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ASSESSMENT OF COMMUNICABLE DISEASES SURVEILLANCE SYSTEM ACTIVITIES IN PHC CENTERS IN BAGHDAD

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ABSTRACT

Surveillance communicable diseases is a public health corner stone. Routine notification data on communicable diseases are used as a basis for public health action as well as for policy making. Surveillance systems must detect a new communicable diseases as well as recognize and track diseases that currently are, or have the potential to become of major public health importance. **Objectives:** The general objective of this study is to assess the core activities and supportive functions of the communicable diseases surveillance system in term of structure, performance, epidemic preparedness and response at all heath facilities level in Baghdad. **Methodology:** This study was a descriptive, cross-sectional study conducted at (50) Primary Heath Care Centers (PHCC) which randomly selected (Multi – stage sample) in Baghdad and both directorates of health (Karkh and Rasafa) and Communicable Diseases Control Center of Iraq from the first of November 2016 till the first of February 2018. The data collected by direct interviews with the managers of surveillance units, observation of records and documents, materials and equipment by using World Health Organization generic questionnaires for assessment of National communicable diseases surveillance. **Results:** The results showed that National Surveillance Manual was present in (6%) of health centers. Data reporting was very good for achieving a rate of (95%) of reporting. Data analysis report scored (80%) without conducting line graphs for communicable diseases. epidemic preparedness was more than the recommended standard indicators (80%). Also (72%) was the achievement of epidemic response in health centers. Feedback was less than standards which was just (66%) of total achievement. Supervision on surveillance system was present in (65%) of health centers. The training was positive for (30%) and resources (21%), all that for primary Health care Centers

level. The next level both, district and central level had achieved very good rate except in resources domain (66% and 77%) respectively. **Conclusions:** surveillance communicable diseases in Baghdad is good in some parameters and deficit in others (which is Training Resources and Expertise). **Recmmendations:** The study recommends improving the surveillance system through increasing the training, provide more expertise, copying with developed countries experiences in this field and using the electronic technologies in reporting and data analysis.

INTRODUCTION

Humanity faces many challenges that require global solutions. One these challenges is the speared of communicable diseases that emerge or (reemerge) from the interface between animals and humans and the ecosystems in which they live.[1] According to the World Health Organization (WHO), communicable diseases account for more than (13) million death every year, including nearly two-third of all deaths among children under (5) years of age. Although the great majority of these deaths occur in developing countries, infectious diseases do not recognize international boundaries. They present a substantial threat to people in all parts of the world. In recent years, this threat has grown in volume and complexity.

New diseases have emerged, others once viewed as declining in significance have resurged in importance drugs. This picture is complicated by the potential deployment of infectious disease pathogens as weapon of war or instruments of terror.[2]

Effective communicable disease control relies on effective response systems and effective response systems rely on effective disease surveillance.[3] Health systems use the information from surveillance to plan, implemented and evaluate health programs and activities.[4] The overall aim of disease surveillance is to collect information for public health action.[5] Monitoring and evaluation is a vital component of communicable diseases surveillance and response systems that helps to ensure that surveillance systems meet the objectives for which they were developed. Monitoring progress and evaluating outcomes and impact are critical in the development of core capacities for surveillance and response.[6] There should ongoing evaluation of surveillance and assessment activities and determination of training and capacity –building needs at all levels of the public health system. An evaluation process is needed that can be applied at all levels of the public health system.[7] Iraq has witnesses tremendous impact on its health situation due to war and sanctions, which have affected the

infrastructure and led to more deterioration in providing of health services. Iraq has utilized primary health care system which has been applied since eighties.[8]

Surveillance is a process of systematic collection, collation and analysis of data with prompt dissemination to those who need to know, for relevant action to be taken. A well-functioning disease surveillance system provides information for planning, implementation, monitoring and evaluation of public health intervention programs. Surveillance for communicable diseases is a part of public health surveillance which in turn is a part of the wider health information system. The objective of the surveillance system and the use of information determines of the collected and the speed of information flow within the system. Early warning of epidemics is essential for effective and rapid control, while information on endemic communicable diseases is essential for monitoring the disease, either way, information on priority communicable diseases is critical for control. Many countries have developed surveillance capabilities to monitor diseases with high burden, to detect outbreaks of epidemic prone disease and monitor progress towards national or international control or eradication targets. In this sense, surveillance of communicable diseases is a national function.[9]

Objectives of the Study

1. General Objectives

To improve communicable diseases surveillance system in Baghdad.

2. Specific objectives

Assess the core activities and supportive functions of the communicable diseases surveillance system in term of structure, performance, epidemic preparedness and response at al health facilities level in Baghdad.

This study was a descriptive cross-sectional study conducted at (50) randomly selected (Multistage sample) Primary Heath Care Centers in Baghdad Governorate and both directorates of health (Karkh and Rasafa) and Communicable Diseases Control Center (CDCC) of Iraq, data collection was by direct interview (face to face) and observation ofequipment, materials and records.

Total number of primary health care centers in Baghdad Governorate had been taken from the official records both directorate of health in Baghdad which were (165) at study time. The

sample included primary health care centers with surveillance units. The total surveillance and communicable diseases units involved in this study was (165). The sampling technique used in this study was multi-stage sample. By multi-stage sample (50) units distributed from (50) health centers, had been selected randomly from health sectors in both directorates of health (Karkh and Rasafa)as.

The data collection was made by the use of (WHO) generic questionnaires for assessment of National and response system at three levels communicable diseases surveillance.[9] The researcher at each level completed it. Eighty percent performance at all CDSS levels as the standard benchmark for each indicator had been taken in account, based on the study in Sudan[10] as an Arab country, where there was no such performance indicator for Iraq or Arab countries in the Eastern Mediterranean Region. Also WHO and CDC Guide for the use of core Integrated Disease surveillance and Response Indicators in the African Region.[11]

Data entry was done using computer Pentium 1V directly to the statistical analysis program and statistical analysis was done by using the SPSS (statistical package of the social science) package version.[18] For the surveillance questionnaire, the performance indicators were calculated using WHO questionnaire. Data were summarized and frequency distribution tables were constructed. Tables were stratified according to the surveillance levels, and the findings were arranged through descriptive statistical measurements (frequency and percentage). The average percent of achievement of each core and support function was calculated by dividing the summation of achieved number of this function over the sub-system on (50) which is the total number of assessed facilities for each level.

RESULTS

For case detection and registration of communicable diseases surveillance, (table 4.1) demonstrates that registries are present in (49(98%) of health facilities. There is difference among the Health Centers in correct filling of these registries, as the correct filling of registers was in (43) (86%) of Health Centers. Case definition for communicable diseases was present in (8) (16%) of health centers. The rate for use of standard case definition for diagnosing the communicable diseases was (8) (16%) and not used in (42) (84%) of health centers. Correct diagnosis of disease was achieved in only (8) (16%) of health centers using the standard case definition.

Table 4.1: Case detection and registration in Surveillance Units (n=50).

Case Detection And Registration	*Surveillance Unit(n=50)*	
	Freq.	**%**
The presences of a clinical register.	49	98%
The correct filing of the clinical register during the previous 30 days.	43	86%
Presence of case definition of communicable disease.	8	16%
The use of standard case definition for diagnosing communicable disease.	8	16%
The respondent correctly diagnose one of the country's priority diseases using a standard case definition	8	16%

Table 4.2: shows that the ability to collect specimens was mainly for blood and stool 50 (100%) and no facilities to collect CSF in all PHCC. The availability of materials required to collect specimens was mainly for blood 50 (100%) and stool 49 (98%). The ability to handle sputum, stool, blood /serum and SCF until shipment from these centers to the next level was present in 44 (88%) of centers. The functional cold chain was present in 48 (96%) of health facilities. The transport media for stool present in 40 (80%) of health facilities. Ninety percent (45) of health facilities have packing materials for shipment if specimens to the next level.

Table 4.2: Case confirmation in Surveillance Unit (n=50).

Case Confirmation	*Surveillance Unit(n=50)*	
	Freq.	**%**
The ability to collect the sputum	**6**	**12%**
The ability to collect the stool	**50**	**100%**
The ability to collect the blood	**50**	**100%**
The ability to collect the cerpro-spinal – fluid (CSF)	**0**	**0%**
The presence of materials required to collect sputum	**6**	**12%**
The presence of materials required to collect stool	**49**	**98%**
The presence of materials required to collect blood	**50**	**100%**
The presence of materials required to collect CSF	**0**	**0%**
The capacity to handle sputum,stool /serum and CSF till shipment at this facility	**44**	**88%**
The presence of functional cold chain at health facility	**48**	**96%**
The presence of transport media for stool at health facility	**40**	**80%**
The presence of packing materials for shipment of specimens at health facility	**45**	**90%**

In data reporting, 23 (46%) of centers under study show that there is shortage in surveillance forms used for reporting during the last six months while the health centers under study shows that no register and reporting for (Elimination, Epidemic prone and Major public health importance targeted diseases) (table 4.3).

Table 4.3: Data reporting in surveillance units (n=50).

Data Reporting	*Surveillance Unit(n=50)*	
	Freq.	**%**
shortage in surveillance forms during the last six months	23	46%
The presence of correct register of targeted disease as for Eradication	0	0%
The presence of correct register of targeted disease as for Elimination	0	0%
The presence of correct register of targeted disease as for Epidemic prone	0	0%
The presence of correct register of targeted disease as for Major public health importance	0	0%

According to the number of reports that the health centers should send to higher level which is (1 report weekly and 1 report monthly), the mean score of weekly report was (11.40) compare to expected number for the las three months (12) and (2.92) for monthly reports compare to expected number for the las three months (3). The mean score for weekly reports submitted on time was (11.14) and the mean score for monthly reports submitted on time was (2.90) as illustrated in (table 4.4).

Table 4.4: The score of monthly and weekly reports according to the number of reports in surveillance units (n=50).

Number of reports	**Score mean± SD (Range)**
Number of reports in the last three months compared to expected number, weekly.	11.40±2.50(0-12)
Number of reports in the last three months compared to expected number, monthly.	2.92±0.44 (0-3)
Number of weekly reports submitted on time	11.14
Number of monthly reports submitted on time	2.90

Table 4.5 shows that mail (hand posting) was the main and only tool of data reporting for the system in a rate of 50 (100%). Respondents suggested that reporting could be improved by use of electronic (38) (76%). Telephone 6 (12%), electronic and telephone 2 (4%), mail 1 (2%).

Table 4.5: Types of reporting and ways to strengthen reporting according to staff in surveillance units (n=50).

Reporting		Surveillance Units (n=50)	
		Freq.	%
Types of reporting	Mail	50	100%
	Fax	0	0%
	Telephone	0	0%
	Radio	0	0%
	Electronic	0	0%
	Other	0	0%
Ways to strengthening reporting	Electronic	38	76%
	Telephone	6	12%
	None	3	6%
	Electronic and Telephone	2	4%
	Mail	1	2%

Inquiry about the data analysis indicates that all health facilities described data by sex50 (100%), place 50 (100%), but the description of data by time was 48 (96%). None of health facilities has threshold level for action, i.e. when the level of any disease occurrence become above the usual one, an action should be taken. The presence of demographic data was 50 (100%) and rates derived from demographic data scored 40 (80%) as shown in table 4.6.

Table 4.6: Data analysis in surveillance units (n=50).

Data Analysis	Surveillance Units (n=50)	
	Freq.	%
The presence of description of data by age and sex	50	100%
The presence of description of data by place (locality, village, work site and other)	50	100%
The presence of description of data by time	48	96%
The presence of line graph of cases by time	3	6%
The presence of an action threshold for country priority diseases	0	0%
The presence of demographic data	50	100%
The presence of rates derived from demographic data	40	80%

Table 4.7: **The score of feedback according to the number of feedback and meeting in surveillance units (n=50).**

Number of Feedback	Score Mean± SD
Number of feedback bulletin or reports has the health centers had received in the last year	3.24± 7.44
Number of meeting with the community members in the past six months	1. 2.41

The surveillance activities during supervisory visits from the higher levels were 44 (88%). Surveillance data of communicable diseases was reviewed in 21 (42%) of health facilities by the supervisors (table 4.8).

Table 4.8: **Supervision in surveillance units (n=50).**

Supervision	**Surveillance Units (n=50)**	
	Freq.	**%**
The presence of supervision in last 6 months	**44**	**88%**
The presence of appropriate review of surveillance practices in supervision	**21**	**42%**

The bar chart that is shown below, displays the results of the training function in surveillance system. Training of the staff in disease surveillance and data management had a total achievement of 15 (30%) while 35 (70%) was not available in the health centers for workers and staff f surveillance units in the health facilities.

Table 4.9: ***Ways of surveillance systems improvement according to workers in surveillance units(n=50).***

Ways of surveillance systems improvement	**Surveillance Units (n=50)**	
	Freq.	**%**
Increase personnel(staff)	33	66%
Facilities	32	64%
Training	25	50%
Communications	10	20%
Transport	9	18%
Technologies	7	14%
Physicians in communicable diseases	4	8%
Labs	3	6%
Improve reporting	2	4%
Lectures	2	4%
Changing the surveillance systems	1	2%
Surveillance centers	1	2%

Table 4.10: summarizes the average percent of achievement of each core and supportive functions with presence of NSM for the surveillance systems evaluation results at health centers level (n=50) and central level (N=1). This assessment showed that all levels in data reporting scored high rates, 95% in PHCC, 98% in district level and 100% for central level. The data analysis showed that 80% of data had been analyzed in health centers, 85% in district and in central level 100%.

Epidemic preparedness in all levels came almost with same results of data analysis as (86%, 83% and 100%) respectively. PHCC scored 72% in Epidemic response while 100% for both district and central level. In feedback also, PHCC scored 60% while district and central level both scored 100%. Supervision for health centers was 65% and less in district which is 50%, as with other results the central level scored 100% too. Thirty percent was the achievement in training for health centers, 96% for district level and central level 100%. Presence of resources was very low in health centers which scored 21%, district 66% and for central level was 77%. National Surveillance Manual was present in just 6% of presence in health centers while scored 100% in both levels the district and the central.

Table 4.10: Total achievement of core and supportive functions at the health centers, districts and central level.

	Core And Supportive Functions	% of Achievement		
		PHCC level (n=50)	**district level (n=2)**	**central level (n=1)**
1	Data reporting	95%	98%	100%
2	Data analysis	80%	85%	100%
3	Epidemic preparedness	85%	83%	100%
4	Epidemic response	72%	100%	100%
5	Feedback	66%	100%	100%
6	Supervision	65%	50%	100%
7	Training	30%	96%	100%
8	Resources	21%	66%	77%
National Surveillance Manual		6%	100%	100%

DISCUSSION

Surveillance provides information for action against infectious disease threats. Basic surveillance functions include detecting and reporting cases of disease, analyzing and confirming this information to identify outbreaks and clarity longer-term trends and applying the information to inform public health decision making. when effective, surveillance can facilitate (1) timely action to control outbreaks, (2) informed allocation of resources to meet changing disease conditions, and (3) adjustment of disease control programs to make them more effective. According to CDC, factors that can be taken in account in evaluating surveillance systems include their case of operation l the extent to which health care providers and laboratory personnel actually provide the system with information l and the system's ability to identify cases of disease, accurately diagnose them, and generate timely and accurate information on disease events and trends.[2]

In this study there were only 6% of health centers (surveillance units) had. National Surveillance Manual. This very low percentage may be because there is no complete guidance as a book for surveillance in the directorates of health in Baghdad and CDCC, no follow up in PHCC for new instructions, where the new instructions and updates come as an annually plan from the central level vertically, while old plans just left on shelves and forgotten.

Also may be due to there is no permanent staff or persons in charge, where the study found some surveillance units run by newly graduated doctors and they are in rotation stage or by physicians which the manage more than one program in the same time. These results were lower than the results obtained by Abbas study in Wasit, Iraq 2010, where it is showed that just 41.2% of health facilities have surveillance manual.[12] In Sudan a study by *Sahal et.al, 2011*, showed that 13.3% of health facilities have surveillance manual.[10]

In Mozambique 2006 report by WHO for assessment of Epidemiological Disease Surveillance system found that only 34.8% of the health facilities and national epidemiological disease surveillance guidelines.[13] This study disagree with *Ibrahim et.al.in* Saudi Arabia 2009 where 57% of health facilities have surveillance manual.[14] The difference between both studies may be due to the increased knowledge level for the staff and management manner in their surveillance units.

This study revealed that the availability of clinical registers in all health facilities was 98%. This very high rate may be attributed to the registration that check more than one time and by many persons in PHCC also physicians in medical units enforce patients to register communicable diseases unit if they had one. These results were similar to the results from *Al-jawadi. et.al.* study in Mosul. Iraq 2008 where clinical registers scored 100%.[15] Results from Wasit, Iraq 2010 by Abbas clinical registers also high as 94.1%.[12]

This study came with higher percentage in clinical registers than *Ibrahim et.al.*[14] where scored 75.8%. The correct filling of the clinical register in this study was 86% of registration which is higher than *Al-jawadi.et.al* study in Mosul, Iraq 2008 where the results of the study was 81.8%[15] also higher than *Ibrahim et.al.* where just 60.6% of registers filled correctly[14], but in Wasit the results was very low just 22.9% of centers correctly filled the registers.[12]

For the presence of case definition of communicable disease in this study, it was declared that the PHCC which had case definition for communicable disease under surveillance was just 16%. This low percentage may be attributed to same reasons which led to decrease in percentage of national surveillance manual availability, an addition to there was an old book published by Iraqi Ministry of Health /CDCC 2009[16] and was distributed to all health facilities and it was found in some centers where the workers in the surveillance units still lave it and not found in many centers also many workers lack of knowledge about the case definition.

These results agree with Abbas, Wasit, Iraq 2010[12] where just 5.9% of health facilities and caser definition of communicable diseases. Also agree with the study in Uganda 2000, where 35% of health facilities the presence of case definition was found[17] *Ibrahim et. al.* in Saudi Arabia 2009 found that 54.5% of health facilities had case definition for communicable diseases.[14]

The difference between the two studies may be because the case definition was included with National Surveillance Manual in health facilities. *Krause et.al.* in Berlin, Germany 2005.[18] Expressed that the existence of case definition was unknown to 86.5% of the respondents, 75.2% expressed the desire to have case definition available.

The study also revealed that the use of standard case definition for diagnosing the communicable diseases was in 16% of the health centers and this low percentage may be reasonable because of the presence of standard case definition was just 16%. These results were not consenting with *Ibrahim et. al*[14], they revealed that 57.5% were using standard case definition and this difference may be attributed to the same reason that case definition was included with National Surveillance Manual in health facilities.

The result of this study shows that the ability to collect sputum, stool, blood and CSF was (12%, 100% and 0%) respectively in the health centers. This low percentage of ability to collect sputum may be due to these not all centers have units to T,B, examination and the zero percent of CSF sample collection may be because the centers laboratories were not able to deal with SCF samples and physicians prefer sending suspected cases to hospitals for more confirmation and they consider it a surgical procedure. Results from Saudi Arabia in 2009[14] revealed that ability to collect sputum, stool, blood and SCF was (75.8%, 69.7% and 24.2%) respectively.

The presence of materials required for collecting sputum, stool, blood and CSF was (12%, 98%, 100% and 0%) respectively, which was almost the same of ability to collect the samples. Ibrahim et.al.[14] found (60.6%, 51.5%, 48.5% and 24.2%) respectively. These differences between both studies may be because of the ability of the their laboratories in the health centers.

Also this study is clearing up that 88% of sample had the capacity to handle sputum, stool, and blood until shipment at health facilities. The presence of functional cold chain at health facility was 96%. The presence of transport media for stool at health facility was 80%. The presence of packing materials for shipment of specimens at health facility was 90%. These high percentages may be due to availability of electricity, and materials required to keep and store the samples in these health facilities, the continuous follow up and support of MOH to health centers and its laboratories. This study was higher than Ibrahim et.al. study[14] where it is scored just 45.5% was the capacity to handle the samples, 60.6% the presence of functional cold chain, 42.4% the presence of transport media for stool and 48.5% the presence of packing materials for shipment of specimens. Study result also higher than study results in Georgia (a former republic of the Soviet Union) in 2002.[19] Lower percentage may be because suspected cases that need laboratory investigations were referred to more advanced laboratories in health facilities**.**

The study found that the shortage of surveillance forms (lack of reporting forms) during the last 6 months was 46%. These forms distributed by CDCC through chain of command to finally be at surveillance units in the health facilities to be filled and send back weekly or monthly according to timelines and reporting priority of diseases and instructions of MOH. A study in Mosul, Iraq[15] reported no shortage in the forms required for reporting. Abbas in Wasit, Iraq 2010 found shortage in 51% of centers.[12] Results from Uganda[17] showed that 65% of facilities lacked an adequate supply of reporting forms during the 6 months preceding the study. This evection perhaps due to, differences in the resources available for health care between the countries.

In the present study the results showed that, the mean score of weekly and monthly reports scored 11.40 (95%) reports from 12 in three months which should be send weekly and 2.92 (97.3%) reports from 3 in three months which should be send monthly. The timelines for these reports to be submitted on time to the next level was, weekly 11.14 (92.8%), monthly 2.90 (96.6%) of reports. These high rates may reflect the nature of system in Iraq which

obligates health centers to send reports even if there were no cases of communicable disease. These results resemble to the evaluation of Iraqi MOH 2008 for the health system in presence of good reporting and notification process.[20] Positive results had been revealed by Abbas in Iraq[12] where 74.5% weekly reports completed and 84.3% submitted on time. Nsubuga et.al. in Study in Tanzania found just 35% of reports was submitted on time.[21]

Type of reporting in this study revealed that 100% of PHCC using regular mail (hand posting) as the main way for sending the weekly and monthly reports, receiving documents from other facilities and all forms of formal writing, also no using of fax, radio call and E-mail. This very high.

Result may be because the formal writing in the MOH and all the systems in Iraq still use the ordinary mail. Agreement with Al Jawadi *et.al.* results from Iraq that shows hand posting was the main tool of data reporting and none of these health facilities have other communication technologies as E-mail, fax or radio call.[15] While in Australia 2004, as an example of developed country, data are received from various clinical sources via papers, telephone and fax.[22]

The data analysis demonstrates that description of data by place, sex and time was (100%, 100% and 96%) respectively. The presence of line graph of cases by time in this study was 6%. The presence of an action threshold for country priority diseases in this study was absent. The presence of demographic data in the health facilities that used in surveillance system wasl00%. The description of data was high may be due to good recording of information for visitors to health facilities and the nature of health system and how the health centers were located according geographical area.

The low percentage of presence of line graph of cases may be devoted to lack of computers and trained staff to do line graph, where it is almost found in higher level. No signs had been noticed about availability of action threshold for priority diseases in the county. 100% was the rate of presence of demographic data in PHCC, where through observation, it is found that epidemiological map and rates of population in each health center which were provided by higher level.

The study in Mosul agreed with this study where (80%, 100% and 60%) respectively, was the description of data by place, sex and time. 0.6% was the presence of line graph which is very

close to the present study. Only 12.1 % of centers had an action threshold. Also 100% was found by this study for presence of demographic data.[15] Abbas 2010, proclaimed presence of place description 70.6%,time description 90.2% and only 3.9% perform cases line graph.[12] Lower percentage presented by Ibrahim et al 2009, where 33.3% description byplace, 39.3% description by time.12.1% of centers conducting line graph for cases. Action threshold was 20.2% for a country- priority disease. Also *Ibrahim et.al.* study explains presence of demographic data in 15.2 % of health centers.[14] Study in Khartoum, Sudan 2011 by *Sahal et.al*. described data analysis as. Performing trend analysis 0.0%, Aggregate case data by demographic category 100%.[10]

At the health facilities level the presence t)f national plan of epidemic preparedness, written case management protocol and a rapid response team with action threshold of action can enhance their ability to respond to an epidemic prone disease after notification of an outbreak. Also 86% of health facilities had written case management protocol and that was obvious during the study where case management protocol provided by primary health districts through OH to PHCC. The study disagreed with Abbas 2010 in Iraq, low percentage obtained in that study which was 11.8%.[12] Better results from Ibrahim et.al. in Jeddah 2009 about presence of written case management protocol which was 57.6%.[14]

Regarding epidemic response,72%of health facilities implemented prevention and control measures for one epidemic prone disease, based on a local data the staff in.health centers did many control and prevention procedures for suspected and confirmed cases diagnosed in die same centers, or centers get informed from higher level if diagnosis made in hospital or other health facility.

Acceptable case fatality rate for most recent outbreaks was achieved in 48% of PHCC, and this low percent maybe not because other PHCC not achieved acceptable case fatality rate but because they don’t know the outcome of cases after their referral to hospitals with no feedback from those hospitals. In comparison with Abbas study this study results was higher, where Abbas study explain that just 21.6% of health centers implemented prevention and control measures.[12] In agreement with Ibrahim et.al. study where scored 60.6%.[14] Also close results from *Nsubuga et.al*. in United Republic of Tanzania 2002.[21]

The results showed that feedback from higher level to health facilities was 30% and that percentage below the standards. One of the great problems discovered in this study was the

poor feedback from higher levels to surveillance units and that may effect on the performance of staff which they consider it kind of neglecting and cutting channels of connection with higher levels according to them. This may be belong to weakness in coordination between primary health sectors and hospitals about cases sent for more confirmation, also published bulletins from MOH about communicable diseases were very little.

Sixty two percent of health facilities were conducting meeting with community leaders within the last six months preceding the present survey with mean of 4.08±2.41 from six meeting should achieved as one meeting monthly, these meetings with community members [local council) are very useful to discuss the last health problems in the area and for co-support with other facilities.

In Iraq, the study of Abbas 2010 found feedback or report on surveillance from higher level in only 15.7% and that agreed with this study.[12] *Al-Jwadi et.al*. from Iraq agreed with this study too presence of poor feedback where Al-Jwadi found just 3% of health facilities received feedback from higher level, while disagree about conducting the meeting with community member where the study declared that just 1.2% of centers were attended and that may be because of the security situation in Mosul.[16]

Ibrahim et.al. was close in study result (24.2%) to this study in presence of feedback from higher level.[14] Also Nsubuga et al 2002 from Tanzania represent the same percentage 36%.[21] In Republic of Armenia, study by *Wuhib et.al*. 2002 found feedback should provide to all reporting sources and share information across vertical program lines and with officials throughout the public health community in a timely fashion. A bulletin could include descriptions of important outbreak investigations, disease- specific analyses of surveillance data, graphic and tabular information on selected diseases, indicators of community health, and recommendations for public health concerns.[23]

The presence of supervision in last 6 months for surveillance units in PHCC from higher level was 88% in this study. These supervisor visits made by primary health districts at most, DOH and sometimes from MOH. In this process of supervision, there must be documentation during the visits, so the presence of appropriate review of surveillance practices in supervision in the study scored 42%. This discrepancy between the percentage of presence of supervision (88%) and presence of appropriate review (42%) may be due to that the

supervisor may don't have information about surveillance or the supervision was to health center in general.

42% may represent just the supervisors whom came from surveillance units in higher level, also this may reveals the lack of one of the primary objective of the communicable diseases surveillance. In developed countries, the supervision functions are done regularly through competent and qualified staff, with much more resources, and clear assignment of responsibility and accountability among authorized surveillance personnel.[24] *Al-Jwadi et.al*. in Mosul got close results to this study, where 67.5% Surveillance activities supervised in the last 6 months, 5.5% of surveillance data reviewed during the visit.[15]

This study demonstrated the availability of training in diseases surveillance and epidemic management which was 30%. This low percentage may be because of two reasons: (1) there is no permanent staff or persons in charge in surveillance units, and hat is the same reason which leads to decrease in percentage of National Surveillance Manual presence, which explained before (2) the absence of pure Surveillance training about surveillance practices.

Abbas in Wasit 2010, showed that more than half (52.7%) of health workers in charge of surveillance reported received training.[12] The study of *Al-Jwadi et.al.* in Mosul 2008 demonstrated that training in disease surveillance was 69.8% and Training in epidemic management was 28.5%.[15] Ibrahim et.al. also disagreed with this study where scored 66.7%.[14] In Uganda, 62% of the staff received training on use of surveillance forms.[17] This study result may be lower than these studies because the lack of centralized training, public health (surveillance) expertise, plus reasons mentioned above and that need to increase and improve the training to be enough to staff.

The availability of resources at health facilities surveyed was variable. Resources in surveillance units putting up these results, which showed a complete presence for some and deficiency or absence for others. The most important results gained from this study were almost complete presence of electricity, stationery, disinfectants and protection materials.

Also the lack or complete absence of the most important resources which should be available in foe surveillance units as vehicles 4%, computers 10%, statistical package (*SPSS, Epi Info* or others) 0.0%, fax and radio call 0.0% too and spray pump 8%. The diminishing in basic resources may hamper the work of staff and performance of the whole surveillance system.

Results from Iraq by Abbas[12] revealed this؛ stationer 82.4%, Computers 9.8% and 7.8% had statistical package (SPSS). Vehicles only 3.9% and that agree with the present study.

Another study from Iraq by *Al-Jwadi et.al.*[15] calculators were present in all the examined health facilities only this study demonstrated the availability of training in diseases surveillance and epidemic management which was 30%.

This low percentage may be 7.8% had statistical package (SPSS). Vehicles only 3.9% and that agree with the present study. Another study from Iraq by *Al- Jwadi et.al.*[15] calculators were present in all of the examined health facilities. Electricity Generators were available in 94.1%؛ while 85.3% of health facilities had telephone, 88.3% had stationary, more than three-quarters (76.5%) had computers and 29.4% of these health facilities had their special vehicles.

Almost one tenth (8.8%) had spray pump and disinfectants and none of them have radio call for urgent notification. Ibrahim et al[14] found that 63.6% of health facilities had Stationery, 54.5% had Computers 6.1% had statistical package and 48.5./. had vehicles. The study of Sahal et al in Sudan 2010 got these results, presence of functioning telephone 80%, computers 14.7%, spray pump 0.0%, disinfection materials 65.3% and protection materials 60.7%.[10] In Uganda 2000, stationery 75%, calculators 77%, telephone 27% and radio call 14%.[17]

Nsubuga et.al. from Tanzania found that telephone 44 % and radio call 6% vehicle 34% computers 16%.[21] Almost all studies agreed that there was deficiency in resources especially in presence of computers, statistical programs, radio call and spray pump that need improvements. These results indicate variable use of resources and finances in different countries. Nevertheless the availability of generators, calculators, stationary and statisticians can help the core activities to simplify the registration and reporting procedures.

The satisfaction with surveillance system in health centers according to staff and persons in charge in the surveillance units in the health facilities revealed that only 20% were satisfied while 80% were not satisfied with the system and its activities. The opinions about surveillance system reflects the fact of that cadres may lack information about surveillance and how its work or they already recognized the defects and they have the ways for improvements and developments.

The opportunities for integration of surveillance activities and functions to be complete program and merge all other units which are concern with communicable diseases, mentioned by 48% of respondents. This study agrees with Tanzanian study where it is found that 38% of respondents not satisfied.[21] Disagreement with Mozambique Study 2006[13] 81% of the respondents were satisfied with the performance of epidemiological surveillance. This difference between both studies may be due to old creation of epidemiological surveillance system in Mozambique since 1979 according to the study.

This improvements ways that suggested by staff in the surveillance units, higher percentage was 33 (66%) for increase personnel (staff), 32 (64٠%) for facilities and 25 (50%) for training. In Mozambique 30 (40.5%) of the respondents mentioned training, four (5.4%) mentioned supervision and the same number proposed increasing the staff and providing manuals.[13]

The total achievements of evaluated domains had been calculated according to all questions or to specific questions which represent those domains.[15&25] For CDCC, we chose it as the central level for Baghdad where both DOH collect information and send it to CDCC, so the complete and final result found there. All domains at this level scored 100% except resources scored 77%, and that may be accepted results for level represents whole country.

Also on districts level, all domains showed results higher than standard benchmark which is 80% except supervision 50% and resources 66%. For those domains below the standard benchmark and those with slightly higher than benchmark, the proper improvements will be necessary to make system close to perfection. On the other hand the achievements of primary health care centers (health facilities level) for surveillance system assessment came with lower results than other levels, just data reporting, data analysis and epidemic preparedness was above the benchmark.

Epidemic response, feedback and supervision was close to standard benchmark and need more attention to increase the percentage of achievement but at all still under acceptable limit. Results of resources showed very low percentage of achievement, where just 21% of PHCC, had enough resources, also training was low too where scored 30%. These deficiencies in core and supportive functions may be because of the gap between health system in Iraq and the development in health sector in the world that happened during last three decades where Iraq was in war and sanction.

CONCLUSIONS

This assessment has revealed strengths and weaknesses in the communicable disease surveillance system in Baghdad Governorate, and the study has reached the following conclusions.

1.The national surveillance manual for communicable diseases was not present in complete form in surveillance units at health facilities.

2.Absence of newly and updated case definition for communicable diseases.

3.Staffs in surveillance units at health facilities don't know the targeted diseases for eradication, elimination, epidemic prone and major public health importance in the country.

4.Complete absence of knowledge about action threshold for country priority diseases.

5.Obvious reduction in feedback as bulletins and reports for the health facility level.

6.Weakness in the presence of appropriate review of surveillance practices in supervision on surveillance units from the supervisors.

7.Training of staff about surveillance and epidemics management was very poor.

8.There is clear deficiency in different resources for surveillance system especially the computers, fax, statistical package, internet services and transportation at all levels.

9.Poor satisfaction with the surveillance system.

Recommendations

Based on the results of this study, the Communicable Diseases Surveillance System (CDSS) in Baghdad Province needs to.

1.Strengthen die quality, core activities and supportive functions of the surveillance at all levels of the health system.

2.Fomulation of clear written objectives for CDSS at all levels should be foe first priority.

3.Foming an electronic network for reporting between districts and health facilities would be beneficial and make the raw surveillance data more accessible.

4.An urgent intervention is needed to build a system of updated, advanced data analysis both for the routine surveillance and for outbreaks to make use of the large amount of data collected by the system at different levels.

5.The system should build a strong collaborative link with the laboratories network.

6.The system should implement proper documentation methods for all foe CDSS data collected mainly for the urgent notification of communicable diseases and. outbreaks data as well as for zero reporting.

7.The surveillance system needs to develop a standard, regular and effective feedback system. The challenge is to respond quickly and properly to epidemics, thus formulation of standard rapid response team at all levels is the very first step in building effective epidemic preparedness in the province.

8.Adequate human resources (community health physicians, epidemiologist and statisticians) at lower levels of foe surveillance system as well as creation of incentives system, which would maintain committed personnel in foe CDSS, are needed.

9.Advanced training of all workers in surveillance units about surveillance activities, epidemics and data management.

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