# Jordan Ministry of Health

# Integrated Plan of Preparedness and Response to Cholera

# DRAFT

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## Introduction and Background

Jordan is a country with 9.5 million population and more than one million Syrian refugees. There are many health sectors that provide health care in the country, namely: Ministry of Health, Royal Medical Services, Universities, United Nations for Relief and Works Agency for Palestine Refugees, private sector, and many international agencies. Jordan is divided in to twelve governorates, and every governorate has a health directorate. For communicable diseases all hospitals and health centers report to health directorate of the governorate. Health directorate in turn reports to the Directorate to of Communicable Diseases. List of communicable diseases includes more than 40 diseases and events, and it is divided in two categories, category A includes diseases and events that should be notified within 24 hours such as cholera, while category B includes diseases and events that should be notified on weekly basis, such as hepatitis A. Epidemics of diseases included in category B should be notified immediately. The epidemiological week starts on Saturday and ends on Friday. Jordan has experienced of emerging diseases within recent years, such as pandemic influenza A 2009, and MERS-CoV with three clusters in 2012, 2014, and in 2015.

Syrian refugees in Jordan pose a huge burden on the health system of the country, with special challenge on the communicable diseases. An extra challenge is that more than 85% percent of them are distributed within the Jordan community. The potential of occurrence of Cholera in Jordan is present as cholera is endemic in some neighboring countries. In Iraq, outbreaks of cholera occur almost yearly

### Cholera

Cholera and the Bloody Diarrhoea are the most severe types of the diarrhoeal diseases causing severe outbreaks in the population. Cholera is an acute Diarrheal infection caused by ingestion of the *Vibrio cholerae* bacterium. Transmission occurs through direct Faecal-oral contamination or through ingestion of contaminated water and food. The disease is characterized in its most severe form by a sudden onset of Acute Watery Diarrhea that can lead to death from severe dehydration and kidney failure. The extremely short incubation period, two hours to five days, enhances the potentially explosive pattern of outbreaks, as the number of cases can rise very quickly.

About 75% of people infected with cholera do not develop any symptoms. However, the pathogens stay in their feces for one to two weeks and are shed back into the environment, potentially infecting other individuals. Cholera is an extremely virulent disease that affects both children and adults. Unlike other diarrheal diseases, it can kill healthy adults within hours. Individuals with lower immunity, such as malnourished children or people living with other chronic conditions, are at greater risk of death if infected by cholera.

### Prevention and control of Cholera outbreaks

Among infected people who developing symptoms, 80% of episodes are of mild or moderate severity remaining 20% of cases develop severe Cholera with of dehydration. If untreated, as many as 50% of the people may die. With proper treatment, the fatality rate should stay below 1%.

Measures for the prevention of cholera mostly consist of providing clean water and proper sanitation to populations potentially affected. Health education and good food hygiene are equally important. In particular, systematic hand washing should be taught, and the preventive measures should continue and enhanced in some areas covered by WASH (Water, Sanitation, and Hygiene) sector members or commence in other areas. Once an outbreak is detected, the usual intervention strategy is to reduce

mortality by ensuring prompt access to treatment and proper case management and controlling the spread of the disease.

Up to 80% of the patients can be treated adequately through the administration of oral rehydration salts (ORS). Very severely dehydrated patients are treated through the administration of intravenous fluids, preferably Ringer lactate. Appropriate antibiotics can be given to severe cases to diminish the duration of diarrhea, reduce the volume of rehydration fluids needed and shorten the duration of Vibrio Cholera excretion. Routine treatment of a community with antibiotics, or "mass chemoprophylaxis", has no effect on the spread of cholera and can have adverse effects by increasing antimicrobial resistance. In order to ensure timely access to treatment, cholera treatment centers should be set up among the affected populations whenever feasible.

The provision of safe water and adequate sanitation in the IDPs situation is a difficult challenge but remains the critical factor in reducing the impact of cholera outbreaks. Recommended control methods, including standardized case management, have proven effective in reducing the case-fatality rate. Comprehensive surveillance data are of vital importance to guide the interventions and adapt them to each specific situation.

In addition, cholera prevention and control is not an issue to be dealt by the health sector alone. WASH (Water, Sanitation, and Hygiene) Health and Nutrition (health & hygiene promotion), communication and camp management are also the important clusters in the Cholera outbreak control and prevention.

Regular Monitoring of the safe drinking water supply and sanitation facilities in the camps with water quality testing health education on prevention of Cholera both in camps and in host community must be continued and expanded. Therefore a comprehensive multidisciplinary approach should be adopted for dealing with potential cholera outbreaks in the host community as well as in the IDP camps.

## Objective of the Plan

The purpose of the Plan is to reduce morbidity and mortality in the even of acute watery diarrhoea and other diarrhoea epidemics among members of the community through timely preparedness for epidemics and early detection of outbreaks in addition to the introduction of appropriate measures to control and contain outbreaks and prevent fatalities.

## Specific Objectives

The plan is specifically expected to:

- Enhance coordination and partnership at the national and governorate level
- Enhance the existing surveillance system for early case detection and timely notification and response
- Establish standard procedures for early detection and laboratory confirmation of outbreaks.
- Ensure appropriate case-management during outbreaks.
- Enhance environmental control procedures in response to outbreaks.

## Scope of the plan

The Ministry of Health leads in all public health issues inside the country, including refugee camps. For communicable diseases such as cholera, all health sectors, including those in refugee camps, should follow the case definition, diagnosis, case management, and all protocols and guidelines issued by Ministry of Health. The Ministry of Health will declare the occurrence of cholera outbreaks and the end of these outbreaks.

## 1. Risk Assessment

Acute watery diarrhoea caused by Vibrio cholera is transmitted through water and food contaminated with faeces, and it essential to conduct a stratified risk assessment of at risk communities and locations.

This risk stratification should account for the current burden of diarrhoeal diseases transmitted through faeco-oral routes (to determine the degree of endemicity), overcrowded dwellings, access to health services, quality of drinking water in addition to availability of water and sanitation facilities.

An attack rate of 1-2% should be used in order to determine the number of expected incidents in an outbreak of acute watery diarrhoea. The expected need for medicines, medical supplies and other needs can be calculated by using this reference number

In order to optimize the use of resources for the purpose of response and to make the optimal choice in terms of places where these resources should be delivered; detailed mapping of outbreak response should be made for all the resources required, their quantity and the quantity of what is left of resources that were previously available.

Resources include the following:

- Medicines and medical supplies necessary for outbreak response.
- Trained human resources (doctors, nurses, technicians, etc.).
- Health educators (could be volunteers from the community itself).
- Available material for health awareness.
- Available supplies for environmental control.
- Available supplies for cholera treatment centre and hydration points.
- Any other resources like incidence forms, investigation forms, etc.

It is necessary to hold the following training workshops for health service providers in areas at risk of outbreak:

- Training on case management.
- Training on laboratory diagnosis.
- Training for the Rapid Response Team on outbreak investigation, verification and response.
- Training community health workers and community volunteers on conducting searches for cases of acute watery diarrhoea and providing home treatment for them, referring cases to health institutions for suitable case management, and on promoting personal hygiene and environmental sanitation (chlorinating water, waste disposal, etc.).

## 2. Coordination

A three-tiered coordination mechanism within Ministry of Health ensures effective preparedness and response to waterborne disease outbreaks.

### 1. Central Level

The Ministry of Health is the leading authority and determines all stakeholders who have a role in the cholera preparedness and response plan. The purpose of the central level co-ordination structure is to ensure intra- and inter- sectoral coordination, coordination with international and regional organizations and cross border coordination with neighboring counties.

The **National Committee for Epidemics** includes experts from different health sectors, including MoH, RMS, universities, private sector, WHO and EMPHNET and is chaired by his Excellency the Minister. In this meeting Directorate of Communicable Diseases, Directorate of Environmental Health, Directorate of Laboratories, and Directorate of Awareness and Communication presented plans for preparedness and response to cholera outbreak.

Key functions

- Ensure coherence of the prevention, preparedness and response activities through development of plans and agreements on technical standards.
- Develop coordination mechanisms for Cholera preparedness and response.
- Determine gaps in training and contingency stocks.
- Develop capacity building plans
- Develop response plans
- Share information with all stakeholders
- Monitor and analyze epidemiological data
- Mobilize and allocate resources as needed.
- Assign roles and responsibilities to health cluster members.
- Collect and report on Cholera cases and deaths.
- Announce Cholera outbreak/end of outbreak in accordance with WHO standards

### 2.2 Governorate Level

Locations: All Governorates of Jordan

It is necessary to set up a control committee that has specific tasks and authorities in every province. The committee is to be headed by the Director of Health with the membership of all health and other related institutions in the province. A Rapid Response Team has been formed in each Directorate of Health. The team is headed by the Health Director or his representative with the membership of representatives from health institutions and relevant authorities. The mission of the team is to respond to epidemics of communicable diseases.

It is necessary to provide the committee with written tasks; the Ministry of Health issues a letter demanding the formation of the Committee and the definition of its duties. The first meeting is held as soon as possible to review preparedness to control acute watery diarrhoea outbreaks.

Members:

- Health director or representative (Team leader).
- DLO (Surveillance).

- Wash officer.
- General practitioner of NGO staff
- Lab technician
- Health promotion officer
- Logistic officer.

Key functions
- Coordination with NGOs
- Assign roles and responsibilities to other cluster members.
- Identify and report on suspected Cholera cases and deaths.
- Sample collection and transportation.
- Organize relevant training e.g. Lab sampling, RDT, case management, surveillance, line listing
- Implement, supervise, monitor and evaluate control activities.
- Distribution of IEC materials.
- Identify locations for CTC/CTU.
- Coordinate distribution of stocks.

### 2.3 Facility Level

Members:
- Health staff focal point (Medical Doctor).
- Nurse
- WASH officer

Key functions

Health staff focal point
- Contact DLO in non ISIS controlled areas for suspected cases
- Ensure supplies for case management are in Place.
- Ensure adequate case management.
- Liaise with respective NGO focal point for replenishment of stocks.
- Coordinate with referral CTU/CTC.
- Case reporting.
- Organize relevant training
- Implement, supervise, monitor and evaluate control activities.

Nurse:
- Assist in case management.
- Coordinate community activities with CHW.
- Coordinate with WASH officers.
- Maintain case records and line listing.

WASH officer:
- Ensure adequate isolation and hygiene procedures are in place and respected
- Disposal of contagious waste and material
- Disinfection of vehicles used for referral of cholera patients
- Preparation and constant availability of various chlorine solutions for the different uses

## 3. Surveillance

It is necessary to strengthen the surveillance system for acute watery diarrhoea during pre-epidemic stage, and to cover more than 90% of all health institutions by an early warning and rapid response system and by a surveillance system that achieves at least 85% timely reporting and more than 85% complete reporting.

A program of electronic public health surveillance is being implemented in 291 outpatient clinics in Jordan, in partnership with WHO and Ministry of Health. The project introduces case-based, integrated disease surveillance of mental health, non-communicable disease and communicable disease.

The clinician uses the system within the consultation, which introduces clinical-decision support for child health and mental health, as well as best practice prescribing guidance and and real-time reporting of information. Information is made available within one hour via an online framework with automated generation of SMS and email alerts and support for mapping and reporting.

Surveillance tools that should be all set for the process of reporting cases include the following:

- Standard case definition.
- Case Series Report to report suspected cases.
- Tools for data collection when investigating outbreaks (investigation forms, etc.).
- Guidelines on collecting stool samples and transporting them.
- Guidelines on outbreak detection, response and laboratory verification.
- Protocols for data entry and analysis including drawing charts.

### 3.1 Case Definitions

| Disease/Syndrome | Case Definition |
|---|---|
| Acute diarrhoea | • Three or more abnormally loose or fluid stools in past 24 hours |
| Acute watery diarrhoea (suspected cholera) | • Age five years or older with sudden onset of acute watery diarrhoea with severe dehydration or death, with or without vomiting (non-endemic area)<br>• Any patient presenting 3 or more liquid stools with or without vomiting for the last 24 hours (Epidemic area) |
| Confirmed Case | • Vibrio cholera O1 or O139 is isolated from any patient with diarrhoea |
| | • Person with 3 or more loose stools (should take shape of container) in a day (24 hours) |

### 3.2 Alert Notification

An alert is an unusual health event that can signal the early stages of an outbreak and can be triggered from surveillance data, by individual clinicians reporting suspected cases, by community

members detecting unusual events and reporting to the appropriate health authorities. An alert for cholera can be triggered through several ways:

- **Public Health surveillance** – the electronic public health surveillance system alerts directorate and central focal points within one hour via SMS and email if a suspected case of cholera is reported from a clinic
- **Laboratory surveillance** – if a case of Vibrio cholerae is detected by local laboratory in each governorate, an alert notice will be issued to DCD. An outbreak will only be declared if culture confirms Vibrio cholerae O1 or O139.

### 3.3 Alert Verification

Alerts notices not originating from the laboratory require verification and must be verified within 24 hours. Alert Investigations are completed by Directorate Level focal points who complete forms on electronic forms using the initial alert ID generated via the public health surveillance system.

This alert is then automatically linked by to the original case report via the online technical framework and alert line list. A central level review is then undertake to determine if the case is confirmed.

### 3.4 Outbreak Declaration and Investigation

Only MOH acan declare an outbreak and only if a case of laboratory-confirmed Vibrio cholerae O1 or O139 is reported by the CPHL.

### 3.5 Rapid Response Teams (RRT)

**General Objectives of RRTs:**
Ensure rapid and coordinated detection of cholera
Immediate response to cholera outbreaks
Promote comprehensive outbreak investigation.
Improve the collaboration and partnerships among stakeholders working in outbreak investigation and response.

**Specific Objectives:**
Prevent potential outbreaks
Early detection of outbreaks
Control of outbreaks
Strengthening of Surveillance
Provision of guidelines and tools required to deal with outbreaks
Cooperation and coordination with other partners
Writing epidemiological reports
Effective communication

**Component of RRTs at the national level:**
Director of Communicable Diseases directorate
Head of Surveillance department
Head of diarrheal unit
Head of data management
Communication expert
Representative from Directorate of Environmental health
Representative from Food and Drug Administration
Director of laboratories
Clinician

Head of Infection prevention and control department

**Component of RRT at the subnational level:**
Epidemiologist
Head of food and environment department
Laboratory expert
Infection prevention and control focal point

**Roles of national RRT:**
Regular meeting
Designation of experts (from inside the country or outside)
Allocate resources
Training of health care workers
Prediction, planning of potential outbreaks
Coordination with other partners in the ministry of Health
Coordination with the national committee for epidemics
Coordination with National IHR focal point Coordination with WHO and other international and regional organizations
Coordination with unit of emergency management
Issue of reports

**Roles of national RRT:**
Regular meetings
Determination of team members
Determination of needs
Simulation exercises
Conduction of outbreak investigation
Writing reports
National RRT should provide technical and logistic support to the subnational teams and should go to any region in case of request from the subnational team or in case of request from higher authority or according to the epidemiological situation.

Subnational RRTs needs training workshop for 2 days
**1A4**-Form a line listing for suspected cases of cholera, with the necessary relevant variables.
**1A5**- Prepare a key fact sheet about the disease
**1A6**- Distribution of key facts sheet about the disease to all health sectors in the country, including those health sectors in refugee camps
**1A7-** Establishment of a free hot line for the public all over the country to reply any inquiry regarding the disease
**1A8-**Testing of 10-15% of diarrhea cases for cholera in all governorates and in refugee camps.
**1A9:** Close cooperation with all organizations working in refugee camps
**1A10-** Jordan is free from cholera since more than 3 decades, but diarrhea due other causative agents is a main reason for attendance to health facilities and admissions to hospitals. Weekly Directorate of communicable diseases is notified of about 1000-2000 of diarrhea cases from all governorates. Compare the weekly trend of acute diarrheal diseases cases with previous weeks or with corresponding weeks of prvious years for detection of any rising trend
**1A11-** Outbreaks of diarrhea should be notified immediately to the relevant health directorate and directorate of communicable diseases, and these outbreaks should be investigated to determine the causative agent
**1A12-** Training, and building capacity of physicians in primary health centers is essential for preparedness of cholera. Training will include: Key facts of the disease, case definition, case management, and laboratory diagnosis
**1A13-** Simulation exercises are recognized as an important element of the planning process for preparedness and as a means of strengthening knowledge and building capacity.
**1A14**- Awareness regarding the diseases should be strengthened in health facilities at points of entry (ground crossings and airports) .

**1B- Surveillance during response to Cholera:**

**1B1**- Suspected cases **(**before the declaration of the cholera outbreak) should be notified to health directorate and directorate of communicable Diseases
**1B2** All suspected cases (before the declaration of the cholera outbreak) should be tested by culture to confirm or exclude diagnosis of cholera
**1B3**- Diagnosis of cholera: will be in the CPHL, first diagnosed cases in governorates will be sent to the CPHL for confirmation
**1B4**- Declaration of cholera in the country is **solely** by the ministry of health at the central level
**1B5**- Daily line listing will be send from all health facilities to the relevant health directorate, including **zero** line listing. Directorates of health in turn will send a daily line list to DCD
**1B6**- Data in line listing should be analyzed twice weekly. Descriptive analysis should include: epicurve, spot maps; CFR, attack rate, and tabulation by age, sex and place of residency
**1B7**-Analytical studies may be conducted to identify sources of infection, risk factors for the outbreak
**1B8**- Results of descriptive and analytical studies should be shared regularly with all stakeholders
**1B9**- IHR focal point should notify WHO about cholera outbreaaks within 24 hours from confirmation of the outbreak
**1B10**- Cooperation with WHO, UNICEF, UNHCR, EMPHNET, and other international and regional organizations.
**1B11-** Designation of a single spokesperson who will be the focal point for dealing with the media.
**1B12-** Plan regular press releases and conferences, according to the epidemiological situation
**1B13-** Deal with rumors and panic by maintaining a very open flow of information, rumors spread easily when information is incomplete or delayed.

## 4. Laboratory

Although Jordan has been cholera-free since 1982, all MOH Laboratories perform stool analysis or culture and participate in the surveillance of Vibrio cholera.

It is essential to carry out tests for laboratory confirmation and sensitivity to antibiotics by the Ministry of Health reference laboratory for the initial cases of acute watery diarrhoea when a patient is suffering from acute watery diarrhoea and Vibrio cholera (O1, O139) are isolated. However, treatment of patients with dehydration should not be delayed (including treatment with antibiotics) until the lab results from stool samples are obtained.

For rapid and efficient laboratory support, it is essential to ensure that the following preparatory procedures are carried out:

- The provision of at least 20 Cary Blair mediums with rectal swabs for each sheltering centre or high outbreak risk area in order to collect and transport stool samples.
- The provision of sufficient quantities of collection and transport mediums in all the laboratories that have been developed in order to allow the collection and transportation of at least 50 samples of stool from the field at any time.
- The provision of sufficient laboratory reagents to be stocked as reserves in the labs developed in provinces to ensure the ability of any lab to prepare at least 100 stool specimens for culturing at any given time.

### 4.1 Roles and Responsibilities

- Laboratory technician at the medical center level :
  - Select 10 – 15 % of liquid stool and Inoculate (APW) media mentioning the date and exact time of Inoculation.
  - Follow the transportation of (APW) to the Public Health Laboratory (PHL) or hospital Laboratory in the governorate

- Laboratory technician of the PHL and / or hospital Laboratory:
  - Incubate APW.
  - Subculture onto TCBS.
  - Perform gram stain, motility, oxidase & biochemical test.
  - Follow the transportation of suspected Vibrio cholerae culture to the Central Public Health Laboratory (CPHL) in Amman, taking in to consideration full compliance with biosafety measures

- Central Public Health Laboratory (CPHL):
  - Confirm the Laboratory diagnosis of Vibrio cholerae by slide agglutination tests.
  - Report positive results to DCD.
  - Preserve positive culture at -80$^{o}$C.

- Health and hospital directors:
  - Ensure the transportation of "APW" from the medical centers Laboratories to the hospital and / or PHL in the governorate and the transportation of the suspected Vibrio cholera cultures to the CPHL in Amman in a timely manner.

## 4.2 Laboratory Protocols

Each Laboratory should select 10–15% of received liquid stool specimens "even if not requested by the physician" to start the Laboratory process for detection of Vibrio cholera according to the following procedure:

- Inoculate Alkaline peptone water (APW) prepared in 20 mls sterile containers with liquid stool/ rectal swab.
- Incubate the inoculated (APW) with cap loosened at 35-37$^{o}$C for 6 – 8 hours.
- Subculture a loopful from the surface of (APW) without shaking the container onto Thiosulphate Citrate Bile salt Sucrose Agar (TCBS).
- Incubate the TCBS plate at 35-37$^{o}$C for 18 – 24 hours.
- Subculture suspected Vibrio cholera which appears on TCBS as yellow shiny colonies onto non-selective media and incubate at 35-37$^{o}$C for 18 – 24 hours .
- Perform the following tests on colonies grown on the non- selected media :
    1. Gram stain : Vibrio cholerae is a gram negative curved rods.
    2. Motility: Vibrio cholerae is actively motile.
    3. Oxidase test : positive.
    4. Biochemical reactions :
    5. KIA : K/A without gas and without $H_2S$.
    6. Lysine : Positive .
    7. Ornithine : positive .
    8. Serological tests: slide agglutination tests with (O1) polyvalent containing Ogawa and Inaba anti-sera. if positive , test with Inaba and Ogawa antiserum separately.
- Report positive results immediately to the Directorate of Communicable Diseases (DCD), which in turn will inform director of primary health care administration, who in turn will inform Secretary General and his Excellency the minister.
- DCD will inform governorate health directorates about the results (positive or negative)

## 4.3 Collection and Transport of Specimens

Whole stool samples should be collected as soon as possible and before administration of antibiotics from eligible patients. If a stool specimen cannot be obtained e.g. infants, a rectal swab should be done. Fresh stool should reach the lab and be refrigerated within 2 hours; if this is not possible, place 2 stool swabs in Cary-Blair transport media in a leak proof container and ensure they reach the lab as soon as possible. Ensure that the specimen is properly labelled with identification, date of birth, date of collection. All specimens should be sent for culture.

If specimens had been collected following an alert notification, preliminary results will be available within 72 hours. Once an outbreak has been confirmed and at least 10 positive results reported, it is not necessary to collect specimens for all suspect cases all the time. Specimen collection may vary depending on stage of epidemic and the need for evaluating drug susceptibility patterns during the outbreak. The partners will issue guidance on specimen collection and testing during the intra-

epidemic period. At the end of the outbreak, at least 10 specimens collected consecutively should test negative for Vibrio cholerae before the outbreak is declared over.

### 4.4 Rapid Diagnostic Test (RDT)

Rapid diagnostic tests have also been utilised elsewhere in the world for the detection of cholera. The current available rapid diagnostic tests (RDTs), while very sensitive, generally have low specificity. The positive predictive value is low when there is no ongoing cholera epidemic. However, as a general rule, if a cluster of unusual cases of diarrhoea are detected and rapid evaluation is necessary, RDTs may be used. Test at least five specimens from five cases and if proportion positive is ≥ 70%, the health team may issue an alert notice pending culture confirmation. If a few RDT positive cases are identified DO NOT issue an alert, await culture results.

The Ministry of Health has requested from WHO the RDT. Once it is available in the country, criteria for it is use will be distributed to health facilities

## 5. Case management

It is essential to determine the general need of provinces for medicines and other essential supplies to respond in the event of an outbreak. This is determined by using an estimated attack rate of 1-2% (according to previous experience). On the basis of these general needs the provision of medicines and essential supplies are made in advance and stored in the warehouses of the various health directorates as reserves to be quickly mobilized to affected areas to deal with the onset of outbreaks. It is essential to carry out periodic inventories of medicines and supplies to replace nearly expired stock (usually six months before expiry date). Supplies needed for environmental control procedures are also secured and stocked in health directorates' warehouses as reserves.

### 5.1 Establishment of Cholera Treatment Centres and Rehydration Points

It is essential to set up temporary hospitals close to high outbreak risk areas to become centres for cholera treatment; and to make provisions for some health institutions that provide outpatient services to serve as hydration corners.

This is to enable a big number of patients to access specialized care during outbreaks. It is essential to open up cholera treatment centres or dehydration corners when:

- Cases of acute watery diarrhoea are reported in hard to reach geographical areas.
- Cases of acute watery diarrhoea are reported in areas or sheltering centres where specialized health facilities for isolation and management of cases are not available or insufficient.

An outbreak of acute watery diarrhoea due to Vibrio cholera is expected to last 6-8 weeks at maximum. Because the incubation period is very short (2 hours - 5 days), incidence rate may rise so rapidly to exceed the capacity of the health system to deal with the emerging situation. It is therefore essential to set up temporary hospitals (cholera treatment centres) or hydration corners in advance in order to manage the cases efficiently and swiftly to control the outbreak.

In order to treat 100 patient daily during an outbreak, the following numbers and types of human resources are required:

- Doctors (4)
- Nurses (3)
- Cleaners (2)
- Educators (2)

### 5.2 Provision of essential medicines and supplies for outbreak response

In order to find the estimated number of expected incidents during an outbreak we multiply the number of vulnerable people times (0.01) or (0.02) as the size of the expected outbreak is based on the average attack rate that is used as a reference value which is (1-2%). Once the expected number of incidents is determined, the need for medicines and supplies can be determined according to the following:

- 80% of cases will need only oral rehydration fluid (each case needs at least 6 litters of fluid)
- 20% of cases will need IV fluids (Ringer's Lactate) followed by oral rehydration fluid (each case needs 3000 cc of Ringer's Lactate).
- For adults: each case of severe dehydration (20% of cases) needs 3 capsules (100mg) of Doxycycline or 24 capsules of (250mg) tetracycline.
- For children: each case of severe dehydration needs Erythromycin syrup (200mg) or (7.5 mg/kg) 4 times a day for 3 days.
- Each pregnant woman needs forazolidone (1.25 mg/kg) 4 times a day for 3 days.

- Note: In Syria, antibiotic treatment is given to all suspected cases of diarrhoea (with no symptoms of dehydration, with mild symptoms of dehydration or with severe dehydration). Medicines needed should be calculated accordingly.
- It is necessary to work out the amount of medicines needed for people in contact with the case (based on 10 persons per case).

### 5.3 Cholera vaccine

Based on the WHO position paper and given the availability of oral cholera vaccines (OCV) and data on its efficacy, field effectiveness, feasibility and acceptance in cholera-affected populations, immunization with the vaccines should be used in conjunction with other prevention and control strategies in areas where the disease is endemic and should be considered in areas at risk for outbreaks.

Based on the predictive risk assessment on the WHO position paper, it's recommended to use the two dose Shanchol® oral vaccine for its efficacy (bivalent), suitable course (two weeks apart), easiness of use (doesn't need buffer), needs little space for storage, as well as its cost effectiveness. Cholera vaccination is an additional means to the usual preventive measures for cholera (like improvement of water and sanitation, health education, outbreak preparedness, case management); hence, it should never replace these activities.

The use of OCVs should also be considered reactively to reduce mortality in areas where other interventions cannot be delivered effectively. This means that OCV should be considered an additional measure to control outbreak of cholera, and other conventional control measures are considered of more priority. The national committee for epidemics in October 2015, gave a recommended that currently no need for OCV campaigns

## 6. Risk Communication

The information and communication is important in educating community members and urge them to adopt healthy lifestyles ,in order to raise the level of health of the community through the advancement of knowledge, information, and building healthy trends and promotion of healthy behaviors, using various communication channels and means.

It is essential to prepare those responsible for promoting personal hygiene in each area or sheltering centre beforehand if possible in order for them to be able to present short concentrated messages that stimulate the community to pay attention to personal hygiene during outbreaks. Health messages have to be tested before they are presented. Supplies for health education purposes have to be stocked (posters, leaflets, messages targeting the community, etc.).

During a cholera outbreak, it is essential that at sheltering centres there is at least one community health worker or home visitor / 2500 people living in sheltering centres, trained on promoting community awareness procedures.

**Objectives:**

- Advocacy of decision-makers.
- Raise health awareness and mobilize community members.
- Promote the patterns of health behavior for all segments of the community.
- Strengthen partnership and cooperation with various local and international various relevant sectors.
- Buildup partnerships with the media.
- Buildup capacity of health workers.

**Elements of the educational and media plan:**

1. The **media** (the delivery of the right and documented information) and to clarify the importance of the partnership with various media.
2. **Health providers** (doctors, nurses and health promoters) to increase their awareness about cholera and train them on procedures to be followed when dealing with suspected cases.
3. Involvement of the **local community** through health promoters and community health committees.

**Target groups:**

- Decision-makers
- Health service providers
- Media sector
- All segments of community, especially those prone to the disease.

**Implementation steps:**

1. Preparing content of educational messages, to be published through various media channels:
    - definition of cholera
    - modes of transmission
    - methods of prevention and treatment

2. Preparation of educational materials brochures and flyers and posters for the following categories:
    - Community members
    - Health providers
    - Travelers arriving at airports and border points in both languages Arabic and English.
    - Officials in border points and airports.

    The following points to be taken in consideration:
        1. Definition of cholera.
        2. Methods of transmission of cholera.
        3. Common symptoms and signs.

4. Prevention of cholera.
5. Treatment.

The awareness and the involvement of members of the local community is important for the success of the fight against the spread of the disease. Here are several factors and messages that should be focused on to reduce the risk of disease procedures such as:

1. Drinking water from safe sources.
2. Wash hands with soap and water:
    - After care of a sick person suffering from diarrhea.
    - Before preparing and eating food.
    - After using the toilet.
    - After visiting hospital , and caring for patients at home .
3. Wash fruits and vegetables well especially leafy ones with running water.
4. Ensure the safe drainage of waste.

3. Identify a media spokes man and agree on a regular meeting with the media for updates as necessary.
4. Provide a hot line, and the Ministry of Health website www.moh.gov.jo
5. Training of focal points and health promoters at health directorates and health centers ,in order to conduct awareness sessions for the community leaders and members of health committees, in the provinces .
6. Health awareness and media directorate represented by Information and Communication Department and the Department of awareness review the information materials ,and process a list of those approved (experts) to speak for the media program. Prepare the following address lists concerned:
    - The members of the National Committee for Epidemics.
    - List processing of journalists involved in health affairs of the various means of media.
    - Focal points in Private Hospitals, Doctors Syndicate, Nursing Association, the Pharmacists Syndicate of associations and the private sector interested in health awareness and media (such as the Royal Health Awareness Society, the Middle East network, radio and television, government and private agencies, NGO'S and coordination with relevant international bodies.
    - Formation of a committee from the Head of Media , Head of Education Department and a representative from the Directorate of Public Relations and international media to follow up and monitor visual and audio-visual means
7. Conduct a survey KAP Study for health workers and health promoters and for the community members to measure their knowledge and attitudes about cholera.
8. Conduct a workshop for editors from major media (health editors) and representatives from mass media and bloggers of the means of social communication (Face book + Twitter) to illustrate the importance of community participation in efforts to prevent the spread of cholera.
9. Emphasis on the formation of a coordinating committee of all of the following sectors , the media, the clergy, the private sector (private hospitals, the Greater Amman Municipality, the doctors union, the Pharmacists Syndicate, Nursing Association), the universities, the Royal Medical Services, and Relief Agency, the transport sector, the Ministry of Interior, Civil Defense and nominate a liaison officer in each institution.
10. Assign focal point to follow-up information materials within mass media channels.
11. Provide information technology directorate at ministry of health of all data and update the information as needed on the website of the Ministry of Health.
12. Measure the impact of the plan by conducting a KAP Study to identify the knowledge and trends for health workers and health promoters and for the community members.

## 7. Infection prevention and control

Contact Infection Control measures should therefore be applied with Standard Precautions for confirmed and suspected cases of cholera:

### 7.1 Patient placement

- Place patient with confirmed or suspected in seprated room(isolation room)with toilet.

- Place together in the same room patients who are infected with the same pathogen.
- Ensure that patients are physically separated (i.e., >3 feet apart) from each other.
- Ensure all PPE are availibe
- Perform hand hygiene and and change PPE between contact with patients in the same room, regardless of whether one or both patients are on Contact Precautions
- Clean and disinfect such equipment (e.g. thermometers, stethoscope and sphygmomanometer) before use on every patient single use instrument when you can should be used and every patient should has seprated equipment.

### 7.2 Personal protective equipment (PPE)

- Wear a gown and gloves for all interactions that may involve contact with the patients presenting vomits and profuse diarrhea.
- For practical purposes, put on PPE upon room entry and discard before exiting the patient room
- Remove gown and gloves and observe hand hygiene before leaving the patient-care environment

### 7.3 Hand hygiene

- Perform hand hygiene by means of hand rubbing or hand washing
- Ensure availability of hand-washing facilities with clean running water
- Ensure availability of hand hygiene products (clean water, soap, single use clean towels, alcohol-based hand rub).
- Alcohol-based hand rubs should ideally be available at the point of care

### 7.4-Drinking vessels and eating utensils

- Eating utensils and drinking vessels that are being used should not be shared.
- If adequate resources for cleaning utensils and dishes are not available, disposable products may be used.
- The combination of water and detergents is sufficient to decontaminate dishware and eating utensils.

### 7.5 Safe injection practices

Recommendations applicable to the use of needles, cannula, and intravenous delivery systems:

- Use aseptic technique to avoid contamination of sterile injection equipment.
- Do not administer medications from a syringe to multiple patients, even if the needle or cannula on the syringe is changed.
- Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients

### 7.6 Waste Disposal and Puncture resistant waste

- Clinical waste such should be placed into red bags and autoclaved or incinerated.
- When outer surface of red bag contaminated we should put it in anther red bag(double bag).
- Solid infectious waste must be placed into red bag and left for incineration/other appropriate treatment
- Containers located at the point of use (e.g., sharps containers) are used as containment for discarded slides or tubes with small amounts of blood, scalpel blades, needles, cannulas, and syringes.
- To prevent needle stick injuries, needles and other contaminated sharps should not be recapped, purpose fully bent, or broken by hand.
- Wash
- Liquids should be flushed down in the sewage system with using disinfectant(chlorine with concentration5000ppm).
- Hand should be washed after Waste disposal.

### 7.7 Soiled laundry

- Not shaking the items or handling them in any way that may aerosolize infectious agent.
- Avoiding contact of one's body and personal clothing with the soiled items being handled.
- Containing soiled items in a laundry bag or sharp box.
- Laundry should be treated according to ministry of health policy and procedures it should wash with degree 70 Celsius for 20 minutes

### 7.8 Environmental Control

Promptly clean and decontaminate spills of vomit, stools or other potentially infectious materials. Use protective gloves and other PPE appropriate for this task

- Appropriate clean with water and soap
- Clean small liquid spill with then use anthor mop that has soaked with disinfectant(chlorine with concentration5000ppm).
- When handling large liquid quantity put dry mop until area be dry and then disposed in appropriate bag then good clean using water and soap next put chlorine for 10 minutes at area after that mop and disposed in appropriate bag.
- chlorine solution concentration (500) per million should be used for disinfect frequently touched surfaces regularly, (e.g., chairs, bed, tables) and floor.
- Concentrations for use in the hospital area according tocalculate available concentration in million/used concentration.
- Or used any anthor appropriate disinfectant according to it instruction.
- disinfect frequently touched surfaces regularly, (e.g., chairs, bed, tables) and floor at least twice time daily and clean befor disinfect.

### 7.9 Collect and transfer of samples

- Consider all sample is source of infectionand all health worker who collect and transfer samples should apply infection control measures
- Wear apprpriatePPE while collect your sample
- Put sample in plastic bio hazard bag and then close and it should has patient name on it.
- Lab should take all precaution for transfer sample .
- The name of patient should be put clearly on and inform the lab that smple had been sent

### 7.10 Home care and visitors

- Place patient with in seprated room(isolation room)with seprated toilet if possible.
- Never leave home during period of illness and if necessaiy should consult the doctor
- Family members or visitors who are providing care or having very close patient contact (e.g., feeding, holding) should use PPE correctly.
- Visitor should be informed to avoid contact patient
- Wear gloves whenever touching the patient's intact skin or surfaces and articles in close proximity to the patient(e.g., medical equipment, bed rails).
- -Use gown upon entry into the room and contact patient body fluid.
- Remove gown and gloves and observe hand hygiene before leaving the patient-care environment.
- Perform hand hygiene by means of hand rubbing or hand washing.
- Change personal clothes every day.
- Train on appropriate way of handling patient clothes and linen_Drinking vessels and eating utensils.
- Daily clen and disifect for patient room and surfaces (chlorine in concentration500 for 500 concentration water).
- Observe the people in direct contat with patient if they appear any symptoms.

### 7.11 Handling Corpses

People who wash and prepare the dead body must apply infection prevention measures as the body is alive :

- wear gown and gown and surgical mask
- Wear and remove appropriate PPE
- Perform hand hygiene by means of hand rubbing or hand washing.
- supervision of infection control focal point for every hospital in process

## 8. Water and Sanitation

### General measures

Monitoring program on the quality of drinking water intended to be exploited for the purposes of drinking and initiating procedures to permit the new water sources for drinking.
Monitoring program on the quality of drinking water in water supply systems, which includes pumping stations, reservoirs and major selected samples from the distribution network.

- Monitoring program of complaints received about the quality of drinking water and taking the necessary measures
- Assessing the quality of drinking water in accordance with the requirements of standard specification for drinking water, No. 286/2008
- Assessing the quality of treated waste water water in accordance with the requirements of standard specification for waste water standard, No. 893/2006.
- Preparation of technical reports that require corrective action necessary to maintain the quality of drinking water safe and fit for human consumption permanently and continuously.
- Continuing the process of licensing private wells in accordance with the requirements of Jordanian standards
- Periodic sanitary inspections of the waste water treatment plants and Control of irrigated crops
- Prepare periodic reports for the work of the Directorate

### Specific measures

- Investigation of residual chlorine in the water system on a daily basis and record it in a special register with the verification procedure and the emphasis on health surveys on the various units of the water system (sources, networks, distribution tanks and reservoirs assembly) as well as public swimming pools.
- Collect drinking water samples for testing highly specialized test at a rate of monthly sample of public networks, reservoirs and from different locations in (the capital, Mafraq, Zarqa, Ruwaished).
- Collecting laboratory samples of wastewater from the inlets and outlets of wastewater domestic treatment plants, for the Specialist test in order to investigate the cholera from each of the: Queen Alia International Airport treatment plant ,Mafraq , Khirbet Samra and the Center for the Karama borders (at a rate of one sample per week).
- Intensity control over the transfer of drinking water by tanks (green colored ) to make sure of safe water source and fits into the health conditions, and take legal action against violators, as well as the intensification of control floods and agricultural springs and wells to prevent their use for drinking.
- Emphasis on control procedures relating to the destruction of all vegetables irrigated by water of Zarqa flood from Sokhna Bridge area and even King Talal Dam and activate committees of public health and safety.
- Intensify monitoring to ensure there is no health nuisances resulting from the leakage of waste water from septic tanks and aggregate carrier lines and sewage, and take deterrent legal measures against violators.
- Continue the collecting samples program for the Specialist test from springs (that not allow for drinking), and coordination with the Greater Amman Municipality, municipalities and administrative governors to prevent their use for drinking too.

Zaatari Camp

- Ministry of health represented by its directorates in jordan implements monitoring and surveillance programs in Syrian refugee camps and specially Za'atari camp and deals with it as any area in the kingdom according to plans and protocols prepared for that and perhaps we note the intensification of the monitoring procedures and the especially dealing because of the possibility of the spread of diseases( especially communicable diseases) and epidemics through it is more accelerated due to over-crowding in camps .

The monitoring and surveillance programs controlling the environmental health services which can help improve health of population through the following:

1- Protecting potential vehicles of disease (ensuring safe water, adequate sanitation) by this :

a. Access and water quantity: all people should have access to a sufficient quantity of water for many proposals.
b. Water quality.
c. Water use facilities and goods.
d. Access and number of toilets.

2-Eliminating causative agents outside the human body (e.g. sanitary disposal of human waste) by the following:

a. Solid waste collection and disposal.
b. Hygiene behaviour and use of facilities.
c. Drainage works.
d. Installations and tools: people have the means to dispose of domestic wastewater conveniently and effectively.

- Ministry of health directorates implementing a monitoring and surveillance programs on camps and this programs include drinking water , wastewater , wwtps especially in Za'atari camp, by:

a. Collecting the samples and tested it.
b. Measuring the free residual chlorine and documented the measures in especially records.
c. Control the transfer procedures for the drinking and wastewater.

- And in the preparedness :

a. Investigation of residual chlorine in the water system on a daily basis and record it in a special register with the verification procedure and the emphasis on health surveys on the various units of the water system (sources, networks, distribution tanks and reservoirs assembly)
b. Collect drinking water samples for exploring the presence of cholera at a rate of monthly sample of public networks, reservoirs and from different locations in (the capital (Amman) , Mafraq, Zarqa, Ruwaished).
c. Collecting laboratory samples of wastewater from the inlets and outlets of wastewater domestic treatment plants, in order to investigate the cholera from each of the: Queen Alia International Airport treatment plant ,Mafraq , Khirbet Samra and the septic tanks at the Karama borders (at a rate of one sample per week).
d. Intensify inspection over the transfer of drinking water by tanks (green colored ) to make sure of safe water source and fits into the health conditions, and take legal action against violators, as well as the intensification of control torrents and agricultural springs and wells to prevent their use for drinking.
e. Intensify monitoring to ensure there is no health nuisances resulting from the leakage of waste water from septic tanks and aggregate carrier lines and sewage, and take deterrent legal measures against violators.

JFDA role approach aims to ensure the safety of foods that are exposed for trading in food premises along the food chain length and this requires a collaborative effort involving all relevant authorities to achieve it.
Food becomes contaminated from contaminated food handlers or contaminated water used for irrigation of fruit and vegetables and consumed raw.
The most commonly are seafood "shellfish, fish and crustaceans ,Grains, legumes, meat, fruits and vegetables are also vehicles as they get contaminated by irrigating with contaminated water .
Factors supporting survival of vibrio cholera
-Foods with high-moisture content
-An alkaline pH, low temperature
-High organic content
-Absence of other competing bacteria.
Strategies developed by the JFDA to reduce the transmission of disease and prevention of food borne cholera :

**Public awareness measures**

- Raise the awareness and knowledge of the consumers by focusing on the 5 keys for safer food consisting of proper food preparation, storage and consumption of foods in hygienic environment especially the high risk food.
- Use of safe water for food preparation and washing of fruits and vegetables
- Raw food and vegetables should be washed with clean water or Peeled before eating as it could be a preventive measure .
- Cook food thoroughly and serve while still hot .
- Washing of hands with soap and after toilet visits to avoid faecal contamination, before and after handling raw food and before eating.
- Avoid eating raw fish and shellfish
- Store cooked food below 5c or above 60c if stored longer than 4 hours and must be reheated thoroughly.
- Cooked Infant foods shouldn't be stored.
- Keep kitchen surfaces clean to avoid cross contamination.
- The addition of lime juice in food and water inactivates vibrio cholera
- Choose processed food (canned, acidic, dried) as they are considered low risk food comparing to high risk foods like alkaline, organic and moist food

**Preventive and control measures**

- Assessing and ensuring of proper food handling practices in eating places such as restaurants, street vended foods and markets is essential.
- Countries are being assisted in the promotion of the Healthy Food approach. The approach aims to ensure the safety of foods during the food chain through a collaborative effort involving all stakeholders.
- Health education of food handlers in areas under threat **.**
- Ensure the adequate processing steps according to guidelines to meet the particular food safety objective as :
- Keep food at < 5 C or > 60 C
- Ensure the shellfish are harvested from approved waters.
- Avoid direct contact of food with infected food handlers.
- Wash thoroughly the raw vegetables and fruit or Peel them before eating as it could be a preventive measure .
- Avoid cross contamination of raw and cooked foods
- Ensure imported foods from endemic countries are without risk

## Annexes

### 1. Dehydration Case Management guidelines

| No Dehydration | Some Dehydration | Severe Dehydration |
|---|---|---|
| Not enough signs to classify as some or severe dehydration. | Two of the following signs:<br>• Restless, irritable<br>• Sunken eyes<br>• Drinks eagerly, thirsty<br>• Skin pinch goes back slowly. | Two of the following signs:<br>• Lethargic or unconscious<br>• Sunken eyes<br>• Not able to drink or drinking poorly<br>• Skin pinch goes back very slowly. |

#### 1.1 For No Signs of Dehydration

- Patient observed to be without signs of dehydration could be treated at home.
- Give ORS packets to take home. Give enough ORS for 2 days.
- Instruct the patients or the care-giver to return if the patient develops watery stool, marked thirst, repeated vomiting, fever and bloody stool

| Age | Amount of solution after each loose stool | ORS packets needed |
|---|---|---|
| <24 months | 50 – 100 mls | Enough for 500ml/day |
| 2 – 9 years | 100 – 200 mls | Enough for 1000ml/day |
| 10 yrs and > | As much as wanted | Enough for 2000ml/day |

#### 1.2 For Some Dehydration (moderate)

- Give ORS solution in the amount recommended in the table below. If the patient passes watery stools or wants more ORS solution than shown, give more.
- Monitor the patient frequently to ensure that ORS solution is taken satisfactorily and to detect patients with profuse and continuing diarrhea who will require closer monitoring.
- Reassess the patient after 4 hours:
  - If signs of severe dehydration have appeared (this is rare), treat as in step 3 above.
  - If there is still. Some dehydration, repeats the procedures for some dehydration, and start to offer food and other fluids.
  - If there are no signs of dehydration, go on to Step 4 to maintain hydration by replacing continuing fluid losses.

| Approximate amount of ORS Solution to give in the first 4 hours | | | | | | |
|---|---|---|---|---|---|---|
| Age* | < 4 months | 4 – 11 months | 12 – 23 months | 2-4 years | 5-14 years | 15 years or older |
| Weight | < 5 kg | 5-7 kg | 8-10 kg | 11-15 kg | 16-30 kg | > 30 kg |
| ORS Solution in ml | 200-400 | 400-600 | 600-800 | 800-1200 | 1200-2200 | 2200-2400 |

Use the patient's age only when you do not know the weight. The approximate amount of ORS requires (in ml) can also be calculated by multiplying the patient's weight (in kg) by 75
**NB:** Use Nasogastric tube if patient cannot drink and IV therapy not possible at the facility. Regular urinary output (every 3-4 hrs) is a good sign that enough fluids is being given.
All children under five years should be given Zinc sulphate as per current protocols

**1.3 For Severe Dehydration**

- Give IV fluid immediately to replace fluid deficit. Use Ringer's lactate solution or, if not available, normal saline.
- If the patient can drink give ORS by mouth simultaneously while the drip is being set up.
- For patients aged 1 year and older, give 100 ml/kg IV in 3 hours, as follows:
  - 30 ml/kg as rapidly as possible (within 30 minutes); then
  - 70 ml/kg in the next 2.5 hours
- For patients aged less than 1 year, give 100ml/kg IV in 6 hours, as follows:
  - 30 ml/kg in the first hour; then
  - 70 ml/kg in the next 5 hours
- Monitor the patient very frequently, especially for signs of over hydration. After the initial 30 ml/kg have been given, the radial pulse should be strong and blood pressure should be normal: If the pulse is not yet strong, continue to give IV fluid rapidly
- Give ORS solution (about 5 ml/kg per hour) as soon as the patient can drink, in addition to IV fluid
- Reassess the patient after 3 hours (infants after 6 hours), using Table in Annex 2
- If there are still signs of severe dehydration (this is rare), repeat the IV therapy
- If there are signs of some dehydration, continue as indicated above for some dehydration
- If there are no signs of dehydration, go on to step 1 to maintain hydration by replacing continuing fluid losses.

**Maintain Hydration, Replace continuing fluid losses until diarrhea stops**

| **Age** | **Amount of solution after each loose stool** |
|---|---|
| Less than 24 months | 100 ml |
| 2-9 years | 200 ml |
| 10 years and above | As much as wanted |

- The amount of ORS solution varies from one patient to another.
  - The greatest amount of ORS solution is required within the first 24 hours, especially in patients with severe dehydration (avg. 200 ml of ORS per kg body weight)
- Prompt fluid therapy with volumes of electrolyte solution, enough to correct dehydration, acidosis and hypokalemia is the cornerstone to cholera therapy.
- Oral administration of glucose-electrolyte solution to patients with diarrhea
  - 8 teaspoons sugar, half teaspoon salt, mixed with 1 liter safe water

  Approximately 80 - 90% of patients can be successfully treated by oral rehydration. It should be emphasized that all cases of diarrhea showing signs of dehydration must receive adequate oral rehydration immediately, before transportation to hospital.

**NB:** Patients should be properly fed after vomiting has stopped
All children under five years should be given Zinc sulphate as per current protocols

**For cholera cases with severe dehydration give only after the person is rehydrated.**

| **Patient classification** | **First choice** | **Second choice** |
|---|---|---|
| Adult (non-pregnant) | Doxycycline: 300 mg orally in one dose | Erythromycin: 500 mg 4 times a day for 3 days |

| | | |
|---|---|---|
| Pregnant women | Erythromycin: 500 mg 4 times a day for 3 days | |
| Children > 12 months and capable of swallowing pills | Erythromycin: 12.5/kg mg 4 times a day for 3 days | Doxycycline 2-4 mg in one dose |
| Children < 12 months | Azythromycin oral suspension 20mg/kg in one dose | Erythromycin oral suspension 12.5mg/kg 4 times a day for 3 days<br>Doxycycline oral suspension 2-4 mg/kg in one dose |