretions, suggesting a possible respiratory transmission route, MCV is also detected in healthy skin, gastrointestinal tissues, and other locations. The exact mode of transmission remains uncertain. Recent studies hint at the virus's ability to persistently infect human sera and peripheral blood mononuclear cells[8].

These seven viruses cause at least 12% to 20% of the total cancer burden globally. Oncovirus-driven cancers have been described as the "low-hanging fruit" that can be potentially prevented or treated by new vaccines that would alter the course of global human cancer by following preventive strategies.

How to reduce the risk of getting oncoviruses.

- Get vaccinated. The HPV vaccine can help reduce the risk of HPV-related cancer. The hepatitis B vaccine can help reduce HCC risk.

If at risk, get screened and follow up cancer screening guidelines. Screening is available for some cancer-related viruses, like HPV, HIV hepatitis B and C. Screening is one of the best ways to catch cancer early, when it's easiest to treat.

- Practice safe sex. Most oncoviruses like HPV, KSHV, hepatitis B and C HTLV-1 are sexually transmitted.

Don't use illegal drugs, share syringes, needles or other infected equipment or personal items that might have blood on them.

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Compiled by

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Table 1 : Water Quality Surveillance
Number of microbiological water samples October 2023

District	MOH areas	No: Expected *	No: Received
Colombo	15	90	**0**
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	**31**
Galle	20	120	**NR**
Matara	17	102	**39**
Hambantota	12	72	**39**
Jaffna	12	72	**144**
Kilinochchi	4	24	**NR**
Mannar	5	30	**0**
Vavuniya	4	24	**41**
Mullatvu	5	30	**56**
Batticaloa	14	84	**0**
Ampara	7	42	**0**
Trincomalee	11	66	**NR**
Kurunegala	29	174	**NR**
Puttalam	13	78	**0**
Anuradhapura	19	114	**3**
Polonnaruwa	7	42	**21**
Badulla	16	96	**0**
Moneragala	11	66	**0**
Rathnapura	18	108	**NR**
Kegalle	11	66	**NR**
Kalmunai	13	78	**8**

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

Table 1: Selected notifiable diseases reported by Medical Officers of Health 04th– 10th Nov 2023 (45th 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	150	12542	0	15	0	14	0	2	0	12	3	312	0	0	0	6	0	0	0	324	0	42	0	7	**43**	**98**
Gampaha	21	12396	0	21	0	18	0	12	0	13	0	559	0	10	0	18	0	0	0	280	0	121	0	44	**11**	**98**
Kalutara	35	4400	0	28	0	4	0	1	0	19	3	805	0	2	0	10	0	1	7	515	1	97	1	4	**350**	**99**
Kandy	22	7105	0	40	0	3	0	11	0	23	2	289	0	64	0	5	0	2	0	304	0	30	0	34	**90**	**98**
Matale	13	1600	0	4	0	3	0	1	0	29	1	136	0	14	0	7	0	0	0	67	0	9	1	309	**27**	**98**
NuwaraEliya	2	272	0	154	0	5	0	3	0	50	3	168	0	71	0	5	0	0	1	192	0	33	0	3	**62**	**98**
Galle	4	2718	0	48	0	14	0	6	1	37	2	862	0	72	0	2	0	1	0	348	0	28	0	3	**39**	**98**
Hambantota	3	1323	0	14	0	4	0	1	0	9	3	306	0	68	0	9	0	0	4	143	0	19	3	611	**33**	**99**
Matara	3	1794	0	28	0	9	0	1	0	69	1	505	0	34	0	6	0	2	2	292	0	22	0	180	**58**	**98**
Jaffna	49	2240	5	127	0	2	0	13	3	39	0	14	1	530	0	7	0	2	0	175	0	18	0	2	**70**	**93**
Kilinochchi	1	96	4	16	0	0	0	1	0	16	0	8	0	8	1	1	0	0	0	19	0	2	0	0	**46**	**100**
Mannar	4	96	0	7	0	0	0	1	0	0	1	39	0	6	0	1	0	0	0	3	0	10	0	1	**56**	**100**
Vavuniya	4	176	1	12	0	1	0	0	0	25	0	32	0	10	0	2	0	0	0	29	1	14	0	10	**20**	**100**
Mullaitivu	0	126	0	15	0	1	0	5	0	12	0	39	0	7	0	1	0	0	0	19	0	2	0	8	**29**	**99**
Batticaloa	15	2245	5	198	0	10	0	5	0	18	1	99	0	2	0	8	0	3	0	126	2	45	0	1	**67**	**99**
Ampara	1	247	0	12	0	1	0	1	0	69	1	125	0	2	0	2	0	0	2	91	1	59	0	12	**15**	**98**
Trincomalee	1	1709	0	70	0	11	0	0	0	2	0	57	0	1	0	0	0	0	4	160	0	41	0	0	**54**	**99**
Kurunegala	1	2041	0	25	0	1	0	1	0	69	2	74	0	15	0	5	0	0	0	78	0	29	0	7	**32**	**98**
Puttalam	14	2920	1	59	0	16	0	1	0	7	0	411	0	18	0	15	0	3	0	495	0	200	4	539	**30**	**98**
Anuradhapur	2	2999	0	43	0	3	0	1	0	2	0	100	0	8	0	1	0	0	1	109	0	80	0	23	**30**	**98**
Polonnaruwa	7	719	0	16	0	1	0	1	0	11	1	261	0	33	0	4	0	2	2	228	0	46	21	653	**31**	**99**
Badulla	0	557	0	24	0	6	0	1	0	11	0	167	0	7	0	14	0	0	0	84	0	18	0	406	**38**	**98**
Monaragala	2	1137	0	43	0	5	0	0	0	45	0	324	0	60	0	91	0	0	0	181	0	48	0	41	**67**	**98**
Ratnapura	7	689	0	25	0	6	0	0	0	8	3	500	0	39	0	33	0	1	0	74	1	79	1	175	**31**	**98**
Kegalle	4	2056	0	59	0	19	0	3	2	56	0	1171	0	29	0	18	0	2	0	216	0	140	0	185	**37**	**98**
Kalmune	20	2927	0	26	0	2	0	2	0	19	6	675	0	43	0	6	0	0	1	425	1	89	0	42	**36**	**98**
SRILANKA	**385**	**67130**	**16**	**1129**	**0**	**159**	**0**	**74**	**6**	**670**	**33**	**8038**	**1**	**1153**	**1**	**277**	**0**	**19**	**24**	**4977**	**7**	**1321**	**31**	**3300**	**44**	**98**

Source: Weekly Returns of Communicable Diseases (esurvillance.epid.gov.lk). T=Timeliness refers to returns received on or before 17th Nov, 2023 Total number of reporting units 358 Number of reporting units data provided for the current week: 358 **C****-Completeness

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

Table 2: Vaccine-Preventable Diseases & AFP

04th– 10th Nov 2023 (45th 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*	01	02	00	00	00	01	01	00	00	01	01	81	70	15.7 %
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	02	208	79	163.3 %
Measles	04	00	01	00	01	00	00	00	00	06	03	699	23	2939 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	09	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	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Japanese Enceph-alitis	02	00	00	00	00	00	00	00	00	02	00	04	01	300 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	07	01	600 %
Tuberculosis	107	20	12	05	04	00	10	04	18	180	332	8024	5950	34.8%

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
August							
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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