



WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health & Mass Media

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Environmental Surveillance for Polio Eradication

Introduction

Poliomyelitis remains a global public health priority, requiring highly sensitive surveillance to achieve eradication. Acute flaccid paralysis (AFP) surveillance has been the foundation of detection for decades, but it does not capture asymptomatic infections. Environmental surveillance (ES), which tests sewage and wastewater for polioviruses, has become an important addition by detecting viral shedding from both symptomatic and asymptomatic individuals. It provides early warning of transmission, confirms elimination in formerly endemic areas, and has repeatedly identified circulation in places without AFP-positive cases, proving its value as a sentinel system.

Biological Basis of Environmental Surveillance

ES builds on the biological fact that poliovirus is shed in stool and enters sewage systems, where it can be detected through sensitive laboratory techniques. This approach provides earlier and more sensitive detection than AFP surveillance, particularly in urban areas with well-developed sewage networks. Limitations include intermittent shedding, dilution in wastewater, and low feasibility in rural areas. Despite these challenges, ES has expanded significantly under the Global Polio Eradication Initiative, with over 550 sites in 45 countries processing more than 12,000 samples annually. It now plays a vital role in tracking virus spread, guiding vaccination strategies, and supporting eradication certification.

Principles of Environmental Surveillance

ES depends on three principles:

1. **Risk Prioritisation:** Target high-risk areas for poliovirus importation or vaccine-derived poliovirus emergence.
2. **Balancing Sensitivity and Feasibility:** Ensure sensitive detection while maintaining

practical, cost-effective operations suited to local infrastructure.

3. **Collaboration:** Coordinate efforts among epidemiologists, sanitation engineers, laboratory scientists, and immunisation managers globally.

Site Management and Field Implementation

The value of ES depends on the selection and management of sites. High-risk locations include communities with a history of poliovirus circulation, low immunisation coverage, or inadequate sanitation. In cities with large sewage networks, ES is especially sensitive. Countries such as Nigeria and Pakistan operate networks of more than 50 sites, illustrating the scale needed in endemic areas. Proper documentation, supervision of collection, and careful transport procedures ensure that each site contributes reliably to the surveillance system.

Sample Collection, Packaging, and Transportation

Wastewater collection and handling are critical for environmental surveillance (ES). The WHO recommends regular sampling, ideally in the early morning, to capture peak virus concentration. At least one litre of wastewater is collected midstream, avoiding debris and contaminants. Samples are securely sealed, triple-packed, and maintained at 2–8°C under a reverse cold chain for transport to the lab. If delayed, samples are frozen at –20°C. Delivery within 3–7 days ensures sample viability. Trained and supervised staff with proper equipment is vital for quality assurance.

Use of Data for Action

The impact of ES lies in how its results are applied. Laboratory findings are reported through national systems and integrated into the global Polio Information System. ES data are used to detect outbreaks, monitor immunisation campaigns, and provide assurance for eradication

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certification. Positive results require urgent action, including expanded AFP surveillance and additional sampling. While laboratory processing can take longer than AFP samples due to the complexity of wastewater specimens, timely communication of results is critical.

Monitoring and Evaluating Performance

Continuous monitoring is essential to ensure the sensitivity of ES systems. Regular review of these indicators helps countries identify weak sites and improve performance before expanding to new locations, ensuring efficient use of resources. Indicators to monitor ES performance at the site (and/or national, as appropriate) level are shown in the Table below.

Table 5. Performance indicators

Indicator	Calculation (expressed as a percentage)	Target	Comments
Enterovirus detection	$\frac{\text{\# samples where EV (PV or NPEV) was detected}}{\text{\# of samples}}$	>=50%	Analysis to be conducted per site, for 12-month period, to account for seasonality
Completeness of sample collection	$\frac{\text{\# samples collected}}{\text{\# samples scheduled to be collected}}$	>=80%	Each site should have a sampling schedule (i.e., monthly, fortnightly)
Timeliness of sample collection	$\frac{\text{\# of samples collected on the week assigned}}{\text{\# of samples collected}}$	>=80%	Each site has a scheduled week of collection to facilitate transport and laboratory workload.
	$\frac{\text{\# of samples collected at the recommended time of day}}{\text{\# of sample collected}}$	>=80%	Each site has a scheduled time of collection to coincide with peak wastewater flow
Condition of ES sample	$\frac{\text{\# of samples that arrive in the laboratory in good condition}^{\dagger}}{\text{\# of samples arrived in the laboratory}}$	>=80%	Good condition = volume ≥ 1 L*, reverse cold chain from each site maintained, no leakage
Timeliness of ES sample shipment	$\frac{\text{\# of samples that arrive at a WHO-accredited lab } \leq 3 \text{ days of sample collection}}{\text{\# of samples collected}}$	>=80%	Analysis at national level; however, subnational or site-specific analyses may be useful for identifying bottlenecks or concerns
Timeliness of reporting laboratory results	$\frac{\text{\# of samples with final lab results } \leq 35 \text{ days of collection}}{\text{\# of samples collected}}$	>=80%	Program staff should be aware of laboratory turn-around times to monitor for expected ES sample results
Timeliness of reporting PV laboratory results	$\frac{\text{\# PV samples with sequencing results available } \leq 7 \text{ days of receipt at a WHO-accredited sequencing lab}}{\text{\# of PV samples positive by ITD requiring sequencing}}$	>=80%	

* volume specific to grab sampling method; refer to guidance related to bag-mediated filtration for appropriate volume. Surveillance standards for vaccine-preventable diseases, second edition. Geneva: World Health Organization; 2018. EV= enterovirus; PV= poliovirus; NPEV= non-polio enterovirus; ITD= intratypic differentiation

Photo credit: Field guidance for the implementation of environmental surveillance for poliovirus, WHO (2023)

At national and subnational levels, ES monitoring includes quarterly site reviews, integration with AFP/EPI meetings, and semi-annual desk reviews. Sites that have underperformed for over a year need reassessment. National programmes must report promptly with action plans to the WHO. At regional and global levels, supervision assesses ES coverage and high-risk population inclusion, uses lab dashboards for remote monitoring, and conducts external reviews every five years to ensure quality.

Programmatic Response to Poliovirus Detection

Detection of poliovirus in wastewater indicates a serious public health threat. Once confirmed, authorities and the World Health Organisation are notified within 24 to 48 hours. Response measures include intensified AFP case searches, expansion of ES sites, and targeted vaccination campaigns to close immunity gaps. In endemic countries, results guide adjustments to vaccination strategies, while in polio-free countries, a single positive sample is treated as a potential emergency. Such rapid responses have been instrumental in containing outbreaks before they escalate.

Way Forward for Sri Lanka

Sri Lanka has maintained its polio-free status through strong immunisation coverage and acute flaccid paralysis (AFP) surveillance, but increasing global travel and migration continue to pose a risk of poliovirus importation. This is an opportune moment to introduce environmental surveillance (ES) in high-risk urban centres such as Colombo and its suburbs to strengthen existing safeguards. Effective implementation will require close collaboration with the Central Environmental Authority and municipal councils for site access and management, along with expanded laboratory capacity at the Medical Research Institute to enable timely sample analysis. Integrating ES with AFP surveillance will enhance preparedness, preserve Sri Lanka's polio-free status, and establish a platform for wastewater-based monitoring of other emerging public health threats.

Compiled by:

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References:

1. Field guidance for the implementation of environmental surveillance for poliovirus, WHO (2023)

Table 1: Selected notifiable diseases reported by Medical Officers of Health 16th–22nd Aug 2025 (34th Week)

RDHS	Dengue Fever		Dysentery		Encephalitis		En. Fever		F. Poisoning		Leptospirosis		Typhus F.		Viral Hep.				H. Rabies		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	A	B	A	B	T*	C**		
Colombo	137	8400	0	24	0	11	0	11	1	34	4	316	0	5	0	14	0	0	12	409	0	52	0	3	37	1343	100	100						
Gampaha	108	5510	1	34	0	25	0	3	1	128	14	559	0	10	1	15	0	0	20	603	10	125	1	34	27	781	93	100						
Kalutara	39	1794	0	30	0	6	0	17	0	45	7	441	0	3	0	5	0	0	24	631	2	37	0	2	5	376	100	98						
Kandy	92	3226	0	38	0	3	1	7	0	36	5	209	1	42	0	7	0	0	14	382	0	18	0	50	11	446	100	100						
Matale	17	913	0	20	0	2	0	0	1	66	5	180	0	4	0	9	0	0	1	94	0	8	3	202	2	105	100	100						
Nuwara Eliya	8	248	0	65	0	6	0	4	0	57	3	110	0	46	0	2	0	0	5	203	1	24	0	0	6	194	100	100						
Galle	27	1519	0	33	0	4	0	5	0	55	3	572	1	60	0	8	0	1	4	529	0	117	0	3	15	344	95	100						
Hambantota	7	683	1	29	0	5	0	0	0	4	3	290	0	27	0	10	0	0	2	237	0	18	2	202	0	107	100	100						
Matara	26	1210	0	12	0	2	0	1	0	12	1	339	0	12	0	13	0	0	9	290	1	32	0	76	4	117	100	100						
Jaffna	6	904	2	71	0	2	2	15	0	42	0	126	3	405	1	3	0	2	2	258	0	21	0	0	4	150	92	93						
Kilinochchi	0	72	1	14	0	1	0	4	0	5	1	64	0	11	0	1	0	0	0	4	0	0	0	2	1	36	100	100						
Mannar	1	128	0	5	0	0	0	0	0	2	0	23	0	14	0	1	0	0	0	18	0	13	0	5	0	39	100	100						
Vavuniya	3	70	0	9	0	0	0	1	0	38	1	73	2	10	0	0	0	0	0	37	0	17	0	15	1	41	100	100						
Mullaitivu	0	48	0	5	0	0	0	1	0	23	0	53	0	9	0	0	0	0	0	29	0	5	0	3	0	21	100	100						
Batticaloa	6	1531	1	108	0	14	0	2	0	156	2	90	0	2	0	22	0	0	3	150	1	27	0	1	2	100	100	100						
Ampara	6	195	1	38	0	11	0	0	1	18	6	178	0	3	0	8	0	1	3	157	2	38	0	21	1	41	100	100						
Trincomalee	4	895	0	35	0	4	0	1	0	72	0	117	0	9	0	5	0	0	1	97	1	12	0	7	0	85	100	100						
Kurunegala	24	1268	1	39	0	15	0	1	0	48	5	539	0	23	0	7	0	1	25	616	1	118	10	421	8	240	97	100						
Puttalam	4	496	0	24	0	3	0	0	0	5	0	205	0	33	0	2	0	1	1	118	2	71	0	25	0	135	92	100						
Anuradhapura	6	441	0	29	0	6	0	3	0	30	1	303	1	22	0	12	0	0	7	244	1	49	4	514	7	216	87	100						
Polonnaruwa	5	271	1	14	0	6	0	1	0	10	3	229	0	1	0	19	0	0	7	146	1	17	8	318	3	66	100	90						
Badulla	14	605	0	23	0	9	0	3	1	7	8	223	2	24	1	51	0	0	9	295	1	54	5	46	6	210	94	100						
Monaragala	8	651	0	20	0	3	0	0	0	4	3	439	0	30	4	38	0	0	7	129	0	38	6	152	6	106	91	100						
Ratnapura	62	3744	0	86	0	6	0	3	1	55	10	1083	0	24	0	12	0	1	12	331	0	83	10	164	5	282	100	100						
Kegalle	24	1128	0	49	0	13	0	9	0	32	7	544	0	13	0	15	0	0	9	633	1	83	0	22	6	190	90	100						
Kalmunai	1	312	1	28	0	6	0	0	0	19	1	86	0	1	0	3	0	1	8	133	1	41	0	0	2	92	85	100						
SRILANKA	635	36262	10	882	0	163	3	92	6	1003	93	7391	10	843	7	282	0	8	185	6773	26	1118	49	2288	159	5863	97	99						

Source: Weekly Returns of Communicable Diseases (surveillance.avid.gov.lk). T=Timeliness refers to returns received on or before 29th Aug, 2025 Total number of reporting units 360 Number of reporting units data provided for the current week: 359. C**=Completeness. A = Cases reported during the current week. B = Cumulative cases for the year.

Table 2: Vaccine-Preventable Diseases & AFP

16th – 22nd Aug 2025 (34th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2025	Number of cases during same week in 2024	Total number of cases to date in 2025	Total number of cases to date in 2024	Difference between the number of cases to date in 2025 & 2024
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	01	01	00	00	01	00	00	00	03	01	43	48	-10.4%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	02	00	00	01	00	00	00	00	00	05	07	168	190	-11.5 %
Measles	00	00	00	00	00	00	00	00	00	00	10	01	282	-99.6%
Rubella	00	00	00	00	00	00	00	00	00	00	00	04	02	-100%
CRS**	00	00	00	00	00	00	00	00	00	00	00	01	00	0 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	05	05	0 %
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	04	06	33.3 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	02	17	39	-56.4 %

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 August 2025,

05

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**

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