USAID
FROM THE AMERICAN PEOPLE

PRIMARY HEALTH CARE PROJECT

# Surveillance Strategy for Priority Communicable Diseases in Iraq

DECEMBER 2014

**University Research Co,.LLC**

Table of Contents

1 ACRONYMS: ..... 5

2 PREFACE ..... 6

3 ACKNOWLEDGEMENTS ..... 7

4 INTRODUCTION ..... 8

4.1 4.1 Priority communicable diseases ..... 8

4.2 MoH vision ..... 9

4.3 Communicable disease surveillance defined ..... 9

4.4 Passive versus active surveillance ..... 9

4.5 Indicators ..... 9

4.6 Core components of the communicable disease surveillance system in Iraq ..... 10

4.7 The current communicable-disease surveillance system in Iraq ..... 12

4.8 General components for developing a National communicable-disease surveillance system ..... 13

5 NCDSS GOALS, OBJECTIVES, MILESTONES, AND INDICATORS ..... 13

6 A STRATEGY FOR PRIORITY COMMUNICABLE DISEASES IN IRAQ ..... 21

6.1 Priority communicable disease preparedness, response, monitoring and evaluation phases ..... 21

6.2 Surveillance system objectives ..... 21

6.3 Core functions and responsibilities ..... 22

6.4 Phase I – Preparedness ..... 23

6.5 Phase II – Response ..... 25

6.6 Phase III – Monitoring and Evaluation ..... 35

6.7 Annex 1: Institutional RRT member minimum core functions and responsibilities ..... 36

6.8 Annex 2: Preparedness and response capacity indicators ..... 39

**6.9 Annex 3: Alert management indicators** ..... **40**

**6.10 Annex 4: Field investigation indicators** ..... **41**

**6.11 Annex 5: Field response indicators** ..... **42**

**7 AFP SURVEILLANCE** ..... **46**

**7.1 Definitions** ..... **46**

**7.2 Targets and Milestones** ..... **47**

7.2.1 Case Detection/Registration ..... 47

7.2.2 Case Confirmation/Investigation ..... **Error! Bookmark not defined.**

7.2.3 Reporting ..... **Error! Bookmark not defined.**

7.2.4 Data Analysis ..... **Error! Bookmark not defined.**

7.2.5 Response and Feedback ..... **Error! Bookmark not defined.**

7.2.6 Environmental Surveillance: ..... **Error! Bookmark not defined.**

**8 MEASLES SURVEILLANCE** ..... ERROR! BOOKMARK NOT DEFINED.

**8.1 Definitions** ..... Error! Bookmark not defined.

**8.2 Targets and Milestones** ..... Error! Bookmark not defined.

8.2.1 Case Detection/Registration ..... **Error! Bookmark not defined.**

8.2.2 Case Confirmation/Investigation ..... 59

8.2.3 Reporting ..... 61

8.2.4 Data Analysis ..... 63

8.2.5 Response and Feedback ..... 64

**9 CHOLERA SURVEILLANCE** ..... **66**

**9.1 Definitions** ..... **66**

**9.2 Targets and Milestones** ..... **66**

9.2.1 Case Detection/Registration ..... 66

9.2.2 Case Confirmation/Investigation ..... 68

9.2.3 Reporting ..... 70

9.2.4 Data Analysis ..... 72

9.2.5 Response and Feedback ..... 73

9.2.6 Environmental Considerations ..... 74

**10 VHF SURVEILLANCE** ..... **75**

**10.1 Definitions** ..... **75**

**10.2 Targets and Milestones ..... 77**
10.2.1 Case Detection/Registration ..... **Error! Bookmark not defined.**
10.2.2 Case Confirmation/Investigation ..... 78
10.2.3 Reporting ..... 80
10.2.4 Data Analysis ..... **Error! Bookmark not defined.**
10.2.5 Response and Feedback ..... 83

**11 TUBERCULOSIS SURVEILLANCE ..... 86**

**11.1 Definitions ..... 86**

**11.2 Targets and Milestones ..... 88**
11.2.1 Case Detection/Registration ..... 88
11.2.2 Case Confirmation/Investigation ..... 90
11.2.3 Reporting ..... **Error! Bookmark not defined.**
11.2.4 Data Analysis ..... 93
11.2.5 Response and Feedback ..... **Error! Bookmark not defined.**

**12 VIRAL HEPATITIS SURVEILLANCE ..... 96**

**12.1 Definitions ..... 96**

**12.2 Targets and Milestones ..... 98**
12.2.1 Case Detection/Registration ..... 98
12.2.2 Case Confirmation/Investigation ..... 99
12.2.3 Reporting ..... 102
12.2.4 Data Analysis ..... 103
12.2.5 Response and Feedback ..... 104

**12.3 Chronic Liver Disease Surveillance ..... 106**

**13 SARI SURVEILLANCE ..... 107**

**13.1 Definitions ..... 107**

**13.2 Milestones and Targets ..... 1**
13.2.1 Case Detection/Registration ..... **Error! Bookmark not defined.**
13.2.2 Case Confirmation/Investigation ..... 4
13.2.3 Reporting ..... 8
13.2.4 Data Analysis ..... 10
13.2.5 Response and Feedback ..... 11

**14 REFERENCES ..... 14**

# 1 ACRONYMS:

| | |
|---|---|
| ALT | Alanine Transaminase |
| CD | Communicable Diseases |
| CDC | Communicable Disease Control |
| CME | Continuous Medical Education |
| CPHL | Central Public Health Laboratory |
| DOH | Directorate Of Health |
| DST | Drug Susceptibility Testing |
| *ELISA* | Enzyme Linked Immunosorbent Assay |
| EMRO | SubnationalOffice for the Eastern Mediterranean |
| ENRS | Electronic Nominal Recording System |
| HAV | Hepatitis A Virus |
| HCV | Hepatitis C Virus |
| HIV | Human Immunodeficiency Virus |
| *IFA* | Immunofluorescence Assay |
| ILI | Influenza-Like Illness |
| KMOH | Kurdistan Ministry of Health |
| MDR-TB | Multidrug-resistant TB |
| MERS-CoV | Middle East Respiratory Syndrome Coronavirus |
| MOH | Ministry of Health |
| NTP | National TB Control Program |
| PHCC | Primary Health Care Center |
| PHCPI | Primary Health Care Project in Iraq |
| RRT | Rapid Response Team |
| *rRT-PCR* | Realtime Reverse Transcription Polymerase Chain Reaction |
| SARI | Severe Acute Respiratory-Tract Infections |
| SGOT | Serum Glutamic Oxaloacetic Transaminase |
| TB | Tuberculosis |
| USAID | United State Agency for International Development |
| VHF | Viral Hemorrhagic Fevers |
| WHO | World Health Organization |
| WTBS | Web-based TB Surveillance System |
| XDR-TB | Extensively Drug-resistant TB |

# 2 PREFACE

This document presents Iraq's Surveillance Strategy for Priority Communicable Diseases. It has been prepared by the Ministry of Health/ CDC /CPHL with technical support from partners including the United States Agency for International Development's (USAID's) Primary Health Care Project in Iraq (PHCPI).

United State Agency for International Development (USAID)/P rimary Health Care Project (PHCPI) has assisted the Iraqi Ministry of Health (MOH) to achieve its strategic goal of quality primary health care (PHC) services in the country. PHCPI supports the MOH in three key components: 1) strengthening health management systems, 2) improving the quality of clinical services, and 3) encouraging community involvement to increase the demand for and use of PHC services.

In October 2013, a modification to PHCPI's technical scope of work had the project re -focus its efforts to further help the MOH accelerate the achievement of MDGs 4 and 5, reduce child mortality and improve maternal health.

For PHCPI, capacity development for surveillance of communicable diseases has been a key element in addressing MDG 4 and improving over health for Iraqi communities. PHCPI has specifically addressed this goal through the provision of training to health care providers, field workers, and community partners on the importance of proper surveillance that includes precise collection of real time data and the proper reporting to ensure a timely and accurate response. Additionally, PHCPI has updated a multitude of clinical guidelines to include surveillance aspects and has provided training to primary health care staff across Iraq.

Further support for Iraq's surveillance efforts included the development of an acute flaccid paralysis (AFP) field manual to be used by health care workers for the detection of poliomyelitis, which reemerged in Iraq in 2014.

# 3 ACKNOWLEDGEMENTS

University Research Co., LLC wishes to thank all the people who have collaborated on the development of this strategy. They have given generously of their time and their experience. Significant contributions to the Technical assistance to develop of this plan were mad e by USAID/Primary Health Care Project in Iraq (PHCPI) team in the field: Dr. Hala Jassim AlMossawi, Chief of Part, Dr. Atheer Sabah, Dr. Ramzeah Rabee, Eng. Saif Ali and Merwan Muwafaq and HQ team: Dr. Neeraj Kak, Colleen Longacre and Taylor Price and international Epidemiologist Paul Roddy for their significant assistance in reviewing and revising the document. Special thanks are due to Ministry of Health Public Health Directorate headed by Dr. Ziad Tariq and the technical working group who contributed time and experience to develop this document.

**Ministry of Health Technical Working Group:**

- Dr.Muthana Ibrahim Abd- Al-Kareem, Director of CDC Center.
- Dr. Adnan Nawar, Director of Surveillance Section, CDC Center.
- Dr. Muneer Kubba, Epidemiologist, CDC Center.
- Dr. Anwar Noah Ghazala, Epidemiologist, Director of Hepatitis Section/CDC Center.
- Dr.Hashim Jameel, Epidemiologist, CDC Center.
- Dr. Shaker Mohsen, Director of Enteric disease Section, CDC Center.
- Dr. Laeth Ghazi, Institute of TB and Acute Respiratory Infection.
- Dr. Yusra Khlif, Immunizations Section
- Dr. Jenan Khalid, Zoonotic Disease Section/CDC Center.
- Dr. Suzan Abd-al- Kareem, Director of Hepatitis Section/ CPHL

# 4 INTRODUCTION

## 4.1 Priority communicable diseases

Communicable diseases are a frequent cause of illness, disability, and death in Iraq. Although myriad public health responses are known to be effective for the control and prevention of communicable diseases, these responses typically require robust national health-system capacity for timely and effective communicable-disease detection, diagnoses, and response. Thus, the Iraq Ministry of Health (MoH) works with the World Health Organization (WHO), the United States Agency for International Development (USAID), and other partners to e nsure ongoing improvement to their national health system, such as the development and implementation of a national communicable-disease surveillance strategy to strengthen surveillance capacities for detecting, diagnosing, and responding to priority communicable diseases.

The MoH/Kurdistan MOH (KMOH) and other partners have provided justification for their identification of seven communicable diseases/conditions as a priority for surveillance efforts in Iraq for 2015 and beyond based on the following selection criteria:1

- The disease results in a high disease impact (morbidity, disability, mortality);
- The disease has a significant epidemic potential;
- The disease is a specific target of a national, subnational or international control program;
- The information to be collected will lead to significant public health action.

The seven priority diseases/conditions are as follows:

1. ***Poliomyelitis:*** Poliomyelitis is contagious, preventable, an international target for eradication, and incident infections have recently been confirmed in Iraq;
2. **Measles:** Measles is contagious, preventable, and there are currently over 700 laboratory-confirmed cases in Iraq, WHO works to reach the elimination;
3. ***Cholera:*** Iraq is at-risk for cholera outbreaks, which can be prevented with proper sanitation measures the disease can cause media pressure and panic of the community;
4. ***Hemorrhagic fevers:*** Crimean-Congo hemorrhagic fever (CCHF). CCHF is endemic in Iraq and has a high fatality ratio (up to 40%); Ebola virus due to its current pandemic status and possible importation to Iraq.
5. ***Viral Hepatitis:*** Hepatitis is endemic in Iraq. Limited laboratory diagnostic capacity at Primary Health Care Center (PHCC) level makes hepatitis C diagnosis challenging. Patients infected with hepatitis C may develop chronic liver disease, cirrhosis, and die;
6. ***Tuberculosis:*** is endemic in Iraq, WHO estimates per 100,000 population in Iraq the incidence of 42 new cases, relapse of 3 cases and prevalence of 73. Whit out early diagnosis and proper treatment, case fatality rate exceeds 50% and such maltreated patients propagate both TB and drug resistant TB in the community.
7. ***SARI:*** Risk of epidemic - cases are detected in neighbor country.

[1] http://www.who.int/cs r/resources/publications /surveillance/whocds csrisr992.pdf

## 4.2 MoH vision

A primary communicable disease vision of the MoH is to reduce the incidence and prevalence of communicable diseases in Iraq. This reduction will be achieved by strengthening Iraq's communicable-disease surveillance strategy. The strategy aims to provide health professionals and decision makers with relevant and accurate prospective communicable-disease data and reports to facilitate their efficient and effective communicable-disease prevention and control responses.

## 4.3 Communicable disease surveillance defined

Surveillance has been defined as "the ongoing systematic regular collection, management, analysis, interpretation and dissemination of data for a given population to detect changes on patterns of disease or disease determinant with action taken if a predefined criteria or thresholds are met", or more succinctly as providing the right information at the right time and in the right place to inform decision- making and action-taking.

Communicable disease surveillance is a recognized and well-documented public health approach (i.e. methodology) to generate prospective health data. Surveillance data are used to estimate measurements for program monitoring and evaluation. programmed monitoring and evaluation includes the modification of intervention strategies based on real-time communicable disease trends, the identification of high-risk groups, and the identification of the most prevalent causes of morbidity and mortality. Additionally, surveillance data provide real-time indications of program deteriorations or improvements so as to respond with apropos health intervention strategies based on the prospective data.

## 4.4 Passive versus active surveillance

Surveillance data are either passively or actively obtained. Passive disease surveillance is the routine reporting of individuals with an incident disease reaching to a health care facility for treatment or service. No special effort is made by health officials to locate or identify the incident infection. Passive surveillance will typically only identify those who become ill and seek health care, excluding those who are ill and do not seek health care and healthy carriers. Active disease surveillance is regularly scheduled or survey-tool based contacting by health officials of healthcare providers, laboratories, and/or institutions that provide details on incidence disease occurrences.

## 4.5 Indicators

Indicators are measurement estimations over time, typically expressed in whole numbers and ratio percentages. As they are estimated measurements, it is important that they are, to the greatest extent possible, both reliable and valid. A good indicator is one that is both valid and reliable. Reliability is an estimate of the consistency of the measurement whereas validity is an estimation of the accuracy of the measurement.

Indicators are typically categorized as being either a process or outcome indicator. A process indicator measures program and activity performance, such as number of visceral leishmaniasis diagnostic tests performed in one month at Health Facility X. An outcome

Indicator measures how well the program initiative is accomplishing its stated objectives, such as the comparison of health determinants within a defined population prior to a program implementation and 6 months after.

## 4.6 Core components of the communicable disease surveillance system in Iraq

The core functions of the communicable-disease surveillance system in Iraq include case detection and notification, case registration, case confirmation, reporting, data analysis and interpretation, epidemic preparedness, response and control, and feedback.

1. Case detection and notification

   Case detection is the process of identifying cases and outbreaks. Case detection can be through the formal health system, private health systems, or community structures. There is a current lack of appropriate case detection due to a dearth of training for health care providers, and no communication between private and governmental sectors, which lack community health educations and awareness. Urgent notification must be done by telephone direct to MOH/Iraqi CDC center decision makers but routine notification is completed on a paper-based routine notification form.

2. Case registrationn

   Case registration is the process of recording identified cases. This requires a standardized register to record data variables on targeted diseases and conditions. Demographic data such as age, gender, and occupation should be added.

3. Case confirmation

   Case/outbreak confirmation refers to the epidemiological and laboratory capacity for diagnostic confirmation. Capacity for case diagnostic confirmation is enhanced through

   Improved referral systems, networking, and partnerships. This means having the capacity for appropriate specimen collection, packaging, and transportation. The existence of internal and external quality control mechanisms are important elements for case confirmation, which help to ensure the validity and reliability of test results. In addition, the lab facilities at not all the PHCCs are well equipped and not all staff are trained on simple crucial tests for confirmation of targeted communicable diseases.

4. Reporting

   Reporting refers to the process by which surveillance data moves through the surveillance system from the point of its generation. It also refers to the process of reporting suspected and confirmed outbreaks. Different reporting systems may be in existence depending on the type of data and information being reported, purpose and urgency of relaying the information, and where the data/information is being reported the national guidelines for the different reporting systems should be implemented.

5. Data analysis and interpretation

   Surveillance data should be analyzed routinely and the information interpreted for use in public health actions. The surveillance staff should use alert and epidemic threshold values for relevant communicable diseases. Capacity for routine data analysis and interpretation should be established and maintained for epidemiological and laboratory data.

6. Epidemic preparedness

Epidemic preparedness refers to the existing level of preparedness for potential epidemics and includes availability of preparedness plans, stockpiling, designation of isolation facilities, setting aside of resources for outbreak response, etc.

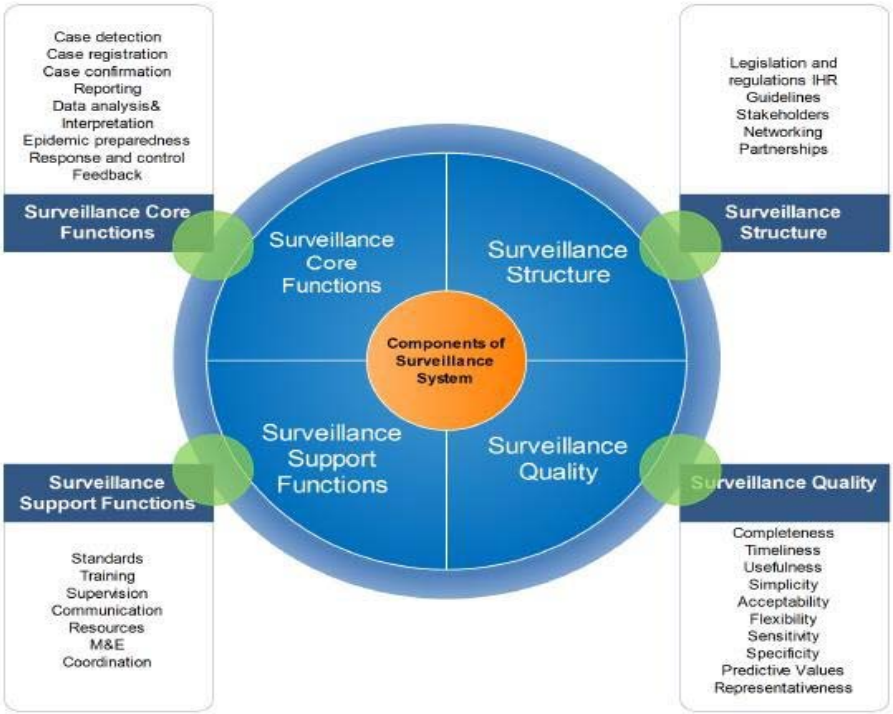
7. Response and control

   Public health surveillance systems are only useful if they provide data for appropriate public health response and control. For an early warning system, the capacity to respond to detected outbreaks and emerging public health threats needs to be assessed. This can be done following a major outbreak response and containment to document the quality and impact of public health response and control. Surveillance systems designed to monitor and evaluate program interventions should be evaluated to establish the extent to which the objectives of the systems are being met. Information should be simple, complete, timely, and useful so as to enable data analyses leading to an active public health response. Each communicable disease has a specific response protocol which should be available at all PHCC, hospital, district, and DoH levels.

8. Feedback

   Feedback is a crucial component of all surveillance systems. Appropriate feedback can be maintained through supervisory visits and newsletter. It is possible to monitor the provision of feedback by the different levels of surveillance to evaluate the quality of feedback provided and the implementation of follow-up actions. Investigators should work to implement long-term control measures to end an ongoing outbreak and prevent future outbreaks.

**Figure 1 below shows key components of the surveillance system**

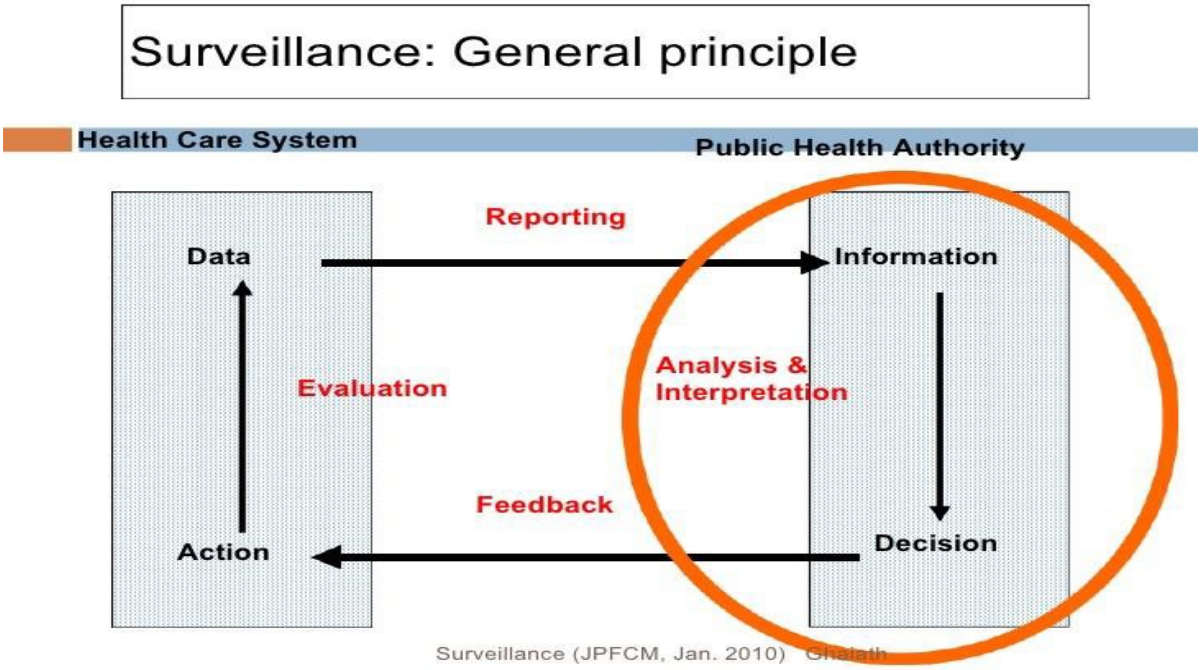


## 4.7 The current communicable-disease surveillance system in Iraq

The current communicable-disease surveillance system in Iraq primarily involves passive surveillance through health-service provider reporting of detected incidents of WHO International Health Regulations (IHR)-notifiable diseases at the primary or secondary health-system level. Presently, the communicable-disease reporting system in Iraq is paper-based, up to the level of the DOH. That report electronically to the MOH/Iraqi CDC center.

There are currently 38 diseases/conditions under surveillance in Iraq. As mentioned previously, for the purpose of this proposed strategic initiative, only seven communicable diseases/conditions will initially be incorporated into the surveillance strategy. To date, the communicable diseases/conditions under surveillance are categorized into immediate, weekly, and monthly passive-reporting groups. The weekly and monthly communicable disease/conditions are recorded on a standardized paper forms and reported to the DoH and MOH / Iraqi CDC center as aggregated data distributed according to district, province, gender, and age group.

The DOH and/or the MOH / Iraqi CDC center typically respond accordingly to all IHR-disease reports. However, response for communicable disease prevention and control at the PHCC, hospital, and district levels is generally lacking. This inaction at the PHCC, hospital, and district levels constitutes a major challenge for the national health system and it is highlighted as a major focus for improvement in order to meet the overall National Communicable Diseases Surveillance Strategy (NCDSS) objectives. Figure 2 below shows general principles of Surveillance system.



## 4.8 General components for developing a National communicable-disease surveillance system

General components for developing a comprehensive NCDSS would include but are not limited to the following:

1. The creation of a collaborative partnership with all relevant stakeholders;
2. The development of clear and concise objectives designed to meet the public health problems caused by communicable diseases;
3. The creation of an agreement on intervention strategies, measurement indicators, and data sources (which health centers and/or hospitals will be participating and contributing data etc...);
4. The identification of who will be managing and systematically analyzing and interpreting the generated data;
5. The creation of a monitoring and evaluation unit in order to assume responsibility for and guide the initiative;
6. The training of relevant health staff;
7. The development of guidelines and data collection templates.
8. Conducting periodic data quality assessments.

Specifically, in order to achieve a comprehensive NCDSS the Iraq MOH and supporting partners would agree on objectives for the Surveillance Strategy create a monitoring and evaluation component-specific framework, and subsequently monitor the implementation of the Surveillance Strategy on the targeted population.

# 5 NCDSS GOALS, OBJECTIVES, MILESTONES, AND INDICATORS

The overall objective of the NCDSS is to reduce morbidity and mortality in Iraq attributed to the seven identified priority communicable diseases. Specific goals and objectives of the strategy are as follows.

| **Goal 1:** | **Prioritization of disease for surveillance/appropriate selection of the target** |
|---|---|
| **Objective 1.1:** | To convene multiple communicable disease/condition-specific consultation groups to provide expert guidance on a number of disease/condition-specific issues. These groups will constitute six major groups, with the possibility of forming subgroups, the disease/ pathogen are divided into six major groups that include (food and water born and zoonosis, HIV and STI, RESPIRATORY, environmental emerging and vector born, vaccine preventable, antimicrobial<br>Resistance and health care associated infection). Each group will comprise experts for each specialty (epidemiologist, physician/pediatrician, and microbiologist) and have participants from the reciprocal Iraqi CDC center Taskforce. |
| **Milestones:** | 1. Develop and agree disease/disease group specific objectives: by the end of December 2014 a list of required specialties are generated, the first meeting to be arranged by January 2015, the consultation group is expected to hold one annual meeting to contribute to the following.<br>2. Develop and agree on criteria for prioritization of diseases, Updating the under surveillance disease list to cover possible risks according to the new scientific update.<br>3. A comprehensive surveillance guideline/ toolkit to be finalized by the end of 2015, the guideline provide comprehensive description of notifiable disease and action plan on detection starting from the PHCC level, training to the new |

| | |
|---|---|
| | guideline to follow within the next year, the training would cover health service provider in the primary healthcare level and hospitals. |
| **Monitoring and Evaluation:** | **Indicator 1.1.1:** Number of meeting held for all six disease/disease group each group include at least three members (epidemiologist, physician/pediatrician, microbiologist) specific with reciprocal Iraqi CDC center taskforce by January 2015.<br>**Target:** At least one of meeting held for all six disease/disease group specific with reciprocal Iraqi CDC center taskforce by January 2015. |
| | **Indicator 1.1.2:** Percentage of PHCCs/Hospitals that received a printed copy of surveillance guideline/toolkit is finalized by the July of 2016.<br>**Target:** 80% of PHCCs/ Hospital received a printed copy of surveillance guideline/toolkit is finalized by the July of 2016. |

| | |
|---|---|
| **Goal 2:** | **Improve Surveillance coverage and involve the private sector with main focus on private hospitals** |
| **Objective 2.1:** | In Iraq, the private sector provides approximately 40% of the population's health-care service needs. It is thus crucial that private hospitals are stakeholders in the NCDSS. To ensure cooperation between the MOH and the Iraq Medical Associations (IMA) to maximize cooperation at the private clinics and hospital levels with regards to communicable-disease surveillance. |
| **Milestones:** | 1. By January 2017 the first meeting between MOH, CDC center/Iraq, and IMA is convened. Suggested legislation that cover mainly communicable-disease surveillance at private hospitals, antimicrobial resistance, and health-care associated infection are issued within six month of that meeting.<br>2. By June 2017 regulations that define the role of private sector in surveillance process will be legislated.<br>3. Performing orientation session about the surveillance system for key/active physicians/ member in the private sector at each district, to promote their participation in diseases notification. |
| **Monitoring and Evaluation:** | **Indicator 2.1.1:** Number of meeting held that involve decision maker from the MOH and IMA that discuss involvement of private clinic and private hospital in notification process by January 2017.<br>**Target:** At least on meeting held that involve decision maker from the MOH and IMA that discuss involvement of private clinic and private hospital in notification process by January 2017. |
| | **Indicator 2.1.2:** percentage of district in each at least one orientation session for key/active physicians/ member in the private sector, to promote their participation in diseases notification. By 2016 |

| | |
|---|---|
| | **Target:** 80% of district in each at least one orientation session for key/active physicians/ member in the private sector, to promote their participation in diseases notification. By 2016 |

| **Goal 3:** | **Improving quality of data/improving lab diagnosis** |
|---|---|
| **Objective 3.1:** | To map the laboratory surveillance potential in Iraq. In Iraq there is large variation in the diagnostic capacity at different PHCC and hospital laboratories. These variations occur intra- and inter-provincially. A thorough assessment of laboratory functioning and capacity is required to formulate a specific strategy to improve laboratory performance and reporting. |
| **Milestones:** | 1. To perform ad hoc analysis to assess current status of hospitals, PHCCs laboratory capacity with regard to ability to diagnose under surveillance diseases.<br>2. CPHL to finalize protocol by end of April 2015.<br>3. Data collection finalized by July 2015.<br>4. Data analysis and formulation of final report is handed in formal letter to the PHD/ Iraqi CDC center by December 2015. |
| **Monitoring and Evaluation:** | **Indicator 3.1.1:** Percentage of subnational labs that are covered by ad hoc analysis report presented to the PHD/ Iraqi CDC center by December 2015.<br>**Target:** 100% of subnational labs that are covered by ad hoc analysis report presented to the PHD/ Iraqi CDC center by December 2015. |
| **Objective 3.2:** | To promote the harmonization of testing practices and reporting systems and pilot advanced methods of analysis. Diagnosis of many notifiable disease may be delayed due to lack of modern diagnostic techniques in most hospital and centers as the national reference laboratory lacks many advanced molecular and genomic techniques. Though treatment of individual cases starts on suspicion as a delay can cause a negative health consequence, delays are often caused by poor or non-Existent laboratory diagnostic capacity. The availability of advanced diagnostic methods at PHCC and hospital levels would improve case detection and response. |
| **Milestones:** | 1. CPHL capacity improved (MOH to equip and provide training to the relevant staff of the CPHL) to be able to detect, identify, characterize and subtype human pathogens of public health significance by end of 2017.<br>2. Improve ((MOH to equip and provide training to the relevant staff) diagnosis capacity of laboratories at the level of the DOH by end of 2017. |
| **Monitoring and Evaluation:** | **Indicator 3.2.1:** Percentage of the diseases under surveillance that CPHL is capable of providing definite diagnosis of, in addition to molecular and genetic characteristic of the pathogen when required by end of 2017.<br>**Target:** 100% of the diseases under surveillance can be definitely diagnosed by CPHL in addition to molecular and genetic characteristic of the pathogen when required by end of 2017. |

| | |
|---|---|
| | **Indicator 3.2.2:** Number of subnational laboratory at each DOH that are capable of providing diagnosis for 60% disease under surveillance with at least 80% specificity by end of 2017.<br>**Target:** one subnational laboratory at each DOH is capable of providing diagnosis for 60% disease under surveillance with at least 80% specificity by end of 2017. |

| **Goal 4:** | **Accelerate the utilization of emerging tools and approaches to improve the availability, quality, timeliness, and credibility of surveillance data** |
|---|---|
| **Background and Rationale** | Emerging health information technology (HIT) improvements offer tremendous potential to improve the timeliness, quality, quantity, and efficiency, of public health data enabling decision makers to take action while also linking public health agencies and systems more effectively with clinical systems and healthcare professionals. Currently, routine surveillance report data are send in paper format from the PHCCs to the health district, then to the DOH. Data from hospitals are also reported in paper format to the DOHs; DOHs then report to the Iraqi CDC center data by email using the EpiInfo 3 forms. Reporting is limited to the 38 diseases currently under surveillance.<br><br>***Impact of a web-based reporting system:*** The Web-based reporting system can play an unparalleled role in discovering and containing infectious diseases in a timely fashion and protecting the lives and health of the entire population by reducing the financial and human impact of diseases on society as a whole. System impact include: *1) Increase in the Timeliness and Accuracy of Data.* In the working model of China, the pre- 2004 aggregated monthly reports for infectious disease are replaced by real-time, case-specific direct reports. As of 2004, the system can boast a tenfold increase in overall reporting speed and a 33% increase in the number of complete reports. This working model gave rise to a material leap in the infectious disease surveillance and public health information management in China. "Missing reports" have been greatly reduced with the transition to real-time, Web-based reporting. *2) Early Health response.* More accurate, timely disease reporting has led to the early detection and containment of outbreaks, which not only protects the public from illness but also mitigates other potential negative impacts (e.g., economic, social) associated with the spread of disease. The system maximizes the efficiency of outbreak response efforts by mobilizing professional forces quickly and appropriately, thereby minimizing the hazards of a serious infectious disease outbreak. *3) An Accurate Picture of Disease Prevalence.* After the completion of the Web-based system, the number of disease cases increase. This increase reflects more accurate, frequent reporting rather than an actual increase in infection. The system also facilitates the investigation of cases where a diagnosis may be uncertain or the cause of death unknown. Piecing together these unexplained cases can lead to the early detection of new diseases or outbreaks. *4) An Affordable, Easy-to-Use Standardized Platform.* Epidemic disease surveillance will become standardized across institutions, facilitating communication and efficiency. Costs are low, deployment is easy, and information is timely and valid. Additionally, modularized information analysis and retrieving features are easy to operate. 5) Improvements in Health Infrastructure. The implementation of the Web-based system will pave the way for improvements in infrastructural networks for local medical institutions and increased the computer proficiency of healthcare |

| | |
|---|---|
| | Personnel.[2] |
| **Objective 4.1:** | To change the current paper-based reporting system into an electronic reporting system. Epi Info has been in existence for over 20 years and is currently available for Microsoft Windows. The program allows for electronic survey creation, data entry, and analysis. Within the analysis module, analytic routines include t-tests, ANOVA, nonparametric statistics, cross tabulations and stratification with estimates of odds ratios, risk ratios, and risk differences, logistic regression (conditional and unconditional), survival analysis (Kaplan Meier and Cox proportional hazard), and analysis of complex survey data. The software is in the public domain, free, and can be downloaded. |
| **Milestones:** | 1. By the end of January 2015, all health district in the country (except in hot zones) are trained and equipped to use Epi info 3, partial analysis would start at district level, and data are reported by email to the respective DOH.<br>2. By the end of March 2015 DOH staff would be trained and equipped to use EPI info 7 program.<br>3. By end of 2016 more than 80% of PHCCs have at least 2 communicable disease officers trained and equipped to use Epi info.<br>4. By the end of 2017 "communicable disease surveillance website" is founded, Data are reported directly from the DOH to the website.<br>5. By the end of 2018 communicable disease unit officer and /or physician at the level of PHCCs are trained and equipped to use Epi info form and report data electronically to the district, DOH or "communicable disease surveillance website". |
| **Monitoring and Evaluation:** | **Indicator 4.1.1:** Percent of districts (except those in hot zones) that report via Epi Info forms by the end of January 2015.<br>**Target:** By end of January 2015, 100% of districts (except those in hot zones) report via Epi info forms. |
| | **Indicator 4.1.2:** Percent of PHCCs from which at least 2 communicable disease officers are trained to use Epi info by end of end of 2016.<br>**Target:** By end of end of 2016, >=80% of PHCCs have at least 2 communicable disease officers trained and equipped to use Epi info. |
| | **Indicator 4.1.3:** Percent of PHCCs report notifiable disease using Epi info forms, by February 2017.<br>**Target:** By February 2017, 80% of PHCCs report notifiable disease using Epi info forms, less than 20 % of reports are delivered by paper form. |
| | **Indicator 4.1.4:** Percent of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017. **Target:** 100% of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017. |
| | **Indicator 4.1.5:** Percentage of districts, hospitals and PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017. |

[2] (http://pacifichealthsummit.org/downloads/HITCaseStudies/Functional/CISDCP.pdf)

| | |
|---|---|
| | **Target:** 100% of districts and hospitals and 80% of PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017 |
| | **Indicator 4.1.6:** Percentage of notifiable disease reports delivered by paper or epi Info forms by end of January 2018.<br>**Target:** < = 20% of notifiable disease reports delivered by paper or epi info forms by end of January 2018. |
| | |
| **Objective 4.2:** | To accelerate electronic laboratory reporting. Electronic reporting of laboratory Results to public health agencies can improve public health surveillance for reportable diseases and conditions by making reporting more timely and complete. This objective is strongly limited by the pace at which electronic report system is adopted at the level of PHCCs and hospitals; central public health labs already report to the **Iraqi** CDC center electronically but report is case based by email. |
| **Milestones:** | 1. By **March 2015**, CPHL staff are able to send reports using Epi info forms.<br>2. By June **2015 hospital** laboratories and reference subnational at the health Districts are trained and equipped to send data using Epi form. |
| **Monitoring and Evaluation:** | **Indicator 4.2.1:** Number of members of each division of CPHL who are trained To use Epi info forms by April 2015.<br>**Target:** One members of each division of CPHL are trained to use Epi info forms by April 2015. |
| | **Indicator 4.2.2:** Percentage of surveillance lab result that are sent as paper document from CPHL to the Iraqi CDC center (except for medico legal purposes) by June 2015.<br>**Target:** 0% of surveillance lab result are sent as paper document from CPHL to the Iraqi CDC center (except for medico legal purposes) by June 2015. |
| | **Indicator 4.2.3:** Percentage of hospital and reference laboratories from each at least one member is trained to use Epi info forms by September 2015.<br>**Target:** 100% of hospital and reference laboratories from each at least one member is trained to use Epi info forms by September 2015. |
| | **Indicator 4.2.4:** Percentage of surveillance lab results that are sent as paper document from a hospital lab or reference lab to the Iraqi CDC center (except for medico legal purposes). By end of 2015.<br>**Target:** 0% of surveillance lab results are sent as paper document from a hospital laboratory or reference lab to the Iraqi CDC center (except for medico legal purposes). By end of 2015. |

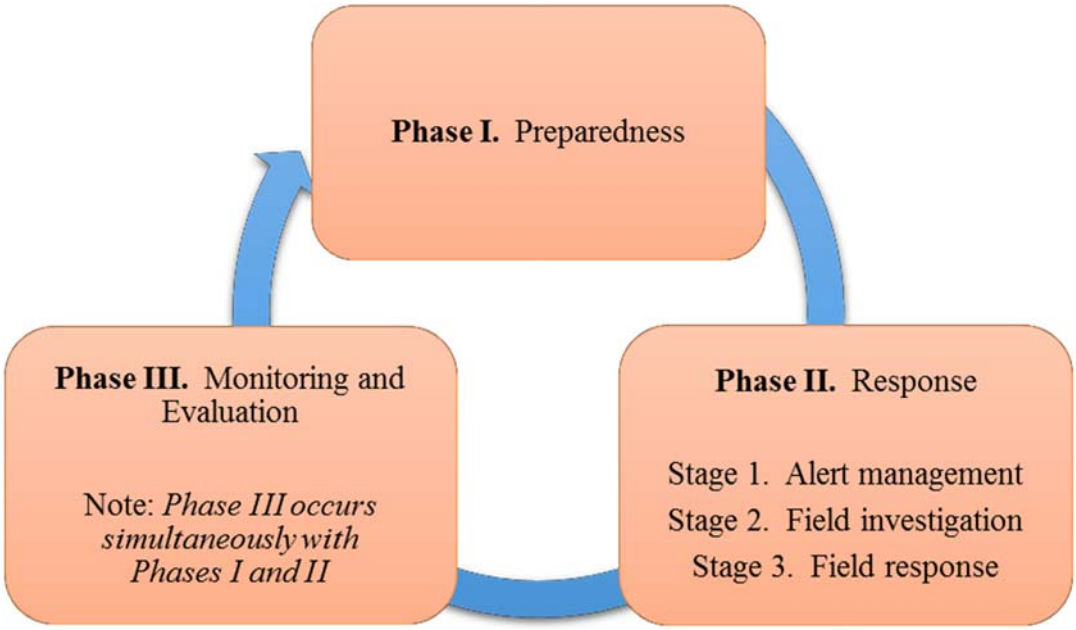
| **Goal 5:** | **Provide a plan of action at the PHCC and district levels** |
|---|---|
| **Objective 5.1:** | A Rapid Response Team (RRT) with detailed protocol for outbreak management is developed in each PHCC, district, hospital and DOH. |
| **Milestones:** | 1. By January 2016 members of RRT are nominated in each, district, hospital and DOH the team can include physician, epidemiologist and microbiologist.<br>2. By March 2016 a copy of comprehensive surveillance guideline/ toolkit is printed and distributed to the PHCC, district and hospitals. The toolkit provide comprehensive description of notifiable disease and action plan on detection starting from the hospital level.<br>3. By June 2016 members of the RRT are trained to use the new surveillance toolkit.<br>4. By August 2016 specific detailed protocol for outbreak management are formulated in each PHCC, district, hospital and DOH. |
| **Monitoring and Evaluation:** | **Indicator 5.1.1:** Percentage of, district and DOH in each One RRT team is nominated by official letter (the team should include at least, 3 members in the district and hospitals, and 5 members in the DOH including physician, epidemiologist and microbiologist) By **January 2016.**<br>**Target:** 100% of, district hospital and DOH in each One RRT team is nominated by official letter (the team should include at least, 3 members in the district and hospitals, and 5 members in the DOH including physician, epidemiologist and microbiologist) By **January 2016** |
| | **Indicator 5.1.2:** Percentage of PHCCs/ Hospitals in each a copy of the comprehensive surveillance guideline/ toolkit (that contain a detailed action plan for each of the priority disease) is available by March 2016.<br>**Target:** 100% of PHCCs/ Hospitals in each a copy of the comprehensive surveillance guideline/ toolkit (that contain a detailed action plan for each of the priority disease) is available by March 2016. |
| | **Indicator 5.1.3:** Percentage of, Hospitals, Districts and DOHs, the members of its RRT are trained to use the new surveillance toolkit by June 2016.<br>**Target:** training to use the new surveillance toolkit is provided to the members of RRT in 100% of Hospitals, Districts and DOHs by June 2016. |
| | **Indicator 5.1.4:** Percentage of, Hospitals, Districts and DOHs that formulated Specific detailed protocol for outbreak management by August 2016.<br>**Target:** 100% of Districts and DOHs had formulated Specific detailed protocol for outbreak management by August 20 16. |

# 6 A STRATEGY FOR PRIORITY COMMUNICABLE DISEASES IN IRAQ

## 6.1 Priority communicable disease preparedness, response, monitoring and evaluation phases

The preparedness and response to priority communicable diseases involves three cyclic phases of overall communicable-disease surveillance: Phase I, Preparedness; Phase II, Response; and Phase III, Monitoring and Evaluation. Phase II comprises three sequential stages: alert management (stage 1); field investigation (stage 2); and field response (stage 3 ) (Figure 3). Monitoring and evaluation occurs simultaneously with Phase I and Phase II, but constitutes its own phase, as it is a process requiring ongoing commitment and rigour. To have complete surveillance of a priority communicable disease, the three phases need to be addressed in a comprehensive manner, including the use of standardized forms and reporting mechanisms. These phases are described in a step-wise manner below (Figure 2).

**Figure 2 Cyclic phases of overall communicable diseases surveillance: preparedness, response, monitoring, and evaluation**




## 6.2 Surveillance system objectives

**Overall objective of the surveillance system:**

The overall objective of the priority-communicable-disease surveillance system is to provide technical guidance for early and effective preparedness (Phase I and III) and response (Phase II and III) to communicable diseases, which may contribute to minimizing human morbidity and mortality through, respectively, a reduction in communicable disease exposure and the pro vision of early clinical management for those affected.

Specific objectives are as follows:

- ***To start:*** Describe core functions and responsibilities required for realizing early and effective preparedness and response to and monitoring and evaluation of communicable diseases.
- ***Phase I – Preparedness:*** Identify and describe the systems and activities required for realizing communicable disease preparedness.
- ***Phase II – Response:*** Describe step-by-step activities and their components for realizing communicable disease alert management, field investigation, and field response.
- ***Phase III – Monitoring and Evaluation:*** Describe the monitoring and evaluation process; provide key indicators for measuring and evaluating preparedness and response capacity; and provide key indicators for measuring and evaluating efficiency and effectiveness for alert management, field investigation, and field response.

## 6.3 Core functions and responsibilities

Although not a specific phase, it is imperative that core functions and responsibilities required for realizing early and effective preparedness and response to and monitoring and evaluation of the priority communicable diseases in Iraq are met by the individuals who serve as institutionally supported rapid response team (RRT) members (Annex 1). The RRT Manager / Team Leader should ensure maintained communication and coordination with multisectoral institutions involved in communicable disease surveillance in Iraq. For example, an epidemiologist working for a Ministry of Health Infectious Disease Unit may be a re-contributing RRT member, but in the case of his or her absence, the epidemiologist's functions and responsibilities must stil be ensured through institutional agreements with the MOH. For all current and prospective RRT members, the RRT Manager / Team Leader should maintain a roster of names, titles, professions, and contact details. Each RRT member should have professional qualifications in his or her field of expertise, relevant and multifarious communicable disease expe rience, and attend and participate in all RRT meetings and activities. RRT member inclusion and responsibilities should be written and agreed on by all relevant technical and political entities in the Ministry of Health and Government (Annex 2, indicator 1.1).

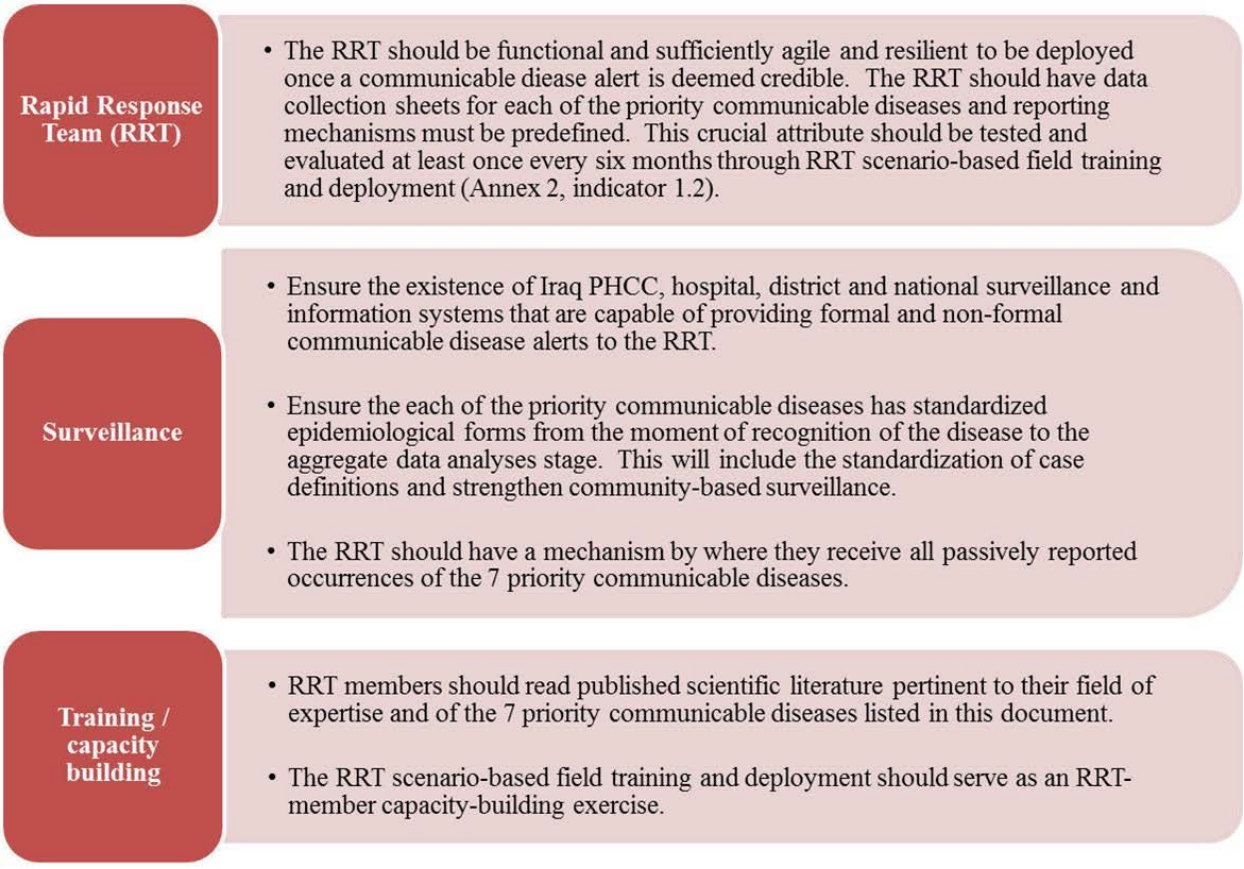
The recommended absolute minimum composition of RRT members to be deployed during a communicable disease-field investigation stage should include 1 Manager / Team leader, 1 clinician / infection control expert, 1 epidemiologist, 1 logistician, 1 social mobilization expert, (n=5). It is also necessary to include 1 laboratory specialist to facilitate the extraction of patient samples for diagnostic testing. Finally, a multisectoral approach should be taken into consideration when forming an RRT deployment to the field. If a communicable disease outbreak/event is suspected of involving any part of the animal, human, and ecosystem interface, then individuals with expertise in these sectors should ideally be present (e.g. veterinarian, wildlife specialist, toxicologist, environmental health officer). Institutional RRT-member functions and responsibilities listed in Annex 1 may be modified according to context.

## 6.4 Phase I – Preparedness

An overview of the identification and description of the systems and activities required for realizing priority communicable-disease outbreak/event preparedness is listed in Figure 3. When, prior to the occurrence of a communicable disease outbreak/event, the identified systems and their corresponding recommended action points (including data collection sheets and reporting mechanisms) are established, functional, and maintained, an RRT's effort to minimize morbidity and mortality during field investigation and field response is greatly facilitated.

Specifically, the preparedness phase aims, through MOH leadership, to ensure that an RRT is able to respond efficiently and effectively to a communicable disease outbreak or occurrence, and that essential resources are available for immediate action. Although the systems and activities listed in Figure 4 may serve as a recommended checklist for communicable disease outbreak/event preparedness, it is recognized that each local infrastructure has its own opportunities and challenges. While some may require contextual modification, all Figure 3-listed systems and activities should be established, functional, and maintained prior to the occurrence of a communicable disease outbreak/event.

**Figure 3: An overview of the identification and description of the systems and activities required for realizing communicable disease preparedness**



**Infection, prevention, and control**

- Ensure all relevant infection, prevention, and control national policies are established and their corresponding systems are functional for preventing the spread of communicable disease. This includes the complete vaccination coverage for all RRT members.
- An RRT should have the capability of implementing these measures when conducting field investigation and response.

**Communication plan**

- Define responsibilities and lines of multisectoral and multidisciplinary communication for ensuring efficient and effective technical and political support and action.

**Logistics and finance**

- An RRT should ensure that all its communicable disease preparedness and response activities are sufficiently supported logistically and financially. When in the field this may include the provision of perdiem, lodging, petrol and vehicles, medical material, general supplies, and communication devices such as a satellite phone, two-way radios, and/or cell phones.
- In particular, an RRT must ensure that a budget (i.e. a mechanism that releases timely funds) is available for the purchase of petrol and that an adequate number of vehicles are functional and immediately accessible *prior* to the field investigation stage.
- Preposition material and supplies.

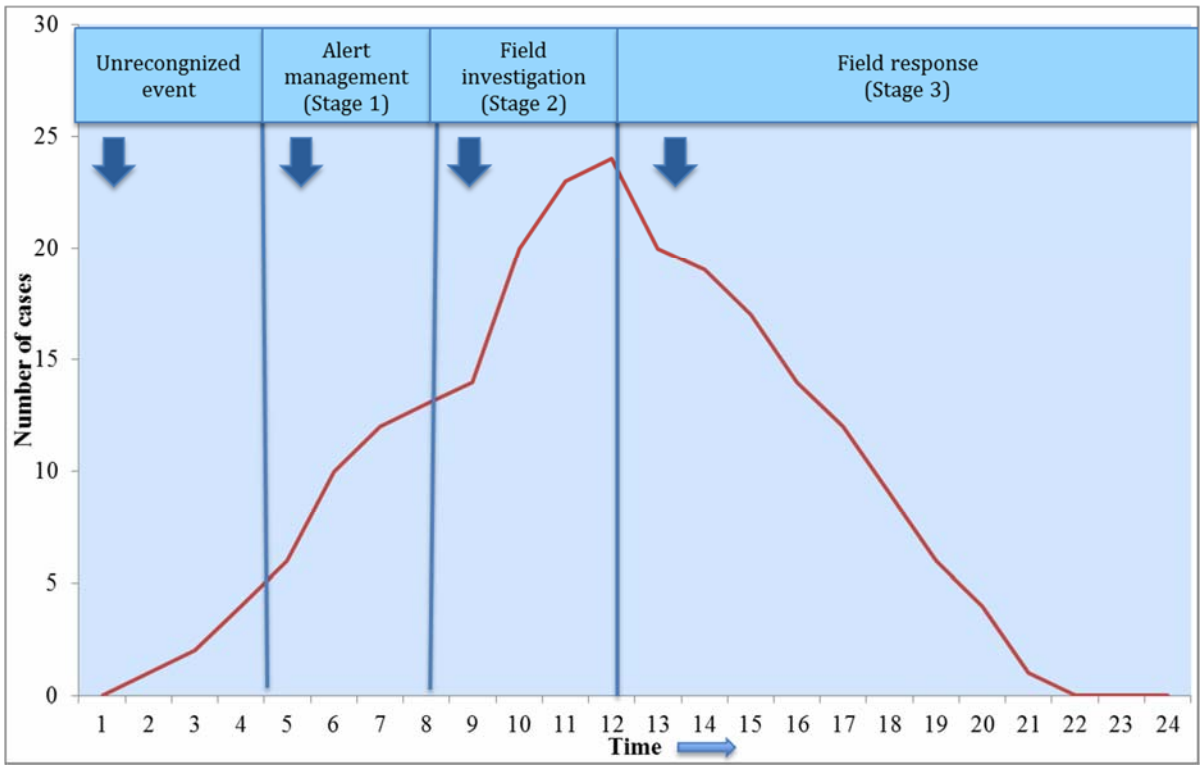
**Written response plan**

- The RRT should develop a written copy of their locally-adapted and context-relevant communicable disease preparedness and response plan. This includes how to process alerts and conduct the field investigation and field response for the priority communicable diseases expected to occur in the future (e.g. coronavirus in Iraq).
- Disease-specific data-collection sheets should be created as templates prior to a communicable disease outbreak/event (Annex 2, indicator 1.3). These forms should include standardized epidemiological and clinical data collection templates for clinical and epidemiological data collection during field investigation and field response stages.
- For each specific priority communicable disease a case management strategy, including details for the prompt availability of supplies from quality assured sources, (such as ringer lactate for cholera, etc.) should be agreed on and written in the response plan *prior* to the occurrence of a communicable disease outbreak/event.
- Define the relationship between the RRT and the IHR Focal Point.

## 6.5 Phase II – Response

As on ongoing part of surveillance activities, Phase II describes recommended step -by-step activities and their components for an RRT to realize the three sequential stages of communicable-disease outbreak/event response: alert management (stage 1); field investigation (stage 2); and field response (stage 3) (see example: Figure 5). Activities and components in this section may serve as a recommended checklist, though the realities of each event as well as the local infrastructure will impact to what degree and in what way each step is realized. Activities are presented in approximate chronological order, though some may be carried out simultaneously while others may require contextual modification.

**Figure 4: An example of alert, investigation, and response stages to a public health event**



***Alert management***

Alert management is the first stage of the communicable disease response. An alert is information from a formal or informal source that a communicable disease is either occurring or likely to commence. A formal alert source may include a functioning communicable -disease surveillance system, while a non-formal alert source could include a written or verbal report from a health professional, community, the media, or other entity. With an emphasis on characterizing the outbreak/event and developing standardized clinical and epidemiological case definitions, the alert management stage aims to identify the occurrence of a suspected communicable-disease outbreaks or events, commence field investigation when necessary, and report details to the next level of the health system in Iraq.

***Field investigation***

Field investigation is the second stage of the communicable disease response. The field investigation of the priority communicable diseases aims to ensure that samples are collected and sent to previously identified laboratories for diagnostic confirmation and to gather evidence about what may be causing the communicable-disease outbreak/event in order to implement appropriate control, prevention, and treatment strategies.

***Field response***

Field response is the third stage of the communicable disease response. The field response aims to coordinate and mobilize resources and personnel to implement an appropriate public health response. More specifically, this stage aims to stop the primary and/or secondary acquisition of the communicable disease and to ensure that optimum patient care is provided. Primary transmission involves human infection through single or multiple events from a hazardous source. Secondary transmission typical y involves direct contact with a person's infected bodily fluids during the acute phase of their illness, direct contact with their remains, and/or with contaminated fomites. Note: for some communicable diseases, airborne transmission may be possible.

Typically, an RRT remains on-site when transitioning from the field investigation to the 'ful - blown' field response stage. Laboratory diagnosis confirming the cause of the communicable disease typically triggers the implementation of more extensive response activities. Recommended field response step-by-step activities are to 1) scale up, 2) maintain, and 3) scale back. As a part of these activities, field response components are, in no order of predetermined priority, implemented for reducing communicable disease exposure and providing optimum clinical care for those infected.

**Figure 5: Stage 1. Alert management activities (Steps 1 to 6)**

**Step 1.** Ensure the establishment of an alert network

The RRT should have an established, functional, and maintained countrywide and regional information-source network for receiving and managing formal and non-formal alerts. This network should be multisectoral and multidisciplinary (i.e. include animal and other surveillance systems). The RRT should agree on, record, disseminate, and adhere to clinical and epidemiological case definitions and epidemic thresholds for all priority communicable diseases that could potentially occur in Iraq.

**Step 2.** Maintain vigilance

The RRT should be vigilant when monitoring both formal and non-formal alert sources for potential communicable diseases occurring in their sector of responsibility, as a credible alert may not always be obvious.

**Step 3.** Receive alerts and assess their credibility

As an alert will trigger the preliminary multisectoral decision-making processes for the communicable disease field investigation, the RRT must first assess an alert's credibility. Thus, RRT members who receive and manage alerts must have prior communicable-disease experience in order to apply his or her knowledge and logic to the alert's credibility assessment process. Also, it should be recorded how and by whom the alert was communicated to the RRT.

**Step 4.** Receive alerts and assess their credibility II

When assessing an alert, RRT members will use criteria to determine if an alert is credible or not (see Box 1 on page 49). Remember, proactive inquiries in the community are helpful and/or requests for further information are encouraged, though not at the expense of efficiency.

**Step 5.** Commence coordination of the field investigation

If the RRT Manager / Team Leader determines that an alert is credible the coordination of the field investigation stage will commence. The RRT will initially state what possible public health risk(s) may be underway and ensure that the relevant multisectoral and multidisciplinary stakeholders are informed and ready to support the imminent field investigation stage. This will include, among others, non-governmental organizations (NGOs) and academia. Additionally, assistance can be requested from WHO, which has the ability to coordinate international support through regional mechanisms.

*The commencement of the field investigation stage should not be unnecessarily hindered by a lack of previously agreed logistical and/or financial support as the RRT scenario-based field training and deployment training has previously ensured the efficiency and effectiveness of the multisectoral response.*

**Step 6.** Evaluate

The alert management stage should be evaluated for efficiency and effectiveness at least once per month. This includes writing a short report detailing the number of alerts received, number of alerts deemed credible, and number of alerts responded to with a field investigation by the RRT (Annex 3, indicators 2.1-2.3).

**Figure 6: Stage 2. Field investigation activities (steps 1-10)**

**Step 1.** Pack the vehicle(s) / transport

Pack the vehicle(s) / transport with medicine for infected patients potentially encountered during the investigation. Medication should be selected based on what communicable disease may be occurring and only administered by a trained medical doctor. Also pack diagnostic sampling kits (as recommended by official laboratory protocols), office supplies, communication devices, data collection templates, analysis tools such as a laptop with appropriate statistical software, and money for expenses.

**Step 2.** Arrive on location

Proceed to the geographic location(s) where the communicable disease is reportedly occurring. Ensure that collaborative relationships between local, district, and regional health and other authorities are developed from the start. To the greatest extent possible, establish working relationships that complement each entity's investigative responsibilities.

**Step 3.** Conduct a preliminary assessment and collect data

Together with local authorities, review all available sources of information in the affected community, including patient registrars at each implicated health facility. At health facilities and in the community, collect demographic, epidemiological, and clinical data, which may help to formulate an hypothesis about the etiology of the event and to establish preliminary epidemiological and clinical case definitions. Note: for effective communicable disease management, all stakeholders should adhere to the same case definitions. Case definitions may be modified once further information is made available (Annex 4, indicator 3.3). Also, provide standardized data collection templates, which were designed and agreed on in the preparedness phase.

**Step 4.** Formulate a hypothesis

Following the preliminary assessment and data collection, the RRT should formulate an initial hypothesis regarding the possible cause(s) of the communicable disease. If a source, such as water, food, or a particular location, is thought to be responsible for primary communicable disease transmission, ensure that access to the potential hazard is blocked and prohibited. Continuously assess and, when appropriate, modify the hypothesis according to the emergence and availability of new data and information.

**Step 5.** Collect and send specimens and/or patient samples for laboratory diagnosis

Collect appropriate samples including patient, animal or environmental samples based on your preliminary hypothesis and in accordance with laboratory protocol procedures for confirming a diagnosis. Communicate via telephone, or other, to the appropriate laboratory that samples are being sent (Annex 4, indicator 3.1). Procedures and reasons for the diagnostic test should be clearly explained to the patient and their family and only performed with their verbal consent.

**Step 6.** Training

When necessary, provide medicine and supplies to local health staff or other after providing training on its use. An example of possible medical training might include the treatment of coronavirus in a location without previous recognized infections. Training sessions might also include community members, health staff, and local authorities to prevent exposure to the coronavirus, and how they might best treat and care for those infected and/or affected.

**Step 7.** Ensure the provision of optimum clinical care

Prioritize the health and safety of those infected by ensuring (encouraging) health authorities to provide optimum clinical care and early clinical management (Annex 4, indicator 3.2). Optimum patient care is defined as the best possible care available based on the probable and eventual diagnosis of the communicable disease and the contextual setting.

**Step 8.** Communicate to health authorities and enact support channels

Communicate via telephone or other method to the health authorities regarding the field investigation findings so that technical and political support channels can be immediately activated and utilized, as previously established during the preparedness phase, and IHR reporting at the national level can commence. It may be desirable to request the presence of an on-site diagnostic and patient-monitoring laboratory.

**Step 9.** Write a field investigation report

Immediately following step 8, write a report to inform all authorities and stakeholders of the current situation.

**Step 10.** Identify potential research

Identify potential research that may be undertaken by the RRT and others that may contribute to the improvement of communicable disease identification, control, prevention, and/or treatment efforts. Maintain involvement in research design, development, implementation, and follow-up. Ensure that standards for clinical research and participant protection are respected. This includes using an Ethical Review Board-approved study protocol and obtaining written consent for research participation from individuals informed about the potential risks, benefits, alternatives, and responsibilities of the study *prior* to their study enrollment.

**Figure 7: Stage 3. Field response activities (steps 1-3)**

**Step 1.** Scale up response components

In no predetermined order of priority, an RRT should ensure that the response components in Figure 5 commence as soon as possible. The RRT may not always be responsible for the development and implementation of each component, but the RRT should ensure that each component is being addressed by a relevant entity and that the associated activities complement national and/or international standards. Remember, all response components are aimed at preventing communicable disease exposure and ensuring the provision of optimum patient care for those infected/affected. Also, an RRT should ensure daily community and multisectoral communication for and coordination of implemented response components (Figure 5).

**Step 2.** Maintain response components

Ensure that all response components are effective and maintained throughout the duration of the event. Also, ensure daily community and multisectoral communication for and coordination of implemented response components (Figure 5).

**Step 3.** Scale back response components

In discussion with multisectoral and multidisciplinary stakeholders, slowly begin to scale back the response components. Typically, the epidemiological data contribute to the decision making process of when to begin this step. Important: remain vigilant as premature scaling back of activities may result in further transmission. Also, when possible, conduct post-communicable-disease outbreak health services restoration, patient follow-up, reporting, and research according to Iraq guidelines. Reminder: ensure that standards for clinical research and participant protection are respected. This includes using an Ethical Review Board-approved study protocol and obtaining written consent for research participation from individuals informed about the potential risks, benefits, alternatives, and responsibilities of the study *prior* to their study enrollment.

**Component 1**

Epidemiological surveillance and case detection

- An epidemiological surveillance and case detection system should be organized whereby community leaders and members alert the RRT of suspect cases. This system should refer individuals fulfilling a communicable disease epidemiological or clinical case definition, when available, to a health facility for clinical assessment and, if appropriate, admission. These activities aim to identify incident communicable disease cases and allow for prompt hospitalization to minimize, when relevant, secondary transmission in the community (Annex 5, indicator 4.1). Also, there may be the need to collect additional patient or environmental samples during the course of the communicable disease to guide case management.

**Component 2**

Case diagnosis

- Individuals who fulfill clinical and epidemiological case definitions are accompanied to a hospital ward for clinical assessment and, when appropriate, categorized as a communicable-disease suspect patient while a sample is obtained for laboratory confirmation. Patients with eventual laboratory-confirmed negative test results are discharged and assessed for an alternative illness or remain on the ward and re-tested if clinical suspicion of the communicable disease remains.
- The RRT should contribute to clinical discussions regarding discharge protocols and long-term patient follow-up.

**Component 3**

Case detection in the health facility

- Similar to epidemiological surveillance and case detection in the community, case detection in a health facility aims to identify incident communicable disease cases and allow for prompt isolation to stop secondary transmission. Activities include screening patients on admission as well as those hospitalised on general wards such as paediatrics, adult medicine, and maternity. Corpses are also screened. General wards refer their suspected cases to the specified hospital ward. When possible, RRTs encourage health facility authorities to operate all normal services during a communicable disease outbreak in order to satisfy the population's hospital care needs. However, RRTs also accept when health facility authorities suspend or reduce non-essential services, as the best way to conduct health facility management during some communicable-disease outbreaks remains unresolved (Annex 5, indicator 4.1).

**Component 4**

Case management

- All patients should receive optimum patient care, which is defined as the best possible care available based on the probable diagnosis of the communicable disease and the contextual setting (Annex 5, indicator 4.3). Case management protocols should be in accordance with national and/or international standards.

**Component 5**

Design and construction of the ward

- After arriving at a communicable-disease outbreak location and encountering a make-shift hospitalization unit, an RRT, when relevant, will design and construct a ward, which has separate areas for the eventual suspected and confirmed cases. The size of the structure(s) allows for adequate spacing between patients, especially for those awaiting laboratory-confirmation, so as to avoid cross-contamination among patients. Design and construction of the ward are dependent on what type of event is transpiring.

**Component 6**

Peripheral health facility support

- Health staff of facilities located on or near the fringe of a communicale-disease outbreak's epicentre are trained on prevention measures and requested to identify possible infections and report potential cases to the authorities. Peripheral health facility support is dependent on what type of communicable-disease event is transpiring.

**Component 7**

Information, education, and communication campaign

- An effective information, education, and communication (IEC) campaign is crucial to the control of a ommunicable disease, and is typically implemented at the beginning of the field response stage. Its aims, via mass media communication and discussions with community groups and individual families, are to increase community understanding of the communicable disease occurrence and acceptance of the response, and to encourage health facility-based assessment and hospitalization for suspected and confirmed cases. IEC programmes mitigate fear and anger among family members, reduce patient stigmatisation, and quell rumours and panic in the community. (Annex 5, indicator 4.2). The RRT should identify a spokesperson for this component. IEC campaigns are dependent on what type of event is transpiring.

| Box 1. List of alert criteria, which may guide a Rapid Response Team'sdecision of whether or not to commence the coordination of a communicable-disease field investigation stage. |
|---|
| 1. The source of the information<br>2. Available epidemiological data<br>3. Contextual information<br>4. The magnitude, duration, and severity of the reported event<br>5. The potential risk for international spread<br>6. Political implications for not responding<br>7. Media interest<br>8. The experience of the persons conducting the assessment |

## 6.6 Phase III – Monitoring and Evaluation

Monitoring and evaluation involves the systematic and ongoing collection, analysis, and interpretation of data. Stakeholders analyze and interpret data to plan, implement, adapt, and evaluate a public health strategy. In the specific case of this communicable -disease surveillance strategy, monitoring is the routine and continuous tracking of the RRT's preparedness and response capacities and the efficiency and effectiveness of the response (i.e. alert management, field investigation, and field response). Evaluation is the periodic assessment of how well the RRT has met their objectives (e.g. efficiency and effectiveness of the response for reducing communicable-disease exposure [minimizing morbidity] and providing early clinical management for those infected [minimizing mortality]).

Surveillance is a recognized and well-documented public health approach to generate prospective health data. Surveillance data are used to estimate measurements for programme monitoring and evaluation, including the monitoring of programme intervention strategies in relation to ongoing communicable-disease trends, and the identification of high-risk groups and the most prevalent causes of morbidity and mortality. Additionally, surveillance provides indications of programme deteriorations or improvements so as to respond with health interventions based on the generated data. Recommended key indicators for measuring and evaluating RRT preparedness and response capacities, see Annex 2. For key indicators for measuring and evaluating RRT efficiency and effectiveness for alert management, field investigation, and field response, see Annexes 3-5.

Finally, to improve the preparedness and response to priority communicable diseases, it is crucial that an RRT and all other relevant entities conduct an after-action review of their preparedness and response to a recently transpired communicable-disease outbreak. An after-action review, often conducted as a multisectoral discussion and subsequent write-up of lessons learned, helps stakeholders to identify what went well and what needs to be improved prior to the next communicable-disease outbreak occurrence. The key indicators in annexes 2-5 should be calculated and presented together with the write-up of the after-action review for a discussion among relevant stakeholders. This process should be undertaken and completed within six months following the official declaration of a communicable diseases' conclusion.

## 6.7 Annex 1: Institutional RRT member minimum core functions and responsibilities

| Minimum number of RRT members | Minimum core functions required | Communicable disease preparedness, response, and monitoring and evaluation minimum responsibilities | **RRT Manager:** *Record here the names, titles, professions, and contact details for each identified human resource* |
|---|---|---|---|
| **Manager/ Team Leader** (1) | 1. Relevant management and/or team leader experience;<br>2. Experience with surveillance and response to communicable diseases;<br>3. Able to engage technical and political entities within the National Government. | 1. Maintain communication and coordination with the multisectoral institutions that are identified by the RRT as being contributors to the surveillance of priority communicable diseases in Iraq;<br>2. Ensure that both technical and political mechanisms respond to communicable disease;<br>3. Oversee the technical inputs of each RRT member;<br>4. Responsible for assessing RRT preparedness and response capabilities by using indicators. The epidemiologist should calculate the indicators for the Manager / Team leader;<br>5. Responsible for testing at least once every six months through scenario-based field training and deployment, the functionality, agility, and resilience of the RRT to be deployed upon communicable-disease outbreak recognition;<br>6. With the epidemiologist, responsible for managing all RRT-generated data sources.<br>7. Responsible for the bi-annual revision and adaptation of the country-adapted and context-relevant communicable disease response plan<br>8. Responsible for writing a short monthly RRT report detailing the number of alerts received, number of alerts deemed credible, of the number of alerts deemed credible, how many infectious versus non-infectious communicable diseases, and number of alerts were responded to by the RRT, with their corresponding timeframes. | 1. Individual's name:<br>2. Individual's job title:<br>3. Individual's organization:<br>4. Individual's contact details: |
| **Epidemiologist** (1 to 2) | **Education:** postgraduate degree in epidemiology<br><br>**Experience:** Proven field experience in responding to communicable disease outbreaks | 1. Able to investigate and analyze the epidemiology of clusters of suspected, probable and confirmed cases, including time, place, person analysis, and mode of contamination, as well as the investigation of the source of a communicable disease outbreak;<br>2. To establish/strengthen active surveillance activities and follow-up of contacts;<br>3. Calculate all indicators for the Manager / Team leader and discuss their meaning and interpretation with him or her;<br>4. Support and mobilize teams for rapid outbreak assessment and/or investigation;<br>5. Evaluate the current alert and response systems, including the existing case definitions;<br>6. Support data management, analysis, and interpretation of the descriptive epidemiology;<br>7. Assist in the planning of retrospective analytical epidemiological studies aimed at identifying the | 1. Individual's name:<br>2. Individual's job title:<br>3. Individual's organization:<br>4. Individual's contact details: |

| | | | |
|---|---|---|---|
| | | source and route of the communicable disease's transmission;<br>8. Reporting to national response team/partners as needed;<br>9. Liaise with other international partners in the field to facilitate field investigation and response. | |
| **Clinician and Infection Control Expert**<br>(1 to 2) | **Education:** Medical or Nursing University degree<br><br>**Experience:** Field experience in effective clinical case management during communicable disease outbreaks. Referral system skills are also required. Clinical experience in infection control, experience in training of professionals on infection control measures and implementing and evaluating infection prevention and control practices would be an advantage. | 1. Directly support case management in the health facilities, as well as within the community;<br>2. Guide the RRT and others to ensure that optimum care is provided;<br>3. Provide guidance on clinical and epidemiological case definitions;<br>4. Collect robust demographic, treatment, and patient monitoring data for improved clinical response to communicable diseases;<br>5. Assess infection control practices in health care facilities in the affected districts/area;<br>6. Provide guidance on necessary infection control equipment for central, provincial, and district level hospitals that are needed in order to adequately respond to an outbreak;<br>7. Adapt infection control national guidelines and advise on modifications to be implemented in order to prevent the occurrence of communicable-disease infection associated with health care in health facilities within an affected district;<br>8. Conduct on-site IPC training for staff at provincial/district hospitals according to the review of infection control measures;<br>9. Work in coordination with all response teams<br>10. Report on findings and assist the RRT/International team and national authorities. | 1. Individual's name:<br>2. Individual's job title:<br>3. Individual's organization<br>4. Individual's contact details: |
| **Social Mobilization Expert**<br>(1 to 2) | **Education:** University degree in social sciences and/or communication.<br><br>**Experience:** Experience in social mobilization / behavioural communication approaches. | 1. Undertake a rapid appraisal to understand perceptions, knowledge, beliefs and practices within households, communities, and health care settings in affected areas in relation to communicable disease control, prevention, and treatment interventions;<br>2. Identify barriers and facilitating factors (including the socio-cultural and organizational context) that may hinder or facilitate the uptake of potential recommended risk reduction and health protection measures within households, communities and health care settings;<br>3. On the basis of the findings of the rapid assessment, advise and make recommendations to the MoH/KMOH /DOH on the implementation of effective response strategies and effective and feasible interventions;<br>4. On the basis of the findings of the rapid assessment, develop effective social mobilization strategies that support outbreak control and prevention measures. | 1. Individual's name:<br>2. Individual's job title:<br>3. Individual's organization:<br>4. Individual's contact details: |

| | | | |
|---|---|---|---|
| **Laboratory Specialist**<br>(1 to 2) | **Education:** University degree in microbiology, biology, or related science<br><br>**Experience:** Field experience in the interaction of the laboratories and the surveillance activities. | 1. Provide guidance on establishing an operational system for appropriate collection, packaging, and transport of samples from the field to reference lab;<br>2. Establish SOPs for the participation of laboratories in investigation and laboratory confirmation of communicable disease;<br>3. Set up systems to better link laboratories and epidemiology teams;<br>4. Work in coordination with response teams for to enhancing national, regional, and international lab networks to allow efficient laboratory identification of epidemic-prone diseases and public health risks. | 1. Individual's name:<br>2. Individual's job title:<br>3. Individual's organization<br>4. Individual's contact details: |
| **Logistician**<br>(1 to many)<br><br>*Note: Logisticians are crucial for timely and effective investigations and responses. The more logistical support, the better.* | **Education:** University Degree or equivalent level of education in supply chain management, emergency response logistics, or communicable disease response logistics.<br><br>**Experience:** Field experience in logistics operations for responding to infectious disease outbreaks and/or other public health emergencies | 1. Ensure logistical support is provided to all aspects of preparedness, investigation, and response to communicable disease for each discipline / technical area. For example, patient samples for laboratory diagnosis require logistic support for sampling and transport;<br>2. Maintain stockpiles of essential communicable disease investigation and protective material during the response;<br>3. Identify strategic storage points to support the response;<br>4. Provide guidance on logistics and supply chain management at all levels;<br>5. Provide logistics support for track shipment of samples to identified laboratories;<br>6. Operate and maintain administrative procedures during the field operations, address financial management, and human resource issues;<br>7. Responsible for finance issues when relevant;<br>8. Responsible for logistical communication devices;<br>9. Responsible for team security. | 1. Individual's name:<br>2. Individual's job title:<br>3. Individual's organization<br>4. Individual's contact details: |

## 6.8 Annex 2: Preparedness and response capacity indicators

The following table of recommended key indicators may facilitate RRTs when measuring and evaluating an RRT's preparedness and response capacity to communicable disease. All data sources will be from RRT-generated data managed by the RRT Manager / Team Leader and the epidemiologist. All indicators are to be reported monthly, unless stated otherwise.

| Number | Indicator | Numerator / Denominator[3] |
|---|---|---|
| **1.1** | Percentage of RRT-member positions which have been filled by on RRT-member who fulfils all of the listed core functions needed to realize communicable disease preparedness | Number of RRT-member positions which have been filled by an RRT-member who fulfils all of the listed core functions needed to realize communicable disease preparedness<br>÷<br>Number of RRT-member positions, both filled and not yet filled |
| **1.2** | The number of scenario-based field trainings conducted by the RRT | NA[4]<br><br>Note: *This essential RRT preparedness training should be conducted and evaluated at least once every six months* |
| **1.3** | The EMC / RRT has developed and written a country-adapted and context-relevant communicable disease preparedness and response plan | NA<br><br>Note: *This essential RRT preparedness and response plan should be revised and updated at least once every 6 months* |

[3] Numerator and denominator are multiplied by 100 for calculating percentage

[4] NA = Not applicable

## 6.9 Annex 3: Alert management indicators

The following table of recommended key indicators may facilitate RRTs when measuring and evaluating RRT timeliness and effectiveness for communicable-disease alert management. All data sources are from RRT-generated data managed by the RRT Manager / Team Leader and the epidemiologist. All indicators are to be reported monthly, unless stated otherwise.

| Number | Indicator | Numerator / Denominator[5] |
|---|---|---|
| **2.1** | Percentage of alerts received by the RRT that the RRT deem credible | Number of alerts received by the RRT that the RRT deem credible<br>÷<br>Number of alerts received by the RRT |
| **2.2** | Of the number of alerts received by the RRT that the RRT deem credible, the percentage that are later determined to be caused by a infectious disease | Number of alerts received by the RRT that the RRT deem credible and are later determined to be caused by a infectious disease<br>÷<br>Number of alerts received by the RRT that the RRT deem credible |
| **2.3** | Of the number of alerts received by the RRT that the RRT deem credible, the percentage that are responded to by the RRT with a field investigation starting <48 hours[6] after receiving the alert | Number of alerts received by the RRT that the RRT deem credible and are responded to by the RRT with a field investigation starting <48 hours after receiving the alert<br>÷<br>Number of alerts received by the RRT that the RRT deem credible and are responded to by the RRT with a field investigation |

[5] Numerator and denominator are multiplied by 100 for calculating percentage

[6] as determined by the International Health Regulations (2005) Protocols for Assessing National Surveillance and Response Capacities for the International Health Regulations in Accordance with Annex 1A of the Regulations. WHO. International Health Regulations (2005) Protocols for Assessing National Surveillance and Response Capacities for the International Health Regulations in Accordance with Annex 1A of the Regulations. *International health regulations (2005)* -- 2nd ed. Geneva: WHO, 2005. Available at: www.who.int/ihr/publications /who_hse_ihr_201007/en/ index.html.

## 6.10 Annex 4: Field investigation indicators

The following table of recommended key indicators may facilitate RRTs when measuring and evaluating RRT timeliness and effectiveness for priority communicable disease outbreak/event field investigation. All data sources are from RRT-generated data managed by the RRT Manager / Team Leader and the epidemiologist. All indicators are to be reported monthly, unless stated otherwise.

| Number | Indicator | Numerator / Denominator[7] |
|---|---|---|
| **3.1** | Percentage of samples sent to a diagnostic laboratory that was previously identified by the RRT during the preparedness phase and sent according to the laboratory's stated sample-shipping protocol | Number of samples sent to a diagnostic laboratory that was previously identified by the RRT during the preparedness phase and sent according to the laboratory's stated sample-shipping protocol<br>÷<br>Number of samples sent to a diagnostic laboratory that was previously identified by the RRT during the preparedness phase |
| **3.2** | Percentage of communicable disease-patients who were receiving optimum patient care when witnessed by the RRT during its field investigation stage | Number of communicable disease-patients who were receiving optimum patient care when witnessed by the RRT during its field investigation stage<br>÷<br>Number of communicable disease-patients identified during the field investigation stage<br><br>Note: *Optimum patient care is defined as the best possible care available based on the probable and eventual diagnosis of the communicable disease and the contextual setting where the patients were hospitalized* |
| **3.3** | Percentage of communicable disease-patients who were having their epidemiological and clinical data recorded by health-facility personnel when witnessed by the RRT during its field investigation stage | Number of communicable disease-patients who were having their epidemiological and clinical data recorded by health-facility personnel when witnessed by the RRT during its field investigation stage<br>÷<br>Number of communicable disease-patients attended to by health-facility personnel when witnessed by the RRT during its field investigation stage |
| **3.4** | Were local authorities involved in the field investigation? (Yes or No) | NA[8] |

[7] Numerator and denominator are multiplied by 100 for calculating percentage

[8] NA = Not applicable.

## 6.11 Annex 5: Field response indicators

The following table of recommended key indicators may facilitate when measuring and evaluating RRT timeliness and effectiveness for communicable-disease field response. All data sources are from RRT-generated data managed by the RRT Manager / Team Leader and the epidemiologist. All indicators are to be reported monthly, unless stated otherwise.

| Number | Indicator | Numerator / Denominator[9] |
|---|---|---|
| **4.1** | Percentage of potential communicable disease-patients detected by the epidemiological surveillance system, who were ill, and which resulted in the subsequent hospitalization of the patient | Number of potential communicable disease-patients detected by the epidemiological surveillance system, who were ill, and which resulted in the subsequent hospitalization of the patient<br>÷<br>Number of potential communicable disease-patients detected by the epidemiological surveillance system and were ill<br>Note: *Early identification of incident communicable disease-patients allows for prompt hospitalization and the minimization of secondary transmission in the community* |
| **4.2** | Number of communicable disease-IEC campaign sessions conducted on-site during the field response stage by the RRT for either the affected community or health personnel, or both | NA[10]<br>Note: *IEC campaign sessions increase understanding of the communicable-disease outbreak or occurrence, acceptance of the response, and encourage health facility-based assessment and hospitalization for suspected and confirmed cases. Moreover, IEC sessions mitigate fear and anger among family members, reduce patient stigmatization, and quell rumours and panic in the community* |
| **4.3** | As assessed by the RRT, the percentage of identified communicable disease-patients who received optimum patient care at any time during the field response stage | Number of identified communicable disease-patients who received optimum patient care at any time during the field response stage<br>÷<br>Number of identified communicable disease-patients<br>Note: *Optimum patient care is defined as the best possible care available based on the probable and eventual diagnosis of the communicable disease and the contextual setting where the patients were hospitalized* |

[9] Numerator and denominator are multiplied by 100 for calculating percentage

[10] NA = Not applicable

## 6.12 Annex 6: Checklist of laboratory supplies for use in an outbreak investigation:

**For using standard safety precautions when collecting and handling all specimens:**

_____ Pieces of bar soap and bleach for setting up hand-washing stations

_____ Supply of gloves

_____ Safety boxes for collecting and disposing of contaminated supplies and equipment

**For collecting laboratory specimens:**

**Blood**

_____ Sterile needles, different sizes

_____ Sterile syringes

_____ Vacutainers

_____ Test tube for serum

_____ Antiseptic skin disinfectant

_____ Tourniquets

_____ Transport tubes with screw-on tops

_____ Transport media (Cary-Blair, Trans-Isolate)

**Blood films (malaria)**

_____ Sterile or disposable lancet

_____ Glass slides and cover slips

_____ Slide box

**Respiratory specimens**

_____ Swabs

_____ Viral transport medium

**Cerebral spinal fluid (CSF)**

_____ Local anaesthetic

_____ Needle and syringe for anaesthetic

_____ Antiseptic skin disinfectant

_____ Sterile screw-top tubes and tube rack _____ Microscope slides in a box

_____ Trans-Isolate transport medium

_____ Latex kit

_____ Gram stain

_____ May Grunwald Giemsa Kit

**Stool**

_____ Stool containers

_____ Rectal swabs

_____ Cary-Blair transport medium

**Plague**

_____ Gram stain kit

_____ Rapid diagnostic test (dipstix AgF1)

_____ Cary-Blair transport

**If health facility has a centrifuge:**

_____ Sterile pipette and bulb

_____ Sterile glass or plastic tube, or bottle with a screw-on top

**For packaging and transporting samples:**

_____ Cold box with frozen ice packs or vacuum flask

_____ Cotton wool for cushioning sample to avoid breakage

_____ Labels for addressing items to lab

_____ Labels for marking “store in a refrigerator” on outside of the shipping box

_____ Case forms and line lists to act as specimen transmittal form

_____ marking pen to mark tubes with patient’s name and ID number (if assigned by the district)

## 6.13 Annex 7: Recommended list of personal protective equipment (PPE):

| Composition of one set of PPE | WHO Deployment Kit |
|---|---|
| 1 surgical gown | 100 surgical gowns |
| 1 coverall | 100 coveralls |
| 1 head cover | 100 head cover |
| 2 pairs of goggles | 50 pair of goggles |
| 1 pair of rubber gloves | 100 pairs |
| 1 mask N95 | 200 pieces |
| 1 boot cover* | 0 |
| 1 box 50 pairs of examination gloves | 800 pairs of examination gloves |
| 1 plastic apron re-usable | 20 pieces |
| 1 pair of gum boots | 20 Gum boots |
| 1 hand sprayer | 2 of 1.5 liters each |
| 1 Back sprayer | 1 back sprayer of 10-12 liters |
| specimen containers | |
| Scotch of tapes | 3 rolls |
| Anti-fog for goggles | 3 bottles |
| Chlorine | |
| N.B: chlorine and gum boots can be purchased locally<br>* Not essential | |

## 6.14 Annex 8: List of SOPs:

1- **Polio laboratory SOP**
2- **Measles investigation guidelines**
3- **Measles Specimen handling S O P**
4- **cholera-investigation guide**
5- **cholera laboratory SOP guideline**
6- **VHF investigation guide**
7- **VHF laboratory SOP guidelines**
8- **Viral hepatitis investigation guide**
9- **Viral hepatitis laboratory SOP guidelines**
10- **SARI/ MERS-CoV investigation guidelines**
11- **SARI/ MERS-CoV laboratory SOP**

# 7 AFP SURVEILLANCE

MOH is using the WHO recommended highly sensitive surveillance for acute flaccid paralysis (AFP)3 as the key surveillance strategy for validating the eradication of polio.

## 7.1 Definitions

***The WHO recommended case definition:***[11]

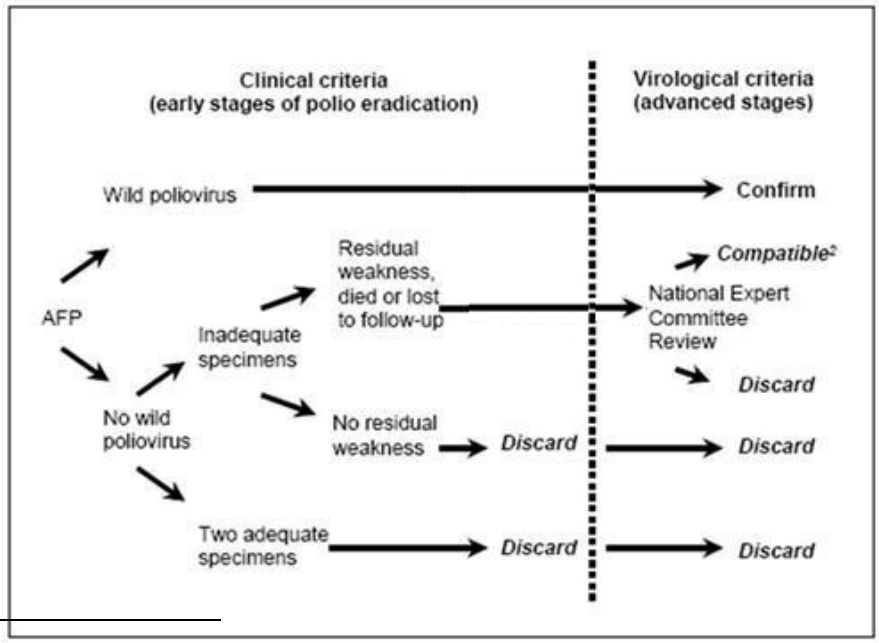
***Clinical case definition:*** Any child under 15 years of age with Acute, flaccid paralysis (Including Guillain-Barré syndrome) or any person of any age with paralytic illness if polio is suspected

***AFP Definition:*** [12] **AFP** is defined as any case of new onset (less than two weeks)of hypotonic weakness in a child aged less than 15 years of age.

***AFP Case classification:***

- Suspected case: A case that meets the clinical case definition.
- Confirmed case: See diagram below

**Figure 8: Final classification scheme for AFP cases**




[11] *http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/poliomyelitis_standards/en/*

[12] *http://www.hpsc.ie/A-Z/VaccinePreventable/Polio/Guidance/File,2461,en.pdf*

## 7.2 Targets and Milestones

***Recommended PEI Target:***

1. At least annual detection of 2 case of AFP per 100,000 children aged less than 15 years
2. ≥80 % of AFP cases with 2 stool specimens[13] collected ≤14 days of onset and ≥24 hours apart
3. ≥80 % of specimens arriving at the laboratory in "good" condition
4. ≥80 % of specimens arriving at CPHL (a WHO-accredited laboratory) within 3 days
5. ≥100% of laboratory results sent within 14 days of specimen receipt

| 7.2.1 Case Detection/Registration | |
|---|---|
| **Background:** | AFP case detection is mainly performed at the peripheral level, (community/PHCC/hospital), prerequisite is proper case definition and that is provided centrally. Proper education of the public and personnel at health facilities to ensure well knowledge of the definition is mandatory.<br><br>The MOH /EPI/ Iraqi CDC center in Baghdad to disseminated knowledge about case definition to the next level by DOHs, districts and PHCC reaching the community level that is required to report suspected cases to the nearest health facility. |
| **Objective:** | Suspected cases need to be reported by community members (e.g. LHC members, health volunteers, teachers, parents etc.) to the nearest health facility (PHCC/hospital). |
| **Milestones:** | 1. MOH /EPI/CDC center Iraq: issue case definition official letter (or as discussed in the general surveillance part, as part of the Communicable disease surveillance toolkit/ guideline referred to under Goal 2 of the general strategy)<br>2. CD units in the DOHs and District to convey the case definition (suspected and confirmed) to the peripheral level (PHCCs/Hospitals)<br>3. In the PHCC/ hospital, Definition of suspected cases is provided to the health facility through CME.<br>4. Definition of suspected cases is provided to the community through proper health education in the PHCC.<br>5. Proper registry of the referred cases is available at the level of the PHCC/Hospital. |
| **Monitoring and Evaluation Mechanism:** | 1. Studying monthly report from PHCC to the district, and DOH<br>2. Supervisory visit to the PHCC (from district and DOH) |

[13] *Collected 24-48 hours apart and within 14 days of the onset of paralysis. Specimens arriving in the laboratory must be of adequate volume (approximatively 8-10g), have appropriate documentation (i.e. laboratory request form) and be in good condition, i.e.. With no leakage or dessiccation and with evidence that the reverse cold chain has been maintained within a domestic freeze temperature -20°C (presence of ice or temperature indicator)*

| | |
|---|---|
| **Indicators:** | **Indicator 1:** Percentage of PHCCs, hospitals, districts and DOH for which comprehensive communicable disease toolkit/guideline printed and distributed by December 2015<br>**Target:** 100% of PHCCs, hospitals, districts and DOH receive at least one copy comprehensive communicable disease toolkit/guideline by December 2015 |
| | **Indicator 2:** Percentage of DOHs from which at least two communicable disease officers/Trainers are trained to use/provide training for the Polio surveillance toolkit/guidelines by February 2016<br>**Target:** 100% of DOHs from which at least two communicable disease officers/Trainers are trained to use/provide training for the Polio surveillance toolkit/guidelines by February 2016. |
| | **Indicator 3:** Percentage of hospitals, district and PHCCs from which at least one<br>Health care provider or communicable disease units officer is trained for the Polio surveillance toolkit/guidelines by June 2016.<br>**Target:** 100% of the Hospitals, district and PHCCs from which at least two Health care providers or communicable disease officers are trained for the Polio surveillance toolkit/guidelines by **June 2016.** |
| | **Indicator 4:** percentage of LHC that perform at least one outreach activity that involve suspected AFP definition Performed monthly by every LHC. after August 2016.<br>**Target:** (100% of LHC perform at least 1 outreach activity that involve increase awareness of suspected AFP definition/ month) after August 2016 |
| | **Indicator 5:** Percentage of PHCCs that list AFP definition as one item of the CME monthly schedule staring from August 2016<br>**Target:** 100% of PHCCs list AFP definition as one item of the CME monthly schedule starting from **August 2016.** |
| | **Indicator 6:** Percentage of Monthly reports for LHC meetings that include AFP case definition staring from August 2016.<br>**Target:** 100% of Monthly reports for LHC meetings include AFP case definition staring from August 2016. |

| 7.2.2 Case Confirmation/Investigation | |
|---|---|
| **Background:** | All AFP cases should have a full clinical and virological investigation with at Least 80% of AFP cases having 'adequate' stool specimens collected.<br>'Adequate' stool specimens are two stool specimens of sufficient quantity6 for laboratory analysis, collected at least 24 hours apart, within 14 days after the onset of paralysis, and arriving in the laboratory by reverse cold chain (within 72 hours starting from the date of collection of the first stool, within a cool box supplied with ice pack) and with proper documentation. At least 100% of AFP cases should have a follow- up examination for residual paralysis at 60 days after the onset of paralysis. |
| **Objective:** | All AFP case specimens must be processed in CPHL/NPL (a WHO -accredited Laboratory within the Global Polio Laboratory Network (GPLN)). |
| **Suggested Goals for MOH:** | • Short term goals include formulating laboratory SOP, to be finalized (by TWG including members form the MOH and PHCPI) and approved by the MOH by **March 2015.**<br>• Intermediate term goals would include training lab personnel at all PHCCs/ hospital to use the new SOP/guidelines by August 2015 (the training will follow a hierarchical scheme start with training TOT from the DOHs by MOH advisors/trainer, those TOT will then finalize training of candidates(specified below) in their respective provinces)<br>• Long term goals would include implementation of electronic referral system to ensure proper (quick, accurate, credible, and accountable) referral of cases **(MOH will ensure completion of this target by end of 2017)** |
| **Monitoring and Evaluation Mechanism:** | 1. Studying monthly report from PHCC to the district, and DOH<br>2. Supervisory visit to the PHCC (from district and DOH) |
| **Indicators:** | **Indicator 1:** Percentage of reported cases from PHCCs that are referred to specialized centers by March 2015.<br>**Target:** Monthly reports are assessed (by surveillance unit in the DOH and district) to ensure that 100% of cases reported within the district's PHCCs are referred to specialized centers by March 2015. |
| | **Indicator 2:** Percentage of cases for which proper6 stool sample is collected (at the PHCC/hospital or specialized center for which the case is referred) and sent for further analysis (NPL/CPHL) By August 2015<br>**Target:** Monthly reports are assess (by surveillance unit in the DOH and district) to ensure that Two proper6 stool samples are collected and sent for further Analysis for 80% cases reported within the district's PHCCs By August 2015. |
| | **Indicator 3:** Percentage of reported cases who had follow up visit 60 days later (feedback from the hospital or specialized center (data are reviewed at the DOH, district) By January 2015<br>**Target:** ≥80% of patients reported/referred 60 days earlier have made a follow up visit to the PHCC/hospital By January 2015 |

| | |
|---|---|
| | **Indicator4:** Polio Lab SOP manual is formulated (by TWG including members form the MOH and PHCPI) and approved by the MOH by March 2015.<br>**Target:** by March 2015 Polio Lab SOP manual is formulated (by TWG including members form the MOH and PHCPI) and approved by formal letter from the MOH. |
| | **Indicator 5:** percentage of DOH from each at least two TOT Trained for polio SOP lab manual by end of June 2015.<br>**Target:** 100% of DOH from each at least two TOT Trained for polio SOP lab manual by end of June 2015. |
| | **Indicator 6:** Percentage of PHCCs from which at least one lab staff is trained to use polio lab SOB manual for sample transfer By August 2015.<br>**Target:** By August 2015, 80% of PHCCs from which at least one lab staff are trained to use polio lab SOB manual for sample transfer. |
| | **Indicator 7:** Percentage of PHCCs in which electronic referral system is implemented by 2017 (this step is managed by the MOH)<br>**Target:** 80% of PHCCs in which electronic referral system is implemented by 2017 (this step is managed by the MOH) |
| | **Indicator 8:** Percentage of the samples for which CPHL will be able to provide intratypic differentiation and possible sequencing. (And referral to regional WHO lab for confirmation). By January 2017.<br>**Target:** By January 2017 CPHL is equipped and trained by the MOH to be able to provide intratypic differentiation and possible sequencing. (And referral to regional WHO lab for confirmation) for 100% the samples. |

.

| 7.2.3 Reporting | |
|---|---|
| **Background:** | The current system involve paper report by communicable disease units officer to the district, on identification of one of the immediate notification diseases, or sending weekly report, only in the DOH an electronic formula is used to be reported to the CDC center (currently the communicable disease officers in the district are being trained to use PEI info program, to send their report in electronic formula) the aim of the MOH is to extend PEI info training to the PHCC level and finally transform the system into web based surveillance. AFP is one of the immediate notification condition, that being reported immediately form the **PHCC level**, starting from January 2015 districts will send electronic report by email (using Epi info forms ) to the DOH, and then to the DOH and EPI center. |

| | |
|---|---|
| **National Recommended Data to be Reported** | **Aggregated Data:**<br>• Number of third doses of oral poliomyelitis vaccine (OPV3) administered to Infants during routine immunization in addition to the number of OPV doses administered during NIA campains<br>• Number of AFP cases<br><br>**Case-based data** (to be linked to specimen-based data for analysis):<br>• Unique identifier<br>• Geographical area (district and province) name<br>• Date of birth<br>• Date of onset of paralysis<br>• Date of notification<br>• Date of case investigation<br>• Total poliomyelitis vaccine doses received,<br>• Fever at onset of paralysis<br>• Progression of paralysis within 4 days<br>• Asymmetric paralysis<br>• Date of 60-day follow-up examination<br>• Findings at 60-day follow-<br>• Final classification (1 = confirmed; 2 = compatible; 3 = discarded; 4 = vaccine-associated)<br>**Specimen-based data** (to be linked to case-based data for analysis):<br>• Unique identifier<br>• Specimen number<br>• Date of paralysis onset<br>• Date of last OPV<br>• Date of stool specimen collection<br>• Date stool specimen sent to laboratory<br>• Date specimen received in laboratory<br>• Condition of stool (good; poor; unknown)Date final culture results sent from laboratory to EPI<br>• Date intra-typic differentiation results sent from laboratory to EPI RESULTS<br>• Poliomyelitis type 1 isolated? (1 = yes, wild; 2 = yes, Sabin; 3 = yes, pending intratypic differentiation; 4 = yes, wild and Sabin mixed; 5 = no P1 isolate; 6 = specimen not processed)<br>• Poliomyelitis type 2 isolated? |

| | |
|---|---|
| | • Poliomyelitis type 3 isolated? (1 = yes, wild; 2 = yes, Sabin; 3 = yes, pending intratypic differentiation; 4 = yes, wild and Sabin mixed; 5 = no P2 isolate; 6 = specimen not processed)<br>• Non-poliomyelitis enterovirus (NPEV) isolated? (1 = yes; 2 = none; 3 = specimen not processed) |
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to report electronically to the DOH (by January 2015 CD officers at the district are trained/ regulations are issued by MOH).<br>2. Trained DOH personnel provide training to the communicable disease unit's officer at the PHCC level to be able to report electronically using Epi info forms prepared at the EPI (training mechanism to be decided by the MOH /EPI/ Iraqi CDC center).by end of 2016.<br>3. Iraqi CDC center finalize the pioneer study for the web based surveillance system by (currently Iraqi CDC center is working on this pioneer study in cooperation with DETRA )<br>4. TOT training for DOH personnel is performed for the web based surveillance system (Iraqi CDC center will govern this process under supervision of MOH).<br>5. Training of communicable disease officers form the district PHCCs and hospital is performed.(DOH`s TOT to perform training in their respective provinces)<br>6. Web based reporting system is launched |
| **Indicators:** | **Indicator 1:** Percent of weekly district reports received by end of January 2015.<br>**Target:** 90% of weekly district reports received by end of January 2015 |
| | **Indicator 2:** Percent of districts (except those in hot zones) that report via Epi info forms by the end of January 2015<br>**Target:** By end of January 2015, 100% of districts (except those in hot zones) report via Epi info forms |
| | **Indicator 3:** Percent of PHCCs from which at least 2 communicable disease officers are trained to use Epi info by end of end of 2016<br>**Target:** By end of 2016, >=80% of PHCCs have at least 2 Communicable disease officers trained to use Epi info. |
| | **Indicator 4:** Percent of PHCCs report notifiable disease using Epi info forms, by February 2017<br>**Target:** By February 2017, 80% of PHCCs report notifiable disease using Epi info forms, less than 20 % of reports are delivered by paper form. |
| | **Indicator 5:** Percent of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017 |

| | |
|---|---|
| | **Target:** 100% of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017 |
| | **Indicator 6:** Percentage of districts, hospitals and PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017.<br>**Target:** 100% of districts and hospitals and 80% of PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017 |
| | **Indicator 7:** Percentage of notifiable disease reports delivered by paper or epi Info forms by end of January 2018.<br>**Target:** < = 20 % of notifiable disease reports delivered by paper or epi info forms by end of January 2018. |

| 7.2.4 Data Analysis | |
|---|---|
| **Background:** | Surveillance data should be analyzed routinely and the information interpreted for use in public health actions. The alert and epidemic threshold values for polio is detection of single case paralytic polio due to wild virus, in the current system data analysis start at the level of the DOH (provincial level) and final analysis is done at the EPI in Baghdad. Faster response require analysis at an earlier step (district). Earlier analysis enables faster response and increase chance of confirming possible cases. |
| **WHO Recommended Data Analysis, Presentation, and Reporting:** | **Aggregated data:**<br>• Cases by month, year, and geographic area<br>• OPV3 coverage by year and geographic area<br>• Completeness/timeliness of weekly reporting<br><br>**Case-based data: same as aggregated data plus the following:**<br>• Confirmed cases by age group, immunization status, geographic area, month and year<br>• Confirmed cases from which wild poliovirus was isolated<br>• Compatible cases by geographic area<br>• All suspect cases by final classification<br>• Non-poliomyelitis enterovirus isolation rate |
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to analyses surveillance data, a surveillance analysis report then sent to the district manager.<br>2. Trained DOH personnel provide training to the communicable disease unit's officer at the PHCC level to be able to analyses surveillance data.<br>3. Surveillance analysis report is sent by communicable disease unit's officer at the PHCC to the PHCC manager and the district manager on detection of AFP case (also zero report). |

| | |
|---|---|
| **Monitoring and Evaluation Mechanism:** | 1. Studying monthly report from PHCC to the district, and DOH<br>2. Supervisory visit to the PHCC (from district and DOH) |
| **Indicators:** | **Indicator 1**: The percentage of districts that send data analysis reports to the DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received, starting from January 2015<br>**Target:** Starting from January 2015, data analysis reports are sent by 100% of districts to **the** DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received. |
| | **Indicator 2:** Percent of the data analysis reports that are acceptable within the EPI/CDC center Baghdad standards starting from **January 2015**<br>**Target:** Starting from **January 2015** =>80% of the data analysis reports are acceptable within the CDC center/ Baghdad standards |
| | **Indicator 3:** Percentage of PHCCs from which at least 2 communicable disease officers are trained to use Epi info to generate data analysis reports by end of **End of 2016**<br>**Target:** =>80% of PHCCs from which at least 2 communicable disease officers who are trained to use Epi info to generate data analysis reports by end of **end of 2016.** |

| 7.2.5 Response and Feedback | |
|---|---|
| **Background:** | Proper and quick response increase the sensitivity and accuracy of the surveillance system, the more peripheral the response start the faster it is, shifting from passive surveillance to active surveillance is one of the measures that can be taken in response to over threshold notification. Response plans need to be prepared centrally and modified at each level to be formulated in specific protocols.<br><br>One of the major drawback in the surveillance system in Iraq is the limited feedback mechanism, routinely information flow in one direction (except in time of crisis like the one happened in 2014). Poor feedback is a general problem, it also include feedback for hospital referred cases. One step ahead is to issue an EPI/ Iraqi CDC center monthly report that share information not only about AFP or polio but rather all diseases under surveillance. This step rely mostly on regulation/ legislation under the current situation, major advance would be founding the web based report system that allow sharing of the appropriate information at the appropriate level. Proper feedback will improve cooperation of health care provider by increasing the awareness of the magnitude of the problem. |
| **Milestones:** | 1. By end of June 2015 EPI/ Iraqi CDC center monthly and annual report issued and approved by the MOH. |

| | |
|---|---|
| | 2. The monthly and annual report to be shared with the DOHs (and the n districts and PHCCs/Hospital) via official letter starting from June 2015.<br>3. EPI/ Iraqi CDC center information is allocated within the PHD website by **January 2016**.<br>4. CPHL routinely feedback DOHs/districts and PHCC regarding the samples sent for study.<br>5. Feedback report including the data analysis generated by the DOH is shared at the level of the districts.<br>6. Feedback report that include the data analysis report generated by the district is shared at the level of the PHCCs. |
| **Indicators:** | **Indicator 1**: The percentage of DOHs, District, PHCC and hospitals that receive Iraqi CDC center `s monthly and annual report by June 2015.<br>**Target: 100%** of DOHs, District, PHCC and hospitals receive Iraq DC center`s monthly and annual report by June 2015. |
| | **Indicator 2**: The percentage of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center information at PHD website by **January 2016.**<br>**Target: 100%** of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center information at PHD website by **January 2016.** |
| | **Indicator 3**: The percentage of referred cases for which reference laboratory reports are received by the referring entity by June 2015.<br>**Target:** 100% of referred cases for which reference laboratory reports are received by the referring entity by June 2015. |
| | **Indicator 4:** Percentage of DOHs that share its data analysis report with the districts/hospitals within the province by June 2015.<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |
| | **Indicator 5:** Percentage of districts that share its data analysis report with its reciprocal PHCCs within the province by **June 2015.**<br>**Target:** 100% of DOHs share its data analysis report with the Districts/hospitals within the province by June 2015. |

### 7.2.6 Environmental Surveillance:

Environmental surveillance involves testing sewage or other environmental samples for the presence of poliovirus. Environmental surveillance often confirms wild poliovirus infections in the environment. Systematic environmental sampling (e.g.in Egypt and Mumbai, India and Pakistan etc.) provides important supplementary global surveillance data. Ad –hoc environmental surveillance elsewhere (especially in polio-free regions) provides insights into the international spread of poliovirus for the purpose of complete poliomyelitis eradication worldwide in compliance with WHO instructions

# 8 MEASLES SURVEILLANCE

## 8.1 Definitions

***Case definition[7]:***

The National recommended case definition is as follows:

***Clinical case definition[14]:***

Any person for whom a clinician suspects measles infection, or Any person with fever and maculopapular rash (i.e. non-vesicular)

***Laboratory criteria for diagnosis:***

Presence of measles-specific IgM antibodies

***Clinical classification scheme:***

**Compatible case:** A case that meets the clinical case definition

**Discarded:** A suspect case that does not meet the clinical case definition

***Laboratory classification:***

**Laboratory-confirmed:** A case that meets the clinical case definition and is subsequently laboratory-confirmed

**Epidemiologically confirmed:** A case that meets the clinical case definition and is linked to a laboratory-confirmed case.

**Epidemiologically linked case:** a case in which a) the patient has had contact with one or more persons who either have had the disease or have been exposed to a point source of the disease And b) transmission of the agent by the usual modes of transmission is plausible. A case may be considered epidemiologically linked to a laboratory-confirmed case if at least one case in the chain of transmission is laboratory confirmed.

**Clinically confirmed:** A case that meets the clinical case definition and for which no adequate blood specimen was taken.

**Discarded:** A suspect case that meets the clinical case definition but is then laboratory diagnosed as negative.

[14] (*http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_standards/en/)

## 8.2 Targets and Milestones

***Case-based surveillance:***

To date, the recommended type of surveillance for Iraq is Case-based surveillance. Case-based surveillance should be conducted throughout the country, and every sporadic suspect case should be reported and investigated immediately (and also included in the weekly reporting system). **Laboratory specimens should be collected from every sporadic suspect case.** Suspected measles outbreaks should only be confirmed by conducting serology on the first 5-10 cases that are able to provide blood samples. Urine, nasopharyngeal or Gumswap specimens (for virus Isolation, detection and genetic characterization) should be collected from sporadic/outbreak cases (approximately 10 cases from each chain of transmission) to characterize viral circulation and importation patterns.

Designated reporting facilities/sites at all health-care levels should report on a systematic basis (e.g. weekly or monthly), even if there are zero cases (often referred to as "zero reporting").

| **8.2.1 Case Detection/Registration** | |
|---|---|
| **Background:** | Case detection starts at community level. Education (mainly through LHC) is conducted based on national criteria and guideline issued centrally (MOH/EPI/ Iraqi CDC center) (comprehensive communicable disease toolkit/guidelines). Health care providers/health enforcement officers at different levels (DOH, District and PHCC/Hospital) are trained for the communicable disease toolkit/guidelines, and should name two focal-point individuals responsible for ensuring compliance with case definitions and timely reporting. |
| **Objectives:** | To increase the detection of suspected cases by the community (LHC members, health volunteers, teachers, parents etc.) and the health facility. |
| **Milestones:** | 1. MOH/ CDC Center Iraq: formulate/review case definitions and management protocol on case detection. The protocol needs to include measles case definitions (either as separate document or as part of comprehensive communicable disease toolkit/guidelines).<br>2. DOH to provide training for the health care providers and communicable disease/health enforcement officers in the hospitals, district and PHCC for the Iraq CDC center measles case definitions.<br>3. At the PHCC/ hospital, health care providers and communicable disease officers are trained about case definitions and the management protocol through CME.<br>4. Definition of suspected cases is provided to the community through proper health education by the PHCC (outreach activities). |
| **Indicators:** | **Indicator 1:** % of cases notified ≤ 48 hours after the onset of rash<br>**Target:** 80% of cases notified ≤ 48 hours after the onset of rash. |

| | |
|---|---|
| | **Indicator 2:** Percentage of PHCCs/hospitals that have a printed copy of the measles surveillance protocol that is formulated and approved by the MOH/EPI/CDC center in Baghdad (as an independent document or as part of a priority communicable disease toolkit/guideline).<br>**Target:** By June 2015 100% of PHCCs and hospitals contain printed copies of the Measles surveillance protocol that is formulated and approved by the MOH/EPI/CDC center in Baghdad. |
| | **Indicator 3:** Percentage of DOHs from which at least two communicable disease officers/Trainers are trained to use/provide training for the Measles surveillance toolkit/guidelines by August 2015<br>**Target:** 100% of DOHs from which at least two communicable disease Officers/Trainers are trained to use/provide training for the Measles surveillance toolkit/guidelines by August 2015. |
| | **Indicator 4:** Percentage of hospitals, district and PHCCs from which at least one Health care provider or communicable disease units officer is trained for the Measles surveillance toolkit/guidelines by **November 2015.**<br>**Target:** 100% of the Hospitals, district and PHCCs from which at least two Health care providers or communicable disease officers are trained for the Measles surveillance toolkit/guidelines by **November 2015.** |
| | **Indicator 5:** Percentage of PHCCs that list suspected the **Measles** definition as one item of the CME monthly schedule by **December 2015.**<br>**Target: 100%** of PHCCs list the **Measles** definition as one item of the CME monthly schedule **by December 2015** |
| | **Indicator 6:** Percentage of Monthly reports for LHC meetings that include suspected measles definition by **December 2015.**<br>**Target: 100% of** Monthly reports for LHC meetings include measles suspected case definition By **December 2015.** |
| | **Indicator 7:** Percentage of LHC that perform at least 1 outreach activity that involves the suspected Measles definition monthly **starting from December 2015.**<br>**Target:** (100% of LHC perform at least 1 outreach activity that involves the increased awareness of suspected **Measles** definition per month) **starting from December 2015.** |

| 8.2.2 Case Confirmation/Investigation | |
|---|---|
| **Background:** | Since Iraq is among the low incidence-elimination phase for measles, it is recommended to use a Laboratory diagnosis for the diagnosis of measles. (There must be a detectable presence of measles-specific IgM antibodies). |
| **Suggested Goals for the MOH:** | 1. To ensure that prompt and proper investigation is performed for notified Measles cases.<br>2. To ensure identification of source of infection for confirmed measles cases.<br>• **Short-term objective:** include formulating laboratory SOP, to be finalized and approved (by technical working group that include members from the EPI and PHCPI) and Measles investigation guidelines (as separate entity or part of comprehensive CD toolkit/guidelines).<br>• **Intermediate-term objective:** would include training lab personnel at all PHCCs/ hospitals to use the SOPs/guidelines and Measles investigation guidelines, to ensure proper follow-up of referred cases.<br>• **Long-term objective:** MOH to equip National Measles Lab. /CPHL and train its staff to be able to provide definite diagnosis of, in addition to molecular and genetic characteristic of the Measles |
| **Milestones:** | 1. MOH formulates Measles investigation guidelines and Measles Specimen handling SOP guidelines to guide the primary investigation of the case and ensure proper handling of the samples at the health facilities.<br>2. The Measles investigation guidelines and Measles specimen handling SOP guidelines to be distributed to all the PHCC, hospital districts, and DOHs.<br>3. TOT training is provided to communicable disease officers/ lab personnel from all DOHs to use Measles investigation guidelines and Measles specimen handling SOP guidelines.<br>4. Health care providers/ lab personnel or officer from the districts, hospitals, and PHCCs are trained to use the Measles investigation guidelines and specimen handling SOP guidelines.<br>5. NML/CPHL is capable of providing a laboratory-confirmed measles diagnosis in addition to do virus isolation, molecular detection and genetic characteristic for measles. |
| **Indicators:** | **Indicator 1:** Percentage of PHCCs and Hospitals in which Measles investigation guidelines and specimen handling SOP guidelines are generated and approved by the MOH by **July 2015**<br>**Target:** By **June 2015** Measles investigation guidelines and specimen handling SOP guidelines (generated and approved by the MOH) are available in 100% of PHCCs and Hospitals. |

| | |
|---|---|
| | **Indicator 2:** Percentage of DOH from which at least two members are provided with TOT training about the Measles investigation guidelines and specimen handling S O P guidelines by September 2015.<br>**Target:** 100% of DOHs had at least two members provided with TOT training about the Measles investigation guidelines and specimen handling S O P guidelines by September 2015. |
| | **Indicator 3:** Percentage of districts, hospitals, and PHCCs from which at least 2 Health care providers/ CD officers or laboratory staff are trained to use the Measles investigation guidelines and specimen handling S O P guidelines by **November 2015.**<br>**Target:** By **November 2015**, ALL (100%) districts and hospitals and 80% of PHCCs have at least 2 Health care providers/ CD officers or laboratory staff who are trained to use the Measles investigation guidelines and Specimen handling SOP guidelines. |
| | **Indicator 5:** Percentage of required test of v i r u s isolation, in addition to molecular detection and genetic characteristic of Measles that can be is performed at the CPHL By **September 2016.**<br>**Target:** By **September 2016**, CPHL is capable to do virus isolation in addition to molecular detection and genetic characteristic for measles for 100% of test. |
| | **Indicator 6:** Percentage of cases investigated $\leq$ 48 hours of notification by **November 2015**.<br>**Target:** 80% of cases investigated $\leq$ 48 hours of notification by **November 2015**. |
| | **Indicator 7:** Percentage of cases with adequate specimen (one blood specimen collected within 3-28 days of rash onset) and laboratory results are subsequently made available, by **November 2015.**<br>**Target:** 80% of cases with adequate specimen (one blood specimen collected within 3-28 days of rash onset) and laboratory results are subsequently made available, by **November 2015.** |
| | **Indicator 8:** Percentage of laboratory-confirmed cases with their source of Infection identified, by November 2015.<br>**Target:** 80% of laboratory-confirmed cases with their source of infection identified, by November 2015. |

| 8.2.3 Reporting | |
|---|---|
| **Background:** | The current system involves paper-based reporting by communicable disease officers to the district, on identification of one of the immediate IHR- notification diseases, or sending weekly or monthly reports. Only in the DOH an electronic format is used to report to the Iraqi CDC center (currently the communicable disease officers in the district are being trained to use Epi info program to send their report in electronic format). The aim of the MOH is to extend Epi info training to the PHCC level and finally transform the system into web-based surveillance. Suspected measles is one of the immediate notification diseases, and that being reported immediately from the **PHCC level**, starting from January 2015, districts will send electronic reports via email (using Epi info forms) to the DOH, and then to the DOH and Iraqi CDC center. Since Iraq is among the low incidence-elimination countries the report for the Measles is recommended to include case-based data and the data- collection form eventually prepared by the EPI/CDC center Baghdad and<br>disseminated to the peripheral levels:<br>• Unique identifier<br>• Geographical area (e.g. district and province)<br>• Date of birth<br>• Gender<br>• Date of onset of rash<br>• Number of prior measles vaccine doses received.<br>• Date of receipt of last dose.<br>• Date of notification.<br>• Date of case investigation.<br>• Date of blood specimen collection.<br>• Date blood specimen sent to laboratory<br>• Date blood specimen received by laboratory<br>• Condition of blood specimen on receipt.<br>• Date measles serology results reported<br>• Results of measles serology.<br>• Results of differential serology<br>• Collection of specimen for viral culture/identification.<br>• Specimen type: 1 = urine; 2 = respiratory; 3 = Gumswap<br>• Date specimen received for viral culture/identification<br>• Results of measles viral culture/identification.<br>• Final classification: 1 = clinically confirmed; 2 = laboratory-confirmed; 3 = epidemiologically linked to laboratory-confirmed case; or discarded Source of infection identified. |

| | |
|---|---|
| **Suggested Goals for the MOH:** | To improve the timeliness, quality, quantity, efficiency, and credibility of Measles reporting from the PHCCs/Hospitals levels to the central level. |
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to report electronically to the DOH (**using the electronic forms provided by the EPI/CDC Baghdad**).<br>2. Trained DOH personnel provide training to the communicable disease unit's officer at the PHCC level to be able to report electronically using Epi info forms prepared at the Iraqi CDC center.<br>3. Iraqi CDC center finalizes the pioneer study for the web-based surveillance system<br>4. TOT training for DOH personnel is performed for the web-based surveillance system.<br>5. Training of communicable disease officers from the districts to PHCCs and hospitals is performed.<br>6. Web-based reporting system is launched |
| **Indicators:** | **Indicator 1:** Percent of weekly district reports received by end of January 2015.<br>**Target:** 80% of weekly district reports received by end of January 2015 |
| | **Indicator 2:** Percent of districts (except those in hot zones) that report via Epi info forms by the end of January 2015<br>**Target:** By end of January 2015, 100% of districts (except those in hot zones) report via Epi info forms. |
| | **Indicator 3:** Percent of PHCCs from which at least 2 communicable disease officers are trained to use Epi info by end of 2016<br>**Target:** By end of 2016, >=80% of PHCCs have at least 2 communicable disease officers trained to use Epi info. |
| | **Indicator 4:** Percent of PHCCs report notifiable disease using Epi info forms, by February 2017<br>**Target:** By February 2017, 80% of PHCCs report notifiable disease using Epi info forms, less than 20 % of reports are delivered by paper form. |
| | **Indicator 5:** Percent of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017<br>**Target:** 100% of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017. |
| | **Indicator 6:** Percentage of districts, hospitals and PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017.<br>**Target:** 100% of districts and hospitals and 80% of PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017. |

| | |
|---|---|
| | **Indicator 7:** Percentage of notifiable disease reports delivered by paper or epi Info forms by end of January 2018.<br>**Target:** < = X% of notifiable disease reports delivered by paper or epi info forms by end of January 2018. |

| **8.2.4 Data Analysis** | |
|---|---|
| **Background:** | Surveillance data should be analyzed routinely and the information interpreted for public health action. In the current system, data analysis start at the level of the DOH (provincial level) and final analysis is done at the Iraqi CDC center Baghdad. Faster response requires analysis at an earlier step (district). Earlier analysis enables faster response and increases the chance of confirming possible cases. |
| **Suggested Goals for the MOH:** | • Number of cases and incidence rate by month and year, and geographical area<br>• Age-specific, sex-specific and district-specific incidence rates<br>• Measles vaccine coverage by year and geographical area.<br>• DTP1-measles or BCG-measles dropout rate<br>• Completeness/timeliness of monthly reporting<br>• Proportion of known outbreaks confirmed by the laboratory<br>• Proportion of cases by age group and immunization status. Core age groups suggested: 0-8 months, 9-11 months, 1-4 years, 5-9 years, 10-<br>14 years, 15-19 years, 20-24 years, 25 years and over<br>Under the current status of Iraq as low incidence-elimination phase, the current use of data is to identify chains of transmission, monitor the epidemiology (age groups at risk, inter-epidemic period, immunization status) of measles, accelerate immunization activities accordingly to avert potential outbreaks, use epidemiological data to classify cases, use performance indicators to assess the quality of surveillance, and identify areas that need strengthening. Also, data will facilitate the detection and investigation of outbreaks to ensure proper<br>case management, and determine why outbreaks are occurring (e.g. failure to vaccinate, vaccine failure or accumulation of susceptible) |
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to analyses surveillance data, a surveillance analysis report is then sent to the district manager.<br>2. Trained DOH personnel provide training to the communicable disease officers at the PHCC level to be able to analyses surveillance data.<br>3. Surveillance analysis report is sent by communicable disease officers at the PHCC to the PHCC manager and the district manager on detection of Measles case (also zero reporting) |
| **Indicators:** | **Indicator 1:** The percentage of districts that send data analysis reports to the DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received, starting from January 2015 |

| | |
|---|---|
| | **Target:** Starting from January 2015, data analysis reports are sent by 100% of districts to **the** DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received. |
| | **Indicator 2:** Percent of the data analysis reports that are acceptable within the EPI/CDC center Baghdad standards starting from **January 2015**<br>**Target:** Starting from **January 2015** =>80% of the data analysis reports are acceptable within the CDC center/ Baghdad standards |
| | **Indicator 3:** Percentage of PHCCs from which at least 2 communicable disease officers are trained to use Epi info to generate data analysis reports by end of **August 2015**<br>**Target:** =>80% of PHCCs from which at least 2 communicable disease officers who are trained to use Epi info to generate data analysis reports by end of **August 2015.** |

| **8.2.5 Response and Feedback** | |
|---|---|
| **Background:** | Proper and quick response increases the sensitivity and accuracy of the surveillance system; the more peripheral the response start, the faster it is. Shifting from passive surveillance to active surveillance is one of the measures that can be taken in response to over threshold notification. Response plans need to be prepared centrally and modified at each level to be formulated in specific protocols.<br>One of the major drawbacks in the surveillance system in Iraq is the limited feedback mechanism, routinely information flow in one direction (except in time of crisis). Poor feedback is a general problem, it also include feedback for hospital-referred cases. One step ahead is to issue Iraqi CDC center monthly report or bulletin that share information not only about Measles but rather all diseases under surveillance. This step rely mostly on regulation/legislation under the current situation, major advance would be founding the web based report system that allow sharing of the appropriate information at the appropriate level. Proper feedback will improve cooperation of health care provider by increasing his awareness of the magnitude of the problem. |
| **Suggested Goals for the MOH:** | Proper feedback is provided to the referring entity form all levels. |
| **Milestones:** | 1. The Iraqi CDC center to issue a monthly and annual report, a daily bulletin is required during epidemic.<br>2. The report is disseminated via official letter to the DOHs and then to the district.<br>3. Iraqi CDC center website founded and linked to the PHD website, information can then be reached by the authorized authority/persons. |

| | |
|---|---|
| | 4. CPHL routinely feedback DOHs/districts and PHCC regarding the samples sent for study.<br>5. Feedback report including the data analysis generated by the DOH is shared at the level of the districts<br>6. Feedback report that includes the data analysis report generated by the district is shared at the level of the PHCCs. |
| **Indicators:** | **Indicator 1:** The percentage of DOHs, District, PHCC and hospitals that receive Iraqi DC center`s monthly and annual report via official letter by June 2015.<br>**Target: 100%** of DOHs, District, PHCC and hospitals receive Iraqi DC center`s monthly and annual report via official letter by June 2015. |
| | **Indicator 2:** The percentage of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC website by **January 2016.**<br>**Target: 100%** of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center website by **January 2016.** |
| | **Indicator 3:** The percentage of referred cases for which reference laboratory reports are received by the referring entity by June 2015.<br>**Target:** 100% of referred cases for which reference laboratory reports are received by the referring entity by June 2015. |
| | **Indicator 4:** Percentage of DOHs that share its data analysis report with the districts/ hospitals within the province by June 2015.<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |
| | **Indicator 5:** Percentage of districts that share its data analysis report with its reciprocal PHCCs within the province by **June 2015.**<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |

# 9 CHOLERA SURVEILLANCE:

## 9.1 Definitions

***Case definition:***

WHO standard case definitionn: A case of cholera should be suspected when:

1. In an area where the disease is not known to be present, a patient aged 5 years or more develops severe dehydration or dies from acute watery diarrhea;
2. In an area where there is a cholera epidemic, a patient aged 5 years or more develops acute watery diarrhea, with or without vomiting.
3. A case of cholera is confirmed when Vibrio cholera O1 or O139 is isolated from any patient with diarrhea.

***Case classification:***

1. Suspected case: Any case complains of acute watery diarrhea without pain, and/or vomiting, regardless of patient age.
2. Probable case: Any suspected case with severe dehydration, or death due to acute watery diarrhea.
3. Confirmed case: A suspected case with isolation of *Vibrio cholera* O1 or O139 from stools.
4. Carrier: Asymptomatic person *Vibrio cholera* isolated from his or her stool.

## 9.2 Targets and Milestones

| 9.2.1 Case Detection/Registration | |
|---|---|
| **Background:** | All cases of cholera should be reported by health care providers at the peripheral level (community, PHCCs, & hospitals); case classification, proper education, & training of public & health care providers is provided at the central level.<br>Note: Cholera does appear in children under 5 years, however, the inclusion of all cases of acute watery diarrhea in the all ages year age group in the reporting of cholera greatly reduces the specificity of reporting. However, for management of cases of acute watery diarrhea in an area where there is a cholera epidemic, Cholera should be suspected in all patients.<br>Health facilities should list patients suspected to have cholera in their general diarrhea register. Also, deaths and referred cases should be recorded in the register together with whether a specimen was collected, to which laboratory it was sent, and the date.<br>If a health facility decides to create a special epidemic register during a cholera epidemic, cholera patients should be listed in both the general consultation register |

| | |
|---|---|
| | and the special epidemic register in order to ensure that at least one permanent record of the epidemic remains at the clinic. |
| **Objectives:** | During epidemics, daily reporting of cases and deaths by health facilities should be conducted. Health facilities should send a report even if they had no cases.<br>This "zero" case reporting allows the district level to distinguish areas that do not have any cases from areas that are not reporting. Cases should be reported by the most rapid and reliable means available. These can include, telephone, or courier. During epidemics, special, temporary methods of reporting, should be considered so that reports will arrive in a timely manner. |
| **Milestones:** | 1. MOH /CDC center Iraq: issues a case definition official letter (or as discussed in the general surveillance part, as part of the Communicable disease surveillance toolkit/ guideline referred to under Goal 2 of the general strategy)<br>2. CD units in the DOHs and District to convey the case definition (suspected and confirmed) to the peripheral level (PHCCs/Hospitals)<br>3. In the PHCC/ hospital, definition of suspected cases is provided to the health facility through CME.<br>4. Definition of suspected cases is provided to the community through proper health education in the PHCC.<br>5. Proper registry of the referred cases is available at the level of the PHCC/Hospital. |
| **M&E Mechanisms:** | 1. Studying monthly report from PHCC to the district, and DOH<br>2. Supervisory visit to the PHCC (from district and DOH) |
| **Indicators:** | **Indicator 1:** At December 2015 comprehensive communicable disease toolkit/guideline that includes standard case definition for cholera cases is finalized by the Iraqi CDC center/consultation group.<br>**Target:** One comprehensive communicable disease toolkit/guideline that includes a standard case definition for suspected cholera cases is finalized by the Iraqi CDC center/consultation group and approved by MOH for distribution by an official letter by December 2015. |
| | **Indicator 2:** Percentage of PHCCs, hospitals, districts and DOH for which a comprehensive communicable disease toolkit/guideline is printed and distributed<br>**Target:** 100% of PHCCs, hospitals, districts, and DOH receive at least one copy of a comprehensive communicable disease toolkit/guideline |
| | **Indicator 3:** Number of outreach activities that involve a suspected CHOLERA definition performed monthly by every LHC.<br>**Target:** (100% of LHC perform at least 1 outreach activity that involves increased awareness of suspected CHOLERA definitions/ month) |
| | **Indicator 4:** Percentage of PHCCs that list CHOLERA definition as one item of the CME monthly schedule |

| | |
|---|---|
| | **Target: 100%** of PHCCs list CHOLERA definition as one item of the CME monthly schedule |
| | **Indicator 5:** Percentage of monthly reports for LHC meetings that include the CHOLERA suspected case definition<br>**Target: 100% of** monthly reports for LHC meetings that includes the CHOLERA suspected case definition. |
| | **Indicator 6:** Percentage of PHCCs in which proper (as determined by Cholera Regulation) registry of the cholera cases is available.<br>**Target:** 100% of PHCCs in which proper (as determined by Cholera regulations) registry of the cholera cases is available. |

| **9.2.2 Case Confirmation/Investigation** | |
|---|---|
| **Background:** | If a suspect or confirmed case of cholera is reported, or there is any potential exposure to an agent that could cause cholera, an investigation should be started in close collaboration with the CDC unit in the DOH or CDC center in Baghdad in order to confirm the outbreak, following WHO guidelines. Stool samples must be taken or a rectal swab and transported in Cary Blair medium. . It is recommended that at least 10 cases be used to confirm the cause, identify antibiotic sensitivity and verify the outbreak. Once laboratory-confirmed, it is not necessary to obtain laboratory confirmation for subsequent patients. |
| **Responsibilities of the Investigation Team:** | 1. Verify the reported suspect cholera cases<br>2. Determine magnitude and characteristics of the reported outbreak<br>3. Collect specimens to confirm cholera and send the specimens to a predetermined laboratory capable of conducting cholera diagnostic tests.<br>4. Decide whether additional help is needed by assessing the local ability to respond to an epidemic, that is,<br>- review case management protocols<br>- assess local human and material resources for treatment of cases<br>- assess ability to implement / cooperate with control measures<br>5. Create an investigationn register which contains a line listing of ill persons, including their identifying and risk factor informationn<br>6. Identify high-risk groups and possible contaminated sources<br>7. Implement simple, on-site control measures<br>8. Provide emergency treatment supplies<br>9. Communicate findings to decision makers<br>***Community investigation:***<br>1. At the health facility:- |

| | |
|---|---|
| | - collect the names and identifying information for<br>(a) Patients meeting the case definitionn and<br>(b) Patients aged 5 years and older treated for acute, watery diarrhea;<br>- ask staff to describe the illness and their treatment protocols;<br>- Inventory local supplies and medicine.<br><br>2. In the community:<br>- Interview patients and their families regarding identifying information, risk factor information, and ill contacts;<br>- Interview any other ill persons identified by these interviews and refer these individuals for medical treatment where necessary.<br>3. Collect stool sample or 5 rectal swabs (if health facility has not already done so).<br>4. Analyze information:<br>- create a line listing, map location of cases, and graph the number of cases by date of onset of illness;<br>- determine the number of cases and deaths, attack rate, case fatality rate, potential high risk groups and sources of infection, And whether the outbreak is increasing.<br><br>5. Arrange transport of rectal swabs to laboratory.<br>6. Report investigation results and actions taken to decision makers<br>7. Perform follow-up surveillance visit(s); collect any unused treatment materials when there are no further cases. |
| **Milestones:** | 1. MOH formulates a cholera-investigation guide (as a separate entity or as a part of a CD toolkit/guideline), laboratory SOP guideline to guide the primary investigation of the case and ensure proper handling of the samples at the health facilities.<br>2. TOT training is provided to communicable disease officers from all DOHs<br>3. Health care providers/ CD officer from the districts, hospitals, and PHCCs are trained to use the cholera investigation guide and laboratory SOP guidelines.<br>4. CPHL and subnational laboratories in the provinces are capable to provide supportive and confirmatory diagnosis of suspected cases to be able to determine the genotype of Vibrio Cholera to differentiate the type and the source of infection (Water, Food, and Human) by PFGE technique. |
| **M&E Mechanisms:** | 1. Studying monthly report from PHCC to the district, and DOH<br>2. Supervisory visit to the PHCC (from district and DOH) |
| **Indicators:** | **Indicator 1:** Percentage of PHCCs that have received a printed copy of the Cholera Lab SOP manual that is formulated (by TWG including members form the MOH and PHCPI) and approved by the MOH at May 2015 |

| | |
|---|---|
| | **Target:** by May 2015 100% of PHCCs have received a printed copy of the Cholera Lab SOP manual that is formulated (by TWG including members form the MOH and PHCPI) and approved by formal letter from the MOH. |
| | **Indicator 2:** Number of TOTs from each DOH that are trained for Cholera SOP lab manual by end of **June 2015**.<br>**Target:** 38 TOTs (2 from each DOH) are trained to use Cholera SOP lab manual by end of **June 2015**. |
| | **Indicator 3:** Percentage of PHCCs from which at least one lab staff are trained to use Cholera lab SOB manual for patient stool-sample transfer.<br>**Target:** By August 2015, 80% of PHCCs from which at least one lab staff are trained to use Cholera lab SOB manual for patient stool-sample transfer. |
| | **Indicator 4:** Percentage of PHCCs in which an electronic referral system is implemented by 2017 (this step is managed by the MOH)<br>**Target:** 80% of PHCCs in which an electronic referral system is implemented by 2017 (this step is managed by the MOH) |
| | **Indicator 5:** Percentage of subnational laboratories in the provinces that are capable to provide supportive and confirmatory diagnosis of suspected cases by end of 2017.<br>**Target:** 100% of subnational laboratories in the provinces are capable to provide supportive and confirmatory diagnosis of suspected cases by end of 2017. |
| | **Indicator 6:** Percentage of samples for which CPHL is capable to determine the genotype of Vibrio Cholera to differentiate the type and the source of infection (Water, Food, and Human) by PFGE technique. By the end of 2018<br>**Target: 100%** of samples for which CPHL is capable to determine the genotype of Vibrio Cholera to differentiate the type and the source of infection (Water, Food, and Human) by PFGE technique. By the end of 2018 |

| **9.2.3 Reporting** | |
|---|---|
| **Background:** | The current system involve paper-based reporting by communicable disease units officer to the district on identification of one of the immediate notification diseases, or by sending weekly or monthly reports (only in the DOH does an electronic format get used for reporting to the Iraqi CDC center. Currently the communicable disease officers in the district are being trained to use the Epi info program to send their report in electronic formula. The aim of the MOH is to extend Epi info training to the PHCC level and finally transform the system into web-based surveillance. Cholera is one of the immediate notification disease, that being reported immediately form the **PHCC level**, starting from January 2015 districts will send electronic reports by email (using Epi info forms) to the DOH, and then to the DOH and Iraqi CDC center. |

| | |
|---|---|
| **WHO Recommended Minimum Data Elements for Reports** | **Case-based data for investigation and reporting**<br>• Age, sex, geographical location<br>• Hospitalization (Y/N)<br>• Clinical Outcome<br>**Aggregated data for reporting**<br>• Number of cases by age, sex<br>• Number of deaths |
| **Milestones:** | 1. Starting from June 2015 districts use Epi info to report electronically to the DOH.<br>2. Trained DOH personnel provide training to the communicable disease unit's officer at the PHCC level to be able to report electronically using Epi info forms prepared at the Iraqi CDC center.<br>3. Iraqi CDC center finalizes the pioneer study for the web-based surveillance system<br>4. TOT training for DOH personnel is performed for the web-based surveillance system.<br>5. Training of communicable disease officers from the district PHCCs and hospital is performed.<br>6. Web-based reporting system is launched |
| **M&E Mechanisms:** | |
| **Indicators:** | **Indicator 1:** Percentage of districts (except those in hot zones) that report via Epi info forms, by end of September 2015<br>**Target:** By end of September 2015, 100% of district (except those in hot zones) report via Epi info forms. |
| | **Indicator 2:** Percentage of PHCC with at least 2 CD officers from each are trained to use Epi info by end of end of 2016.<br>**Target:** By end of 2016, 2600 communicable disease units officer covering 80% of PHCCs are trained to use Epi info. |
| | **Indicator 3:** Percentage of PHCCs that report notifiable disease using Epi info from February 2017.<br>**Target:** From February 2017, 80% PHCCs report notifiable disease using Epi info forms. |
| | **Indicator 4:** Percentage of DOHs with at least two TOTs from each are trained to use web based surveillance system by June 2017.<br>**Target:** By June 2017 two TOT are performed to communicable disease units officer from 100% of DOH to use web based surveillance system. |
| | **Indicator 5:** Percentage of districts and PHCC from each at least 2 CD Officers are trained to use the web based surveillance system by November 2017. |

| | |
|---|---|
| | **Target:** 100% of districts and 80% PHCC from each at least 2 CD officers are trained to use the web based surveillance system by November 2017. |
| | **Indicator 6:** Percentage of CD report that are delivered via web bases surveillance system by January 2018.<br>**Target:** 100% of CD report that are delivered via a web-based surveillance system by January 2018. |

| **9.2.4 Data Analysis** | |
|---|---|
| **Background:** | Surveillance data should be analyzed routinely and the information interpreted for public health action. In the current system, data analysis starts at the level of the DOH (provincial level) and final analysis is done at the Iraqi CDC center in Baghdad. Faster responses require analysis at an earlier step (district level). Prompt analysis enables faster response and increases the chance of confirming possible cases. |
| **WHO Recommended data analyses, presentations, reports:** | • Use weekly numbers, not moving averages<br>• Case-fatality rates (graphs)<br>• Weekly/monthly plots by geographical area/location (district) and age group (GIS graphs)<br>• Comparisons with same time period in previous five years |
| **Milestones:** | 1. Starting from September 2015 districts use Epi info to analyses surveillance data, a surveillance analysis report then sent to the district manager.<br>2. Trained DOH personnel provide training to the communicable disease unit's officer at the PHCC level to be able to analyses surveillance data.<br>3. Surveillance analysis report is sent by communicable disease units officer at the PHCC to the PHCC manager and the district manager on detection of cholera case (also zero report) |
| **Indicators:** | **Indicator 1:** The percentage of districts that send data analysis reports to the DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received, starting from September 2015<br>**Target:** Starting from September 2015, data analysis reports are sent by 100% of districts **to the** DOH**,** district manager, **and the** reporting PHCC for 100% of notification reports received. |
| | **Indicator 2:** Percent of the data analysis reports that are acceptable within the EPI/CDC center Baghdad standards starting from **September 2015**<br>**Target:** Starting from **September 2015** =>80% of the data analysis reports are acceptable within the CDC center/ Baghdad standard |

| 9.2.5 Response and Feedback | |
|---|---|
| **Background:** | A proper and quick response increases the sensitivity and accuracy of the surveillance system, the more peripheral the response initiation, the faster it will be to shift from passive surveillance to active surveillance, which is one of the measures that can be taken in response to over threshold notification. Response plans need to be prepared centrally and modified at each level to be formulated in specific protocols.<br>***Routine surveillance data:***<br>• Detect an isolated case or an outbreak and immediately take appropriate measures to avoid an epidemic<br>• Active case finding and contact tracing during outbreaks are essential for control<br>• Identify all cases and contacts<br>• Assess and monitor the spread of an outbreak<br>• Evaluate control measures<br>• Provide a basis for research (epidemiological data, clinical specimens)<br>One of the major drawbacks in the surveillance system in Iraq is the limited feedback mechanism, routinely information flow in one direction (except in time of crisis). Poor feedback is a general problem, it also include feedback for hospital-referred cases. One step ahead is to issue an Iraqi CDC center monthly report or bulletin that shares information not only about cholera but rather all diseases under surveillance. This step relies mostly on regulation/ legislation under the current situation; major advancement would be founding the web-based report system that allows sharing of the appropriate information at the appropriate level. Proper feedback will improve cooperation of health care provider by increasing his awareness of the magnitude of the problem. |
| **Milestones:** | 1. The Iraqi CDC center to issue a monthly and annual report (a daily bulletin is required during epidemic).<br>2. The report is disseminated via official letter to the DOHs and then to the district.<br>3. Iraqi CDC center website founded and linked to the PHD website, information can then be reached by the authorized authority/persons.<br>4. Subnational labs and CPHL routinely feedback DOHs/districts and PHCC regarding the samples sent for study.<br>5. Feedback report including the data analysis generated by the DOH is shared at the level of the districts<br>6. Feedback report that includes the data analysis report generated by the district is shared at the level of the PHCCs. |
| **Indicators:** | **Indicator 1:** The percentage of DOHs, District, PHCCs and hospitals that receive Iraqi CDC center`s monthly and annual report via official letter by June 2015.<br>**Target: 100%** of DOHs, District, PHCC and hospitals receive Iraqi CDC center`s monthly and annual report via official letter by June 2015. |

| | |
|---|---|
| | **Indicator 2:** The percentage of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center website by **January 2016.**<br>**Target: 100%** of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center website by **January 2016.** |
| | **Indicator 3:** The percentage of referred cases for which subnational laboratory Reports are received by the referring entity by June 2015.<br>**Target:** 100% of referred cases for which subnational laboratory reports are Received by the referring entity by June 2015. |
| | **Indicator 4:** Percentage of DOHs that share its data analysis report with the districts/hospitals within the province by June 2015.<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |
| | **Indicator 5:** Percentage of districts that share its data analysis report with its reciprocal PHCCs within the province by **June 2015.**<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |

### 9.2.6 Environmental Considerations

Areas without a safe water supply and good sanitation are at risk for epidemic cholera. This includes municipal areas with inadequately chlorinated piped water, rural areas without access to tube or deep, protected wells, and areas where latrines or sewage systems are not commonly used The seasonality of cholera epidemics is not well understood. Near the equator, Cholera epidemics are unpredictable and may recur in either the rainy or dry season. In a given locale, however, cholera epidemics tend to recur at roughly the same time of year. In temperate zones, cholera epidemics usually occur during the summer between June & September.

# 10 VHF SURVEILLANCE

## 10.1 Definitions

***Case definition:***

***Confirmed Case Definition[15]:***

To meet the definition for a confirmed case of a viral hemorrhagic fever (VHF), a person would have to have fever >38.5°C, plus one or more of the following:

- Severe headache, muscle pain, vomiting, diarrhea, abdominal pain, bleeding not related to injury, thrombocytopenia, or a red maculopapular rash on the trunk with fine desquamation 3-4 days after rash onset.

**In addition**, in order to be a confirmed VHF case, the individual must have at least one of the following laboratory findings:

- Detection of VHF viral antigens by enzyme-linked immunosorbent assay (ELISA),
- VHF viral isolation in cell culture for blood or tissues,
- Detection of VHF-specific genetic sequence by reverse transcription-polymerase chain reaction (RT-PCR) from blood or tissues, or
- Detection of VHF viral antigens by immunohistochemistry

For CCV the onset of symptoms is sudden, with fever, myalgia, (muscle ache), dizziness, neck pain and stiffness, backache, headache, sore eyes and photophobia (sensitivity to light). There may be nausea, vomiting, diarrhea, abdominal pain and sore throat early on, followed by sharp mood swings and confusion. After two to four days, the agitation may be replaced by sleepiness, depression and lassitude, and the abdominal pain may localize to the upper right quadrant, with detectable hepatomegaly (liver enlargement).

Other clinical signs include tachycardia (fast heart rate), lymphadenopathy (enlarged lymph nodes), and a petechial rash (a rash caused by bleeding into the skin) on internal mucosal surfaces, such as in the mouth and throat, and on the skin. The petechial may give way to larger rashes called ecchymosis, and other hemorrhagic phenomena. There is usually evidence of hepatitis, and severely ill patients may experience rapid kidney deterioration, sudden liver failure or pulmonary failure after the fifth day of illness.

***Suspect Case Definition:***

A suspect VHF case must meet the clinical criteria listed above in addition to having experienced one or more of the following exposures in the **three weeks** before onset of symptoms:

---

[15] https://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/ReportingCommunicableDisease/ReportingGuidelines/Documents/vhf.pdf

- Contact with blood or other bodily fluids of a patient with VHF,
- Residence in—or travel to—a VHF-endemic area,
- Work in a laboratory that handles VHF specimens,
- Contact with animals ,animals Caracas, animal blood or their body fluid
- Bite by ticks or other vector

***Threshold for action:***

**Even a single case of VHF is considered an outbreak and is a public health emergency.**

## 10.2 Targets and Milestones

| 10.2.1 Case Detection/Registration | |
|---|---|
| **Background:** | |
| **Objectives:** | Due to the high fatality of the disease and relative ease of secondary transmission, a single case of VHF is considered an outbreak, and requires ***Immediate notification***. Consequently public and health workers must be well educated about suspect VHF case identification and take precautions to protect themselves, alert the authorities, and provide care for the infected.<br>It is also crucial to educate and consult with local health care providers and facilities to ensure compliance with patient isolation and medical procedures. |
| **Milestones:** | 1. MOH/ CDC center Iraq: formulate/ review VHF case definitions and management protocols on case detection. The protocol needs to include specific instructions to :<br>a. Educate and consult with local providers and facilities to ensure compliance with patient isolation and medical procedures in the special isolations room in the general Hospitals<br>b. Assure all contacts potentially exposed to the VHF case-patient are identified, educated, and placed under adequate surveillance for the period when symptoms are most likely to occur.<br>c. Complete the reporting forms, surveillance and follow-up forms, and otherwise document investigation, outreach, active surveillance, and completeness of containment efforts.<br>d. List of equipment, materials (gowns, gloves, masks, goggles etc.), and appropriate paper-based forms to be available at the health facility.<br>2. DOH to provide training for the health care providers and communicable disease officers in the hospitals, district and PHCC for the Iraqi CDC center VHF case definition/management protocol.<br>3. In the PHCC/ hospital health care provider, and communicable disease unit are trained about case definition and management protocol.<br>4. Definition of suspected cases is provided to the community through proper health education in the PHCC. |
| **Indicators:** | **Indicator 1:** Percentage of DOHs/districts /Hospitals and PHCCs that received a printed copy of the VHF management protocol By June 2015<br>**Target:** 100% of DOHs/districts and PHCCs receive a printed copy of the VHF management protocol By June 2015 |
| | **Indicator 2:** Percentage of DOHs from which at least 2 trainer are trained to provided training for the VHF management protocol (toolkit/guideline) by August 2015 |

| | |
|---|---|
| | **Target:** 100% of DOHs from which at least 2 trainer are trained to provided training for the VHF management protocol (toolkit/guideline) by August 2015 |
| | **Indicator 3:** Percentage of Districts/ Hospitals and PHCCs from which at least 2 members (communicable disease officer/health care provider are trained by the DOH`s TOT for VHF case definition/management protocol by November 2015. **Target:** By November 2015, 2 members (communicable disease officer/health care provider from each district and hospitals (100%) and 80% of PHCCs) are trained by the Iraqi CDC center for VHF case definition/management protocol. |
| | **Indicator 4:** Percentage of LHC that perform at least 1 outreach activity that involves suspected VHF definition/infection control is performed monthly Starting from December 2015<br>**Target:** Starting from December 2015, 100% of LHC perform at least 1 outreach activity that involves suspected VHF definition/infection control is performed monthly. |

| **10.2.2 Case Confirmation/Investigation** | |
|---|---|
| **Background:** | If a suspect or confirmed case of VHF is reported, or there is any potential exposure to an agent which could cause VHF, an investigation msut be started in close collaboration with the Iraqi CDC center unit in the DOH or Iraqi CDC center in Baghdad. VHFs are communicable. Contacts at risk for VHF infection must be identified, located, interviewed, and assessed for symptoms of illness. Local health department staff will do rapid screening of contacts for symptoms of illness. They can also advise each contact to monitor his or her temperature and can review key symptoms to guide decision-making about medical referral, the following investigation steps are general guide to the communicable disease units officer in charge of investigation (PHCC, Hospital, DOH or central)<br>1. Use a gown and gloves if entering the room of an ill patient. Additionally, use a face shield, a surgical mask, and eye protection (Goggles) if you will be within 1 meter of the patient. Consider additional barriers, such as an impermeable gown, leg or shoe coverings, if there is a substantial amount of blood or other bodily fluids in the patient area you are entering.<br>2. Complete the case report form. (to be finalized by the Iraqi CDC center)Most of the information required on the form can be obtained from the healthcare provider or the medical record. For each VHF case or suspect, record "Viral Hemorrhagic Fever" as the disease being reported. For initial suspects and cases, and in early phase of symptoms, lab results may not be available. When possible, record the type of VHF. |

| | |
|---|---|
| | 3. Record demographic and clinical information about the suspected or confirmed case patient. In some instances, interviews may be done with close household members of the suspect or confirmed case patient, as the patient may be too ill to provide adequate information. Use the case report form to collect the following data for each case:<br>• name, age, race/ethnicity, address, phone numbers;<br>• parent/guardian information, if applicable;<br>• clinical data, including signs and symptoms, date of onset, date of diagnosis, duration;<br>• Status (hospitalized, at home, deceased).<br>4. List information about the healthcare providers attending the case patient:<br>• name and phone number of the hospital where the case is or was hospitalized;<br>• name and phone number of the attending physician;<br>• name and phone number of the infection control official at the hospital;<br>• if the patient was seen by a healthcare provider before hospitalization, or seen at more than one hospital, obtain these names and phone numbers as well;<br>• name of any person or agency involved in transporting the patient while symptomatic<br>***Lab investigation:***<br>The diagnosis of VHF require one of the following:<br>**Supportive:**<br>• Positive serology for (ELISA for IgG and/or IgM), or<br>• Detection of viral antigen in Human serum.<br>**Confirmatory:**<br>• Positive virus isolation (*only in a laboratory of biosafety level3*) *or*<br>• Positive skin biopsy (immunohistochemistry) or<br>• Positive PCR |
| **Suggested Goals for MOH:** | • Short term goals include formulating laboratory SOP, to be finalized and approved<br>• Intermediate term goals would include training lab personnel at all PHCCs/ hospital to use the new SOP/guidelines, ensure proper follow up of referred cases.<br>• Long term goals would include implementation of electronic referral system to ensure proper (quick, accurate, credible, and accountable) referral of cases. |
| **Milestones:** | 1. MOH formulates a VHF investigation guide (as separate entity or as part of CD toolkit/guideline), laboratory SOP guideline to guide the primary investigation of the case and ensure proper handling of the samples at the health facilities.<br>2. TOT training is provided to communicable disease officers from all DOHs |

| | |
|---|---|
| | 3. Health care providers/ CD officer from the districts, hospitals are trained to use the VHF investigation guide and laboratory SOP guidelines.<br>4. CPHL membersare trained and equipped to be Capable to provide supportive and confirmatory diagnosis of suspected cases. |
| **Indicators:** | **Indicator 1:** Percentage of PHCCs that contain a copy of the VHF investigation guide and laboratory SOP guidelines that are generated and approved by the MOH By **July 2015**<br>**Target:** 100% of PHCCs contain a copy of the VHF investigation guide and laboratory SOP guidelines that are generated and approved by the MOH By **July 2015** |
| | **Indicator 2:** Percentage of DOHs from which at least 2 CD officers or helaht care providers are provided with TOT training for the VHF investigation guide and laboratory SOP guidelines by August 2015.<br>**Target:** By **August 2015**, 2 CD officers or health care providers from 100% of DOHs are provided with TOT training for the VHF investigation guide and laboratory SOP guidelines |
| | **Indicator 3:** Percentage of Districts, Hospitals and from which at least 2 Health care providers/ CD officer are trained to use the VHF investigation guide and laboratory SOP guidelines by **November 2015**<br>**Target:** By **November 2015**, 2 Health care providers/ CD officer from the ALL (100%) of districts, hospitals and 80% of PHCCs are trained to use the VHF investigation guide and laboratory SOP guidelines. |
| | **Indicator 5:** Percentage of samples for which CPHL is equipped and has trained staff to be capable to do Immunohistochemistry and Rt- PCR. For the diagnosis of VHF by December 2015.<br>**Target:** By December 2015, CPHL is equipped and has trained staff to be capable to do Immunohistochemistry and Rt- PCR. For the diagnosis of VHF for 100% of samples |

| **10.2.3 Reporting** | |
|---|---|
| **Background:** | The current system involve paper-based reporting by communicable disease units officer to the district, on identification of one of the immediate IHR-notification diseases, or sending weekly or monthly report, only in the DOH an electronic formula is used to be reported to the Iraqi CDC center (currently the communicable disease officers in the district are being trained to use Epi info program, to send their report in electronic formula) the aim of the MOH is to extend Epi info training to the PHCC level and finally transform the system into web-based surveillance. VHF is one of the immediate IHR-notification disease, that being reported immediately form the PHCC level, starting from January 2015 districts will send electronic report by email (using Epi info forms) to the DOH, and then to the DOH and Iraqi CDC center. |

| | |
|---|---|
| **WHO Recommended Data to be Reported:** | ***Case classification (suspected/probable/confirmed):***<br>• Unique identifier, name, age, sex<br>• What VHF is suspected, and which specific suspect case definition did the patient meet.<br>• Geographical information, name of head of family, name of father (if child)<br>• Profession, place of work<br>• Date of onset of fever, symptoms, signs<br>• Hospitalization, including date<br>• Death including date<br>• Contact with previous case, including date<br>• Nature and date of clinical samples taken for laboratory investigation (if any)<br>***Aggregated data for reporting:***<br>• Number of cases (suspected/probable/confirmed) by age, sex<br>• Number of deaths |
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to report electronically to the DOH.<br>2. Trained DOH personnel provide training to the communicable disease unit's officer at the PHCC level to be able to report electronically using Epi info forms prepared at the Iraqi CDC center.<br>3. Iraqi CDC center finalize the pioneer study for the web-based surveillance system<br>4. TOT training for DOH personnel is performed for the web based surveillance system.<br>5. Training of communicable disease officers from the district PHCCs and hospital is performed.<br>6. Web-based reporting system is launched |
| **Indicators:** | **Indicator 1:** Percent of districts (except those in hot zones) that report via Epi info forms by the end of January 2015<br>**Target:** By end of January 2015, 100% of districts (except those in hot zones) report via Epi info forms. |
| | **Indicator 2:** Percent of PHCCs from which at least 2 communicable disease officers are trained to use Epi info by end of 2016<br>**Target:** By end of 2016, >=80% of PHCCs have at least 2 communicable disease officers trained to use Epi info. |
| | **Indicator 3:** Percent of PHCCs report notifiable disease using Epi info forms, by February 2017<br>**Target:** By February 2017, 80% of PHCCs report notifiable disease using Epi info forms, less than 20 % of reports are delivered by paper form. |
| | **Indicator 4:** Percent of DOHs from which at least 2 communicable disease |

| | |
|---|---|
| | officers receive TOT training in web-based surveillance systems by June 2017<br>**Target:** 100% of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017 |
| | **Indicator 5:** Percentage of districts, hospitals and PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017.<br>**Target:** 100% of districts and hospitals and 80% of PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017 |
| | **Indicator 6:** Percentage of notifiable disease reports delivered by paper or epi info forms by end of January 2018.<br>**Target:** < = X% of notifiable disease reports delivered by paper or epi info forms by end of January 2018. |

| **10.2.4** | |
|---|---|
| **Background:** | Surveillance data should be analyzed routinely and the information interpreted for use in public health actions. Due to its high fatality and communicability detection of one case of VHF is considered out break and require immediate action, in the current system data analysis start at the level of the DOH (provincial level) and final analysis is done at the CDC center Baghdad. Faster response requires analysis at an earlier step (district). Earlier analysis enables faster response and increase chance of confirming possible cases. |
| **WHO Recommended Data Analysis, Presentation, and Reporting:** | A report should be sent daily to local health authorities. It should include the following information:<br>***Cases:***<br>• Total cumulative number of cases<br>• Total cumulative number of deaths<br>• New number of patients daily<br>• New number of hospitalized patients daily<br>• New number of deaths daily<br>• Date of last identified case<br>• Date of death or hospital discharge of the last reported case<br>• Breakdown by sex and age group can also be provided<br>***Contacts:***<br>• Current number of contacts requiring follow up<br>• Current number of contacts under proper follow-up<br>• Breakdown by sex and age group can also be provided<br>When possible, the geographic distribution of cases and contacts should be provided, as well as a simple epidemic curve. Case-fatality rates, attack rates, and age-specific attack rates can be calculated for epidemiological assessment. A |

| | |
|---|---|
| | more detailed report summarizing events and data should be produced weekly and a complete report should be available at the end of the epidemic |
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to analyses surveillance data, a surveillance analysis report is then sent to the district manager.<br>2. Trained DOH personnel provide training to the communicable disease officers at the PHCC level to be able to analyses surveillance data.<br>3. Surveillance analysis report is sent by communicable disease officers at the PHCC to the PHCC manager and the district manager on detection of VHF case (also zero reporting) |
| **Indicators:** | **Indicator 1**: The percentage of districts that send data analysis reports to the DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received, starting from January 2015<br>**Target:** Starting from January 2015, data analysis reports are sent by 100% of districts to **the** DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received. |
| | **Indicator 2:** Percent of the data analysis reports that are acceptable within the EPI/CDC center Baghdad standards starting from **January 2015**<br>**Target:** Starting from **January 2015** =>80% of the data analysis reports are acceptable within the CDC center/ Baghdad standards |

| **10.2.5 Response and Feedback** | |
|---|---|
| **Background:** | Proper and quick response increase the sensitivity and accuracy of the surveillance system, the more peripheral the response start the faster it is, shifting from passive surveillance to active surveillance is one of the measures that can be taken in response to over threshold notification. Response plans need to be prepared centrally and modified at each level to be formulated in specific protocols.<br><br>**Routine surveillance data:**<br>• Detect an isolated case or an outbreak and immediately take appropriate measures to avoid a major epidemic<br>• Active case finding and contact tracing during outbreaks are essential for control<br>• Identify all cases and contacts<br>• Assess and monitor the spread of an outbreak<br>• Evaluate control measures<br>• Provide a basis for research (epidemiological data, clinical specimens)<br><br>**SPECIAL ASPECTS**<br>**Since extreme biohazard is associated with sampling, transportation and laboratory investigation, strictly applied biosafety procedures and appropriate isolation of patients are essential**. |

| | |
|---|---|
| | One of the major drawbacks in the surveillance system in Iraq is the limited feedback mechanism, routinely information flow in one direction (except in time of crisis). Poor feedback is a general problem, it also include feedback for hospital referred cases. One step ahead is to issue a Iraqi CDC center monthly report or bulletin that share information not only about VHF but rather all diseases under surveillance. This step rely mostly on regulation/ legislation under the current situation, major advance would be founding the web based report<br>System that allow sharing of the appropriate information at the appropriate level. Proper feedback will improve cooperation of health care provider by increasing his awareness of the magnitude of the problem. |
| **Suggested Goals for MOH:** | Proper feedback is provided to the referring entity form all levels. |
| **Milestones:** | 1. The Iraqi CDC center to issue a monthly and annual report, a daily bulletin is required during epidemic.<br>2. The report is disseminated to the DOHs and then to the district.<br>3. Iraqi CDC center website founded and linked to the PHD website, information can then be reached by the authorized authority/persons.<br>4. CPHL routinely feedback DOHs/districts and PHCC regarding the samples sent for study.<br>5. Feedback report including the data analysis generated by the DOH is shared at the level of the districts<br>6. Feedback report that includes the data analysis report generated by the district is shared at the level of the PHCCs. |
| **Indicators:** | **Indicator 1**: The percentage of DOHs, District, PHCC and hospitals that receive Iraqi CDC center`s monthly and annual report via official letter by June 2015.<br>**Target: 100%** of DOHs, District, PHCC and hospitals receive Iraqi CDC center`s monthly and annual report via official letter by June 2015. |
| | **Indicator 2**: The percentage of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center website by **January 2016.**<br>**Target: 100%** of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center website by **January 2016.** |
| | **Indicator 3**: The percentage of referred cases for which reference laboratory reports are received by the referring entity by June 2015.<br>**Target:** 100% of referred cases for which reference laboratory reports are received by the referring entity by June 2015. |
| | **Indicator 4:** Percentage of DOHs that share its data analysis report with the districts/hospitals within the province by June 2015.<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |

| | |
|---|---|
| | **Indicator 5:** Percentage of districts that share its data analysis report with its reciprocal PHCCs within the province by **June 2015.**<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015 |

| **10.2.6** | |
|---|---|
| **Background:** | |
| **Objectives:** | |
| **Milestones:** | |
| **M&E Mechanisms:** | |
| **Indicators:** | |
| | |
| | |
| | |
| | |
| | |

# 11 TUBERCULOSIS SURVEILLANCE

## 11.1 Definitions

***Case definitions:***

A **laboratory-confirmed tuberculosis (TB)** case is one from whom a biological specimen is positive by smear microscopy, culture or WRD (such as Xpert MTB/RIF). All such cases should be notified, regardless of whether TB treatment has started.

A **clinically diagnosed TB** case is one who has not had a laboratory confirmation test performed, but has been diagnosed with active TB by a clinician or other medical practitioner who has decided to give the patient a full course of TB treatment. This definition includes cases diagnosed based on X-ray abnormalities or suggestive histology and extrapulmonary cases without laboratory confirmation. Clinically diagnosed cases subsequently found to be bacteriologically positive (before or after starting treatment) should be reclassified as laboratory- confirmed cases of TB.

***Laboratory-confirmed or clinically diagnosed cases of TB are also classified according to:***

- Anatomical site of disease;
- History of previous treatment;
- Drug resistance;
- HIV status.

***Classification based on anatomical site of disease:***

**Pulmonary tuberculosis (PTB)** refers to any laboratory-confirmed or clinically diagnosed case of TB involving the lung parenchyma or the tracheobronchial tree. Miliary TB is classified as PTB because there are lesions in the lungs. Tuberculosis intra-thoracic lymphadenopathy (mediastinal and/or hilar) or tuberculosis pleural effusion, without radiographic abnormalities in the lungs, constitutes a case of extrapulmonary TB. A patient with both pulmonary and extrapulmonary TB should be classified as a case of PTB.

**Extrapulmonary tuberculosis (EPTB)** refers to any laboratory-confirmed or clinically diagnosed case of TB involving organs other than the lungs, e.g. pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, meninges.

**Classification based on history of previous TB treatment (patient registration group)** Classifications based on history of previous TB treatment are slightly different from those previously mentioned. They focus only on history of previous treatment and are independent of laboratory-confirmation or site of disease. Note also that the registration groups for drug resistant (DR)-TB are slightly different and are described in the Companion Handbook to the 2011 WHO Guidelines for the Programmatic Management of Drug-Resistant Tuberculosis, due for publication by WHO in 2013.

**New patients** have never been treated for TB or have taken anti-TB drugs for less than 1 month.

**Previously treated patients** have received 1 month or more of anti-TB drugs in the past. They are further classified by the outcome of their most recent course of treatment (see table in section A.2.1) as follows:

**Relapse patients** have previously been treated for TB, were declared cured or treatment completed at the end of their most recent course of treatment, and are now diagnosed with a recurrent episode of TB (either a true relapse or a new episode of TB caused by re-infection).

**Treatment after failure patients** are those who have previously been treated for TB and whose treatment failed at the end of their most recent course of treatment.

**Treatment after loss to follow-up patients** have previously been treated for TB and were declared lost to follow-up at the end of their most recent course of treatment. (These were previously known as treatment after default patients.)

**Other previously treated patients** are those who have previously been treated for TB but whose outcome after their most recent course of treatment is unknown or undocumented.

**Patients with unknown previous TB treatment history** do not fit into any of the categories listed above.

**New and relapse cases of TB are incident TB cases.**

***Classification based on HIV status:***

**HIV-positive TB patient** refers to any laboratory-confirmed or clinically diagnosed case of TB who has a positive result from HIV testing conducted at the time of TB diagnosis or other documented evidence of enrolment in HIV care, such as enrolment in the pre-ART register or in the ART register once ART has been started.

**HIV-negative TB patient** refers to any laboratory-confirmed or clinically diagnosed case of TB who has a negative result from HIV testing conducted at the time of TB diagnosis. Any HIV- negative TB patient subsequently found to be HIV-positive should be reclassified accordingly.

**HIV status unknown TB patient** refers to any laboratory-confirmed or clinically diagnosed case of TB who has no result of HIV testing and no other documented evidence of enrolment in HIV care. If the patient's HIV status is subsequently determined, he or she should be reclassified accordingly.

**Classification based on drug resistance:**

Cases are classified in categories based on drug susceptibility testing (DST) of clinical isolates confirmed to be M. tuberculosis:

**Monoresistance: resistance** to one first-line anti-TB drug only.

**Polydrug resistance:** resistance to more than one first-line anti-TB drug (other than both isoniazid and rifampicin).

**Multidrug resistance:** resistance to at least both isoniazid and rifampicin.

**Extensive drug resistance:** resistance to any Fluoroquinolone and to at least one of three second-line injectable drugs (Capreomycin, kanamycin and Amikacin), in addition to multidrug resistance.

**Rifampicin resistance:** resistance to rifampicin detected using phenotypic or genotypic methods, with or without resistance to other anti-TB drugs. It includes any resistance to rifampicin, whether Monoresistance, multidrug resistance, Polydrug resistance or extensive drug resistance.

These categories are not all mutually exclusive. When enumerating rifampicin-resistant TB (RR- TB), for instance, multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR- TB) are also included. While it has been the practice until now to limit the definitions of Monoresistance and Polydrug resistance to first-line drugs only, future drug regimens may make

it important to classify patients by their strain resistance patterns to Fluoroquinolone, second-

line injectable agents and any other anti-TB drug for which reliable DST becomes available.

## 11.2 Targets and Milestones

| 11.2.1 Case Detection/Registration | |
|---|---|
| **Background:** | Case detection starts at community level. Education (mainly through LHC) is conducted based on national criteria and guidelines issued centrally (MOH/TB center/ Iraqi CDC center) (comprehensive communicable disease toolkit/guidelines). Health care providers/health enforcement officers at different levels (DOH, District and PHCC/Hospital) are trained for the communicable disease toolkit/guidelines, and should name two focal-point individuals responsible for ensuring compliance with case definitions and timely reporting. |
| **Objectives:** | To increase the detection of suspected cases by the community (LHC members, health volunteers, teachers, parents etc.) and the health facility. |
| **Milestones:** | . MOH / TB Center Iraq: review case definitions and surveillance protocol on case detection. (Either as separate document or as part of comprehensive communicable disease toolkit/guidelines).<br>Chest clinic at the level of DOH to provide training for the health care providers and communicable disease/health enforcement officers and TB unit members in the hospitals, district and PHCC for the TB/ Iraqi CDC center TB case definitions . |

| | |
|---|---|
| | At the PHCC/ hospital, health care providers and communicable disease officers are trained about case definitions and the management protocol through CME and in collaboration with National TB Control Program.<br>4. Definition of suspected cases is provided to the community through proper health education by the PHCC (outreach activities) and in collaboration with National TB Control Program (NTP). |
| **Indicators:** | **Indicator 1:** Percentage of the estimated TB (new & relapse) cases in Iraq detected by December 2019.( WHO estimates an incidence of 45 New & relapse per 100,000 population, so estimated number will be the denominator)<br>**Target:** Detect at least 70% of the estimated TB (new & relapse) cases in Iraq by December 2019 |
| | **Indicator 2:** Percentage of PHCCs/hospitals that have a printed copy of the TB surveillance protocol that is formulated and approved by the MOH /TB center center in Baghdad (as an independent document or as part of a priority communicable disease toolkit/guideline).<br>**Target:** By June 2015 100% of PHCCs and hospitals contain printed copies of the TB surveillance protocol that is formulated and approved by the MOH / CRDSC center in Baghdad. |
| | **Indicator 3:** Percentage of DOHs from which at least two communicable disease officers From DOH chest clinic (physician + statistician)/Trainers are trained to use/provide training for the TB surveillance toolkit/guidelines by August 2015 in collaboration with NTP.<br>**Target:** 100% of DOHs from which at least two communicable disease officers/Trainers are trained to use/provide training for the TB surveillance toolkit/guidelines by August 2015. |
| | **Indicator 4:** Percentage of hospitals, district and PHCCs from which at least one health care provider or communicable disease units officer is trained for the TB surveillance toolkit/guidelines by **November 2015.**<br>**Target:** 100% of the Hospitals, district and PHCCs from which at least two Health care providers or communicable disease officers are trained for the TB surveillance toolkit/guidelines by **November 2015.** |
| | **Indicator 5:** Percentage of PHCCs that list presumptive **TB** definition as one item of the CME Quarterly schedule by **December 2015.**<br>**Target: 100%** of PHCCs list **TB** definition as one item of the CME quarterly schedule **by December 2015** |
| | **Indicator 6:** Percentage of monthly reports for LHC meetings that include presumptive TB definition by **December 2015.**<br>**Target: 100% of** Monthly reports for LHC meetings include TB presumptive case definition By **December 2015.** |
| | **Indicator 7:** Percentage of LHC that perform at least 1 outreach activity that involves the suspected TB definition monthly starting **from December 2015.** |

| | |
|---|---|
| | **Target:** (100% of LHC perform at least 1 outreach activity that involves the increased awareness of suspected **TB** definition per month) **starting from December 2015** |

| **11.2.2 Case Confirmation/Investigation** | |
|---|---|
| **Background:** | Since Iraq is among the endemic countries for TB, intensive assessment of the TB cases and contact screening is required. |
| **Objectives:** | 1. Refer at least 3% of patients presenting at a PHCC (who are presumptive TB cases) to district TB coordinator units (DTCUs). **[Indicator** = the proportion of referred presumptive TB cases from PHCCs to district TB coordinator units out of all daily visitor from PHCCs patients. **[The target is** 3% on an annual basis]<br>2. Increase referral of presumptive TB cases to NTP from non-NTP sectors (public hospitals & private sector). [**Indicator** = the proportion of presumptive TB cases referred to NTP from non-NTP sectors out of all presumptive TB cases referred to the NTP. **[The target is** 35% on an annual basis]<br>3. Screen all laboratory-diagnosed TB cases for drug resistance. [**Indicator** = the proportion of laboratory-diagnosed TB cases screened for drug resistance out of all the laboratory-diagnosed TB cases. [**The target** is 100% by 2019]<br>4. To increase case detection of MDR-TB cases among notified (pulmonary) TB cases to 100% by 2019. |
| **Suggested Goals for MOH:** | • **Short-term objective:** include formulating laboratory SOP, to be finalized and approved (by TB center) and TB investigation guidelines (as separate entity or part of comprehensive CD toolkit/guidelines).<br>• **Intermediate -term objective:** include training lab personnel at all PHCCs/ hospitals to use the new SOPs/guidelines and TB investigation guidelines, to ensure proper follow-up of referred cases.<br>• **Long-term objective:** MOH to equip subnational laboratories in the provinces and train their staff to be able to confirm diagnosis of TB. |
| **Milestones:** | 1. MOH formulates TB investigation guidelines and TB laboratory SOP guidelines to guide the primary investigation of the case and ensure proper handling of the samples at the health facilities.<br>2. The TB investigation guidelines and TB laboratory SOP guidelines to be distributed to all the PHCC, hospital districts, and DOHs.<br>3. TOT training is provided to TB officer/ lab personnel from all DOHs to use TB investigation guidelines and TB laboratory SOP guidelines.<br>4. Health care providers/ lab personnel or officer from the districts, hospitals, and PHCCs are trained to use the TB investigation guidelines and laboratory SOP guidelines.<br>5. Subnational lab in the provinces to be equipped and provided with training to be capable of providing a laboratory-confirmed TB diagnosis |

| | |
|---|---|
| | (including, MDR-TB and second line drug resistance study)(the main contributor is the MOH) |
| **Indicators:** | **Indicator 1:** Percentage of PHCCs and Hospitals in which TB investigation guidelines and laboratory SOP guidelines are generated and approved by the MOH by **July 2015**<br>**Target:** By **June 2015** TB investigation guidelines and laboratory SOP guidelines (generated and approved by the MOH) are available in 100% of PHCCs and Hospitals. |
| | **Indicator 2:** Percentage of DOH from which at least two members are provided with TOT training about the TB investigation guidelines and laboratory SOP guidelines by September 2015.<br>**Target:** 100% of DOHs had at least two members provided with TOT training about the TB investigation guidelines and laboratory SOP guidelines by September 2015. |
| | **Indicator 3:** Percentage of districts, hospitals, and PHCCs from which at least 2 Health care providers/ TB officers or laboratory staff are trained to use the TB investigation guidelines and laboratory SOP guidelines by **November 2015.**<br>**Target:** By **November 2015**, ALL (100%) districts and hospitals and 80% of PHCCs have at least 2 Health care providers/ TB officers or laboratory staff who are trained to use the TB investigation guidelines and laboratory SOP guidelines. |
| | **Indicator 4:** Percentage of subnational laboratories in the provinces that are equipped and whose staff are trained (by MOH) to do diagnostic test for TB (including second line drug resistance study) by June 2015.<br>**Target:** By **June 2015** 100% subnational laboratories in the provinces are capable (equipped and whose staff are trained by the MOH) to do diagnostic test for TB (including second line drug resistance study). |

| **11.2.3 Reporting** | |
|---|---|
| **Background:** | |
| **Objectives:** | Changing the current TB management system into a web-based data management system. |
| **Milestones:** | 1. Transition of TB surveillance system from email-based communication (sending fixed forms of excel files (named electronic nominal recording system –ENRS) - into WHO-standardized web-based TB surveillance system –(WTBS)- by 2016) (All governorates by 2015 except for the unstable ones in terms of security; then 100% coverage by 2016, Since the system is used by EMRO countries and a pilot was conducted in 2012-2014 no need for piloting). |

| | |
|---|---|
| | a. Provision of internet access (good quality/high speed) to all NTP facilities (districts TB coordinator units and chest & respiratory disease consultancy clinics) during 2015 **(First half of 2015, to fully expand implementation by end of 2015).**<br>b. Training of all statisticians to work in NTP network on WTBS by July 2015.<br>c. Provision of surveillance-related devices (computer devices and printers) at all NTP levels.<br>2. Using web-based surveillance system to manage all programmatic data (other than patients' data) by all NTP facilities by the end of 2016.<br>a) Training of all statisticians to work in NTP network on using a specified web site (WMDB) to enter program related data during 2016 |
| **Indicators:** | **Indicator 1:** Coverage rate of NTP facilities with internet access<br>**Target:** 100% by the end of 2015 for stable provinces |
| | **Indicator 2:** The number of implemented training sessions on WTBS.<br>**Target:** 5 sessions by July 2015 for stable provinces.<br>**Indicator 3:** percentage of DOH form each at least one NTP member in is involved in TOT training for the WTBS<br>**Target:** 100% of DOH form each at least one NTP member in is involved in TOT training for the WTBS |
| | **Indicator 4:** Proportion of NTP facilities with functioning capacity with all Surveillance related devices.<br>**Target:** 100% by the by July 2015 for stable provinces |
| | **Indicator 5:** Number of implemented training sessions on WTBS.<br>**Target:** 5 sessions in 2016. |

| 11.2.4 Data Analysis | |
|---|---|
| **Background:** | Surveillance data should be analyzed routinely and the information interpreted for public health action. In the current system, data analysis start at the level of the DOH (provincial level) and final analysis is done at the TB center in Baghdad. Faster response requires analysis at an earlier step (district). Earlier analysis enables faster response and increases the chance of confirming possible cases. |
| **WHO Recommended Data Analysis, Presentation, and Reporting:** | **Analysis of geographical area (district) quarterly reports**<br>• Treatment success rate: number of cases cured, plus patients who completed treatment, as a ratio of all cases registered during the same period of time<br>• Quality of diagnostic services: ratio of new sputum-smear positives to all pulmonary cases<br>**Presentation and Reports:**<br>• Case notification rates over several years by geographical area, regions, and country.<br>• Case notification rates (new sputum smear positives) by age and sex<br>• Case detection rate: ratio of the tuberculosis cases detected by the national tuberculosis control program to the number of cases estimated to have occurred in the country |

| 11.2.5 Response and feedback | |
|---|---|
| **Background:** | Proper and quick response increases the sensitivity and accuracy of the surveillance system; the more peripheral the response start, the faster it is. Active case detection (screening campaigns for vulnerable groups; prisoners, IDP, refugees) is one of the measures already taken in response to notifications that surpass the predetermined thresholds. Response plans need to be prepared centrally and modified at each level to be formulated in specific protocols.<br>Routine surveillance data:<br>• At local level: ensure that appropriate treatment services are offered, contact tracing is carried out, and local epidemiology is monitored<br>• At national level: facilitate monitoring of the epidemiology of the disease and of the performance of treatment programmers (ability of a National Tuberculosis Programmed to detect tuberculosis cases, diagnose sputum positive cases, treat tuberculosis cases successfully); and facilitate planning for programmed activities (e.g., securing drug supply, lab supply, etc.)<br>• At international level: examine trends over time and make inter- country comparisons with the aim of coordinating control and treatment efforts |

| | |
|---|---|
| | One of the major drawbacks in the surveillance system in Iraq is the limited feedback mechanism, routinely information flow in one direction (except in time of crisis). Poor feedback is a general problem; it also includes feedback for hospital-referred cases. One step ahead is to issue a TB monthly report or bulletin that shares information not only about TB, but rather all diseases under surveillance. This step relies mostly on regulation/ legislation under the current situation; a major advance would be founding the web-based report system that allows sharing of the appropriate information at the appropriate level. Proper feedback will improve cooperation of health care providers by increasing this awareness of the magnitude of the problem. |
| **Suggested Goals for MOH:** | Proper feedback is provided to the referring entity form all levels. |
| **Milestones:** | 1. The Iraqi Specialized Center for Chest and Respiratory Disease "SCCRD" which is responsible for National TB control Program "NTP" to issue a quarterly report, in addition to the Routine Report, which is quarterly reporting for WHO<br>2. The report is disseminated via official letter to the DOHs and then to the district.<br>3. TB center website founded and linked to the (Public Health Directorate) PHD website, information can then be accessed by the authorized authority/persons.<br>4. Subnational labs and CPHL routinely feedback DOHs/districts and PHCCs regarding the samples sent for analysis/ diagnosis.<br>5. Feedback report including the data analysis generated by the DOH is shared at the district level.<br>6. Feedback report that includes the data analysis report generated by the district is shared at the PHCC level. |
| **Indicators:** | **Indicator 1**: The percentage of DOHs, Districts, PHCCs and hospitals that receive TB center`s monthly and annual report via official letter by June 2015.<br>**Target: 100%** of DOHs, District, PHCC and hospitals receive TB center`s quarterly and annual report via official letter by June 2015. |
| | **Indicator 2**: The percentage of DOHs, District, PHCCs and hospitals that have access to the TB website by **January 2016.**<br>**Target: 100%** of DOHs, District, PHCCs and hospitals that have access to the TB website by **January 2016.** |
| | **Indicator 3**: The percentage of referred cases for which reference laboratory reports are received by the referring entity by June 2015.<br>**Target:** 100% of referred cases for which reference laboratory reports are received by the referring entity by June 2015. |
| | **Indicator 4:** Percentage of DOHs that share its data analysis report with the districts/hospitals within the province by June 2015. |

| | |
|---|---|
| | **Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |
| | **Indicator 5:** Percentage of districts that share its data analysis report with its reciprocal PHCCs within the province by **June 2015.**<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |

# 12 VIRAL HEPATITIS SURVEILLANCE

## 12.1 Definitions

***Clinical case definition:***

An acute illness that includes malaise, extreme fatigue, fever, nausea and sometimes vomiting and upper right quadrant abdominal tenderness, then dark urine followed by jaundice.

***Case classification:***

*Suspected case:* A case compatible with clinical description.

*Probable case:* A suspected case plus positive bile pigment in urine and elevated serum bilirubin and liver enzymes (ALT, SGPT and Serum Alkaline Phosphatase.

*Confirmed case:* Probable/suspected case with positive specific serological tests. This can be done by different methods the most famous one is ELISA method.

*Chronic Hepatitis C:* Any patient who is positive for HCV Abs should be referred to the specialist center for more evaluation because positivity for HCV Abs cannot differentiate infection from immunity and needs further investigations. PCR is necessary to identify such cases.

*Chronic Hepatitis B cases:* Any patient with positive HBsAg for more than 6 months and is considered as a case of chronic carrier state.

Note: The patient should be tested for other markers (HBeAg, Anti- HBcIgM, and Anti- HBe) to determine the health status and infectivity level. Positivity for HBeAg indicates high infectivity while positivity for Anti- HBcIgM means acute infection.

Positive Anti- HBe means less Infectivity.

***Occurrence:***

Iraq is considered highly endemic with Hepatitis A as indicated by 96.4% prevalence of Anti HAV Abs. (The prevalence of hepatitis A-IgG antibodies in Iraqi population is 96.4% (95% confidence interval is 96-96.8%)[16]Hepatitis E is also endemic with prevalence of 20.3%both hepatitis B and C have a low/very low endemicity (1.6% and 0.4%, respectively).[17]

***Goals:***

- Improve public knowledge about the disease.
- Early diagnosis to enable necessary prophylactic
- measures Reduce morbidity and mortality due to hepatitis

---

[16] [9]*Analysis of Acute Viral Hepatitis (A and E) in Iraq Ataallah M. Turky Minstry of Health, Iraq*

[17] *http://www.emro.who.int/irq/programmes/hepatitis.html*

## 12.2 Targets and Milestones

| 12.2.1 Case Detection/Registration | |
|---|---|
| **Background:** | **Infectious agent:**<br>**Hepatitis A virus (HAV):** RNA virus, family *Picornaviridae*.<br>**Hepatitis C virus (HCV):** RNA virus, genus *Hepacavirus*, *Flaviviridae* family. At least 6 genotypes and approximately 100 subtypes<br>Hepatitis B virus (HBV): a *hepadnavirus*, partially double-stranded DNA virus composed of nucleocapsid core (HBcAg), surrounded by an outer lipoprotein coat containing the surface antigen (HBsAg). 8 main genotypes (A-H).<br>Hepatitis E virus (HEV): a spherical, non-enveloped, single-stranded RNA virus, family Hepeviridae.<br>Although "viral hepatitis" is a notifiable disease, the reporting of a confirmed laboratory diagnosis of hepatitis C infection is more complete . Surveillance is essential to inform prevention and control activities and to monitor their effectiveness and impact. In parallel, awareness raising in the genera l public will mean that they are more likely to seek testing and/or accept testing ; it will therefore be necessary to encourage more people in the genera l population who have been or are at risk of infection to come forward for testing. This will be achieved by increasing awareness about hepatitis C amongst health professionals so that they are more likely to offer testing to at-risk patients. |
| **Objectives:** | Suspected cases need to be reported by community members (e.g. LHC members, health volunteers, teachers, parents etc.) to the nearest health facility<br>(PHCC/hospital) |
| **Milestones:** | 1. MOH /EPI/CDC center Iraq: issues case definitions in an official letter (or as discussed in the general surveillance part, as part of the Communicable disease surveillance toolkit/ guideline referred to under Goal 2 of the general strategy)<br>2. CD units in the DOHs and District to convey the case definition (suspected and confirmed) to the peripheral level (PHCCs/Hospitals)<br>3. In the PHCC/ hospital, definition of suspected cases is provided to the health facility through CME.<br>4. Definition of suspected cases is provided to the community through proper health education in the PHCC.<br>5. Proper registry of the referred cases is available at the level of the PHCC/Hospital. |
| **M&E Mechanisms:** | 1. Studying monthly report from PHCC to the district, and DOH<br>2. Supervisory visit to the PHCC (from district and DOH) |
| **Indicators:** | **Indicator 1:** Percentage of PHCCs, hospitals, districts and DOH for which comprehensive communicable disease toolkit/guideline printed and distributed<br>**Target:** 100% of PHCCs, hospitals, districts and DOH receive at least one copy of the comprehensive communicable disease toolkit/guideline |

| | |
|---|---|
| | **Indicator 2:** Number of outreach activity that involve suspected viral Hepatitis definition performed monthly by every LHC.<br>**Target:** (100% of LHC perform at least 1 outreach activity that involve increase awareness of suspected Viral HEPATITIS definition/ month) |
| | **Indicator 3:** Percentage of PHCCs that list Viral HEPATITIS definition as one item of the CME monthly schedule<br>**Target: 100%** of PHCCs list Viral HEPATITIS definition as one item of the CME monthly schedule |
| | **Indicator 4:** Percentage of monthly reports for LHC meetings that include Viral Hepatitis suspected case definition<br>**Target: 100% of** monthly reports for LHC meetings include suspected Viral HEPATITIS case definition. |
| | **Indicator 5:** Percentage of PHCCs in which proper (as determined by Viral Hepatitis regulation) registry of the cases is available.<br>**Target:** 100% of PHCCs in which proper (as determined by Viral Hepatitis regulations) registry of the cases is available |

| 12.2.2 Case Confirmation/Investigation | |
|---|---|
| **Background:** | Confirmed or suspected cases of acute Hepatitis A should be reported and investigated as soon as possible after the case is identified to ensure adequate time to implement preventive measures, including the provision of post-exposure prophylaxis to contacts. To report a case as confirmed, it should be verified that the case meets both the serologic and clinical criteria of the confirmed case definition. The components of a case investigation should include:<br>***Clinical features.*** Determine date of illness onset, whether jaundice was present and results of testing for aminotransferase levels.<br>***Serologic test results.*** For suspected cases, confirmation by IgM anti-HAV testing is ideal but if not done, a potential case of acute Hepatitis A can be reported as confirmed if the person has an epidemiologic link.<br>***Risk factors for infection.*** All confirmed cases of acute Hepatitis A should be interviewed to identify a potential source or risk factor for infection during the 2-6 weeks prior to illness onset. Because IgM antibodies persist for up to 6 months after infection, it is not possible to define the appropriate exposure period for asymptomatic IgM anti-HAV positive persons. Therefore, risk histories for these persons may be unreliable for determining a source of infection.<br>**Hepatitis B Case Investigation:**<br>Confirmed and suspected cases of acute Hepatitis B should be reported and investigated as soon as possible after the case is identified to ensure adequate time to implement preventive measures including post-exposure prophylaxis of contacts. To report a case as confirmed, it should be verified that the case meets both the serologic and clinical criteria of the case definition. The components of a case investigation should include: |

| | |
|---|---|
| | **Clinical features**: Determine date of illness onset, whether jaundice was present and results of testing for elevated aminotransferase levels. · Serologic test results: Serologic confirmation of acute Hepatitis B requires a positive IgM anti-HBc test result. Individuals meeting the clinical criteria who test positive for HBsAg but who were not tested for IgM anti-HBc should be classified as suspected cases.<br>**Risk factors for infection**: All confirmed or suspected cases of acute Hepatitis B should be interviewed to identify a source or risk factor(s) for infection during the 6 weeks to 6 months prior to illness onset. Because IgM antibodies persist for up to 6 months after infection, it is not possible to define the appropriate exposure period for asymptomatic IgM anti-HAV positive persons. Therefore, risk histories for these persons may be likely to be unreliable for determining a source of infection.<br>**Vaccination history**: Obtain a complete history of all doses of Hepatitis B vaccine received including dates of vaccination and the results and dates of post-vaccination testing if such testing was performed.<br>**Case Investigation of Hepatitis C**:<br>Case investigations should be conducted of suspected cases of acute Hepatitis C and should include clinical features. Determine the date of illness onset, whether jaundice or other symptoms consistent with acute viral hepatitis were present and the results of testing for aminotransferase levels. If possible, evaluate previous medical history for evidence of past infection to assess likelihood that current symptoms are due to a newly acquired infection.<br>**Diagnostic test results:** Serologic methods to diagnose Hepatitis C requires screening test positive test result are confirmed by an additional more specific assay (e.g., RIBA and/or western blot for more accurate and sensitive results RT-PCR for HCV RNA is used)<br>**Risk factors for infection**: All confirmed cases of acute Hepatitis C should be interviewed to identify a risk factor(s) for infection during the 2 weeks to 6 months prior to illness onset. |
| **Suggested Goals for MOH** | • Short-term goals include formulating laboratory SOPs, to be finalized (by TWG including members form the MOH and PHCPI) and approved by the MOH by March 2015.<br>• Intermediate term goals would include training lab personnel at all PHCCs/ hospital to use the new SOP/guidelines by **August 2015** (the training will follow a hierarchical scheme start with training TOT from the DOHs by MOH advisors/trainer, those TOT will then finalize training of candidates (specified below) in their respective provinces).<br>• Long-term goals would include implementation of an electronic referral system to ensure proper (quick, accurate, credible, and accountable) referral of cases **(MOH will ensure completion of this target by end of 2017)** |
| **Milestones:** | 1. MOH to formulate Viral Hepatitis investigation guide (as separate Entity or as part of CD toolkit/guideline), laboratory SOP guideline to guide the primary investigation of the case and ensure proper handling of the samples at the health facilities.<br>2. TOT training is provided to communicable disease officers from all DOHs |

| | |
|---|---|
| | 3. Health care providers/ CD officer from the districts, hospitals, and PHCCs are trained to use the Viral Hepatitis investigation guide and laboratory SOP Guidelines.<br>4. CPHL and subnational lab in the provinces are capable to provide supportive and confirmatory diagnosis of suspected cases. |
| **M&E Mechanisms:** | 1. Studying monthly report from PHCC to the district, and DOH<br>2. Supervisory visit to the PHCC (from district and DOH) |
| **Indicators:** | **Indicator 1:** Percentage of PHCCs at which a copy of Viral hepatitis investigation guide and laboratory SOP guidelines is present by July 2015.<br>**Target:** A copy of Viral hepatitis investigation guide and laboratory SOP Guidelines is present in **100%** of PHCCs by July 2015. |
| | **Indicator 2:** Percentage of DOHs from which at least 2 CD officers or health care providers are provided with TOT training for the Viral hepatitis Investigation guide and laboratory SOP guidelines by **August 2015.**<br>**Target:** 100% of DOHs from which at least 2 CD officers or health care providers are provided with TOT training for the HAV&HCV investigation guide and laboratory SOP guidelines by **August 2015.** |
| | **Indicator 3:** Percentage of districts, hospitals and 80% of PHCCs from which at least 2 Health care providers/ CD officer are trained to use the Viral hepatitis investigation guide and laboratory SOP guidelines by **November 2015. Target: 100%** of districts, hospitals and **80%** of PHCCs from which at least 2 Health care providers/ CD officer are trained to use the Viral hepatitis Investigation guide and laboratory SOP guidelines by **November 2015** |
| | **Indicator 4:** Percentage of subnational lab in the provinces are equipped and whose staff are trained to be capable of doing ELISA tests to diagnose Viral hepatitis by **End of 2015**<br>**Target: 100% of** subnational laboratories in the provinces that are equipped and whose staff are trained to be capable of doing ELISA tests to diagnose of Hepatitis (A, B, C, D, E) by **End of 2015** |
| | **Indicator 5**: Percentage of samples of which CPHL is capable of doing Screening and confirmatory tests for the Hepatitis (A, B, C, D, E,), and PCR when required. By end of 2015<br>**Target:** CPHL is equipped and whose staff are trained to perform Screening and confirmatory tests for the viral hepatitis, PCR when required for 100% of samples by end of 2015. |
| | **Indicator 6:** Percentage of reported cases from PHCCs that are referred to District lab by end of 2015<br>**Target:** Monthly reports are assessed (by CDC unit in the DOH and district) to ensure that 100% of cases reported within the district's PHCCs are referred to district lab by end of 2015 |
| | **Indicator 8:** Percentage of reported cases who had follow up (feedback from the hospital or specialized center (data are reviewed at the DOH, district) |

| | |
|---|---|
| | **Target:** 100% of patients have reported/ made a follow up visit to the PHCC/hospital. |
| | **Indicator 9:** Percentage of PHCCs in which an electronic referral system is implemented by 2017 (this step is managed by the MOH)<br>**Target:** 80% of PHCCs in which an electronic referral system is implemented by 2017 (this step is managed by the MOH) |

| **12.2.3 Reporting** | |
|---|---|
| **Background:** | The current system involves paper-based reporting by communicable disease officers to the district, on identification of one of the immediate notification diseases, or sending weekly or monthly report, only in the DOH an electronic formula is used to be reported to the Iraqi CDC center (currently the communicable disease officers in the district are being trained to use Epi info program, to send their report in electronic format) the aim of the MOH is to extend Epi info training to the PHCC level and finally transform the system into web based surveillance, starting from January 2015 districts will send electronic report by email (using Epi info forms) to the Districts, and then to the DOH and Iraqi CDC center. |
| **WHO Recommended Data to be Reported** | **Case classification (suspected/probable/confirmed):**<br>• Unique identifier, name, age, sex<br>• Geographical information, name of head of family, name of father (if child)<br>• Profession, place of work<br>• Date of onset of fever, Jaundice, symptoms, signs<br>• Hospitalization, including date<br>• Death including date<br>• Contact with previous case, including date<br>• Nature and date of clinical samples taken for laboratory investigation (if any)<br>**Aggregated data for reporting:**<br>• Number of cases (suspected/probable/confirmed) by age, sex<br>• Number of deaths by age and sex |
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to report electronically to the DOH.<br>2. Trained DOH personnel provide training to the communicable disease officers at the PHCC level to be able to report electronically using Epi info forms prepared at the Iraqi CDC center.<br>3. Iraqi CDC center finalize the pioneer study for the web-based surveillance system<br>4. TOT training for DOH personnel is performed for the web-based surveillance system.<br>5. Training of communicable disease officers from the district PHCCs and hospital is performed. |

| | |
|---|---|
| | 6. Web-based reporting system is launched |
| **Indicators:** | **Indicator 1:** Percentage of district (except those in hot zones) that report via Epi info forms by end of January 2015<br>**Target:** By end of January 2015, 100% of district (except those in hot zones) report via Epi info forms. |
| | **Indicator 2:** Percentage of PHCC from which at least 2 CD officers each are trained to use Epi info by end of 2016.<br>**Target:** By end of 2016, 80% of PHCC from which at least 2 CD officers each are trained to use Epi info by end of 2016. |
| | **Indicator 3:** Percentage of PHCCs that report notifiable diseases using Epi info from February 2017.<br>**Target:** From February 2017, 80% PHCCs report notifiable diseases using Epi info forms. |
| | **Indicator 4:** Percentage of DOH from which at least two TOTs each are Trained to use web-based surveillance system by June 2017.<br>**Target:** By June 2017 two TOTs are performed to communicable disease Officers from 100% of DOH to use a web-based surveillance system. |
| | **Indicator 5:** Percentage of districts and PHCCs from which at least 2 CD officers are trained to use the web based surveillance system by November 2017.<br>**Target:** 100% of districts and 80% PHCC from which at least 2 CD officers are trained to use the web-based surveillance system by November 2017 |
| | **Indicator 6:** Percentage of CD reports that are delivered via a web-based surveillance system by January 2018.<br>**Target:** 100% of CD reports that are delivered via a web-based surveillance system by January 2018 |

| **12.2.4 Data Analysis** | |
|---|---|
| **Background:** | Surveillance data should be analyzed routinely and the information interpreted for use in public health actions. In the current system, data analysis starts at the level of the DOH (provincial level) and final analysis is done at the Iraqi CDC center in Baghdad. Faster response requires analysis at an earlier step (district) Earlier analysis enables faster response and increase chance of confirming possible cases. |
| **WHO Recommended Data Analysis, Presentation, and Reporting** | A report should be sent daily to local health authorities. It should include the following information:<br>**Cases:**<br>• Total cumulative number of cases<br>• Total cumulative number of deaths<br>• Current number of patients<br>• Current number of hospitalized patients |

| | |
|---|---|
| | • Date of last identified case<br>• Date of death or hospital discharge of the last reported case<br>• Breakdown by sex and age group can also be provided<br>**Contacts:**<br>• Current number of contacts requiring follow up<br>• Current number of contacts under proper follow-up broken down by sex and age groups can also be provided<br>When possible, the geographic distribution of cases and contacts should be provided, as well as a daily and/or weekly epidemic curve.<br>Case-fatality rates, attack rates, and age-specific attack rates can be calculated for epidemiological assessment.<br>A more detailed report summarizing events and data should be produced weekly and a complete report should be available at the end of the epidemic. |
| **Milestones:** | Starting from January 2015 DOH use Epi info to analyze surveillance data, a surveillance analysis report will then be sent to the CDC center. |
| **M&E Mechanisms:** | |
| **Indicators:** | **Indicator 1**: The percentage of DOHs that send data analysis reports to the Iraqi CDC center**, and the** reporting dostrict for 100% of notification reports received, starting from January 2016<br>**Target:** Starting from January 2016, data analysis reports are sent by 100% of DOH**, to the CDC center and the** reporting district for 100% of Notification reports received. |
| | **Indicator 2:** Percent of the data analysis reports that are acceptable within the EPI/ Iraqi CDC center Baghdad standards starting from **January 2015**<br>**Target:** Starting from **January 2016** =>80% of the data analysis reports are acceptable within the Iraqi CDC center / Baghdad standards |

| **12.2.5 Response and Feedback** | |
|---|---|
| **Background:** | A proper and quick response increases the sensitivity and accuracy of the surveillance system; the more peripheral the response start the faster it is, shifting from passive surveillance to active surveillance is one of the measures that can be taken in response to over threshold notification. Response plans need to be prepared centrally and modified at each level to be formulated in specific protocols.<br>***Identification of contacts requiring post-exposure prophylaxis:***<br>Immunoprophylaxis with immune globulin (IG) should be provided to persons recently exposed to a person with acute Hepatitis A including close personal contacts and others in selected settings according to existing recommendations of the Advisory Committee on Immunization Practices. IG should be given as soon as possible but not >2 weeks after the last exposure. Post-exposure prophylaxis is |

| | |
|---|---|
| | not recommended for contacts of persons with asymptomatic HAV infection because the period of exposure is unknown.<br>One of the major drawbacks in the surveillance system in Iraq is the limited feedback mechanism, routinely information flow in one direction (except in time of crisis). Poor feedback is a general problem, it also include feedback for hospital-referred cases. One step ahead is to issue an Iraqi CDC center monthly report or bulletin that share information not only about HAV&HCV but rather all diseases under surveillance. This step relies mostly on regulation/ legislation under the current situation; major advancement would be founding the web- based report system that allow sharing of the appropriate information at the appropriate level. Proper feedback will improve cooperation of health care provider by increasing his awareness of the magnitude of the problem. |
| **Milestones:** | 1. The Iraqi CDC center to issue a monthly and annual report, while a daily bulletin is required during epidemic.<br>2. The report is disseminated via official letter to the DOHs and then to the district.<br>3. Iraqi CDC center website founded and linked to the PHD website, information can then be reached by the authorized authority/persons.<br>4. Subnational laboratories and CPHL routinely feedback DOHs/districts and PHCC regarding the samples sent for study.<br>5. Feedback report including the data analysis generated by the DOH is shared at the level of the districts<br>6. Feedback report that includes the data analysis report generated by the district is shared at the level of the PHCCs. |
| **Indicators:** | **Indicator 1**: The percentage of DOHs, District, PHCCs and hospitals that receive Iraqi CDC center `s monthly and annual report via official letter by June 2015.<br>**Target: 100%** of DOHs, District, PHCCs and hospitals receive Iraqi CDC center `s monthly and annual report via official letter by June 2015. |
| | **Indicator 2**: The percentage of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center website by **January 2016.**<br>**Target: 100%** of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center website by **January 2016.** |
| | **Indicator 3**: The percentage of referred cases for which subnational laboratory reports are received by the referring entity by June 2015.<br>**Target:** 100% of referred cases for which subnational laboratory reports are received by the referring entity by June 2015. |
| | **Indicator 4:** Percentage of DOHs that share its data analysis report with the districts/hospitals within the province by June 2015.<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |
| | **Indicator 5:** Percentage of districts that share its data analysis report with its reciprocal PHCCs within the province by **June 2015.** |

| | |
|---|---|
| | **Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |

### 12.2.6 Chronic Liver Disease Surveillance

Surveillance for HCV-related chronic liver disease can provide information to measure the burden of disease, determine natural history and risk factors, and develop and evaluate the effect of therapeutic and prevention measures on incidence and severity of disease. Recently, a sentinel surveillance pilot program for physician-diagnosed chronic liver disease was established which will provide baseline data and a template for a broader surveillance system for chronic liver disease. As the primary source of data regarding the incidence and natural history of chronic liver disease, this network will be pivotal for monitoring the effects of education, counseling, other prevention programs, and newly developed therapies on the burden of the disease.

# 13 SARI SURVEILLANCE

## 13.1 Definitions

***WHO surveillance case definitions for ILI and SARI[18]:***

The WHO global influenza surveillance standards define the surveillance case definitions for influenza-like illness (ILI) and severe acute respiratory infections (SARI).

Key messages when using the case definitions:

- Influenza infection causes a clinical syndrome not easily distinguished from other respiratory infections.
- The case definitions for ILI and SARI are not necessarily intended to capture all cases but to describe trends over time.
- Using one common case definition globally will allow national health authorities to interpret their data in an international context.

***ILI case definition:***

An acute respiratory infection with:

- Measured fever of ≥ 38 C°
- and cough;
- With onset within the last 10 days.

***SARI case definition:***

An acute respiratory infection with:

- history of fever or measured fever of ≥ 38 C°;
- and cough;
- with onset within the last 10 days;
- and requires hospitalization

***Corona virus Case Definition[19]:***
***Probable case***

Three combinations of clinical, epidemiological and laboratory criteria can define a probable case:

1. Aperson with a febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. Pneumonia or Acute Respiratory Distress Syndrome)

[18] http://www.who.int/influenza/surveillance_monitoring/ili_sari_surveillance_case_definition/en

[19] http://www.who.int/csr/disease/coronavirus_infections/case_definition/en/

**And** Testing for MERS-Cove is unavailable or negative on a single inadequate specimen[1] **And** The patient has a direct epidemiologic- link with a confirmed MERS-CoV case[2].

2. A person with a febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or Acute Respiratory Distress Syndrome)

   **AND** An inconclusive MERS-Cove laboratory test (that is, a positive screening test without confirmation)[3]

   **AND**

   A resident of or traveler to Middle Eastern countries where MERS-CoV virus is believed to be circulating in the 14 days before onset of illness.
3. A person with an acute febrile respiratory illness of any severity **AND**

   An inconclusive MERS-CoV laboratory test (that is, a positive screening test without confirmation)[3]

   **AND**

   The patient has a direct epidemiologic-link with a confirmed MERS-CoV case[2].

*[1]A case may be laboratory confirmed by detection of viral nucleic acid or serology. The presence of viral nucleic acid can be confirmed by either a positive rRT-PCR result on at least two specific genomic targets or a single positive target with sequencing of a second target. A case confirmed by serology requires demonstration of sero-conversion in 2 samples ideally taken at least 14 days apart, by a screening (ELISA, IFA)* ***and*** *a neutralization assay.*

[2] *A direct epidemiological link with a confirmed MERS-CoV patient may include:*

- *Health care associated exposure, including providing direct care for MERS-CoV patients, working with health care workers infected with MERS-CoV, visiting patients or staying in the same close environment of an individuals infected with MERS-CoV.*
- *Working together in close proximity or sharing the same classroom environment with individuals infected with MERS-CoV.*
- *Traveling together with individuals infected with MERS-CoV in any kind of conveyance*
- *Living in the same household as individuals infected with MERS-CoV.*
- *The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.*

[3] *An inadequate specimen would include a nasopharyngeal swab without an accompanying lower respiratory specimen, a specimen that has had improper handling, is judged to be of poor quality by the testing laboratory, or was taken too late in the course of illness.*

*4 Inconclusive tests may include:*

- *A positive screening test on a single rRT-PCR target without further confirmation*

- *Evidence of sero-reactivity by a single convalescent serum sample ideally taken at least 14 days after exposure by a screening assay (ELISA or IFA) and a neutralization assay, in the absence of molecular confirmation from respiratory specimens.*

***Note:***

**Inconclusive testing:** *Patients with an inconclusive initial testing should undergo additional virologic and serologic testing to determine if the patient can be classified as a confirmed MERS-CoV case. It is strongly advised that multiple lower respiratory tract specimens such as sputum, endotracheal aspirate, or bronchoalveolar lavage fluid be collected and tested when possible. If patients do not have signs or symptoms of lower respiratory tract disease and lower tract specimens are not available or clinically indicated, both nasopharyngeal and oropharyngeal swab specimens should be collected. If initial testing of a nasopharyngeal swab is negative in a patient who is strongly suspected to have MERS-CoV infection, patients should be retested using a lower respiratory specimen tract or a repeat nasopharyngeal specimen with additional oropharyngeal specimen if lower respiratory tract specimens are not possible, and appropriately timed paired acute and convalescent sera. Other types of clinical specimens could also be considered for molecular testing if necessary, including blood/serum, urine and stool. These generally have lower titres of virus than respiratory tract specimens but have been used to confirm cases when other specimens were inadequate or unobtainable. Laboratories which obtain discordant PCR testing results and have limited experience in detecting MERS-CoV should consider referring their specimens to laboratories with greater experience for confirmation.*

**Confirmed case:**

A person with laboratory confirmation of MERS-CoV infection4.

**The primary objectives:**

- Detect early, sustained human-to-human transmission.
- Determine the geographic risk area for infection with the virus.

Additional clinical and epidemiological investigations are needed to:

- Determine key clinical characteristics of the illness, such as incubation period, spectrum of disease, and the natural history of the disease.
- Determine key epidemiological characteristics of the virus, such as exposures that result in infection, risk factors, secondary attack rates, and mode of transmission.

## 13.2 Milestones and Targets

| 13.2.1 Case Detection/Registration | |
|---|---|
| **Background:** | Case detection starts at community level. Education (mainly through LHC) is<br>conducted based on national criteria and guideline issued centrally<br>(MOH/ Iraqi CDC center) (Comprehensive communicable disease toolkit/guidelines). Health care providers/health enforcement officers at different levels (DOH, District and PHCC/Hospital) are trained for the communicable disease toolkit/guidelines, and should name two focal-point individuals responsible for ensuring compliance with case definitions and timely reporting.<br>Data on the presentation of illness, pre-existing medical conditions, clinical course of illness, and occurrence of complications are critical for refining case definitions and informing clinical management recommendations. As such, detailed clinical data should be collected on each confirmed case and systematically summarized.<br>**Clinical data:**<br>• Date of illness onset.<br>• Signs and symptoms at initial presentation.<br>• Time course of illness including time from illness onset to: care-seeking, first hospital admission, deterioration requiring advanced clinical management, and final outcome.<br>• Presence of pneumonia and progression to respiratory failure, development of the acute respiratory distress syndrome (ARDS).<br>• Occurrence of other complications such as renal failure or other organ system compromise, coagulopathies, secondary infections, sepsis, etc.<br>• Presence of pre-existing chronic conditions (immunosuppression, cancer, renal insufficiency, hemoglobinopathies, liver disease, neurological disease, endocrine and metabolic disorders, etc.).<br>• Dates and results of any ancillary tests performed (X-Ray, CT scan, etc.).<br>• Use of respiratory support (supplemental oxygen and FiO2; non-invasive and invasive mechanical ventilation, prone positioning, use of inhaled<br>• Nitric oxide, oscillatory ventilation, Extra Corporeal Membrane Oxygenation [ECMO]).<br>• Use of other organ support modalities (renal replacement therapy, vasopressors, etc.).<br>• Use of antibiotics, corticosteroids, other medical therapies. |

| | |
|---|---|
| | • Documentation of co-infections (viral, bacterial, fungal).<br>• Clinical outcomes (recovered, ill, critically ill, duration of intensive care unit admission, duration of hospitalization, deceased).<br>• Virological outcomes (if available), including duration of MER-CoV shedding in respiratory tract specimens, and extrapulmonary clinical specimens. |
| **Objectives:** | 1. To increase the detection of suspected cases by the community (LHC members, health volunteers, teachers, parents etc.) and the health facility<br>2. Detect early, sustained human-to-human transmission |
| **Milestones:** | 1. MOH/CDC center Iraq: formulate/ review case definition and management protocol on case detection the protocol need to includes directions to :<br>a. Educate and consult with local providers and facilities to ensure compliance with respiratory and contact isolation procedures and infection control measures, in medical care of case patients.<br>b. Assure all contacts potentially exposed to corona virus the case patient are identified, educated, and placed under adequate surveillance for the period when symptoms are most likely to arise.<br>c. Complete the reporting forms, surveillance and follow-up forms, and otherwise document investigation, outreach, active surveillance, and completeness of containment efforts.<br>d. List of equipment, materials (gowns, gloves, masks, goggles etc.), and appropriate forms to be available at the health facility.<br>2. DOH to provide training for the health care providers and communicable disease officers in the hospitals, district and PHCC for the Iraqi CDC center Corona virus case definition/management protocol.<br>3. In the PHCC/ hospital health care provider, and communicable disease officers are trained about case definition and management protocol.<br>4. Required equipment and forms are available at the health facility.<br>5. Definition of suspected cases is provided to the community through proper health education in the PHCC by (outreach activities). |
| **M&E Mechanisms:** | |
| **Indicators:** | **Indicator 1:** Percentage of PHCCs/hospitals that have a printed copy of the corona surveillance protocol that is formulated and approved by the MOH /CDC center in Baghdad (as an independent document or as part of a priority communicable disease toolkit/guideline).<br>**Target:** By June 2015 100% of PHCCs and hospitals contain printed copies of |

| | |
|---|---|
| | the Corona surveillance protocol that is formulated and approved by the MOH /EPI/CDC center in Baghdad. |
| | **Indicator 2:** Percentage of DOHs from which at least two communicable disease officers/Trainers are trained to use/provide training for the Corona surveillance toolkit/guidelines by August 2015<br>**Target:** 100% of DOHs from which at least two communicable disease officers/Trainers are trained to use/provide training for the Corona surveillance toolkit/guidelines by August 2015. |
| | **Indicator 3:** Percentage of hospitals, district and PHCCs from which at least one<br>Health care provider or communicable disease units officer is trained for the Corona surveillance toolkit/guidelines by **November 2015.**<br>**Target:** 100% of the Hospitals, district and PHCCs from which at least two Health care providers or communicable disease officers are trained for the Corona surveillance toolkit/guidelines by **November 2015.** |
| | **Indicator 4:** Percentage of PHCCs that list suspected the **Corona** definition as<br>one item of the CME monthly schedule by **December 2015.**<br>**Target: 100%** of PHCCs list the **Corona** definition as one item of the CME monthly schedule **by December 2015** |
| | **Indicator 5:** Percentage of Monthly reports for LHC meetings that include suspected corona definition **by December 2015.**<br>**Target: 100% of** Monthly reports for LHC meetings include corona suspected case definition By **December 2015.** |
| | **Indicator 6:** Percentage of LHC that perform at least 1 outreach activity that involves the suspected Corona definition monthly **starting from December 2015.**<br>**Target:** (100% of LHC perform at least 1 outreach activity that involves the increased awareness of suspected **Corona** definition per month) **starting from December 2015** |
| | **Indicator 7:** Percentage of LHC that perform at least 1 outreach activity that involves the suspected Measles definition monthly **starting from December 2015.**<br>**Target:** (100% of LHC perform at least 1 outreach activity that involves the increased awareness of suspected **Measles** definition per month) **starting from**<br>**December 2015.** |

| 13.2.2 Case Confirmation/Investigation | |
|---|---|
| **Background:** | Laboratory-confirmation of a MERS-CoV case is an immediate trigger to launch a thorough investigation. However, because collection, shipment, and testing of specimens often require several days or longer, the investigation may need to begin before laboratory test results are available for suspected cases.<br>Even if laboratory-confirmation is not possible, an investigation should still be launched if a patient is strongly suspected to have MERS-CoV infection (e.g. patient with severe acute respiratory infection [SARI] who has a history of travel to involved area or has been in contact with cases who have died).<br>The patient and/or family members (if the patient is too ill to be interviewed or has died) should be interviewed within the first 24–48 hours of the investigation to collect basic demographic, clinical, and epidemiological information.<br>The following basic information should be collected, including:<br>1. Patient ID number/cluster number (if applicable).<br>2. Relationship between the person answering questions on behalf of the case patient (in the case that the patient is too ill for interview or has died).<br>3. Date of symptom onset (by symptom, if possible).<br>4. Date of initial admission/ visit to health care facility.<br>5. Date of initial WHO notification.<br>6. Patient contact details (e.g. name, home address, and home/mobile telephone numbers).<br>7. Demographic information (e.g. date of birth/age, sex).<br>8. Occupation (including specific classification such as healthcare worker, laboratory worker, and farm worker etc.<br>9. Date of sample collection, laboratory testing and specimen type (e.g. nasopharyngeal swab, sputum, etc.).<br><br>***Exposure Information and travel history:***<br>Possible exposures in the 14 days before the onset of symptoms should be thoroughly explored and described, with special focus on:<br>***Animal exposures:***<br>• Presence of animals in or around household area where the case patient lives or works (e.g. pets, rats, other rodents, bats, camels, birds, etc.).<br>• Activities that result in animal exposures and type of animals exposed to (e.g. keeping livestock, visiting farms, visiting live animal markets racetracks, or practicing falconry, participating in the slaughter or sacrifice of animals etc.).<br>• Exposures to animal products or products potentially contaminated by animal excreta or body fluids.<br>***Human exposures:***<br>• Recent contact with individuals with respiratory illness and/or gastrointestinal symptoms, including people who have been severely ill or have died |

| | |
|---|---|
| | (indicate the type(s) of contact, frequency, and duration of exposure, and location).<br>• Recent admission in hospital.<br>• Recent visit to outpatient treatment facility.<br>• Recent visit to traditional healer.<br>***Food exposures:***<br>• Recent consumption of unprocessed, raw foods or drinks.<br>• Recent consumption of raw or undercooked meat, or uncooked blood products.<br>• Recent preparation of fresh meat for consumption.<br>• Use of smoking apparatus such as hookah or shisha<br>***Travel history:***<br>• Dates, destinations and details mode of transport for recent travel (local and international).<br>• Activities during the period of travel (including information on animal, human and food exposures as listed above).<br><br>***Biological specimen collection and laboratory testing[20]***:<br>***Specimen Collection***<br>To confirm the presence of MERS-CoV in suspect cases, collect appropriate<br>Clinical specimens for testing:<br>• Available evidence suggests that lower respiratory tract specimens contain higher virus titer than upper respiratory tract specimens and are more sensitive for detecting the presence of the virus. Lower respiratory tract specimens include:<br>• Sputum, induced or non-induced.<br>• Endotracheal aspirate for patients on mechanical ventilation.<br>• Bronchial alveolar lavage for those in whom it is indicated for patient management. Pleural fluid aspirate.<br>• Upper respiratory tract specimens such as nasal and oropharyngeal swabs should be collected in addition to lower respiratory tract Specimens. If initial testing is negative in a patient suspected of having MERS-CoV infection, repeat testing should be performed at multiple periods.<br>• Collect blood for serological testing. For recent cases, an initial blood specimen should be collected and a repeat specimen taken after a period of at least 3 weeks. For cases that had symptom onset more than 3 weeks prior to |

[20] http://www.who.int/csr/disease/coronavirus_infections/MERS_CoV_investigation_guideline_Jul13.pdf

being investigated, a single blood sample is sufficient (note: results of single sera will need to be interpreted with caution as the extent of cross reactivity of currently available serological assays is unknown).

- MERS-CoV has been identified in other body fluids including blood, Urine, and stool of infected patients. However, titers of virus in these body fluids are quite low and they may not be useful for diagnostic testing. The presence of virus in these body fluids could have public health implications and could be part of an ancillary study of a case. Health care workers collecting clinical specimens should exercise appropriate infection control measure including use of personal protective equipment.

***Molecular diagnostics:***

PCR is the most widely used method for detecting the presence of the virus. At least three sites in the virus genome have been identified as suitable targets for such assays, including upE, ORF 1A and ORF 1B, and sequences of the Necessary primers have been published. Positive controls for the UpE screening and the ORF 1A confirmation assays are also available A confirmed case should either have positive test results for at least two different sites in the virus genome, or a positive result for a single site plus sequencing of a different, appropriate site that shows close similarity to known sequences of the virus. Specimens should be sent to a reference laboratory for confirmation A BSL2 facility including use of a microbiological safety cabinet (class 2, or 3) is required for the handling of specimens thought to contain MERS-CoV when performing RNA extraction for PCR.

***Serological testing:***

Descriptions of serological tests using immunofluorescence and protein microarray methods have now been published (Corman et al 2012). Work on further serological assays is continuing in several laboratories around the world. No standard has yet been established for using serology for confirmatory testing. Collection of sera from patients being investigated for infection with MERS-CoV will greatly aid in the validation of assays currently under development and may be useful for confirmation of infection once the validation process is complete.

***Viral culture:***

The MERS-CoV virus has been shown to grow in a number of different commonly available cell lines. However, culture of this virus should not be attempted outside of specialized laboratories with appropriate biosecurity level 3 capabilities.

***Genetic sequencing:***

Specimens testing positive for MERS-CoV should be genetically sequenced, and the data uploaded to publicly accessible databases. If the laboratory doing the initial test does not have the capacity for genetic sequencing, an aliquot of the specimen should be forwarded to a reference center. Such centers should attempt to isolate viruses from all cases so that whole genome sequencing can be performed, either in the national or international reference laboratory. Both partial and whole genome sequencing provides crucial information as to the origin and source of exposure to MERS-CoV.

| | |
|---|---|
| **Suggested Goals for the MOH:** | 1. To ensure that prompt and proper investigation is performed for Notified Corona cases.<br>2. To ensure identification of source of infection for confirmed corona cases.<br>• **Short-term objective:** include formulating laboratory SOP, to be finalized and approved (by technical working group that include members from the Iraqi CDC center and PHCPI) and Corona investigation guidelines (as separate entity or part of comprehensive CD toolkit/guidelines).<br>• **Intermediate-term objective:** would include training lab personnel at all PHCCs/ hospitals to use the new SOPs/guidelines and Corona investigation guidelines, to ensure proper follow-up of referred cases.<br>• **Long-term objective:** MOH to equip subnational labs in the Provinces and train their staff to be able to confirm diagnosis of corona.<br>• MOH to equip and train the respective staff of CPHL to be able to confirm the diagnosis AND perform Genetic sequencing of the Virus. |
| **Milestones:** | 1. MOH formulates SARI/ MERS-CoV investigation guidelines and SARI/ MERS-CoV laboratory SOP guidelines to guide the primary investigation of the case and ensure proper handling of the samples at the health facilities.<br>2. The SARI/ MERS-CoV investigation guidelines and SARI/ MERS-CoV laboratory SOP guidelines to be distributed to all the PHCC, hospital districts, and DOHs.<br>3. TOT training is provided to communicable disease officers/ lab personnel from all DOHs to use Corona investigation guidelines and Corona laboratory SOP guidelines.<br>4. Health care providers/ lab personnel or officer from the districts, hospitals, and PHCCs are trained to use the SARI/ MERS-CoV investigation guidelines and Laboratory SOP guidelines.<br>5. CPHL and subnational lab in the provinces are capable of providing a laboratory-confirmed SARI/ MERS-CoV diagnosis.<br>6. CPHL is capable to confirm the diagnosis and genetic sequencing of the |
| **Indicators:** | **Indicator 1:** Percentage of PHCCs and Hospitals in which Corona investigation guidelines and laboratory SOP guidelines are generated and approved by the MOH by **December 2015**<br>**Target:** By **December 2015** Corona investigation guidelines and laboratory SOP guidelines (generated and approved by the MOH) are available in 100% of PHCCs and Hospitals. |
| | **Indicator 2:** Percentage of DOH from which at least two members are provided with TOT training about the Corona investigation guidelines and laboratory SOP guidelines by March 2016.<br>**Target:** 100% of DOHs had at least two members provided with TOT training about the Corona investigation guidelines and laboratory SOP guidelines by March 2016. |

| | |
|---|---|
| | **Indicator 3:** Percentage of districts, hospitals, and PHCCs from which at least 2 Health care providers/ CD officers or laboratory staff are trained to use the Corona investigation guidelines and laboratory SOP guidelines by **May 2016.**<br>**Target:** By **May 2016**, ALL (100%) districts and hospitals and 80% of PHCCs have at least 2 Health care providers/ CD officers or laboratory staff who are trained to use the Corona investigation guidelines and laboratory SOP guidelines. |
| | **Indicator 4:** Percentage of subnational laboratories in the provinces that are equipped and whose staff are trained (by MOH) to do PCR test for Corona (MERS-CoV) diagnosis by end of 2016.<br>**Target:** By **end of 2016** 100% subnational laboratories in the provinces are capable (equipped and whose staff are trained by the MOH) to do PCR test for Corona (MERS-CoV) - diagnosis. |
| | **Indicator 5:** Percentage of cases for which corona virus sequencing is performed at the CPHL by end of 2018<br>**Target:** By **end of 2018**, CPHL is capable to do virus sequencing for corona for 100% of cases. |
| | **Indicator 6:** Percentage of cases with adequate specimen and laboratory results are subsequently made available, by **June 2017**<br>**Target:** 80% of cases with adequate specimen and laboratory results are subsequently made available, by **June 2017.** |
| | **Indicator 7:** Percentage of laboratory-confirmed cases with their source of Infection identified by CPHL, by end of 2018.<br>**Target:** 80% of laboratory-confirmed cases with their source of infection Identified CPHL, by end 2018. |

| **13.2.3 Reporting** | |
|---|---|
| **Background:** | The current system involve paper report by communicable disease units officer to the district, on identification a case of corona virus, or sending weekly or monthly report, only in the DOH an electronic formula is used to be reported to the Iraqi CDC center The plan of the MOH is to extend Epi info training to the PHCC level and finally transform the system into web based surveillance. WHO strongly encourages the early reporting of investigation results of MERS-CoV patients, even before analyses are complete Several networks have been established by WHO that can advise investigators in the conduct of investigations and the interpretation of preliminary results. In addition, even preliminary data can be critical in the early assessment of international spread and inform decision making. |
| **Recommended Reporting:** | Starting from January 2015 districts will send electronic report by email (using Epi info forms) to the DOH, and then to the DOH and Iraqi CDC center. The report for the Corona virus is recommended to include: |

| | |
|---|---|
| | ***Case classification (probable/confirmed)***<br>• Unique identifier, name, age, sex<br>• Geographical information, name of head of family, name of father (if child)<br>• Profession, place of work<br>• Date of onset of fever, symptoms, signs<br>• Hospitalization, including date<br>• Death including date<br>• Contact with previous case, animals including date<br>• Nature and date of clinical samples taken for laboratory investigation (if any)<br>***Aggregated data for reporting***<br>• Number of cases (suspected/probable/confirmed) by age, sex<br>• Number of deaths |
| **Suggested Goals for the MOH** | To improve the timeliness, quality, quantity, efficiency, and credibility of Corona reporting from the PHCCs/Hospitals levels to the central level. |
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to report electronically to the DOH (**using the electronic forms provided by the /CDC Baghdad**).<br>2. Trained DOH personnel provide training to the communicable disease unit's officer at the PHCC level to be able to report electronically using Epi info forms prepared at the Iraqi CDC center.<br>3. Iraqi CDC center finalizes the pioneer study for the web-based surveillance system<br>4. TOT training for DOH personnel is performed for the web-based surveillance system.<br>5. Training of communicable disease officers from the districts to PHCCs and hospitals is performed.<br>6. Web-based reporting system is launched |
| **Indicators:** | **Indicator 1:** Percent of weekly district reports received by end of January 2015.<br>**Target:** 80% of weekly district reports received by end of January 2015 |
| | **Indicator 2:** Percent of districts (except those in hot zones) that report via Epi<br>info forms by the end of January 2015<br>**Target:** By end of January 2015, 100% of districts (except those in hot zones) report via Epi info forms. |
| | **Indicator 3:** Percent of PHCCs from which at least 2 communicable disease officers are trained to use Epi info by end of end of 2016 |

| | |
|---|---|
| | **Target:** By end of end of 2016, >=80% of PHCCs have at least 2 communicable disease officers trained to use Epi info. |
| | **Indicator 4:** Percent of PHCCs report notifiable disease using Epi info forms, by February 2017.<br>**Target:** By February 2017, 80% of PHCCs report notifiable disease using Epi info forms, less than 20 % of reports are delivered by paper form. |
| | **Indicator 5:** Percent of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017<br>**Target:** 100% of DOHs from which at least 2 communicable disease officers receive TOT training in web-based surveillance systems by June 2017 |
| | **Indicator 6:** Percentage of districts, hospitals and PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017.<br>**Target:** 100% of districts and hospitals and 80% of PHCCs from which at least 2 communicable disease officers are trained to use the web-based surveillance system by November 2017 |
| | **Indicator 7:** Percentage of notifiable disease reports delivered by paper or epi info forms by end of January 2018.<br>**Target:** < = X% of notifiable disease reports delivered by paper or epi info forms by end of January 2018. |

| **13.2.4 Data Analysis** | |
|---|---|
| **Background:** | Surveillance data should be analyzed routinely and the information interpreted for public health action. At a minimum, descriptive analysis of cases should be performed in terms of person, place, and time. For investigations that yield multiple cases, graphical and/or tabular descriptions of cases by date of onset (i.e. epidemic curve), geographical location (e.g. maps of the locale, case patients' homes), and relationship (i.e. transmission or family trees) and demographic characteristics (e.g. distribution by age and sex) should be developed. Key epidemiological (e.g. estimation of an incubation period, description of transmission patterns, attack rates by age, occupation, exposure history etc.) and clinical (e.g. spectrum of illness severity, proportion of cases who develop pneumonia, require hospitalization, die) parameters should be characterized to enhance understanding of the spectrum and dynamics of disease associated with MERS-CoV infection.<br>In the current system, data analysis start at the level of the DOH (provincial level) and final analysis is done at the CDC center Baghdad. Faster response requires analysis at an earlier step (district). Earlier analysis enables faster response and increases the chance of confirming possible cases. |

| | |
|---|---|
| **Milestones:** | 1. Starting from January 2015 districts use Epi info to analyses surveillance data, a surveillance analysis report is then sent to the district manager.<br>2. Trained DOH personnel provide training to the communicable disease officers at the PHCC level to be able to analyses surveillance data.<br>3. Surveillance analysis report is sent by communicable disease officers at the PHCC to the PHCC manager and the district manager on detection of Corona case (also zero reporting) |
| **M&E Mechanisms:** | |
| **Indicators:** | **Indicator 1:** The percentage of districts that send data analysis reports to the DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received, starting from January 2015<br>**Target:** Starting from January 2015, data analysis reports are sent by 100% of<br>districts to **the** DOH**,** district manager **and the** reporting PHCC for 100% of notification reports received. |
| | **Indicator 2:** Percent of the data analysis reports that are acceptable within the EPI/CDC center Baghdad standards starting from **January 2015**<br>**Target:** Starting from **January 2015** =>80% of the data analysis reports are acceptable within the CDC center/ Baghdad standards |
| | **Indicator 3:** Percentage of PHCCs from which at least 2 communicable disease officers are trained to use Epi info to generate data analysis reports by end of **August 2015.**<br>**Target:** =>80% of PHCCs from which at least 2 communicable disease officers who are trained to use Epi info to generate data analysis reports by end of **August 2015.** |

| **13.2.5 Response and Feedback** | |
|---|---|
| **Background:** | Proper and quick response increases the sensitivity and accuracy of the surveillance system; the more peripheral the response start, the faster it is.<br>Shifting from passive surveillance to active surveillance is one of the measures that can be taken in response to over threshold notification. Response plans need to be prepared centrally and modified at each level to be formulated in specific protocol.<br>One of the major drawbacks in the surveillance system in Iraq is the limited feedback mechanism, routinely information flow in one direction (except in time of crisis). Poor feedback is a general problem, it also include feedback for hospital-referred cases. One step ahead is to issue a Iraqi CDC center monthly report or bulletin that share information not only about Corona but rather all diseases under surveillance. This step rely mostly on regulation/ |

| | |
|---|---|
| | legislation under the current situation, major advance would be founding the web based report system that allow sharing of the appropriate information at the appropriate level. Proper feedback will improve cooperation of health care provider by increasing his awareness of the magnitude of the problem. |
| **Suggested Goals for the MOH:** | Proper feedback is provided to the referring entity form all levels. |
| **Milestones:** | 1. The Iraqi CDC center to issue a monthly and annual report, a daily bulletin is required during epidemic.<br>2. The report is disseminated via official letter to the DOHs and then to the district.<br>3. Iraqi CDC center website founded and linked to the PHD website, information can then be reached by the authorized authority/persons.<br>4. Subnational labs and CPHL routinely feedback DOHs/districts and PHCC regarding the samples sent for study.<br>5. Feedback report including the data analysis generated by the DOH is shared at the level of the districts<br>6. Feedback report that includes the data analysis report generated by the district is shared at the level of the PHCCs. |
| **Indicators:** | **Indicator 1:** The percentage of DOHs, District, PHCC and hospitals that receive Iraqi DC center`s monthly and annual report via official letter by June 2015.<br>**Target: 100%** of DOHs, District, PHCC and hospitals receive Iraqi CDC center`s monthly and annual report via official letter by June 2015. |
| | **Indicator 2:** The percentage of DOHs, District, PHCCs and hospitals that have access to the Iraqi CDC center website by **January 2016.**<br>**Target: 100%** of DOHs, District, PHCCs and hospitals that have access to the<br>Iraqi CDC center website by **January 2016.** |
| | **Indicator 3:** The percentage of referred cases for which reference laboratory reports are received by the referring entity by June 2015.<br>**Target:** 100% of referred cases for which reference laboratory reports are received by the referring entity by June 2015. |
| | **Indicator 4:** Percentage of DOHs that share its data analysis report with the districts/hospitals within the province by June 2015.<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |
| | **Indicator 5:** Percentage of districts that share its data analysis report with its reciprocal PHCCs within the province by **June 2015.**<br>**Target:** 100% of DOHs share its data analysis report with the districts/hospitals within the province by June 2015. |

13

# 14 References


1. Centers for Diseases Control and Prevention (U.S.) . Surveillance Strategy A strategy for improving the Centers for Disease Control and Prevention's activities in public health surveillance. http://www.cdc.gov/ophss/docs/cdc-surveillance-strategy-final.pdf (accessed e.g. 31 August
2. Public Health Surveillance towards a Public Health Surveillance Strategy for England. (2014). :https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213339/Towards-a-Public-Health-Surveillance-Strategy.pdf [Accessed 31 Dec. 2014].
3. Who.int, (2014). Communicable disease surveillance and response systems Guide to monitoring and evaluating. http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_LYO_2006_2.pdf?ua=1 [Accessed 31 Dec. 2014].
4. ECDC (European Centre for Disease Prevention and Control) network,(2014). SURVEILLANCE OF COMMUNICABLE DISEASES IN THE EUROPEAN UNION A long-term strategy: 2008–2013. http://www.ecdc.europa.eu/en/aboutus/Key%20Documents/08-13_KD_Surveillance_of_CD.pdf [Accessed 31 Dec. 2014].
5. ECDC (European Centre for Disease Prevention and Control) network,(2014). Framework for a strategy for infectious disease surveillance in Europe (2006–2008). (2014). http://www.ecdc.europa.eu/en/activities/surveillance/Documents/0806_Framework_surveillance_strategy_in_Europe.pdf [Accessed 31 Dec. 2014].
6. Who.int, (2014)., (2014). WHO guidelines for investigation of cases of human infection with Middle East Respiratory Syndrome Coronavirus (MERS-CoV) (July 2013). http://www.who.int/csr/disease/coronavirus_infections/MERS_CoV_investigation_guideline_Jul13.pdf [Accessed 31 Dec. 2014].
7. who.int, (2014). AnnuAl report 2010 Building and Strengthening Partnerships. http://www.who.int/alliance-hpsr/alliancehpsr_annualreport2010.pdf [Accessed 31 Dec. 2014].
8. .emro.who.int, (2014). A Basic Health Services Package for iraq. [http://applications.emro.who.int/dsaf/libcat/EMROPD_2009_109.pdf [Accessed 31 Dec. 2014].
9. pacifichealthsummit.org/, (2014). China Information System for Disease Control and Prevention (CISDCP). http://pacifichealthsummit.org/downloads/HITCaseStudies/Functional/CISDCP.pdf [Accessed 31 Dec. 2014]. Who.int, (2015). Protocol for Assessing National Surveillance and Response Capacities for the International Health Regulations (2005). http://www.who.int/ihr/publications/who_hse_ihr_201007_en.pdf?ua=1 [Accessed 1 Jan. 2015].
10. Who.int, (2015). WHO | WHO-recommended surveillance standard of poliomyelitis. http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/poliomyelitis_standards/en/ [Accessed 1 Jan. 2015].
11. Who.int, (2015). WHO | WHO-recommended surveillance standard of poliomyelitis. http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/poliomyelitis_standards/en/ [Accessed 1 Jan. 2015].

12. hpsc.ie, (2015). Acute Flaccid Paralysis (AFP) Surveillance What is it and why are we doing it?. http://www.hpsc.ie/A-Z/VaccinePreventable/Polio/Guidance/File,2461,en.pdf [Accessed 1 Jan. 2015].
13. Who.int, (2015). WHO | WHO-recommended surveillance standard of measles. http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_standards/en/ [Accessed 1 Jan. 2015].
14. Who.int, (2015). WHO | Prevention and control of cholera outbreaks: WHO policy and recommendations. http://www.who.int/cholera/technical/prevention/control/en/index1.html [Accessed 1 Jan. 2015].
15. public.health.oregon.gov, (2015). Viral Hemorrhagic Fevers. https://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/ReportingCommunicableDisease/ReportingGuidelines/Documents/vhf.pdf [Accessed 1 Jan. 2015].
16. M. Turky, A., Akram, W., S. Al-Naaimi, A., Omer, A. and Rasheed Al- Rawi, J. (2011). Analysis of Acute Viral Hepatitis (A and E) in Iraq. Global Journal of Health Science, 3(1).
17. Emro.who.int, (2015). WHO EMRO | Viral hepatitis | Programmes | Iraq. http://www.emro.who.int/irq/programmes/hepatitis.html [Accessed 1 Jan. 2015].
18. Who.int, (2015). WHO | WHO surveillance case definitions for ILI and SARI. http://www.who.int/influenza/surveillance_monitoring/ili_sari_surveillance_case_definition/en/ [Accessed 1 Jan. 2015].
19. Who.int, (2015). WHO | Revised case definition for reporting to WHO – Middle East respiratory syndrome coronavirus. http://www.who.int/csr/disease/coronavirus_infections/case_definition/en/ [Accessed 1 Jan. 2015].
20. CDC –Baghdad, Iraq, Guideline of Communicable disease control, USAID/PHCPI -2012.
21. CDC-Baghdad, Iraq Annual plan of Surveillance programe-2014.
22. WHO-Communicable Disease Toolkit/ Iraq Crisis, 6. Guideline for outbreak Control, March 2003.
23. Hepatitis C Strategy for England, August 2002.
24. Sever Respiratory disease associated with Middle East respiratory syndrome, Corona Virus (MERS-COV).21 August 2014.
25. 10-Iraq Polio Outbreak Emergency, Response -2014.
26. MOH- A basic Health services package for Iraq, WHO- January, 2009.