WEEKLY EPIDEMIOLOGICAL REPORT

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Infectious Disease Surveillance Part I

This is the first article of series of two artcles named as Infectious Disease Surveillance

Goals of Infectious Disease Surveillance

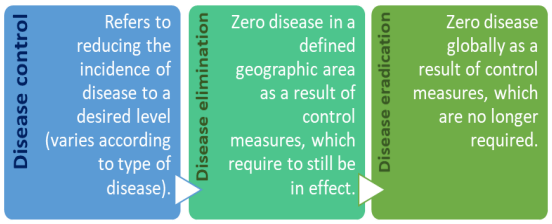
An important epidemiological tool to monitor the health of a population is Infectious Disease Surveillance (IDS).

The goals of IDS are threefold:

•**To describe the current burden and epidemiology of the disease** – critical for demonstrating need of advocating for interventions e.g. vaccination, mass drug administration

•**To monitor trends –** to assess impact of interventions like vaccinations. Also, to not only measure number of cases, but the etiology of cases as well.

•**To identify outbreaks and new pathogens** - ongoing surveillance for outbreak and epidemic prone diseases can facilitate early detection, allowing a faster response and therefore mitigation of the outbreak.



Surveillance also monitors the **CONTROL**, **ELIMINATION** and **ERADICATION** of diseases.

Infectious Disease Surveillance (IDS) can have different approaches based on the epidemiology and clinical presentation of the disease and the goals of surveillance. The distinctions between IDS methods are described with examples below.

Active versus Passive Surveillance

Passive surveillance systems involve medical professionals at community level and in health facilities reporting cases to a designated public health agency, which conducts data management and analysis accordingly. While the public health staff do not directly engage in identifying cases but will assess data completeness and reliability of the reported cases. Notifiable disease surveillance is an example of this method. Notifiable diseases are of public health importance as they have either been considered to be a severe risk to human health, outbreak prone, an emerging / reemerging disease, or having a timely intervention for control of the disease. All countries mandate which diseases are notifiable based on the country epidemiology. Globally, the WHO defines what is notifiable by every country to WHO such as Ebola. Another example of passive surveillance is routinely gathered data such as vital statistics. In contrast, ***active surveillance*** requires public health staff to engage actively and take action to receive reports of disease cases. It can involve calling/ visiting health facilities to encourage follow-up or having medical reviews to identify cases meeting case definitions. While active surveillance aims to detect every case, passive surveillance is likely to miss cases due to the reporting structure. Although active surveillance is more comprehensive, it requires significant human and financial resources, so passive surveillance is often implemented. Active surveillance entails several approaches, including country-wide (e.g. polio, measles, rubella) or restricted to sentinel sites (e.g. SARI/ILI). For some diseases, surveillance be a mixture of passive and active where

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the passive surveillance is complemented by active surveillance to investigate outbreak signals detected through passive surveillance.

Identifying cases in medical facilities and the community

Choosing the place of conducting surveillance is based on a number of considerations: severity of the disease, mode of presentation, importance of finding every single case, how outbreak prone is the disease. Infectious disease cases can be identified at the medical facilities or in the community. More severe cases of disease can often be identified at hospitals (e.g. SARI/ILI). For some diseases (e.g. Ebola), where community fears may prevent cases from going to seek healthcare, hospital surveillance would be insufficient. Milder cases of disease will either result in visits to OPDs or not seeking care at all. In such instances, ***community-based surveillance*** is useful for surveying diseases targeted for eradication because all cases must be traced and is not limited to those severe enough to be admitted to hospitals or those that have access to health care facility. An example would be the Public Health Midwives (PHMs) referring to the MOH, if they come across individuals in the community with maculopapular rash (suspected measles/rubella case); especially as Sri Lanka has currently achieved elimination status in respect to measles and congenital rubella. Acute Flaccid Paralysis (AFP) surveillance is an active surveillance network that aims to identify every case of polio, which is currently targeted for eradication. Suspected cases are sought in the community and health facilities to identify any unreported cases.

Sentinel versus Population-Based Surveillance

Sentinel surveillance involves a single OR small number of health facilities that are responsible for collecting data on cases enrolled with the case definition under surveillance. Sentinel site surveillance provides useful epidemiological information on proportions caused by different pathogens, age distribution and risk factors and could also be used for monitoring trends of hospitalized case within a health facility. Often data gathered in this manner is of higher quality. In contrast, ***population-based surveillance*** involves every appropriate health facility reporting on predefined diseases with the goal of identifying all cases in a specific geographic area. Can represent the whole country or a defined subnational population. Also, since the population is defined, sites of surveillance can produce rates of disease, which allows for comparisons between other population-based surveillance sites. However, this method is more costly than sentinel site surveillance but produces data that is more generalizable on disease incidence.

Case-Based versus Aggregated Surveillance

The main feature of ***aggregate surveillance*** data is that it lacks detailed information on specific cases but typically includes data on number of cases for a specific region and time period. This info can be used to monitor number of cases but lacks the individual-level data required for specific analyses. An example is the Integrated Disease Surveillance and Response (IDSR) framework by the CDC which asks clinicians to report the number of cases of specific diseases.

Case-based surveillance refers to surveillance systems that collect information about each case at individual level. This system usually has a case investigation form where relevant info on the patient, family members, medical and lab records could be documented. These two surveillance systems can transition to each other when required, for example in the 2009 H1N1 outbreak, where a case-based transitioned into an aggregate system due to overwhelming case number. The reverse is also common for example in a disease such as measles. Measles surveillance began as an aggregate system due to being endemic in several countries in the 90s. As it moved away from control towards elimination, the surveillance system moved towards being case-based, to ensure that every case is reported and investigated. A key advantage of this surveillance is that it allows to analyze which age cohorts are being infected and their individual vaccination status to help to target vaccination efforts and close existing immunity gaps ***(to be continued).***

Source:

Cohen, A.L., Murray, J. (2017). Infectious Disease Surveillance. *International Encyclopedia of Public Health*, 2nd Ed, Vol 4, 222-229. http://dx.doi.org/10.1016/B978-0-12-803678-5.00517-8

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… to be continued

Table 1: Selected notifiable diseases reported by Medical Officers of Health 17th– 23rd June 2023 (25th Week)

RDHS	Dengue Fever		Dysentery		Encephaliti		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	373	8685	1	7	0	9	0	1	1	7	3	169	0	0	0	3	0	0	2	160	2	25	0	5	**25**	**100**
Gampaha	412	9042	1	8	1	13	0	1	0	2	12	312	0	6	0	9	0	0	8	145	3	40	2	27	**1**	**99**
Kalutara	161	2956	0	14	0	1	0	0	0	5	31	473	0	1	1	4	0	1	5	251	7	51	0	1	**14**	**100**
Kandy	277	3149	3	23	0	0	0	7	0	12	5	144	0	36	0	2	0	1	6	146	2	14	1	16	**85**	**100**
Matale	49	812	0	2	0	0	0	1	0	8	6	101	0	10	0	3	0	0	1	31	0	4	14	175	**20**	**100**
NuwaraEliya	7	128	1	76	0	1	0	2	0	38	3	60	3	40	0	4	0	0	5	64	0	8	0	0	**58**	**100**
Galle	85	1322	2	28	0	11	0	5	0	19	18	524	0	27	0	1	0	1	5	189	0	12	0	1	**33**	**100**
Hambantota	53	942	0	6	0	3	0	1	0	8	4	197	4	50	0	7	0	0	4	92	0	15	7	338	**23**	**100**
Matara	71	1012	0	19	0	6	1	1	1	11	11	345	0	19	0	2	0	2	4	152	0	12	5	102	**51**	**100**
Jaffna	26	1610	3	50	0	1	1	9	0	16	0	8	5	473	0	1	0	1	0	111	0	6	0	2	**63**	**93**
Kilinochchi	3	69	0	4	0	0	0	0	0	16	0	7	0	6	0	0	0	0	3	12	0	0	0	0	**18**	**100**
Mannar	3	71	0	6	0	0	0	1	0	0	0	27	0	5	0	0	0	0	0	1	2	6	0	0	**32**	**100**
Vavuniya	3	114	0	5	0	1	0	0	0	0	0	25	0	7	0	1	0	0	1	14	0	3	0	7	**6**	**100**
Mullaitivu	10	87	0	8	0	0	0	3	0	11	1	29	0	5	0	0	0	0	1	11	0	0	0	5	**21**	**100**
Batticaloa	66	1804	3	134	0	6	1	5	0	17	1	60	0	1	2	5	0	1	2	41	0	24	0	1	**53**	**100**
Ampara	0	68	0	1	0	1	0	0	0	0	0	20	0	0	0	1	0	0	0	19	0	11	0	2	**12**	**51**
Trincomalee	53	1827	3	10	0	1	0	0	0	4	1	55	0	13	0	0	0	0	0	33	3	20	0	1	**22**	**100**
Kurunegala	124	1924	2	25	0	7	0	0	1	4	5	225	0	9	0	9	0	2	12	277	3	88	22	270	**21**	**100**
Puttalam	39	2566	0	7	0	1	0	1	0	0	2	32	0	7	0	1	0	0	3	74	1	33	1	15	**17**	**100**
Anuradhapur	41	506	0	4	0	0	0	1	0	2	6	207	0	25	0	2	0	0	1	142	0	29	2	298	**21**	**99**
Polonnaruwa	9	423	0	10	0	5	0	0	0	6	5	125	0	5	0	12	0	0	2	49	0	13	9	237	**33**	**99**
Badulla	28	642	0	19	0	3	0	0	0	27	8	181	0	28	0	60	0	0	1	99	1	26	1	17	**62**	**100**
Monaragala	17	359	0	14	0	5	0	0	0	0	7	387	0	28	0	17	0	0	4	46	1	41	8	101	**24**	**100**
Ratnapura	94	1315	1	27	3	13	0	2	0	13	28	665	0	16	0	12	0	1	3	104	5	103	2	100	**34**	**100**
Kegalle	111	1796	0	13	0	1	0	2	0	8	17	386	1	21	0	3	0	0	10	240	0	34	0	18	**28**	**100**
Kalmune	22	1503	2	42	2	9	0	0	0	0	1	34	0	0	0	0	0	0	3	43	0	20	0	0	**39**	**100**
SRILANKA	**2137**	**44732**	**22**	**562**	**6**	**98**	**3**	**43**	**3**	**234**	**17**	**4798**	**13**	**838**	**3**	**159**	**0**	**10**	**86**	**2546**	**3**	**638**	**74**	**1739**	**34**	**98**

Source: Weekly Returns of Communicable Diseases (esurvillance.epid.gov.lk). T=Timeliness refers to returns received on or before 23rd June, 2023 Total number of reporting units 358 Number of reporting units data provided for the current week: 335 C**-Completeness

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

Table 2: Vaccine-Preventable Diseases & AFP

17th– 23rd June 2023(25th 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	01	00	00	00	00	00	01	00	02	01	45	43	4.6 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	01	00	00	01	00	00	02	01	01	06	00	107	32	234.3 %
Measles	02	00	00	00	01	00	00	00	00	03	00	29	12	141.6 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	01	00	0 %
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	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	02	07	- 71.4 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	04	01	300 %
Tuberculosis	96	31	11	02	07	10	11	12	19	199	28	4450	3032	46.7 %

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 June 2023,

04

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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