International Journal of Advances in Medicine
Samaraweera NY. Int J Adv Med. 2022 Mar;9(3):286-293
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: https://dx.doi.org/10.18203/2349-3933.ijam20220432

Original Research Article

Evaluation of selected aspects of influenza surveillance system and describing influenza surveillance data collected during 2014-2018 of district general hospital Matara, Sri Lanka

Nayana Y. Samaraweera*

Health Services Office, Paramulla, Matara, Sri Lanka

Received: 04 January 2022
Accepted: 11 February 2022

***Correspondence:**
Dr. Nayana Y. Samaraweera,
E-mail: yasindu.samaraweera6@gmail.com

ABSTRACT

Background: Influenza is one of the diseases which have the pandemic potential. Influenza surveillance as part of the pandemic preparedness activities was initiated in Sri Lanka in 2005. This study would help in evaluating, strengthening influenza surveillance system of DGH Matara, and taking targeted preventive measures and contribute to more efficient resource allocation in the future.
Methods: This was a cross sectional analytical study.
Results: Case definitions for ILI and SARI used were consistent with the epidemiology unit Sri Lanka prescribed definitions. Though the site collected data on cases daily and sampled weekly, sampling technique was not random. Respiratory specimen collection, packaging, storage and transport were consistent with the guidelines of epidemiology Unit, Sri Lanka. Refrigerator temperature monitoring, analyzing surveillance data on site as well as supervisory visits made by central level were not satisfactory. No clear pattern of ILI and SARI was observed among different age groups during 2014-2018. Influenza viral activity was detected except for "untyped" from respiratory samples sent by DGH, Matara during 2014-2018. Pandemic preparedness by the site was not at optimal level.
Conclusions: Representativeness of data obtained from respiratory specimen collection and data analyzing were not satisfactory. Temperature monitoring inside storage refrigerators of the site was not possible as no written records were available. Supervision from the central level was not satisfactory.

Keywords: Influenza surveillance, Pandemic preparedness, Cross sectional analytical study

INTRODUCTION

Influenza can result in serious respiratory diseases and surveillance can identify novel viral strains, detect unusual symptoms and assess disease burden. Influenza is one of the diseases which have the pandemic potential.[1,2]

Influenza surveillance as part of the pandemic preparedness activities was initiated in Sri Lanka in 2005 for Avian/ pandemic influenza. This activity in humans had been established complementary to the influenza surveillance already initiated among animals by the department of animal production and health (DAPH). Both these activities are supervised by the national technical committee for Avian/ pandemic influenza preparedness.[1] Human and animal influenza surveillance activities are expected to act as the early warning system for possible Avian/ pandemic influenza outbreak in the country. Human influenza surveillance comprises of 2 components; Influenza like illness (ILI) surveillance and severe acute respiratory tract infections (SARI) surveillance.[3]

For surveillance purposes, according to epidemiology unit Sri Lanka (4), definition of influenza likes illness (ILI) is an acute respiratory illness with measured temperature ≥38° C, cough and onset within past 7 days. Definition of

SARI is an acute respiratory illness with a history of fever or measured temperature ≥ 38 ° C, cough, onset within past 7 days requiring hospital admission.

ILI surveillance has been initiated in 20 hospitals in Sri Lanka identified as sentinel surveillance sites for Avian/ pandemic influenza. These institutions have been selected considering their importance in geographical location and also in being a 'hot spot' for bird migration. They are expected to send at least thirty (30) samples per month from patients with influenza like illness (ILI) attending OPD to the medical research institute (MRI). MRI is the national influenza centre (NIC) in Sri Lanka for human influenza surveillance. Infection control nurse (ICN) is the responsible officer for this activity supervised by the microbiologist officers of the OPD, ICN would select those from whom specimen are collected out of those patients. She or he would also collect the information on the number of total OPD attendees and the number with ILI daily and consolidate this information into a weekly return that is sent to the epidemiology unit, Colombo. SARI surveillance has been established in 4 hospitals in the country; Lady ridgeway hospital (LRH), district general hospital (DGH) Matara, teaching hospital (TH) Peradeniya and TH Ragama. These are expected to send in up to 30 respiratory samples per month from inward patients admitted with severe acute respiratory tract infections (SARI). For the epidemiology component ICN would collect the information on the number of total inward patients in relevant wards and the number with SARI, daily and consolidate this information into a weekly return that is sent to the epidemiology unit.[3]

Animal surveillance is carried out by the department of animal production and health (DAPH) of the ministry of livestock development who is the partner of the ministry of health in Avian/ pandemic preparedness activities. Under routine animal influenza pooled and serum samples are collected randomly from backyard farms, industrial farms, and hot spots for migratory birds. These also include identified special targets such as wet markets, processing plants, parent stocks, pet birds and ducks. Any unusual bird deaths or disease outbreaks are also investigated. Sampling is mainly carried out by the veterinary investigation officer (VIO). Both human and animal influenza surveillance activities are monitored by the national technical committee for Avian/ pandemic influenza preparedness. This is a working group of high-level technical officers of the 2 main ministries and other relevant government, non-government and international donor agencies. The committee is co-chaired by the director general of department of animal production and health of livestock development and the director general of health services of ministry of health.[3]

Evaluating influenza surveillance system of DGH Matara, would help in identifying strengths and weaknesses to take and recommend necessary steps to improve it further. This will help in outbreak as well as pandemic situations. Strengthening influenza surveillance system would help in identifying impending influenza outbreak situation in Matara district as majority of respiratory cases are managed in the DGH Matara. Describing epidemiology of influenza surveillance data would help in taking targeted preventive measures and contribute to more efficient resource allocation in the future.

Objective of the current study was to evaluate selected aspects of influenza surveillance system and describing influenza surveillance data collected during 2014-2018 of district general hospital Matara, Sri Lanka.

METHODS

This was a hospital based analytical cross-sectional study and was conducted in DGH Matara.

Selected aspects of current Influenza surveillance system of DGH Matara such as relevant personnel (Director DGH Matara, microbiologist, ICN, MO-Public health and other surveillance staff) were interviewed. Relevant physical resources and settings (OPD and wards/ICU procedures relevant in influenza surveillance) were observed in evaluating ILI/SARI surveillance system according to Data record sheet.

Data extracted from SARI and ILI online data base of DGH Matara during 2014-2018 was used. Data recorded in Influenza surveillance forms (for SARI/ILI cases which were sampled) maintained by ICN was also used. Usually, a copy of this form was secured with ICN (in case a copy of this form was unavailable, MRI was traced back through proper channels to collect data). Data from bed head tickets (BHTs) of all SARI cases managed during 2014-2018 was also used to collect data.

Total sample size of the current study was 688 (SARI cases) and 1065 (ILI cases). So, the grand total of the sample was 1753.

The study was carried out from January 2020 to September 2020.

Exclusion and inclusion criteria

All SARI and ILI cases (without considering the outcome of the infection and age of the patient in the influenza data base) managed at DGH Matara during 2014-2018 were eligible for the study.

SARI and ILI cases outside duration of 2014-2018 were excluded. Any incomplete BHTs were counted as a case of SARI for the completeness of calculating total number of SARI cases. Available data thereof was also extracted.

Selected aspects of current influenza surveillance system of DGH Matara such as relevant personnel (Director DGH Matara, microbiologist, ICN, MO-public health and other surveillance staff) were interviewed. Relevant physical resources and settings (OPD and wards/ICU procedures

and drug stores relevant in influenza surveillance) were utilized to collect data. All SARI and ILI cases managed at DGH Matara during 2014-2018 were enrolled for the study.

Data record sheet I was employed to evaluate the Influenza surveillance system of DGH Matara. This Data record sheet was modified from CDC-USA influenza surveillance site evaluation form to suit the project's needs. Data record sheets were employed to collect data from SARI cases (Data record sheet IIa).[5] Check list was employed to assess the current pandemic Influenza preparedness of DGH Matara.

Data was collected by the PI himself. Due administrative permission was obtained from RDHS Matara and Director DGH Matara. Data was collected from director DGH Matara, Microbiologist, ICN, MO-public health and other relevant surveillance staff of DGH Matara regarding selected aspects of influenza surveillance and online SARI/ILI data base, BHTs (SARI) and influenza surveillance forms. In case of unavailability of test results (virological), MRI was traced back by the PI.

SPSS 11.2 [6] statistical package was used to enter and analyze data. Frequency and percentages of selected characteristics was described. Odds ratios (OR) and 95% confidence intervals were calculated. Significant level of ≥0.5 was applied.

Ethical clearance was granted by Ethical Review Committee, National Hospital, Colombo, Sri Lanka

RESULTS

Socio demographic details of ILI and SARI cases are demonstrated in Table 1.

We summarized the findings in selected aspects of ILI and SARI surveillance system of DGH Matara in Tables 2, 3, 4.

Case definitions for ILI and SARI used were consistent with the epidemiology unit Sri Lanka prescribed definitions. Relevant site surveillance staff was aware of the definitions.

Though the site collected data on cases daily and sampled weekly, sampling technique was not random. They only used standard format when sampling.

Respiratory specimen collection, packaging, storage and transport were consistent with the guidelines of epidemiology unit, Sri Lanka.

According to Table 1B, no surveillance data was analyzed or reports preparing were not the routine practice except the site staff being asked from the central level. Supervisory visits made by central level to the site were not pre-planned but were of adhoc manner. Quality monitoring of the surveillance system was satisfactory except irregular supervisory visits by central level.

Refrigerator temperature monitoring sheets were not used by the site. Results of respiratory specimens were not routinely reported back to the site from the central lab, Colombo. No on-site testing was available at DGH, Matara.

No clear pattern of ILI and SARI was observed among different age groups during 2014-2018 according to Table 5.

Peak activity of both ILI and SARI was observed during April-June period as well as months of November and December during 2014-2018 according to Table 6. Except for year 2016, all other years showed influenza viral activity during different months of the year.

Peak activity of both ILI and SARI was observed during April-June period as well as months of November and December during 2014-2018 according to Table 6. Except for year 2016, all other years showed influenza viral activity during different months of the year.

According to Table 7, all drugs and PPE were available at the time of data collection except for oseltamivir (Tamiflu)-suspension. No average monthly requirements were calculated by the site for drugs, PPE and for consumables for sampling. Adequacy of these logistics cannot be calculated as average monthly requirements were not calculated by the site.

Table 1: Socio demographic characteristics of ILI and SARI cases (N=N1+N2=1753).

Socio demographic characteristic	ILI cases, (N1=1065)	SARI cases, (N2=688)	Total sample, (N1+N2)=1753
	N 1 (%)	N 2 (%)	N (%)
Age (years), mean (SD)	30 (5.8)	39 (4.2)	34 (5.1)
Sex			
Male	899 (84.4)	579 (84.2)	1478 (84.3)
Female	166 (15.6)	109 (15.8)	275 (15.7)
Civil status			
Married	488 (45.8)	605 (87.9)	1093 (62.4)
Unmarried	577 (54.2)	83 (12.1)	660 (37.6)

Continued.

Socio demographic characteristic	ILI cases, (N1=1065)	SARI cases, (N2=688)	Total sample, (N1+N2)=1753
	N 1 (%)	N 2 (%)	N (%)
Monthly income (Sri Lankan rupees)			
≥70 000	675 (63.3)	400 (58.1)	1075 (61.3)
<70 000	390 (36.7)	288 (41.9)	678 (38.7)
Ethnicity			
Sinhalese	1012 (95.1)	680 (98.8)	1692 (96.5)
Muslims	53 (4.9)	8 (1.2)	61 (3.5)
Employment			
Paid work	345 (32.4)	435 (63.2)	780 (44.5)
Self employed	476 (44.7)	178 (25.9)	654 (37.3)
unemployed	244 (22.9)	75 (10.9)	319 (18.2)
Educational status			
School education completed	1001 (93.9)	684 (99.4)	1685 (96.1)
School education uncompleted	64 (6.1)	4 (0.6)	68 (3.9)

Table 2: Selected aspects of ILI and SARI surveillance system of DGH Matara.

Variables	ILI*	SARI*
Case definition*		
Definition used in practice	Mentioned below Table 1	Mentioned below Table 1
Definition shared with relevant staff	Yes	yes
Data collection		
Frequency	Cases daily/ sampling weekly	do
Representativeness of the population covered by the hospital	No	No
Using a standard format to collect data	Yes(sampling)/ No (cases)	Yes (sampling) /No (cases)
Respiratory specimen collection		
Collecting frequency	Weekly	Weekly
Sampling method	Non random	Non random
Type of specimen collected	Nasal and deep throat swab (2 samples from each patient)	Nasal and deep throat swab (2 samples from each patient)
Staff responsible	ICNO	ICNO
SOP (Standard operating procedure) Availability	Yes	Yes
Unique identifier assigned to the swab	Yes	Yes
Triple package system used for transport	Yes	Yes

*ILI definition-an acute respiratory infection with measured fever >38°C and cough with onset within the last 7 days.
*SARI definition-an acute respiratory infection with history of fever or measured fever >38°C and cough with onset within the last 7 days and requires hospitalization.

Table 3: Selected aspects of ILI and SARI surveillance system of DGH Matara.

Variables	ILI*	SARI*
Data reporting, management, analysis		
Position of the coordinator	ICNO	ICNO
Method used to report to central level	FluSys	FluSys
Frequency of reporting	Weekly	Weekly
Any data analysis performed on-site	No	No
Site capacity to identify increasing trend of cases	Yes	Yes
Preparing reports on increasing disease activity	No	No
Quality monitoring		
All cases recorded according to definition	Yes	Yes
Data quality is monitored at the site	No	No
Feedback from central level received	Yes	Yes
Supervising visits from central level received	Yes	Yes
Frequency of supervisory visits	Not regular	Not regular

Table 4: Selected aspects of ILI and SARI surveillance system of DGH Matara.

Variables	ILI*	SARI*
Training		
Staff is trained on sentinel surveillance	Yes	Yes
Training received on quality issues from central level	Yes	Yes
Hygiene		
Appropriate* PPE used during sampling	Yes	Yes
Hand washing when collecting specimens appropriately	Yes	Yes
SOPs for spillage of samples	Yes	Yes
Laboratory standards		
Average refrigerator storage duration before dispatch	5 hours	5 hours
Temperature of the storing refrigerator checked daily	Yes	Yes
Temperature monitoring sheet availability	No	No
Results of all specimens routinely reported to co-ordinator	No	No
Laboratory results reported back to clinicians	No	No
Respiratory specimen testing		
Frequency	Weekly	Weekly
Specimen receiving laboratory	MRI (National reference lab)	MRI
Means of transport to laboratory	Ambulance	Ambulance
On-site laboratory testing availability	No	No

Table 5: ILI /SARI by age group 2014-2018.

Age group/ Year	<1 year	1-4 year	5-9 year	10-14 year	15-49 year	50-65 year	>65 year
2014-ILI, SARI	60.3, 11.2	2.9, 32.9	7.1, 17.8	9.4, 10.5	5.5, 15.8	4.5, 1.0	10.3, 10.8
2015-ILI, SARI	13.9, 26.5	20.6, 17.8	36.3, 15.2	11.2, 13.8	7.5, 14.5	5.6, 11.8	4.9, 0.4
2016-ILI, SARI	54.3, 20.1	3.9, 15.5	8.1, 14.9	8.5, 14.5	6.8, 20.9	5.5, 10.5	12.9, 3.6
2017-ILI, SARI	17.8, 34.5	12.5, 18.7	2.9, 12.6	15.7, 13.5	23.6, 11.8	4.9, 5.5	22.6, 3.4
2018-ILI, SARI	14, 25.6	34.2, 17.7	12.2, 20.0	25.4, 17.4	5.8, 7.6	6.4, 8.5	2.0, 3.2

Table 6: ILI/SARI and influenza viral types by month 2014-2018.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014-ILI, SARI	1.8, 0.6	1.4, 1.1	1.5, 0.9	3.8, 1.7	3.9, 3.0	3.9, 3.5	3.7, 1.3	1.7, 1.5	1.6, 1.3	1.8, 0.6	3.8, 0.9	3.9, 0.9
Viral type	-	IB	-	-	-	-	-	-	-	-	-	-
2015-ILI, SARI	0.9, 2.7	1.1, 2.8	1.5, 3.1	1.3, 1.9	2.1, 3.1	2.5, 2.9	2.3, 3.2	1.9, 3.5	0.2, 1.1	2.3, 0.8	2.6, 2.1	2.7, 0.9
Viral type	-	-	-	-	-	-	IB	-	-	IB/A (H3N2)	-	-
2016-ILI, SARI	0.7, 0.8	5.1, 1.4	3.2, 3.3	0.9, 3.0	1.7, 0.5	1.9, 2.2	2.4, 2.6	3.5, 2.8	0.6, 1.1	1.5, 2.1	3.5, 1.6	1.4, 0.7
Viral type	-	-	-	-	-	-	-	-	-	-	-	-
2017-ILI, SARI	1.5, 0.5	2.4, 1.3	3.6, 0.7	3.5, 1.5	1.5, 2.5	0.4, 3.1	1.8, 1.1	2.5, 1.4	0.8, 1.2	1.4, 0.4	2.4, 0.7	1.5, 1.1
Viral type	IB*	-	-	-	-	-	-	-	-	A (H1N1)	-	-
2018-ILI, SARI	1.6, 0.5	1.2, 1.3	1.1, 0.5	3.2, 1.4	3.5, 3.2	3.2, 2.5	3.4, 0.3	1.5, 1.6	1.1, 2.3	1.2, 0.9	3.5, 3.9	3.1, 0.6
Viral type	-	-	-	A (H3N2)	Un typed	-	-	-	-	-	-	A (H1N1)

*IB-Influenza B.

Table 7: Assessment of pandemic Influenza preparedness of DGH Matara.

Drugs and PPE	Average monthly requirement	Availability (Y/N)	No. at hand	Adequate for how long?
Oseltamivir (Tamiflu)-tablets	Not calculated	Y*	NA*	Cannot be calculated at present as average monthly requirement had not been calculated
Oseltamivir (Tamiflu)-suspension	Not calculated	N*	NA	Cannot be calculated at present as average monthly requirement had not been calculated
Face masks-N95	Not calculated at the time of interview	Y	45	Cannot be calculated at present as average monthly requirement had not been calculated
Face masks-surgical/ Gloves (pairs)	Not calculated at the time of interview	Y	234/98	Cannot be calculated at present as average monthly requirement had not been calculated
Gowns/ Goggles	Not calculated at the time of interview	Y	15/5	Cannot be calculated at present as average monthly requirement had not been calculated
Aspirators/ throat swabs	Not calculated at the time of interview	Y	27/58	Cannot be calculated at present as average monthly requirement had not been calculated
Transport media	Not calculated at the time of interview	Y	11	Cannot be calculated at present as average monthly requirement had not been calculated

*Y=Yes: N=No: NA=Not available

DISCUSSION

Though the ILI and SARI case definitions used by DGH Matara were consistent with epidemiology unit, Sri Lanka, sampling technique was not random. These definitions are also consistent with the world health organization ILI and SARI definitions except for the duration of illness. So, the samples collected were not representative of the DGH Matara catchment population. Due to these reasons, typical influenza activity of the catchment population cannot be detected. This may lead to undetected Influenza activity among the catchment population goes undetected and sudden influenza outbreaks may occur. This also defeats the purpose of sentinel surveillance to some extent.[7,8]

Respiratory specimen collection, packaging, storage and transport were consistent with the guidelines stipulated by epidemiology Unit, Sri Lanka. Quality specimens with regard to sample collection, storage and transport were observed during 2014-2018. A written SOP on respiratory specimen collection also improved the quality and consistency of sampling procedure. Site staff responsible for respiratory specimen collection was received appropriate training from the central level.

As refrigerator temperature monitoring sheets were not used by the site, there was no way of monitoring the storage temperature of refrigerators storing respiratory samples. No other automatic temperature monitoring devices were not used by the surveillance staff. Virus in the respiratory specimens is temperature sensitive, and this was a weakness of the ILI and SARI surveillance system of DGH, Matara.[9] Anyway, no delay was observed in transporting specimens from the site to the central lab. Rapid tests to detect Influenza activity were not possible as they were not available at the site.

Surveillance data was not analyzed regularly by the site. Usage of available sentinel data for controlling and prevention of Influenza was not evident at DGH Matara. Reporting back of the results of respiratory specimens by the central lab was not observed. If this were practiced, the staff would be aware of the circulating Influenza viral strains of this geographic location. This would have been helpful in preventive measures.

Data was uploaded to online platform (FluSys) but observing or analyzing of their own data was not possible for the site staff. Central level staff made adhoc supervisory visits, but no official supervisory report was available at the site. Regular and pre-planned supervision is vital for improving the quality of the sentinel surveillance as well as improving the morale of the site-staff.[10] Providing written feedback in the form of supervisory report is essential as this may help to measure the progress during follow-up visits.[10] This report is essential in planning corrective measures and to inform health managers and staff on the current situation.[11]

Year-round activity was observed in ILI and SARI activity at DGH Matara though clear pattern was not evident. ILI and SARI may be caused by other viruses/pathogens except influenza viruses. There is no other parallel sentinel surveillance to detect respiratory pathogens other than influenza viruses.

Peak activity of both ILI and SARI was observed during April-June period as well as months of November and December during this period. This coincides with dengue peak of Matara district and can increase doubts in clinical diagnosis and burden on local health system. As sample results were not reported back, it is very difficult to diagnose influenza by the treating physicians.

Certain influenza activity was detected among respiratory samples during this period (Table 5). As Matara being a major tourist destination of Sri Lanka, there is a risk of introduction of foreign Influenza strains to the community. Average monthly requirements of drugs and PPE were not calculated by site staff during the time of data collection and this may reflect the low quality of supervision and training on these aspects. Adequacy of these logistics cannot be determined as above data is missing. Proper logistics management is a vital component in Influenza pandemic preparedness.

Representativeness of data obtained from respiratory specimen collection was not satisfactory. This actually led to identifying real influenza trend of the catchment population unreliable. Being a tertiary care health facility, DGH Matara received non-catchment population through referrals and self-selection by the patients. This also may reduce the representativeness of sampling data.

Temperature monitoring inside storage refrigerators of the site was not possible as no written records were available. As respiratory specimens and viruses are very temperature-sensitive, there was a risk of cold-chain break down go unnoticed. According to centers for disease control and prevention, respiratory specimens are advised to keep at 4°C for not more than 3 days.[12] For this purpose temperature monitoring of inside of storing refrigerators is essential.

One of the main objectives of sentinel surveillance is to use collected data for timely action but this was not practiced at DGH Matara. As there were no on-site rapid tests available to detect influenza, it was much difficult to arrive at definitive diagnosis before treating.

To improve the quality of sentinel surveillance and boosting morale of the staff, regular preplanned supervision is essential. Supervision from the central level was not satisfactory with regard to frequency and feedback. Written feedback in the form of supervisory report is paramount to record supervisory findings and further follow up activities. As there is no mechanism to detect major respiratory pathogens other than influenza viruses, it is much useful for clinicians to have one of such surveillance established at the site. Influenza pandemic preparedness was not optimal at DGH Matara with regard to logistics management.

Limitation of the current study was these results cannot be generalized to other parts of Sri Lanka and must be interpreted cautiously as the study focuses on one sentinel site data of Sri Lanka influenza surveillance system.

CONCLUSIONS

Sampling method employed by DGH Matara was not random. Identifying own catchment population was not satisfactory. Monitoring of cold chain specimen in refrigerator was not satisfactory. Quality and frequency of supervisions made by central level were not satisfactory. Refresher training and in-service training schedule was not available at the site. Analysis of data on-site and preparing disease trend report were not practiced by the surveillance staff.

Recommendations

Random sampling method must be employed by the surveillance staff to improve the representativeness of the catchment population. Exclusion of patients from non-catchment areas may also be practiced when collecting respiratory specimens to improve representativeness in sampling. Proper storage refrigerator temperature monitoring must be introduced in the form of manual recording at stipulated time of the day. Designated person should be available for this purpose and this person must be properly trained in recording temperature as well as identifying cold chain breakdown. Sentinel staff must begin using their own data by analyzing, making reports and shared with clinicians. This would help in preventing Influenza outbreaks and proper patient management. Quality of supervisions should be improved immediately by the central level and it should cover all major aspects of influenza surveillance including cold chain monitoring. Training on pandemic preparedness for the surveillance staff must be provided immediately and should be properly followed up. Data analysis on-site should be started and monitoring Influenza activity is also essential.

ACKNOWLEDGEMENTS

Author would like to thanks for the support rendered and kind understanding by Director DGH Matara, Dr. Mrs. Mediwaka MWMK and hospital staff during data collection.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Bellos A, Mulholland K, O'Brien KL, Qazi SA, Gayer M, Checchi F. The burden of acute respiratory infections in crisis-affected populations: a systematic review. Conflict and health. 2010;4(1):1-2.
2. World Health Organization. Review of the 2010-2011 winter influenza season, northern hemisphere. Weekly Epidemiological Record=Relevé

épidémiologique hebdomadaire. 2011;86(22):222-7. Available at: https://www.who.int/publications/i/item/who-wer-8622-222-227. Accessed on 15 January 2020.
3. Epidemiology Unit, Ministry of Healthcare and Nutrition, Sri Lanka. Report for Web. 2012;7(4):1. Available at http://www.epid.gov.lk/web/attachments/article/180/Surveillance%20introduction.pdf. Accessed on 15 January 2020.
4. Epidemiology Unit, Ministry of Healthcare and Nutrition, Sri Lanka. Background on AI and PI. 2015. Available at: https://www.epid.gov.lk/web/attachments/article/180/Background%20on%20AI&PI.pdf Accessed 15 January 2020.
5. Centers for Disease Control and Prevention, Atlanta, USA. International Influenza Surveillance Assessment Tool. 2017:13. Available at: https://www.cdc.gov/flu/pdf/international/cdc_flu_surveillance_tool_508.pdf. Accessed on 12 April 2020.
6. Stata Corp LLC 4905 Lakeway Drive, College Station, Texas 77845-4512 USA; 2021. Available at: https://www.stata.com. Accessed 15 January 2021.
7. World Health Organization. WHO Regional Office for Europe guidance for sentinel influenza surveillance in humans. World Health Organization. Regional Office for Europe; 2011. Available at https://apps.who.int/iris/bitstream/handle/10665/107265/E92738.pdf?sequence=1. Accessed 15 January 2020.
8. Budgell E. Evaluation of two influenza surveillance systems in South Africa. PLoS One. 2015;10(3):e0120226.
9. Shaw Stewart PD, Bach JL. Temperature dependent viral tropism: understanding viral seasonality and pathogenicity as applied to the avoidance and treatment of endemic viral respiratory illnesses. Reviews in Med Virol. 2021'e2241.
10. Tomlinson J. Using clinical supervision to improve the quality and safety of patient care: a response to Berwick and Francis. BMC Medical Education. 2015;15(1):1-8.
11. World Health Organization. Module 4: Supportive supervision. Training for mid-level managers.2008. https://www.who.int/immunization/documents/MLM_module4.pdf. Accessed on 02 January 2022.
12. Centers for Disease Control and Prevention**,** Atlanta, USA. Interim Guidance on Specimen Collection, Processing, and Testing for Patients with Suspect Influenza A (H3N2) v Virus Infection**.** Available at https:// https://www.cdc.gov/flu/swineflu/variant/h3n2v-testing.htm. Accessed on 02 January 2022.

Cite this article as: Samaraweera NY. Evaluation of selected aspects of influenza surveillance system and describing influenza surveillance data collected during 2014-2018 of district general hospital Matara, Sri Lanka. Int J Adv Med 2022;9:286-93.