

Evaluation of Communicable Diseases Surveillance System Process in Mosul City

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ABSTRACT

Objectives: Evaluating communicable diseases surveillance system Process at Mosul City.

Methodology: A descriptive study using an evaluation approach is conducted to evaluate the Communicable Diseases Surveillance System Process in Mosul City from April 20th, 2022, to May 21st 2023. A non-probability multistage sample was adopted of the study, as twenty-three (23) health institutions are chosen and interview is conducted with health staff works in the communicable diseases Surveillance System. The validity of the instrument determined by a group of experts and the stability of Internal consistency reliability of the questionnaire is ($r = 0.86$), it is determined by using split-half technique and the computation of Cronbach alpha correlation coefficient. Data are gathered from the samples by using the questionnaire and application of the interview technique. The descriptive statistical data analysis approach is used to analysis the data by using SPSS program, version (26).

Results: The study results indicate that the most of system's Process component are effective, available and sufficient in addition to good level of evaluation for all health institutions to implement such system for the benefit of communicable diseases services' consumers in relation to case detection and registration, case information, data reporting and sending, data analysis, epidemic preparation, response to epidemic, feedback and supervision.

Conclusion: The study concluded that all health facilities in Mosul city like family medicine and main primary health care centers that they are providing adequate surveillance system services to the community in regard to Communicable Diseases Surveillance System Process.

Recommendations: The study recommended that Surveillance System Process for Communicable Diseases at hospitals in Mosul city, can be enhanced with all measures to continue and keep its perfect performance; with implement Regular and periodic monitoring and follow-up to benefits to the Communicable Diseases Surveillance.

Key words: Evaluation, Surveillance System, Communicable Diseases

INTRODUCTION

Public health surveillance is the continuous and systematic collection, analysis, interpretation, and dissemination of data regarding diseases or health-related events that have significant public health importance and is used in public health action as preventing and controlling disease and injury; including communicable Diseases Surveillance System¹. Communicable disease surveillance is the continuous monitoring of the frequency and the distribution of disease and deaths due to infections that can be transmitted from human to human or from animals, food, water or the environment to humans, and the monitoring of risk factors for those infections. This definition means information for real action. Surveillance systems are networks maintaining and monitoring their operation at different level and providing information for disease prevention and control². The burden of communicable diseases has always stricken the entire humanity³. Over the years and eras, infectious diseases have been one of the most significant public health problems in the world and a major cause of death for many people around the worldwide⁴. Whereas it remains a main causes of death

globally, which represent a significant proportion of the annual number death (approximately 4–5 million deaths)⁵. Priorities of public health is Infectious disease control on the global level to prevent the spread its⁶ so, effective control of contagious diseases requires an effective disease surveillance system that provides data to act on priority communicable diseases⁷. Therefore, the control and prevent of infectious diseases depends essentially on their epidemiological surveillance systems for communicable diseases⁸. Surveillance System has been around a long time². So, by the mid-20th century, when contagious diseases were a serious problem and a threat to public health, these systems had been existence since 1963 by Alexander Langmuir⁹. But these surveillance systems should be continually and periodically evaluated to ensure effective and efficient monitoring of their public health issues¹⁰. But the surveillance system evaluation relies on three model existed by physician-researcher Donabedian after 1960; to assess quality of health care, which evaluate three elements (structure, process, and outcomes)^{11,12}. The WHO framework for monitoring and evaluating surveillance and response systems for communicable diseases was

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designed to guiding and evaluate the major elements of surveillance and evaluation process (structures, process, outcomes), which are used in evaluation of communicable diseases surveillance system elements; including Process element or model (core and support functions), from which surveillance indicators were derived and adapted by several countries¹³. In these countries, the directly responsible for organizing and supporting this system is the Ministry of Health. Various organizations at the local and state level are working with the Ministry of Health to share data¹⁴. Many studies have been conducted in most of countries showing the poor of structures and their direct impact on the surveillance system⁶. In Iraq there are no studies shows the efficiency of Surveillance Systems Process for communicable diseases excluding some areas. Also, in Mosul city the performance (Process) of the surveillance system was not evaluated. Therefore, the focus of current study was to evaluate the communicable Diseases surveillance system Process.

METHODOLOGY

A descriptive study using an evaluation approach is conducted to evaluate the Communicable Diseases Surveillance System Process at Hospitals, Primary Health Care Centers, Health Care Sectors and Health Directorate in Mosul City from April 20th 2022 to May 21th 2023. The study is conducted in Iraq, (Nineveh governorate), and carried out in this Health Directorate and it is two sectors (Left sector

and Right sector) as well as it is related four (4) Hospitals with sixteen (16) Primary Health Care Centers with selected purposively from both sides of Mosul. A multistage sample of (4) hospitals and (16) primary health care centers; (8) main and (8) family medicine under surveillance are visited; which are selected throughout the use of non-probability sampling approach. The study sample include:

- Stage I: Public Health Department and Health Care Sectors
- Stage II: Hospitals
- Stage III: Primary Health Care Centers

A pilot study was conducted to determine validity and internal consistency reliability of the study instrument. In order to test the validity of the instrument, the questionnaire is present to ¹¹ experts in different field for this purpose. Internal consistency reliability is employed for the study instrument via the use of split-half technique and the computation of Cronbach alpha correlation coefficient, finding indicates that alpha correlation coefficient is ($r= 0.86$) reliably adequate for the interview questionnaire. Data are collected through the use of the study instrument and application of the interview technique as means of data collection. Data are analyzed using SPSS program, version (26) by application of the descriptive statistical data analysis approach (frequency, percentage, total score, range and mean of scores).

RESULTS

Table 1: Overall Evaluation of the Domain of Organizational Structure of Communicable Diseases Surveillance System in Mosul City

List	Range	Type	F	%
1	Good (43.34-52)	Public Health Department	1	100
		Right Healthcare Sector	1	100
		Left Healthcare Sector	1	100
		Main Primary Healthcare Centers	8	100
		Family Medicine Primary Healthcare Centers	8	100
		Hospitals	4	100
2	Fair (34.6-43.3)	Public Health Department	0	0
		Right Healthcare Sector	0	0
		Left Healthcare Sector	0	0
		Main Primary Healthcare Centers	0	0
		Family Medicine Primary Healthcare Centers	0	0
		Hospitals	0	0
3	Poor (26-34.6)	Public Health Department	0	0
		Right Healthcare Sector	0	0
		Left Healthcare Sector	0	0
		Main Primary Healthcare Centers	0	0
		Family Medicine Primary Healthcare Centers	0	0
		Hospitals	0	0

This table outcomes, indicate that overall evaluation of the process domain of Communicable Diseases Surveillance System in Mosul City have good level (100%) for all health institutions.

Table 1a: Evaluation and Mean of Score on Case Detection and Registration as Sub-domain of Process

Items	Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals			
	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%
1	2	High	1	100	2	High	1	100	2	High	1	100	2	High	8	10	2	High	8	100	2	High	4	100
2	2	High			2	High	1	100	2	High	1	100	2	High	8	10	2	High	8	100	2	High	4	100
3	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
4	2	High	0	0	1	Low	0	0	1	Low	0	0	2	High	0	0	2	High	0	0	2	High	0	0
5	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
6	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	1	Low	0	0
	Total 1 100				Total 1 100				Total 1 100				Total 100				Total 100							
Eva. = Evaluation, F: Frequency, %: Percent, Scale: (Yes= 2) (No= 1) T.= Total MS= Mean of Scores, Low = (Mean of Scores < 1.5), Moderate= (Mean of Scores =1.5), High= (Mean of Scores > 1.5) Good (10.1-12), Fair (8.1-10), Poor (6-8)																								
Items																								
1- Is there a staff dedicated to preparing a patient surveillance report for communicable diseases?																		Yes			NO			
2- Staff (Personnel) type? (Physician Nurse Medical Assistance Administrative)																								
3- Is the registration process done correctly? (with note presence each item in the correct position).																		Yes			NO			
4- Are the registers completed?																								
5- Was the unit visited by the surveillance committee continuously?																		Yes			NO			
6- Does the surveillance unit by actively search for cases of communicable diseases in the community																		Yes			NO			

This table outcome displays that case detection and registration as sub-domain of process for all health facilities have good level (100%). Also, the outcomes show that the mean of scores is high on most items.

Table 1b: Evaluation and Mean of Score on Case Information as Sub-domain of Process

Items	Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals			
	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%
1	2	High	1	100	1	Low	1	100	1	Low	1	100	2	High	8	10	2	High	8	100	2	High	4	100
2	2	High			2	High			2	High			2	High			2	High			2	High		
3	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
4	2	High			2	High			2	High			2	High			2	High			2	High		
5	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
	Total 1 100				Total 1 100				Total 1 100				Total 100				Total 100							
Eva. = Evaluation, F: Frequency, %: Percent, Scale: (Yes= 2) (No= 1) T.= Total MS= Mean of Scores, Low = (Mean of Scores < 1.5), Moderate= (Mean of Scores =1.5), High= (Mean of Scores > 1.5) Good (8.34-10), Fair (6.67-8.33), Poor (5-6.66)																								
Items																								

This table outcome depicts that case information as sub-domain of process for all health facilities have good level (100%). Also, the outcomes show that the mean of scores is high on most items.

Table 1c: Evaluation and Mean of Score on Data Reporting and Sending as Sub-domain of Process

Items	Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals			
	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%
1	2	High			2	High			2	High			2	High			2	High			2	High		
2	2	High	1	100	2	High	1	100	2	High	1	100	2	High	8	100	2	High	8	100	2	High	4	100
3	2	High			2	High			2	High			2	High			2	High			2	High		
4	2	High			1	Low			1	Low			1.87	High			1.87	High			1.75	High		
5	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
6	1	Low			2	High			2	High			2	High			2	High			2	High		
7	2	High			2	High			2	High			2	High			2	High			2	High		
8	1	Low	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
9	2	High			2	High			2	High			2	High			2	High			2	High		
	Total 1 100				Total 1 100				Total 1 100				Total 8 100				Total 8 100				Total 4 100			
Eva. = Evaluation, F: Frequency, %: Percent, Scale: (Yes= 2) (No= 1) T.= Total MS= Mean of Scores, Low = (Mean of Scores < 1.5), Moderate= (Mean of Scores =1.5), High= (Mean of Scores > 1.5) Good (15.1-18), Fair (12.1-15), Poor (9-12)																								
Items																								

This table outcome shows that data reporting and sending as sub-domain of process for all health sites have good level (100%). Also, the outcomes show that the mean of scores is high on most items.

Table 1d: Evaluation and Mean of Score on Data Analysis as Sub-domain of Process

Items	Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals								
	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%					
1	2	High	1	100	2	High	1	100	2	High	1	100	1	Low	8	100	1	Low	8	100	2	High	4	100					
2	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0					
3	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0					
4	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0					
Total				1	100	Total				1	100	Total				1	100	Total				8	100	Total				4	100

Eva. = Evaluation, F: Frequency, %: Percent, Scale: (Yes= 2) (No= 1) T.= Total
 MS= Mean of Scores, Low = (Mean of Scores < 1.5), Moderate= (Mean of Scores =1.5), High= (Mean of Scores > 1.5)
 Good (6.78-8), Fair (5.34-6.77), Poor (4-5.33)

Items	Yes	No
1- Is the EPI INFO system used to enter information and send it to the Epidemiological Surveillance Department?	Yes	NO
2- Is there a coordination with the concerned units to standardize and match data?	Yes	NO
3- Is the data analyzed as tables and graphs?	Yes	NO
4- Are the cases classified? (checking records)	Yes	NO

This table outcome indicates that data analysis as sub-domain of process for all health institutions have good level (100%). Also, the outcomes show that the mean of scores is high on most items.

Table 1e: Evaluation and Mean of Score on Epidemic Preparation as Sub-domain of Process

Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals			
MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%
2	High	1	100	2	High	1	100	2	High	1	100	2	High	8	100	2	High	8	100	2	High	4	100
2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
Total				1	100	Total				1	100	Total				8	100	Total				4	100

This table outcome displays that epidemic preparation as sub-domain of process for all health facilities have good level (100%). Also, the outcomes show that the mean of scores is high on all items.

Table (1f): Evaluation and Mean of Score on Response to Epidemic as Sub-domain of Process

Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals			
MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%
2	High	1	100	2	High	1	100	2	High	1	100	2	High	8	100	2	High	8	100	2	High	4	100
2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
Total				1	100	Total				1	100	Total				8	100	Total				4	100

This table outcome depicts that response to epidemic as sub-domain of process for all health institutions have good level (100%). Also, the outcomes show that the mean of scores is high on all items.

Table 1g: Evaluation and Mean of Score on Feedback as Sub-domain of Process

Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals			
MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%
2	High	1	100	2	High	1	100	2	High	1	100	2	High	8	100	2	High	8	100	2	High	4	100
2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
Total				1	100	Total				1	100	Total				8	100	Total				4	100

This table outcome reveals that feedback as sub-domain of process for all health facilities have good level (100%). Also, the outcomes show that the mean of scores is high on all items.

Table 1h: Evaluation and Mean of Score on Supervision as Sub-domain of Process

Items	Public Health Department				Right Primary Health care Sector				Left Primary Health care Sector				Main Primary Healthcare Centers				Family Medicine Primary Healthcare Centers				Hospitals			
	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%	MS	Eva.	F	%
1	2	High	1	100	2	High	1	100	2	High	1	100	2	High	8	100	2	High	8	100	2	High	4	100
			0	0			0	0			0	0			0	0			0	0			0	0
2	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0	2	High	0	0
			0	0			0	0			0	0			0	0			0	0			0	0
			Total	1 100			Total	1 100			Total	1 100			Total	8 100			Total	8 100			Total	4 100
Eva. = Evaluation,		F: Frequency,				%: Percent,				Scale: (Yes= 2) (No= 1)				T.= Total										
MS= Mean of Scores,		Low = (Mean of Scores < 1.5),				Moderate= (Mean of Scores =1.5),				High= (Mean of Scores > 1.5)														
Good (3.34-4),		Fair (2.67-3.33),				Poor (2-2.66)																		
Items																								
1- Are there periodic supervisory visits from higher levels?												Yes			NO									
2- Does the supervisor review the patient surveillance system and inform?												Yes			NO									

This table outcome shows that supervision as sub-domain of process for all health institutes have good level (100%). Also, the outcomes show that the mean of scores is high on all items.

DISCUSSION

The sufficiency of the present system to meet surveillance and response requirements should be examined for priority diseases that are already under monitoring. For each of the significance diseases, process subdomains should be discussed such as availability of laboratories for confirmation, both inside and outside the nation. It must be determining any updates or developments to guidelines and standards. It is important to suggest practical measures to increase the capacity for surveillance and control¹⁵. In regard to domain of process of Communicable Diseases Surveillance System in Mosul City; the outcomes of the table (1), found that all places have good level of overall evaluation (100%). This study does not match with another study done in Iraq, which depicts that the majority of primary health care sectors have experienced inadequate process (94.4%)¹⁶. Concerning case detection and registration as sub-domain of process; the outcomes for table (1a); depict that all places have good level of evaluation (100%). Furthermore; the outcomes show that the mean of scores is high on most items. The present study disagrees with study conducted in Southeast Ethiopia which mentioned Although availability the case definition for measles disease at the district health office and all health facilities. In addition to, the Primary Health Emergency Management focal person of the district health office and visited health centers fully understood the measles case definition. But four (40%) of the health extension workers at the health post understood the measles case definition. The measles cases definition was posted on a wall or notice board of all health centers and three (30%) of the health posts. Healthcare workers have been detecting suspected cases of measles using standard case definitions. All visited health centers and only three (30%) of the health posts were using a clinical register to record the priority reportable diseases including measles. In addition, no rumor registration logbook was available at the visited health facilities¹⁰. Regarding case information as sub-domain of process; the outcomes for table (1b); indicate that all places have good level of evaluation (100%). In addition; the outcomes show that the mean of scores is high on most items. This results corresponds with other study done in the Kurdistan Region-Iraq; which show all laboratory activities were good; they didn't have any problems sampling and transporting and machines except the capacity of lab by the large number of cases to take more than 2 weeks; were needed to get the results because a lot of cases¹⁷. But the outcomes of the data reporting and sending as shown in the table (1c), found that all sites have good level of data reporting and sending as sub-domain of process (100%). Additionally; the outcomes show that the mean of scores is high on most items. This study does not correspond with study done in Baghdad city; Iraq, which found there are shortage of surveillance

forms (lack of reporting forms) during the last 6 months was 46%¹⁸. Concerning data analysis as sub-domain of process; the outcomes for table (1d); depict that all places have good level of evaluation (100%). Moreover, the outcomes show that the mean of scores is high on most items. This results don't match with study done in Iraq which stated there is poor action level according to surveillance data noted in the study at the local level (12.1%) may be attributed to the centralized strategy of action as well as the poor surveillance data analysis at health facilities that could help to raise or lower the level of clinical awareness for a specific condition¹⁹. In relation to epidemic preparation as sub-domain of process; the outcomes for table (1e); show that all places have good level of evaluation (100%). Additionally; the outcomes display that the mean of scores is high on all items. This study is agreeing with study performed in Iraq which said that the epidemic preparedness was well performed at all levels²⁰. In regard to response to epidemic, the outcomes for table (1f), show that all health facilities have good level of response to epidemic as sub-domain of process (100%). The outcomes too indicate that the mean of scores is high on all items. This study is corresponding with study done in Iraq which existed epidemic response in this study showed that all PHCCs (100%) had implemented prevention and control measures based on local data for at least one epidemic-prone disease²¹⁻²⁴. Concerning to outcomes of the tables (1g) and (1h), appeared that all sites have good level of feedback and supervision as sub-domains of process (100%). Also, outcomes, exist that the mean of scores of feedback and supervision as sub-domains of process is high on all items. This study does not agree with study conducted in Iraq which display that feedback was less than standards just 66% of total achievement had achieved, and Supervision on surveillance system was present in 65% of health centers²⁵⁻²⁸.

CONCLUSION

All health facilities in Mosul city like main and family medicine primary health care centers have recognized that they are providing adequate surveillance system services to the community in regard to Surveillance System Process, with focus on case detection and registration, case information, data reporting and sending, data analysis, epidemic preparation, response to epidemic, feedback and supervision.

RECOMMENDATIONS

In Mosul city; the Surveillance System Process for Communicable Diseases at hospitals, can be enhanced with all measures to continue

its perfect performance. it recommended to Regularly and periodically monitor and follow-up can be implemented to gain benefits of the Communicable Diseases Surveillance System implementation. Also, recommended to conducted more National research about same topic to the health facilities under Surveillance System.

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Potential Conflicts of Interest: None

Competing Interest: None

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