Title of the project:

"Evaluation of Communicable Diseases Surveillance System in The Gaza Strip, 2017"

Oxana Abu Saada, Majdi Dheir, Nedal Ghuneim, Ghassan Wahbah and Ayman Abu Rahma

Introduction:

Communicable diseases are one of the main causes of morbidity, mortality and disability in the world. While these diseases present a large threat for the well-being of humans, there are well-known interventions that are available for controlling and preventing them. The wide use of antibiotics in the first half of the 20th century and immunization in the second half led to a significant decrease in incidence and mortality of many infectious diseases - epidemiological transition. Health surveillance is defined by world health organization (WHO) as an on-going systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice[(1)], linked with the timely dissemination of data (CDC, 2001)[(2)]. Thacker defined surveillance system as "the ongoing and systematic collection, analysis and interpretation of health data in the process of describing and monitoring a health event" (Thacker., 2000)[(3)].

Surveillance of communicable diseases is known as the foundation of public health decision making and practice. The development and strengthening of national surveillance systems is a key part of communicable disease control. Surveillance data are vital for monitoring the health status of the population, detecting diseases and starting action to prevent further illness, and to contain public health problems. The need of strengthening disease surveillance and response system is recognized worldwide (WHO, 2006)[(4)]. A well-functioning disease surveillance system offers information for planning, implementation, monitoring and evaluation of public health intervention programs. Many countries have established surveillance capacities to monitor diseases with a high burden, to spot outbreaks of epidemic prone diseases and to monitor progress towards national or international control or eradication targets. In this sense, surveillance of communicable diseases is a national function (WHO, 2001)[(5)].

Communicable diseases are one of the leading causes of morbidity and mortality in Gaza Strip, Palestine. In the Gaza Strip, the surveillance system of communicable diseases was established in 1996 including the main circulated 40 communicable diseases. Through comprehensive implementation of the national surveillance system of communicable diseases, Palestinian health authority had succeeded in prevention and complete control of many communicable diseases. The existing different factors (political, economical and social) make Gaza Strip susceptible for frequent outbreaks of communicable diseases from time to time. This situation has led to adoption of a changeable strategy according to the situation on the ground in order to guarantee an effective surveillance system. In Gaza Strip, one approach of communicable disease surveillance depends essentially on passive surveillance system. It depends on statutory reporting of information regarding persons with notifiable diseases by all heath providers and facilities participated in communicable diseases surveillance system (general practitioners, hospital doctors and laboratories). Diseases that are

subject to surveillance and reporting in PHC are divided into three groups: Group A diseases which include cases that should be notified immediately within 24 hours in order to produce a rapid alert and initiate necessary actions to confirm or not a potential outbreak; group B diseases include less urgent cases that should be notified within one week and group C diseases which include diseases for which notification is required within one month.

Despite the amelioration of reporting system, there is still under-reporting from some health providers. And despite the significant gap between real and reported data from all providers, all received data are routinely analyzed and interpreted to be part of the (monthly, quarterly and annually) reports on communicable diseases to control and prevent them and to help in decision-making. Non-adherence to timely and completeness of data in surveillance and reporting systems, causes problems in data analyzing. Accurate and timely notification by reporting sources for quick and timely response is essential for detecting any unusual increase of the disease to take needed preventive measures. Good surveillance does not necessarily ensure the taking of right decisions but it reduces the chances of wrong ones." (Langmiur, 1993)

Based on the Epidemiology team observations, the underreporting of communicable diseases remains a major problem in communicable diseases surveillance. The team also noted that health care workers reported the detected cases at the end of week based on his memory despite the availability of paper surveillance sheet. This leading to ambiguous documentation and reporting of annual report data. And this will affect the health decision makers and practice.

Aim: This project **aims** to evaluate the communicable diseases surveillance system in Gaza Strip in order to identify, manage and improve different obstacles facing the system.

The specific objectives are:

1. To identify areas of weaknesses and strengths in the surveillance system.
2. To identify factors responsible for under-reporting of infectious disease by general practitioners and suggest an approach that promotes reporting.
3. To explore mechanism of reporting, notification and monitoring system of surveillance program.
4. To describe the existing data management process (reporting, analysis, interpretation, monitoring and evaluation).
5. To suggest recommendations for continuous future improvement of the surveillance system and monitoring of infectious disease.

METHODOLOGY

Study design: This study is a descriptive cross-sectional study (including both quantitative and qualitative methods).

Study setting / data sources: All health care facilities (governmental, UNRWA, military and nongovernmental organizations) in the Gaza Strip which have primary health care centers, hospitals and laboratories were participated in the study.

Study population: The study population included all health care workers involved in the surveillance system.

Sampling Process:

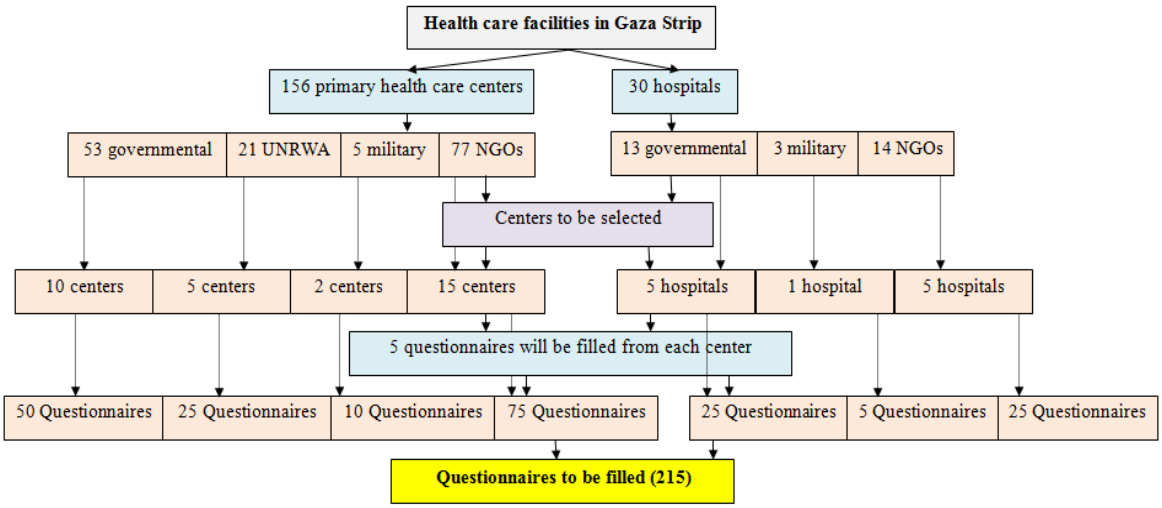
A convenient sample was used to determine the health facilities that participated in the study. Then the study population in these facilities were separated into 5 different strata (Head manager, head medical doctor, head nurses and two medical doctors from each facility).

Sampling method:

For Quantitative Data:

At the primary health care level out of 156 centers (53 governmental , 21 UNRWA, 5 military and 77 nongovernmental organizations)[6], 32 health centers were included in the study as the following: 10 governmental health centers (2 from each governorate), 5 UNRWA health centers (one from each governorate), 15 health centers from private sector (three from each governorate) and two military health center. At secondary health care level out of 30 hospitals[7], from the five governorates the largest 5 governmental hospitals and 5 nongovernmental organization's hospitals and one military hospital will be included in the study.

The total number of the study population sample who included in the quantitative part were 215 health care workers as follow; from the selected 32 primary health care centers a total of 160 health care workers were included in the study and from the selected 11 hospitals, 55 health care workers were included in the study.



For Qualitative Data:

Two focus group sessions were held including 27 experts of health professionals (consultants, stakeholders, epidemiologists from universities and NGOs, MOH and UNRWA health managers and some service providers) in order to collect data about the possible root causes of weaknesses of surveillance system and the suggested solutions to improve the surveillance and overcome the research problem. The participation of different subgroups was to bring different perspectives about the

problem and to have a meaningful suggestions for improvement. One session was held in southern governorates in 4/12/2017 included 12 participants while the second session was held in northern governorates in 11/12/2017 included 15 participants.

Data collection:

For Quantitative Data: A self-administered structured questionnaire for health care workers was used. The questionnaire included a closed-response questions. The questionnaire was validated by five competent experts who decided to add some questions and to omit others. Then the study was executed using a pilot sample of 10 participants selected randomly by SPSS. All the items were coded and entered onto the computer program SPSS. As a result, some un-understandable items (two questions) were revised. The pilot participants were not excluded from the study population because no obvious change was done and this will not affect the study.

For Qualitative Data: A structured focus group discussion guide was prepared to assist in initiating and focusing the discussions. Two sessions were conducted based on the preliminary results of the questionnaires. Exchange of information, ideas and views among participants was done. Two research assistants conducted the group discussions (as a moderators). These research assistants are known to have had many previous experiences with group discussions. One of the team played a role of note-taker and he tried to be aware about the body language.

In each group, the discussion commenced with a brief introduction of the study, its objectives and the purpose of the discussion. In summary, it was clarified that responses to any particular question were voluntary, and there was no pressure to respond or comment if the participant did not wish to; there were no right and wrong answers; all opinions were welcome; differences would be respected, and confidentiality of the discussion was assured. Group discussions lasted generally between 1-1.5 hours.

Data management:

For Quantitative data:

The Statistical Package of Social Science (SPSS) program was used for data entry and analyses. Data were entered by a qualified expert data entry personnel. Frequency tables that show sample characteristics were created.

For Qualitative data:

Open coding thematic analysis methods was used to analyze the transcripts of the focus group. The team obtained the main findings from the transcripts. Then categorization of related ideas, and comparison and integration between the quantitative and the qualitative findings was done to create rich items for discussion.

Monitoring, supervision and quality control:

The following points were taken in considerations:

- Data entry were done on the same day of the data collection and by the same qualified person to avoid any miss or unreal data.
- Data were cleaned to ensure completeness and accuracy.
- Piloting were implemented to ensure the validity and reliability of the research tools.
- An official letter of approval to conduct the research was obtained from the Helsinki Committee-Gaza Strip (Ethical committee) (Annex 1).
- Every participant in the study received a complete explanation about the research purposes and the confidentiality of information.
- Permissions were obtained from all health care organizations and consent form was obtained from each participant in the study (Annex 2) and he knew that participation in the research is optional.
- All the relevant ethical concepts were considered: Respect for people and respect for truth.

Results

Frequency analysis

This chapter presents the main results of statistical analysis of the study variables in a comparative way.

Predesigned Questionnaire

A total of 207 participants out of 215 completed the questionnaire with a response rate of 96%. The majority of participated facilities were from primary health centers (73.5%). The majority of participants were male (75.8%), having a Bachelors degree (63.3%) and 69% have a job experience more than 10 years. According to the job title, the highest percentage of the health care workers were medical health doctors (40.6%) and nurses (20.8%).

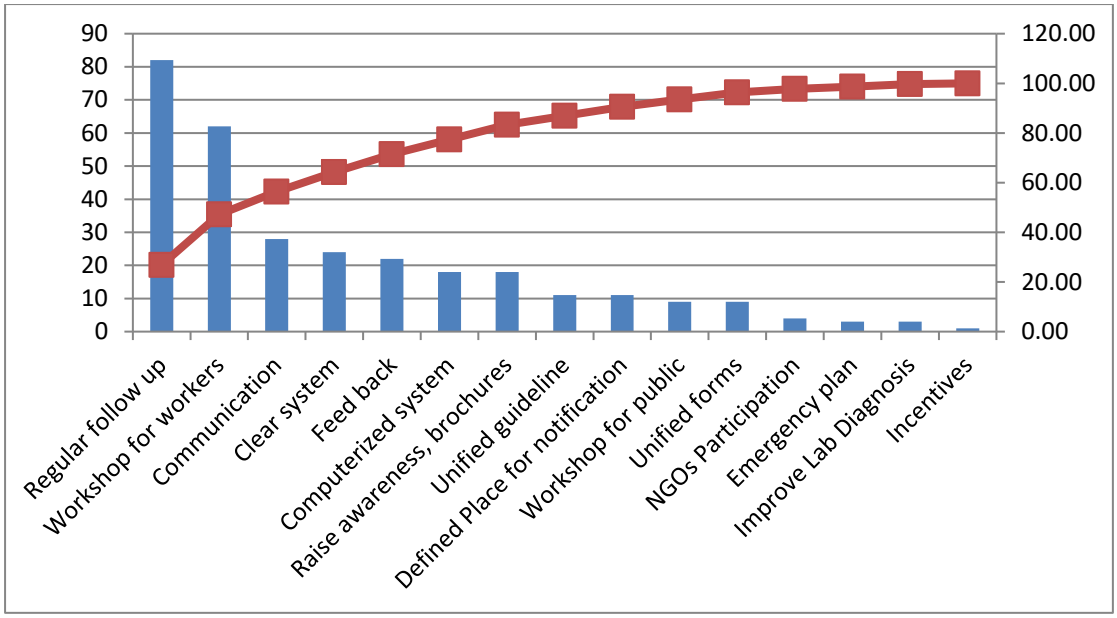
The majority of participants (77.8%) know that they oblige to report infectious disease cases to the epidemiology department by law. About 34.8%, 43.5% and 39.6% of the participants declare that they fill the infectious disease forms, don't have a guidelines nor a case definition respectively about the infectious diseases in their center. About 70% of participants declare that they report infectious disease cases.

Asked about the participation in training workshops about infectious diseases, only 48% of participants reported having these workshops.

The majority of participants (61.8%) declare that the reporting process is accomplished by telephone to the health doctor. Only 21.3% of participants report unexpected increase of any disease. According to participants, different diseases have been reported as unexpected increase like mumps, hepatitis, meningitis, diarrhea and others.

According to participants, there is a lack of regular visits from epidemiology staff and there is a lack of feedback. About half of the participants (48.8%) are not satisfied with services provided by epidemiology department.

The last question was open ended about the methods that can improve monitoring and surveillance system. The majority of participants (75.4%) responded to this question by different methods. We used this question to determine these methods and considered these responses as a voting to know the most important one of these methods. To compare these methods according to their relative frequency or magnitude, a Pareto chart was drawn as seen below. The majority of respondents think that follow up and regular visits from the epidemiology staff and implementing regular training workshops to all medical staff are considered the corner stone to improve monitoring and surveillance system. Other methods for improvements were strengthening the communication between different health care providers, putting an obvious and well known process for reporting, implementation of a feedback system, develop a unified database connecting all facilities and others.



Focus group discussions:

Through the two focus groups discussion, a valuable data were collected about the possible root causes of the different obstacles facing the surveillance system and the suggested solutions to improve the surveillance system and to overcome the research problem. Also multiple ideas were generated to determine and clarify the main causes and barriers affecting under-reporting and notification process.

The surveillance system was seen as poor because the system was not representative: not all primary health care centers, hospitals, private and military sectors are included in the system; it also lacked timeliness due to poor documentation in receiving reports; and in addition, there was no timely send feedback about the implemented interventions for control and prevention of communicable diseases on a routine basis.

Most of participants agreed that there are different obstacles facing health care workers to notify communicable diseases cases like: lack of supervision, the complexity of reporting process, lack of knowledge regarding the responsibility of reporting, the fear of viewed as incompetent by colleagues, over loaded work, lack of training, lack of feedback, not considering the event as important, absence or shortage of registration forms, protocols, and guidelines and others.

Regarding the difficulties of reporting, some think that there should be no difficulties regarding notification. But the majority thought that the difficulties could be due to absence of guidelines, protocols or notification forms and fearing from punishment.

> *"The difficulties are different. Some attributed to lack of awareness among health care workers, absence of clear policy and protocols, lack of notification forms or lack of awareness of medical staff about the importance of notification".*

The majority of participants mentioned that the best solution for reporting improvement is to do a continuous training programs and the availability of definite notification form and to be sent to the epidemiology department on a regular base.

> *"Most of workers don't receive any basic training neither about case definition and investigation nor about disease surveillance."*

Some recommended the importance of using special forms and to change the existing one as they include many diseases that are not exist in our area with very long list of diseases.

All of participants agreed that feedback report from higher level is beneficial. Most of them prefer quarterly feedback rather than annually or upon an occasion and prefer to be via Email rather than access through internet.

> *"Health care workers should have a training program explaining the importance of surveillance system and the value of receiving feedback reports"*

> *"Workshops should never stop and infectious disease issue should be always a priority".*

Regarding the process of notification, some participants think that the majority of infectious diseases are under control and reporting will not lead to change and is not necessary.

> *"We think that report of infectious diseases cases is used only for research studies and not for implementing any prophylactic procedures".*

Some of participants ascertain that there is a weak cooperation or coordination between different health care providers or even between hospitals and primary health care centers regarding the notification.

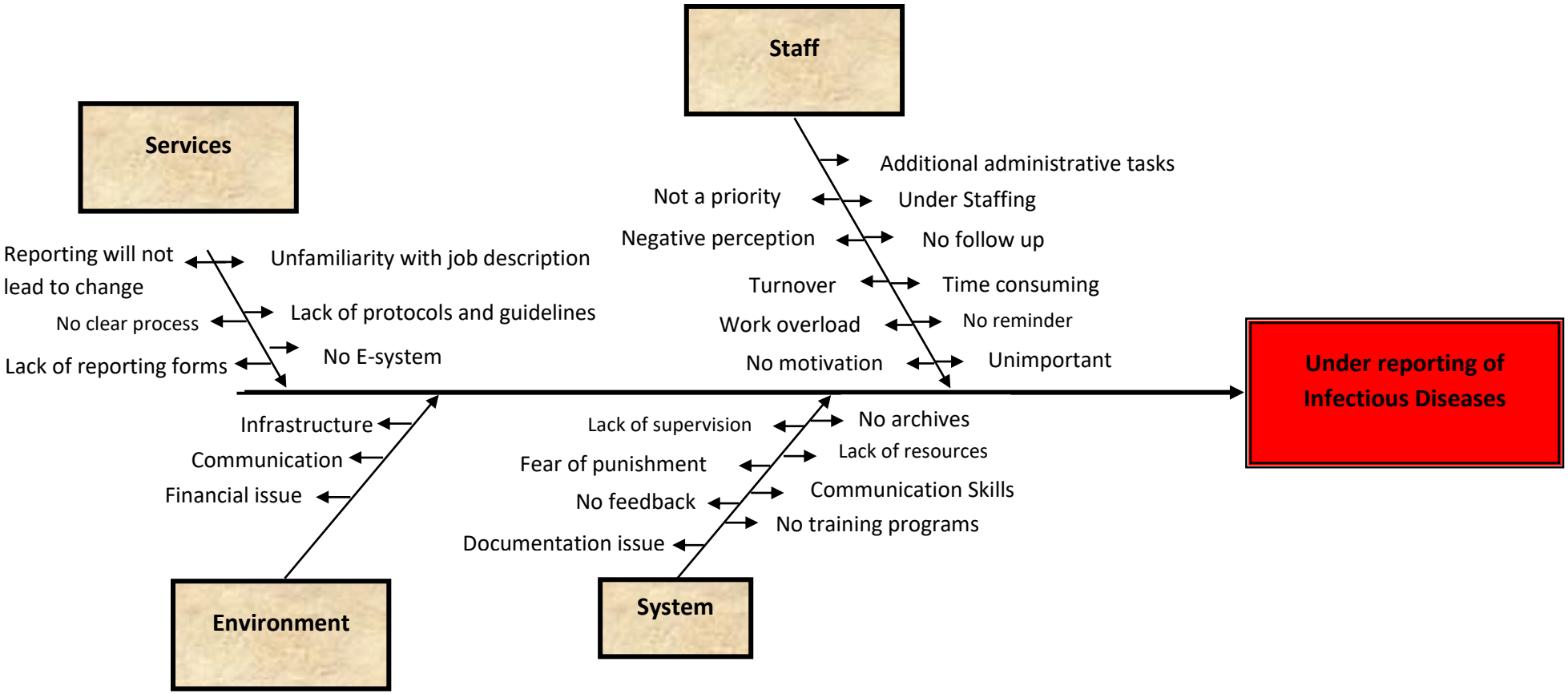
The UNRWA head manager ascertain that:

> *"We have a coordination with the epidemiology department regarding the epidemiological sheet and we report all infectious diseases cases to the epidemiology department".*

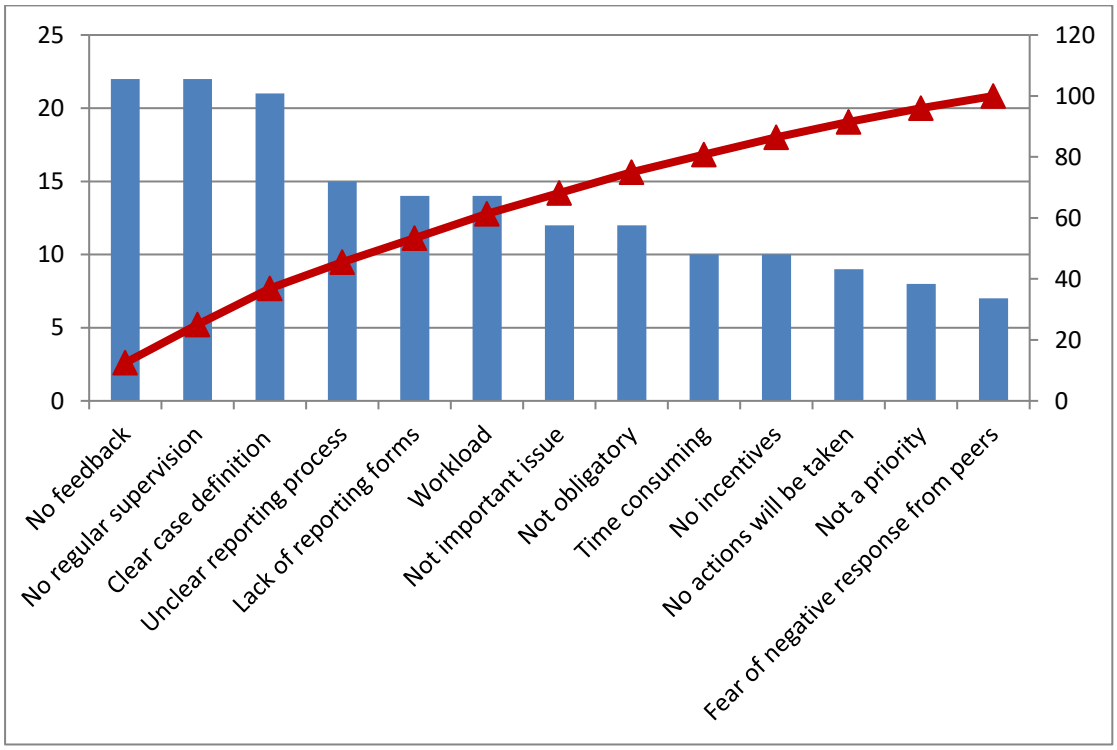
Fish Bone Diagram

During the focus group sessions, a brain storming was held for the participants who involved in the reporting system and notification of infectious disease process. The main question was: What are the main constrains in infectious disease reporting? There was an active participation of all members. At the end of these sessions, all generated ideas or issues have been grouped into a meaningful groups of related topics using the affinity diagram method. Then a title for each group have been created. Accordingly, four categories have been created for the generated ideas as illustrated in the following cause-and-effect-diagram (fishbone diagram). These categories are related to staff, system, services and environment and under each category, different subcategories have been identified as seen on the fishbone diagram.

Fish Bone Diagram



As seen on the fishbone diagram, there are multiple ideas have been generated and in order to narrow this broad list of ideas down to those that are most important, a multi-voting technique has been done. According to their relative frequency or magnitude, a Pareto chart was drawn as seen below which shows that the majority of participants agreed that the lack of feedback, lack of supervision, absence of case definition and unclear process of reporting are different obstacles causing underreporting. Some ascertain that under staffing of the epidemiology department is also an important cause of non-reporting.



Discussion:

Taken together, the quantitative and qualitative findings demonstrate the importance of notification and reporting of communicable diseases.

The study revealed some unexpected findings about the expectations of health care workers toward the infectious disease surveillance system. Experts pointed out that the current surveillance system for communicable diseases in Gaza is exist and well functioning with different obstacles. Despite the majority of participant (77.8%) know that the reporting is obligatory by law, only 34.8% are filling the needed infectious diseases forms. Among the 47.8% who participated in a workshops about the infectious diseases, only 28.5% declare that these workshops included topics about the reporting mechanism. And despite 70.5% report infectious disease cases, about 44% don't know how often they fill the forms. These numbers reflect the misunderstanding of the reporting process of infectious diseases.

Under-reporting of infectious disease still a major challenge for epidemiology department due to under-staffing and lack of supervision from the epidemiological staff, and following protocols, training opportunities etc at the health care workers participating in reporting system. Urgent interventions are needed to involve all health care providers (governmental, military, NGOs and private sectors) in the reporting system. These results were consistent with the study held by Sahal[8] from Sudan which concluded that rapid and strong intervention should be carried out to improve the quality of surveillance system in order to achieve targeted goals. Also these results were consistent with the study held in Zimbabwe in 2015 by Juru et. al.[9] and concluded that reasons for under reporting were lack of forms, lack of induction and poor knowledge on the surveillance system. Other study was done in Gaza by Awad et. al.[10] in 2001 reviewing infectious disease surveillance system. They found that underreporting of infectious diseases remains a major problem in communicable diseases surveillance.

The current surveillance system is facing different problems and if improved, will be satisfactory and it might overcome these problems. At the UNRWA level, there is a well-established system for reporting. While at the governmental, military, NGOs and privet levels, there is a poor reporting adherence of health care workers where the system is weak and a part of health care workers don't know their responsibilities. The lack of monitoring, guidelines, protocols, forms for reporting and evaluation from the higher managerial level are playing a role of weak report. Other different obstacles facing health care workers are lack of knowledge and training regarding the importance of communicable diseases notification. So health care workers must be encouraged to report communicable diseases on a regular base.

Emphasis on the encouragement of physicians who are involved directly in reporting of infectious disease and educate them mainly about the surveillance system, the importance of reporting system and the specific process for reporting diseases in the system will lead to detect disease trends and outbreaks, set priorities and plan interventions.

The results indicate variation between participants in the focus group discussion and participants who fill the questionnaire. The participants in the focus group discussion agreed that one of the root causes of the obstacles faced the surveillance system is the lack of regular supervision and feedback. While participants who fill the questionnaire

think that the main causes are the lack of regular visits and training. Thus training as an intervention is needed to raise the workers knowledge and to create behavioral change at work place.

As there is no an advance computerized database, analysis of data is limited and also reports take time to reach to the central level to be analyzed and information for action generated. This also affects negatively the feedback process.

A good reporting system should have a proper monitoring program. Follow up and feedback mechanism are from the responsibilities of the epidemiology unit in order to collect precise data to be used to determine the extent of infections and the risk of disease transmission. So prevention and control measures can be applied both effectively and efficiently to minimize the burden of illnesses.

It was obvious that there is no clear system for reporting and participants don't aware completely how or to whom they should notify.

Based on the result gained from questionnaires and Paretto diagram, it’s clear that lack of infectious disease reporting forms are one of the reasons of under-reporting. So it’s important to make sure the availability of the forms at all reporting levels and to order these forms from the epidemiology department in case of shortage. These results were consistent with the study held by Lefta[11] from Iraq in 2016 that concluded that the system in average is complex, inflexible, unacceptability, unrepresentative, low utility, unstable system in primary health care centers and health care sectors while were opposite surveillance system at health directorate.

Epidemiology unit are responsible for analysis, interpretation and dissemination of data. Quarterly bulletins and annual report are produced by the unit. Publication of bulletins for information on disease surveillance and reporting is an important step to encourage physicians and increase consciousness among them about the disease reporting system importance as well as many physicians complains this issue in the brainstorming session.

Conclusion and Recommendations

The study results concluded that the surveillance system needs to be improved and the root causes of that are insufficient regular follow up and the bad feedback. The following recommendations are essential and if implemented can improve the surveillance system in the future:

- Regular supervision and mentoring should be conducted for monitoring and evaluation of the surveillance system to ensure that infectious diseases are notified correctly.
- Defining a special worker from epidemiology department to follow up those with low notification and to remind those who report regularly.
- A system for a regular and continuous feedback reports of the infectious diseases situation should be send to all health care workers participating in the surveillance system.
- Conducting training workshops for all health care workers involved in the reporting system
- Providing a clear case definitions, unified guidelines and protocols and notification forms to all health care workers. Updating national guideline for communicable disease surveillance also is essential.
- Publication of bulletins for information on disease surveillance and reporting on a regular base.
- The decision makers at the ministry of health should support the expansion of the surveillance system to reach all health care providers.
- Establishing a suitable data base for surveillance system connecting all health care providers. The data base should include also E-mails for all health care workers to distribute all epidemiology department publications even as quarterly or annual reports.
- Strengthening inter and intra-sectorial cooperation and coordination between different levels.
- Different reporting pathways and responses to infectious diseases report need to be built into the existing system.
- Notification forms should be available at all health care facilities

Acknowledgments

The project was supported by World Health Organization, the Regional Office for the Eastern Mediterranean (WHO/EMRO): "Eastern Mediterranean Regional Office Special Grant for Research in Priority Areas of Public Health (EMRPPH)". We thank EMRPPH for their valuable support.

Annex 1: Helsinki Committee Approval

المجلس الفلسطيني للبحث الصحي
Palestinian Health Research Council
تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار
Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee
For Ethical Approval

Date: 2017/02/13 **Number:** PHRC/HC/195/17

Name: GHASSAN H. WAHBH الاسم:

We would like to inform you that the committee had discussed the proposal of your study about: نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Evaluation of Communicable Diseases Surveillance System in The Gaza Strip

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/195/17 in its meeting on 2017/02/13 و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member **Member**

Chairman

Genral Conditions:-

1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-

E-Mail:pal.phrc@gmail.com
Gaza - Palestine غزة - فلسطين
شارع النصر - مفترق العيون

Annex 2: Consent Form

Dear Participant:

We would like to inform you that we are in the process of conducting a study to assess the surveillance program for communicable diseases in the Gaza Strip, entitled **"Evaluation of Communicable Diseases Surveillance System in the Gaza Strip, 2017"** which will continue nine months, in order to identify the strengths and weaknesses of the program and the mechanism of registration and reporting of communicable diseases to improve and develop it. So you have been selected to be one of the participants in this study. All you have to do is to fill the questionnaire which will take from your valuable time about 15 minutes. Note that you have the right to refuse or withdraw at any time. The consent is optional and your decision will not have any negative sequelaeon you.

All information you provide are highly confidential and will not be used against you but will only be used for scientific research.

Thank you for participation

Research team

References:

1 WHO (2017): Public health surveillance. Available at: http://www.who.int/topics/public_health_surveillance/en/

2 CDC (1986): Comprehensive plan for epidemiologic surveillance: Centers for Disease Control, August 1986. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 1986.

3 Thacker S. (2000): In Principles and Practice of Public Health Surveillance. 2nd ed. New York: Oxford University Press, Inc; 2000. pp. 1–16.

4 WHO (2006): Communicable disease surveillance and response systems. A guide to planning. Available at: http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_LYO_2006_1.pdf

5 WHO (2001): Protocol for the Assessment of National Communicable Disease Surveillance and Response Systems. Guidelines for Assessment Teams. Available at: http://www.who.int/csr/resources/publications/surveillance/whocdscsrisr20012.pdf

6 Ministry of Health (2016): Annual Report: Primary Health Care in Gaza Strip. Palestinian Health Information Center. Available at: www.moh.gov.ps

7 Ministry of Health (2016): Annual Report: Hospitals in Gaza Strip. Palestinian Health Information Center. Available at: www.moh.gov.ps

8 Sahal N. (2011): Assessment of Communicable Diseases Surveillance System in Khartoum State, Sudan 2005 – 2007. Faculty of Health Sciences. University of Southern Denmark

9 Juru P., Ncube N., Notion T., Mufuta T., Bangure D., More M. and Chikodzore R. (2015): Evaluation of the Notifiable Diseases Surveillance System in Beitbridge District, Zimbabwe 2015. Open Journal of Epidemiology, 5, 197-203. http://dx.doi.org/10.4236/ojepi.2015.53024

10 Awad R., Al Rahman O and Abu Shahla N. (2001): A critical review of the infectious diseases surveillance system in the Gaza Strip. La Reveue de Sante de la Mediterranee orientale. Vol. 7, No. 1/2, 2001.

11 Lefta R. and Khalifa M. (2016): Adequacy of Communicable disease Surveillance System Attributes for Target Disease of Expanded Program on Immunization in Al – Najafe Governorate. International Journal of Scientific and Research Publications, Volume 6, Issue 3, March 2016.