WEEKLY EPIDEMIOLOGICAL REPORT

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COLD CHAIN MANAGEMENT IN NATIONAL IMMUNIZATION PROGRAMME

This is the first article of two in a series on "Cold Chain Management in National Immunization Programme"

A vaccine consists of biological substances that stimulate the immune system to produce antibodies against a specific disease. They typically contain weakened or inactivated forms of a virus or bacterium, or their components. Once administered, the body recognizes these antigens as foreign and triggers an immune response, creating memory cells that can quickly identify and neutralize the actual pathogen if encountered later.

Vaccines are saving millions of lives each year across the globe. However, the effectiveness of a given vaccine depends on maintaining the desired temperature range throughout the journey from the manufacturing plant to the recipient. This process is known as the vaccine cold chain.

All vaccines lose their potency when exposed to higher temperatures (> 8 ^{0}C) than recommended while some vaccines lose their potency when they are exposed to temperatures less than 0 ^{0}C. Therefore, the use of potent vaccines, stored and transported at the correct temperature, remains an integral part of the success of a National Immunization Programme (NIP). High levels of immunization coverage become meaningless if the vaccines used are not potent. Sri Lanka has a strong NIP that has helped to significantly reduce the incidence of Vaccine-Preventable Diseases (VPD). One of the main factors that has significantly contributed to the success of the NIP in Sri Lanka was the high vaccination coverage with highly potent vaccines.

Immunization supply chain in Sri Lanka

The Epidemiology Unit, Central Vaccine Store (CVS), is equipped with Walk-In Cold Rooms (WICR) and Walk-In-Freezer Rooms (WIFR), to store vaccines which are being used in NIP. These vaccines are distributed to 27 Regional Medical Supplies Divisions (RMSDs) every two months. Each RMSD has at least one WICR and a Deep Freezer to store vaccines at the district level. Each RMSDs transport vaccines to Medical Officer of Health (MOH) offices once a month based on their requests. MOH offices store vaccines in Ice-Lined Refrigerators (ILRs). On immunization clinic days, vaccines are transported to field immunization clinics using Freeze-Protective Vaccine Carriers (FPVC). Therefore, it is crucial to keep vaccines at the right temperature throughout their journey, from the central vaccine store to the immunization clinic.

Key Components of Cold Chain Management

1. **Personnel:** Trained individuals are responsible for overseeing, handling, and maintaining vaccines within the optimal temperature range.

2. **Systems and Processes:** The systems and processes that providers use to ensure cold chain management include: **Standardized Operating Procedures (SOPs)**. **Inventory Management Systems**, **Temperature Monitoring Systems**

3. **Cold Chain Equipment**: This includes equipment required to store, transport and monitor the temperature by using the devices.

<u>Cold chain equipment</u>: To store, transport vaccine and <u>monitor temperature</u>
Storage equipment
<u>Walk In Cold Room (WICR)</u>

Walk-in cold rooms are large, refrigerated spaces designed to store vaccines at 2 – 8 ^{0}C. They are essential for maintaining the potency and

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vaccines, especially in national and sub-national storage facilities (RMSD & MOH Office). The WICR maintains plus temperature and stores all the freeze-sensitive vaccines to maintain the potency of the vaccines. All the NIP vaccines except the Oral Polio vaccine are kept in the WICR at RMSDs.

Walk In Freezer Room (WIFR)

Walk-in freezer Rooms are essential for the storage of freeze-resistant vaccines, especially those requiring long-term storage (BCG, OPV, Live JE & MMR/MR). These specialized cold storage units are designed to maintain precise temperature control, ensuring that vaccines remain potent and effective.

Ice-Lined Refrigerator (ILR)

The ILR, a WHO-prequalified device specifically designed for vaccine storage, offers extended cold chain capacity compared to standard domestic refrigerators. Its top-opening lid minimizes cold air loss, ensuring optimal temperature conditions. The ILR maintains a temperature range of +2°C to +8°C and features efficient vaccine organization it's inside. Temperature monitoring equipment, such as Column Thermometers & Fridge Tags, should be placed inside the ILR, and temperature records must be meticulously maintained. To ensure proper vaccine storage, all Live vaccines should be stored in lower baskets while non-live vaccines should be kept in upper baskets, as indicated on the storage sticker developed by the Epidemiology Unit.

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Table 1 : Water Quality Surveillance
Number of microbiological water samples October 2024

District	MOH areas	No: Expected *	No: Received
Colombo	18	108	**34**
Gampaha	15	90	**NR**
Kalutara	13	78	**57**
Kalutara NIHS	2	12	**22**
Kandy	23	138	**NR**
Matale	13	78	**NR**
Nuwara Eliya	13	78	**21**
Galle	20	120	**106**
Matara	17	102	**85**
Hambantota	12	72	**8**
Jaffna	14	84	**155**
Kilinochchi	4	24	**29**
Mannar	5	30	**NR**
Vavuniya	4	24	**NR**
Mullatvu	6	36	**20**
Batticaloa	14	84	**20**
Ampara	7	42	**13**
Trincomalee	12	72	**9**
Kurunegala	29	174	**NR**
Puttalam	13	78	**NR**
Anuradhapura	23	138	**NR**
Polonnaruwa	9	54	**29**
Badulla	16	96	**171**
Moneragala	11	66	**NR**
Rathnapura	20	120	**NR**
Kegalle	11	66	**41**
Kalmunai	13	78	**8**

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

To be Continued....

Table 1: Selected notifiable diseases reported by Medical Officers of Health 09th – 15th Nov 2024 (46th Week)

RDHS	Dengue Fever		Dysentery		Encephalitis		En. Fever		F. Poisoning		Leptospirosis		Typhus F.		Viral Hep.		H. Rabiies		Chickenpox		Meningitis		Leishmania-		Tuberculosis		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	A	B	T*	C**
Colombo	156	10342	0	41	0	11	0	49	0	25	9	511	0	8	0	9	0	0	23	540	1	44	0	2	32	1925	**94**	**100**
Gampaha	95	4993	0	41	2	39	0	14	0	77	30	841	0	11	0	11	0	0	9	442	0	129	1	27	33	1066	**67**	**100**
Kalutara	23	2535	1	34	1	3	0	38	0	38	11	797	0	8	0	11	0	1	9	616	0	60	0	2	36	542	**93**	**100**
Kandy	68	4157	0	37	0	7	0	9	2	62	5	249	0	36	1	13	0	3	4	379	1	14	2	59	5	554	**100**	**100**
Matale	41	843	1	18	0	3	0	8	0	29	3	100	0	6	0	9	0	0	1	142	0	24	5	350	0	116	**100**	**100**
Nuwara Eliya	0	330	1	137	0	7	0	11	0	208	1	167	0	42	0	9	0	0	7	256	0	18	0	1	9	249	**100**	**100**
Galle	25	1938	3	53	0	22	0	12	3	108	23	874	0	116	0	11	0	2	12	792	0	93	0	5	7	408	**95**	**100**
Hambantota	4	785	0	28	0	4	0	6	0	48	9	461	0	47	0	7	0	2	4	293	0	28	7	461	1	134	**100**	**100**
Matara	14	1081	2	13	0	6	0	2	9	38	17	547	0	29	0	24	0	0	7	345	1	74	2	113	2	151	**100**	**100**
Jaffna	25	5370	2	67	0	2	0	27	0	47	0	24	3	493	0	7	0	1	4	209	0	33	0	1	3	236	**93**	**93**
Kilinochchi	3	303	0	17	0	0	0	2	0	2	0	20	0	11	0	0	0	2	1	15	0	6	0	2	0	27	**100**	**100**
Mannar	5	307	1	18	0	0	0	1	0	6	1	30	0	13	0	1	0	0	2	12	4	9	1	2	0	56	**100**	**100**
Vavuniya	0	174	0	13	0	1	0	2	0	22	2	106	0	5	0	4	0	0	0	41	1	25	1	11	0	38	**100**	**100**
Mullaitivu	1	211	0	9	0	0	0	0	1	19	2	70	0	11	0	0	0	2	0	11	0	5	1	14	0	32	**100**	**100**
Batticaloa	11	1498	3	121	1	17	0	7	0	64	0	76	0	3	0	24	0	2	7	151	0	51	0	4	2	143	**100**	**100**
Ampara	3	253	0	37	0	4	0	0	0	23	6	193	0	2	0	6	0	1	5	127	0	36	0	22	0	105	**100**	**100**
Trincomalee	16	677	1	19	0	1	0	3	0	11	1	142	0	12	0	4	0	0	2	97	0	22	0	18	0	114	**100**	**100**
Kurunegala	14	2097	1	52	0	36	0	3	1	354	54	852	0	39	0	9	0	4	12	573	5	265	15	598	6	442	**79**	**100**
Puttalam	19	1099	1	12	0	4	0	3	0	3	7	257	0	38	0	4	0	1	4	128	4	78	0	36	26	216	**100**	**100**
Anuradhapura	13	710	0	33	0	8	0	3	0	43	7	410	0	31	1	15	0	1	6	276	2	62	11	824	4	259	**100**	**100**
Polonnaruwa	7	375	0	27	0	3	0	1	0	32	4	252	0	2	0	59	0	1	2	149	0	31	3	466	14	110	**100**	**100**
Badulla	8	797	0	38	1	11	0	8	0	58	4	464	2	50	0	49	0	0	7	356	1	38	0	42	0	225	**100**	**100**
Monaragala	15	903	0	20	0	5	0	3	0	87	12	628	2	35	0	64	0	1	2	163	2	96	6	239	0	118	**100**	**100**
Ratnapura	41	2659	3	116	0	11	0	9	0	33	22	1882	2	34	0	31	0	2	4	352	1	134	9	169	9	344	**100**	**100**
Kegalle	16	1858	1	28	3	14	0	10	0	15	38	799	0	31	1	14	0	1	19	843	2	77	0	30	5	325	**91**	**100**
Kalmunai	3	694	0	17	0	1	0	2	0	30	1	70	0	5	0	4	0	0	8	228	3	23	0	0	2	132	**85**	**100**
SRILANKA	**626**	**46989**	**21**	**1046**	**8**	**220**	**0**	**233**	**16**	**1482**	**269**	**10822**	**9**	**1118**	**3**	**399**	**0**	**27**	**161**	**7536**	**28**	**1475**	**64**	**3498**	**196**	**8001**	**96**	**99**

Source: Weekly Returns of Communicable Diseases (esurvillance.epid.gov.lk). **T=**Timeliness refers to returns received on or before 15th Nov, 2024 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

09th – 15th Nov 2024 (46th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2024	Number of cases during same week in 2023	Total number of cases to date in 2024	Total number of cases to date in 2023	Difference between the number of cases to date in 2024 & 2023
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	03	00	00	00	00	00	00	00	01	04	02	70	86	-18.6%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	01	00	00	01	03	00	02	00	01	08	01	261	211	23.6 %
Measles	01	00	00	01	01	00	00	01	00	04	18	295	730	-59.5 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	02	09	-77.7%
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	02	0 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	05	06	-16.6 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Japanese Enceph-alitis	00	00	00	00	00	00	00	00	00	00	02	11	04	175 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	59	07	742.8 %

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

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

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