Operational guideline for Typhoid outbreak response in Afghanistan
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The present document has been developed by the Ministry of Public Health (MoPH) of Afghanistan, the World Health Organization (WHO), and other collaborative partners.

Currently available guiding documents and standards of the MoPH-Afghanistan and WHO, for Typhoid outbreak control were used as basis of reference to frame the present document.

This publication brings together the existing relevant guidelines, fills knowledge and operational gaps which were not addressed previously, and adapts the information and operational needs to the specific features of Afghan context. The ultimate result is a much needed, ready-to-use, and user-friendly operational guidance.

We hope the document will be of value by providing quick reference and guidance for field outbreak control teams, namely, clinicians, nurses, and surveillance focal points of health facilities, along with the members of the Provincial Emergency Response teams.

Ultimately, it will serve to strengthen the Emergency Preparedness and Response (EPR) capacity of all health sector partners for the benefit of all men, women, and children of Afghanistan.

Sincerely,

[Signature]

Minister of Public Health – Afghanistan
I am grateful to all team members who joined and shared their expertise to develop these guidelines. Particularly, I would like to thank the MoPH team, WHO and other health cluster partners who added their valuable comments and contributions to the draft and shaped the final document.

In addition, special thanks to the EPR Department of MoPH and WHO/EHA/Health Cluster who initiated and led the process; and the CSR/WHO, General Directorate of Preventive Medicine/Communicable Diseases Control, DEWS, Environmental Health and Health Promotion departments that provided substantial technical support throughout the process.

I would also like to extend my sincere gratitude to the funding partners supporting the multiple EPR interventions for health. My particular thank goes to the European Commission Humanitarian Office (ECHO) for its contribution to make these guidelines become possible.

Director
ANPHI
| **AR** | Attack Rate |
| **ARCS** | Afghanistan Red Crescent Society |
| **BPHS** | Basic Package Of Health Services |
| **CDC** | Communicable disease Control |
| **DEWS** | Disease Early Warning System |
| **ERP** | Emergency Response and Preparedness |
| **HF** | Health Facilities |
| **HMIS** | Health Management Information System |
| **HPV** | Human Papilloma Virus |
| **HR** | Human Resource |
| **HTH** | High Tech Hypo Chloride |
| **IV** | Intra Venous |
| **MOPH** | Ministry of Public Health |
| **NGOs** | Non Governmental Organizations |
| **PHC** | Primary Health Care |
| **PHD** | Provincial Health Department |
| **RRD** | Rural Rehabilitation Department |
| **SOP** | Standard of Procedures |
| **TMP-SMZ** | Trimethoprim-Sulphamethoxazole |
| **TOR** | Terms of Reference |
| **UN** | United Nations |
| **UNICEF** | United Nations Children’s Fund |
| **WHO** | World Health Organization |

**Quick Guide**
While you are reading through the guideline the following icons will help you to make a quick reference of relevant topic of interest.

- **= Background information**

- **= Objectives**

- **= Definition**

- **= Alerts**

- **= Warning**

- **= Intervention guidelines and procedures at facility level**

- **= Provincial surveillance Officer/Focal point**

- **= Intervention Guidelines and procedures for field Intervention teams**

- **= necessary tools for the intervention procedures**

- **= Guidance for Management team**

- **= Go to**

Words described in glossary are printed in *orange bold italic* fonts

### 1. Introduction
1.1. Worldwide case load and burden due to Typhoid

Typhoid fever continues to be a serious public health problem in many developing countries. The disease, which disproportionately strikes children, leads to serious complications, including hypotensive shock, perforation of the gut and gastrointestinal hemorrhage, in 10-15% of cases. Global estimates range from 17 to 22 million cases per year and 216,000 to 600,000 deaths. Even using the lower estimate, which is based on a conservative case fatality rate of 1%, (CFR reported from 1% to 4%), the number of typhoid-related deaths each year is comparable to that of cervical cancer caused by HPV and is greater than that of Japanese encephalitis and meningococcal meningitis1. Which are the diseases included under vaccine preventable diseases and routine vaccination programmes are in practice in several countries but, although there is an effective vaccine available for Typhoid; it has not been prioritized yet.

Rapidly rising rates of antibiotic resistance documented in Asia have increased the difficulty and cost of treatment and threatens to increase the case fatality of the disease2. At present, it is believed that 90% of the cases and deaths due to typhoid occur in Asia3, where the disease is endemic. The outbreaks of typhoid affect the population under the outbreak prone regions and local health system due to its prolonged natural history and complications. As mentioned earlier the cost of management for Typhoid cases is high and it might over burden the family of the patient and the health sector as well.

1.2 Typhoid outbreak control activities in Afghanistan

Existing information of reported typhoid outbreaks in Afghanistan would give an idea about progress of typhoid outbreaks in Afghanistan.

Table: 1
Typhoid cases reported from 2008-2011, by Disease Early Warning System (DEWS) of Ministry of Public Health, Afghanistan

![Number of typhoid cases reported by DEWS Afghanistan 2008 to 2011](image)

Although the graph shows a steady increasing trend of typhoid notification it’s not necessarily due to real increasing of cases because of the increasing number of sentinel sites over the past years.

Current Communicable disease surveillance data flow pattern in Afghanistan
Under the current health care system in Afghanistan; primary health care facilities (Mobile clinics, Health posts, sub health centers, and Comprehensive Health Centers), District, Provincial and regional public health hospitals and Private hospitals are endow with the health needs of the communities.

The health facilities are governed by the Provincial Health Directorate (PHD) at provincial level and Ministry of Public Health (MoPH) at national level with the assistance of national and international contracted out agencies. The current curative health services are not up to the regional health service standards and afflicted with inadequate resources and inadequate quality assurance.

The PHDs have a reasonable information sharing system listed as below: Disease Early Warning System (DEWS) is one of the existing Surveillance system which collects weekly incidence of highly infectious diseases from well distributed 330 (in 2012) sentinel sites across the country with coverage of more than 70% districts public health facilities. It also target to increase representation of private sector and introducing community based surveillance in Afghanistan. Under the system the data is analyzed weekly at regional and central level of the country. Weekly morbidity and mortality data and detail outbreak investigation and response reports are shared at provincial, regional and central level with relevant MoPH, CDC, Emergency, Preventive medicines departments and other stakeholders including NGOs, donors, UN organization, coalition forces and WHO Eastern Mediterranean Regional Offices.

Health Management Information System (HMIS) unit collect and prepare reports on all relevant health related events from all the Public health facilities to the provincial directorate of health on monthly basis and a quarterly report is forwarded to the MoPH from all the provinces. Although there is a provision for facility based instant notification of six notifiable diseases; the system failed to do so and monthly reporting to provincial level and quarterly reporting to central level might not help to quickly detect the outbreaks.

Based on the formal and informal information; alerts are detected and disease out breaks are verified with preliminary investigation and identified after laboratory
confirmation. Immediate control measures are carried out by Provincial outbreak investigation and response teams. But still there are some setbacks with some coordination and communication hiccups. On top of it security threats and natural barriers hamper the activities. This might lead to a hazardous situation during large outbreaks and other natural disasters.

1.3 Importance of preparedness and development of an operational guideline for Typhoid outbreak response

Currently there is a functional system for detection and control of Typhoid outbreaks in Afghanistan with some guiding instruments. At the same time there were several constrains identified regarding the response to outbreaks in general and typhoid outbreaks in particular; that can be attributed to:

- There is no universally accepted catchment population figures for health facilities due to accessibility issues and unavailability of proper referral system
- Improper planning due to lack of analysis and integration of different sources of epidemiological data,
- Limited access of MOPH staff in insecure areas
- Inadequate capacity of outbreak investigation amongst field staffs,
- Limited case management skills and facilities at the field level
- Poor and inconsistent integration of outbreak response plans into the BPHS planning combined with lack of clear strategy for resource mobilization.
- Insufficient intra and inter-sectoral coordination particularly to establish an effective integrated surveillance system

On the other hand poor living conditions of the communities with poverty, low literacy rate and insufficient community participation should also be considered as limitations for prevention and control of Typhoid outbreaks.

While we are appreciating the excellent job done by the health service providers who controlled the typhoid outbreaks in the past; we have to evaluate and strengthen the system as well.

In 2010 initiatives for strengthening the surveillance system were started with “road map for strengthening the system capacity to responds to outbreaks” and development of operational guidelines was defined as an integral part of this initiative aiming to provide a practical guiding document for the health managers and field health staff in Afghanistan.

This operational guideline is trying to strengthen the health system of Afghanistan to efficiently manage outbreaks of typhoid through pragmatic guidance to the health managers and field staff.

This might help us to prevent and efficiently control typhoid outbreaks in future.

1.4 Objectives of the operational guidelines for Typhoid outbreak response

- To briefly describe the basic facts, risks, burden and preventable nature, morbidity and mortality trends of Typhoid
- To operationally guide the outbreak investigation and early response teams to prepare, detect, report, verify, identify and response Typhoid outbreaks in time
- To improve the capacity of health service providers to efficiently
1.5 **Key facts of Typhoid**

- Typhoid is one of the endemic disease among the common outbreak prone diseases in Afghanistan, it could affect any healthy personal infected by salmonellae organism causing severe complications and naturally the disease lasts for more than 3 weeks with complications and high case fatality rate up to 10%; thus it needs early prevention and containment activities to reduce the overall burden.

- The disease could be prevented through maintenance of good personal hygiene, food handling procedures with water and sanitation standards among the communities by adopting simple cost effective procedures.

- The case fatality (current AFG CFR = ) could be easily reduced by proper case management of severe cases with necessary supply, technical preparedness and coordination during outbreaks and outbreaks.

- Even after recovery from typhoid or paratyphoid, a small number of individuals (carriers) continue to carry the bacteria and being the source of spread.

1.6 **Causative organism, clinical features and communicability of Typhoid**

Typhoid is a fecal-oral route infection caused by ingestion of food or water contaminated with the bacterium; salmonellae. The long 1-3 weeks **incubation period** of the
causative organism and prevalence of carrier state enhances the potentially endemic pattern of outbreaks.
The specific bacteria causing typhoid are Salmonella enteric; serotype Typhi, serotype Paratyphi A, B and C. It’s a disease spread from human carriers and in endemic areas typhoid fever is most common in school and preschool aged children. Mode of transmission is by contaminated food and water with faeces and urine of patients and carriers. Important vehicles include raw fruits, vegetables fertilized by night soil and eaten raw, contaminated milk and milk products usually by hands of carriers and missed cases. Flies may infect food in which the organism then multiplies to achieve an infective dose.

**Incubation period:**
The incubation period depends upon the size of the infecting dose from 3 days to three months with a usual range of 1-3 weeks. For paratyphoid fever it is as low as 1-10 days.

**Period of Communicability:** As long as bacilli appear in excreta, usually from the first week throughout convalescence; variable thereafter (commonly 1-2 weeks for parathyroid). About 10% of untreated typhoid fever patients will discharge bacilli for 3 months after onset of symptoms, and 2%-5% become permanent carriers.

**Clinical presentation**
The clinical presentation of typhoid fever varies from a mild illness with low-grade fever, malaise, and slight dry cough to a severe clinical picture with abdominal discomfort and multiple complications. Due to the peculiar nature of typhoid fever pattern; charting the temperature may help to make differential diagnosis from other common febrile illnesses.

**Acute non-complicated Typhoid:**
Acute typhoid fever is characterized by prolonged fever, disturbances of bowel function (constipation in adults, diarrhoea in children), headache, malaise and anorexia. Bronchitic cough is common in the early stage of the illness and 25% of patients show exanthem (rose spots), on the chest, abdomen and back.
**Complicated Typhoid:**
Acute typhoid fever may be severe. Depending on the clinical setting and the quality of available medical care, up to 10% of typhoid patients may develop serious complications. Since the gut-associated lymphoid tissue exhibits prominent pathology, the presence of occult blood is a common finding in the stool of 10-20% of patients, and up to 3% may have melena.

Intestinal perforation has also been reported in up to 3% of hospitalized cases. Abdominal discomfort develops and increases. It is often restricted to the right lower quadrant but may be diffuse. The symptoms and signs of intestinal perforation and peritonitis sometimes follow, accompanied by a sudden rise in pulse rate, hypotension, marked abdominal tenderness, rebound tenderness and guarding, and subsequent abdominal rigidity. A rising white blood cell count with a left shift and free air on abdominal radiographs are usually seen.

Altered mental status in typhoid patients has been associated with a high case-fatality rate. Such patients generally have delirium or obtundation, rarely with coma.

Typhoid meningitis, encephalomyelitis, Guillain-Barré syndrome, cranial or peripheral neuritis, and psychotic symptoms are some of rare presentations. Other serious complications documented with typhoid fever include haemorrhages (causing rapid death in some patients), hepatitis, myocarditis, pneumonia, disseminated intravascular coagulation, thrombocytopenia and haemolytic uraemic syndrome. Patients may also experience genitourinary tract manifestations or relapse, and/or a chronic carrier state may develop.

**Carrier state:**
15% of patients, depending on age, become chronic carriers harbouring S.typhi in the gallbladder.

1.7. **Risk factors that are facilitating typhoid outbreaks**

The mode of transmission of Typhoid is **fecal-oral** hence is closely linked to poor living conditions with inadequate water and sanitation management and improper food handling. Typical at-risk areas include peri-urban slums, where basic infrastructure is not available, as well as camps for internally displaced people or refugees, where minimum requirements of clean water and sanitation are not met.

The consequences of a disaster, such as disruption of water and sanitation systems, or the displacement of populations to inadequate and overcrowded camps can increase the risk of typhoid **transmission**. If the bacteria has been endemic in the new location or introduced via carrier, water or food sources; there will be outbreaks of Typhoid.

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2. **Guidelines for routine and emergency Typhoid surveillance**

Early detection of outbreaks with an efficient surveillance system is the corner stone of outbreak control. DEWS Afghanistan has a reasonable capacity to detect the outbreaks and Outbreaks at early with its regular reporting from sentinel sites. There is a
structure and trained staff to do analysis of the surveillance data and to start rapid response initiatives at provincial and national levels. Guidelines for routine surveillance and early warning of typhoid outbreaks could be expounded through sets of definitions, standards and procedures. The following sub topics try to guide us to understand the steps of surveillance activities, detection of outbreaks and control measures from the health facility to Provincial Health Directorate (PHD).

2.1. Case definition

For any surveillance system there should be a defined uniform case definition to detect the cases. The case definition for Typhoid in Afghanistan is defined by Disease Early Warning System as follow

Case definition for typhoid

Clinical case definition

Sudden onset of sustained fever, severe headache, and loss of appetite, constipation or sometimes diarrhea with relative bradycardia can be clinically considered as typhoid fever.

Severe forms can be presented with delirious state.

Strong clinical diagnosis is difficult in absence of laboratory confirmation, and it will take more than two weeks, so any clinical case should be considered relevantly and treated.

Confirmed case

The case confirmed by Isolation of S. typhi from blood or stool samples in laboratory.

2.2. Challenges of laboratory confirmation

Definitive diagnosis of typhoid fever depends on the isolation of Salmonella typhi from blood, bone marrow. Culture of blood yields positive results for 80%–90% of patients, if the sample is collected during the first week of illness, with diminishing yields as the disease progresses.

Culture of bone marrow often yields positive results and is advised only if blood culture results are negative or antibiotic treatment was begun before blood was obtained. Stool culture yields positive results for about half of patients with typhoid fever, but its diagnostic value is limited among residents of areas of endemicity for typhoid fever, because it may be difficult to distinguish acute infection from S. typhi stool carriers.

Widal’s serology is of essentially no value in testing the typhoid-immunized patient and has marginal utility among the unimmunized local population.

Figure: 1 Changing levels of antibodies produced during natural history of Typhoid

Operational guideline for typhoid outbreak response in Afghanistan
As per the above graph we can detect an active increase in IGM after two weeks of the onset of disease. Several studies shown that, the prevalence of salmonella antibodies among the endemic communities are as high as 1/160 titre. So two serum samples have to be collected at an interval of at least 10-14 days to demonstrate four-fold change in antibody titer.

### 2.3. Essential channels of surveillance data flow and response at field level

![Diagram of surveillance data flow and response channels]

The following guidelines give operational guides to the field staff from surveillance focal points and clinicians of health facilities to provincial emergency preparedness and early response committee.
2.4. **Guideline for surveillance focal points of sentinel sites and clinicians/primary health care service provider**

Objective: to ensure that, the quality data is produced and promptly notified from health facility

- Ensure that you and your team have clear understanding on case detection, notification and diagnosis of Typhoid based on the standard case definition above in 2.1
- Regularly maintain daily incidence data (among the cases attended to the health facility) of new case of typhoid on daily incidence charts and carefully observes the changes of case trends.

Be aware of *alert threshold* of Typhoid cases.

**Alert threshold for typhoid**

As typhoid is endemic in Afghanistan and particularly in some provinces; we have to maintain a mean curve for each surveillance location and increasing number of cases beyond the mean expected number of cases should be taken as alert threshold

**Example of alert threshold calculation**

Kandahar is one of the province frequently report more typhoid cases throughout the year and particularly high during summer. The data received from the DEWS Afghanistan is used here to calculate the trend of typhoid in Kandahar.

Table: 1 Number of typhoid cases reported by month from Kandahar 2008-2011

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
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<tr>
<td>Year 2011</td>
<td>857</td>
<td>472</td>
<td>446</td>
<td>424</td>
<td>424</td>
<td>471</td>
<td>957</td>
<td>571</td>
<td>499</td>
<td>635</td>
<td>405</td>
<td>553</td>
</tr>
<tr>
<td>Year 2010</td>
<td>553</td>
<td>359</td>
<td>469</td>
<td>592</td>
<td>846</td>
<td>623</td>
<td>858</td>
<td>447</td>
<td>346</td>
<td>651</td>
<td>363</td>
<td>493</td>
</tr>
<tr>
<td>Year 2009</td>
<td>483</td>
<td>405</td>
<td>515</td>
<td>570</td>
<td>853</td>
<td>775</td>
<td>732</td>
<td>855</td>
<td>671</td>
<td>725</td>
<td>425</td>
<td>415</td>
</tr>
<tr>
<td>Year 2008</td>
<td>142</td>
<td>158</td>
<td>321</td>
<td>322</td>
<td>541</td>
<td>492</td>
<td>549</td>
<td>731</td>
<td>386</td>
<td>567</td>
<td>615</td>
<td>227</td>
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<tr>
<td>Mean Value</td>
<td>509</td>
<td>349</td>
<td>438</td>
<td>477</td>
<td>666</td>
<td>590</td>
<td>774</td>
<td>651</td>
<td>476</td>
<td>645</td>
<td>452</td>
<td>422</td>
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The graph drawn from the mean value for the last four years is given below
Now the number of cases reported more than the trend curve at a particular week has to be taken as alert and the increasing number of cases by 50%. Although the number of cases is less than the expected cases according to the mean curve and if there is unusual increase of clustering of Typhoid cases from one or few villages; it should be taken as an outbreak.

For year 2012 January; >400 cases is an alert for Kandahar province during and more than 600 cases in January is an indicator of outbreak in Kandahar.

>600 cases is an alert in June and >900 cases is an indication of outbreak

- Be aware of importance of notification of suspected outbreaks based on the clinical case definition and or any positive but not confirmatory laboratory tests.
- Be familiar with notification modes, alert forms and weekly reporting forms

Annex: B1, 2&3 Daily AWD with dehydration incidence chart, Alert notification format and DEWS weekly reporting format

- If you observe clustering of clinically diagnosed typhoid cases; then notify to the provincial surveillance officer as early as possible (agency surveillance and outbreak control focal point / provincial outbreak investigation and early response team).

Annex-D updated details of provincial surveillance officers

- A hard copy of the notification form should be sent to the provincial surveillance officer as early as possible
- Also recheck and confirm that, the notification reached the surveillance officer
- Take blood samples from all clinical cases before giving any antibiotics and properly dispatch them for confirmatory bacteriology tests.
Samples
For culture and antibiotic sensitivity testing; samples of blood have to be taken within one week of onset of symptoms and prior to starting antibiotic therapy.

Size of samples
Blood sample collected by a venipuncture from school going children and adults (>6 years) should be 10-15ml for better result. 2-4ml blood sample from children less than 5 years is adequate for culture.

Collection Medium
A typical blood culture bottle contains 45 ml of tryptic soy broth or brain heart infusion broth. These are inoculated with 5 ml of fresh blood and incubated at 37°C.

Inoculation into the medium
Use the same syringe and needle to inoculate the blood into the medium. Use one standard 50ml sample collection container for each 5ml of blood.

Preservation and transport
The blood culture bottle should then be transported to the main laboratory at ambient temperature of 15°C to 40°C (it’s the room temperature range for Afghanistan) as early as possible (but it should be within 24 hours after inoculation).
2.5. Guideline for Provincial surveillance officer (DEWS/Contracted out agency)

Objective: To ensure efficient surveillance activities in the province in order to detect outbreaks in time

- Ensure as a Provincial surveillance officer, you are well capacitated with surveillance procedures, computerized analyzing techniques and sound knowledge on communicable disease control activities.
- Train all clinicians and surveillance focal points of the health facilities on case definition, health facility based new case recording, daily summarization and maintenance of daily new case summary chart and proper notification methods and also SOPs of sample collection and transport.
- Ensure all the tools and supplies (Updated Case definitions, Manuals, guidelines, Forms, Charts with mean trend curves for each year, records/registers, blood, stool, food and water sample collection containers and field water testing kits) for diagnosis, notification, sample testing and collection are available at each facility.
- Update them with on job trainings and regular mentoring during supervision visits.
- Ensure regular notifications are received from all facilities under the province, if not remind, visit and rectify the issues related to notification.
- Regularly compile the data collected from the surveillance focal points or the clinician or the health care provider of the health facilities and analyze (by time, place and person) to detect any alerts or outbreaks at provincial level.
- If any significant alerts are detected during data analysis; clearly verify the same from the source of data.
- Share the compiled data and weekly analysis reports and any alert notification with provincial emergency preparedness and response committee in time.
- Forward the same to MOPH in time as softcopy and all hard copies to be filed at provincial surveillance office.
- Take the lead and provide necessary technical guidance to the rapid outbreak investigation and early response team of the provincial emergency preparedness and response committee under the instruction of Provincial Health Director.

2.6. Guideline for Provincial Emergency (Health) Preparedness and Response Committee

Objective:

To assess and guide on enhanced surveillance case investigation and response of outbreaks

Once the Provincial surveillance officer shared the details (Time, place and person) of the suspected alert or outbreak with the provincial emergency response committee; it should call for a meeting and plan its activities with the following steps.

---

* Outbreak threshold can be determined by 50% increase of expected cases for the particular week according to the mean curve for the location. Or clustering of more than five cases in a week with two interrelated cases in a health facility.
• Deploy a pre trained Outbreak investigation and early response team (For the composition of the team; see Chapter 6) with necessary investigation tools and early response supplies to visit and investigate relevant sites (Health facility, households of the cases, food and water sources and waste management sites etc) to verify surveillance data and find out the source and nature of the alert or outbreak

• Get the weekly feedback from the Outbreak investigation and early response team and do an epidemiological analysis

• If the morbidity and mortality are on the rise; enhance the surveillance activities through mobilizing the available surveillance system and relevant control activities of outbreak investigation and early response team

• Update the MOPH regularly on progress

2.7. Guideline for outbreak investigation and early response team

**Objective:** To verify the outbreak, enhance surveillance and control the typhoid outbreaks

- The team should verify the alerts with the help of alert verification form and telephone conversations and also collect data from other relevant sources and clinicians.

Annex-E sample case investigation form

**Before visit** to the location for rapid assessment and response;

- be clear about the alert message
- Plan and collect all the contacts to be met and investigated
- Organize all necessary logistic arrangements including appropriate transport and communication facilities
- Prepare and take necessary investigation (forms, blood sample collection materials, water testing kits) and control materials with you (soap, water purification tablets, chlorine stock solution and a megaphone, necessary IEC materials, necessary medicine supplies for health facilities where there are no prepositions)

**During visit** to the suspected source of infection and households of the clinical cases and health facilities;

- In the health facility; examine the clinical cases, collect necessary information from cases, care takers or family members, villagers
- Collect evidence of water source, quality, sanitation facilities and food handling habits of the cases
- Collect blood samples from all clinical cases and send them for bacteriological test
- Collecting stool samples from suspected carriers or food handlers and food samples would help to find the source
- Collect water samples from their house hold water storage containers and water sources and do a field water test and if the field test is positive
for coliforms send another sample from the same source to central lab ASAP using standard procedures

- Treat all the water sources with >10 coliforms per 100ml water sample (TTC)\textsuperscript{11}, and temporarily close the suspected food outlets with poor sanitation and typhoid carriers as food handlers.
- Organize and train community based organizations on regular water treatment procedures and good food handling practices
- Provide health education and necessary hygiene promotion supplies, to the family members and neighbors who share the water source, food outlet and sanitation points (The details of prevention of spread are described in chapter-5)
- In the health facilities; check diagnostic criteria in use (case definition) and case management procedures (Details of case management procedures are mentioned in chapter-3)
- Also find out about any shortages of medical supplies and support the clinical teams with urgent supplies.

**After visit**, when you are back from the field

- Send the samples to the laboratory as early as possible and track the progress according to scheduled time period (Up to two weeks)
- Never suspend/await the outbreak response and control operations until receiving the lab results

From your findings; line list the cases according to the standard format given in annex B 3, summarize the relevant findings related to time place and person and identify the clustering of cases and sources

- Discuss the findings with the (provincial) emergency preparedness and response committee and make a preliminary decision until the laboratory report arrives.
- Send the feedback to the facility ASAP with instructions of standard case management, control measures with necessary supplies.
- Keep in touch with the facility and gather updated morbidity and mortality data and also implement an enhanced surveillance with the help of community based focal points/organizations with details needed for line listing

**During re-visit**

- Assist the facility to manage the cases
- Evaluate the community participation and hygiene promotion activities and tasks given earlier
- Plan and implement an intensive community hygiene promotion program which would help for enhanced surveillance as well

**Follow up**

- Once the laboratory confirmation is available and still the cases and complications are on rising trend; then the situation should be discussed with the provincial emergency response committee and expanded control measures should be taken by strengthening HR (bringing in public health experts and case management specialists) and supplies
3. GUIDELINES FOR MANAGEMENT OF TYPHOID PATIENTS

3.1. General management

Supportive measures are important in the management of typhoid fever, such as oral or intravenous hydration, the use of antipyretics, and appropriate nutritious semisolid or fluid diet to prevent overload to the digestive system and to reduce the complication of intestinal perforation. More than 90% of patients can be managed at home with oral antibiotics, reliable care and close medical follow-up for complications or failure to respond to therapy. However, patients with persistent vomiting, severe diarrhea and abdominal distension may require hospitalization and parenteral antibiotic therapy. Some severe cases might need blood transfusions as well.

3.2. Antibiotic therapy

- Efficacy, availability and cost are important criteria for the selection of first-line antibiotics to be used in developing countries.
- Therapeutic strategies for children, e.g. the choice of antibiotics, the dosage regimen and the duration of therapy, may differ from those for adults.
- The fluoroquinolones are widely regarded as optimal for the treatment of typhoid fever in adults. They are relatively inexpensive, well tolerated and more rapidly and reliably effective than the former first-line drugs, viz. chloramphenicol, ampicillin, amoxicillin and trimethoprim-sulfamethoxazole (Table 2).
- The fluoroquinolones attain excellent tissue penetration, kill S. typhi intracellular stationary stage in monocytes/macrophages and achieve higher active drug levels in the gall bladder than other drugs.
- They produce a rapid therapeutic response, i.e. clearance of fever and symptoms in three to five days, and very low rates of post-treatment carriage.
- Evidence from various settings in Asia indicates that the fluoroquinolones are equally effective in the treatment of typhoid fever in children however; the emergence of multi drug resistant strains has reduced the choice of antibiotics in many areas.
- Drug resistance have also been reported from the Indian subcontinent and Tajikistan and there are disturbing recent reports of the emergence of fluoroquinolone-resistant isolates in various parts of Asia.

Table 2 outlines the treatment strategies for uncomplicated typhoid

<table>
<thead>
<tr>
<th>Susceptibility</th>
<th>Antibiotic</th>
<th>Optimal therapy</th>
<th>Alternative effective drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily dose mg/kg</td>
<td>Days</td>
<td>Daily dose mg/kg</td>
</tr>
<tr>
<td>Fully sensitive</td>
<td>Fluoroquinolone</td>
<td>15</td>
<td>5-7(^a)</td>
</tr>
<tr>
<td></td>
<td>e.g. ofloxacin or</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ciprofloxacin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multidrug resistance</td>
<td>Fluoroquinolone</td>
<td>15</td>
<td>5-7</td>
</tr>
<tr>
<td></td>
<td>or cefixime</td>
<td></td>
<td>7-14</td>
</tr>
<tr>
<td>Quinolone resistance</td>
<td>Azithromycin or</td>
<td>8-10</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>ceftriaxone</td>
<td>75</td>
<td>10-14</td>
</tr>
</tbody>
</table>

\(^a\) Three-day courses are also effective and are particularly so in epidemic containment.
The optimum treatment for quinolone-resistant typhoid fever has not been determined. Azithromycin, the third-generation cephalosporins, or a 10-14 day course of high-dose fluoroquinolones, is effective. Combinations of these are now being evaluated.

- The available fluoroquinolones (ofloxacin, ciprofloxacin, fleroxacin, perfloxacin) are highly active and equivalent in efficacy (with the exception of norfloxacin which has inadequate oral bioavailability and should not be used in typhoid fever).
- The fluoroquinolone drugs are generally very well tolerated. However, in some countries the use of fluoroquinolones is relatively contraindicated in children (under 12 years) because of concerns that they may cause articular damage.
- These agents are not registered for routine use in children (under 12 years of age). Their considerable benefits, particularly in areas where there are no affordable oral alternatives, outweigh the putative risk. The only known articular side effect is Achilles tendon rupture in patients who are also taking corticosteroids, and this has been reported rarely.
- Ciprofloxacin, ofloxacin, perfloxacin and fleroxacin have generally proved effective. In recent years, however, there have been many reports of reduced susceptibility and treatment failure for ciprofloxacin. No evidence of toxicity and impact on growth has been described in children with typhoid who have received ciprofloxacin.
- For nalidixic-acid-sensitive *S. typhi*, seven-day regimens have proved highly effective. Courses of treatment of three and five days have also proved highly effective against nalidixic-acid-sensitive strains. These very short courses are best reserved for outbreaks when antibiotics are in short supply.
- Chloramphenicol, despite the risk of agranulocytosis in 1 per 10,000 patients, is still widely prescribed in developing countries for the treatment of typhoid fever. *S. typhi* strains from many areas of the world, e.g. most countries in Africa and Asia, remain sensitive to this drug and it is widely available in most primary care settings in developing countries for the treatment of pneumonia. The disadvantages of using chloramphenicol include a relatively high rate of relapse (5-7%), long treatment courses (14 days) and the frequent development of a carrier state in adults. The recommended dosage is 50-75 mg per kg per day for 14 days divided into four doses per day, or for at least five to seven days after defervescence.
- The usual adult dose is 500 mg given four times a day. Oral administration gives slightly greater bioavailability than intramuscular (i.m.) or intravenous (i.v.) administration of the succinate salt.
- Ampicillin and amoxicillin are used at 50 to 100 mg per kg per day orally, i.m. or i.v., divided into three or four doses. No benefit has been reported to result from the addition of clavulanic acid to amoxicillin.
- Trimethoprim-sulfamethoxazole, (TMP-SMZ) can be used orally or i.v. in adults at a dose of 160 mg TMP plus 800 mg SMZ twice daily or in children at 4 mg TMP per kg and 20 mg SMZ per kg for 14 days.
- Of the third-generation cephalosporins, oral cefixime (15-20 mg per kg per day for adults, 100-200 mg twice daily) has been widely used in children in a variety of geographical settings and found to be satisfactory.
- Other agents, e.g. cefodoxime, have proved successful against typhoid fever. Because of the rising rates of quinolone resistance there is a clear need to identify improved strategies for treating MDR typhoid in childhood.
- Recent data on the use of azithromycin in children indicate that it may be safely given as an alternative agent for the treatment of uncomplicated typhoid fever. Azithromycin in a dose of 500 mg (10 mg/kg) given once daily for seven days has
proved effective in the treatment of typhoid fever in adults and children with defervescence times similar to those reported for chloramphenicol. A dose of 1 g per day for five days was also effective in adults.

- If intravenous antibiotics are required, i.v. cephalosporins can be given in the following doses:

  - ceftriaxone, 50-75 mg per kg per day (2-4 g per day for adults) in one or two doses
  - cefotaxime, 40-80 mg per kg per day (2-4 g per day for adults) in two or three doses
  - cefoperazone, 50-100 mg per kg per day (2-4 g per day for adults) in two doses
  - Ciprofloxacin, ofloxacin and pefloxacin are also available for i.v. use.
  - There are few data on the treatment of typhoid in pregnancy. The beta-lactams are considered safe. There has been several case reports of the successful use of fluoroquinolones but these have generally not been recommended in pregnancy because of safety concerns. Ampicillin is safe in pregnant or nursing women, as is ceftriaxone in such women with severe or MDR disease. Although there are no data indicating that azithromycin is unsafe for pregnant or nursing women, alternatives should be used if available.
  - Knowledge of the antibiotic sensitivity of the infecting strain is crucial in determining drug choice. If no culture is available knowledge of likely sensitivity as indicated by the available national data may be useful.
  - Always check the updated national advice based on antibiotic sensitivity test.

### 3.3. Management of complications of Typhoid

Both outpatients and inpatients with typhoid fever should be closely monitored for the development of complications. Timely intervention can prevent or reduce morbidity and mortality. The parenteral fluoroquinolones are probably the antibiotics of choice for severe infections. In severe typhoid the fluoroquinolones are given for a minimum of 10 days (Table 3).

Typhoid fever patients with changes in mental status, characterized by delirium, obtundation or dull and stupor, should be immediately evaluated for meningitis by examination of the cerebrospinal fluid. If the findings are normal and typhoid meningitis is suspected, adults and children should immediately be treated with high-dose intravenous dexamethasone in addition to antimicrobials. If dexamethasone is given in an initial dose of 3 mg/kg by slow i.v. infusion over 30 minutes and if, after six hours, 1 mg/kg is administered and subsequently repeated at six-hourly intervals on seven further occasions, mortality can be reduced by some 80-90% in these high-risk patients. Hydrocortisone in a lower dose is not effective. High-dose steroid treatment can be given before the results of typhoid blood cultures are available if other causes of severe disease are unlikely.
### Table: 3 Management of severe Typhoid fever

<table>
<thead>
<tr>
<th>Susceptibility</th>
<th>Optimal parenteral drug</th>
<th>Alternative effective parenteral drug</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Antibiotic</td>
<td>Antibiotic</td>
</tr>
<tr>
<td>Fully sensitive</td>
<td>Fluoroquinolone e.g. ofloxacin</td>
<td>Chloramphenicol Amoxicillin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TMP-SMX</td>
</tr>
<tr>
<td>Multidrug resistant</td>
<td>Fluoroquinolone</td>
<td>Ceftriaxone or cefotaxime</td>
</tr>
<tr>
<td>Quinolone resistant</td>
<td>Ceftriaxone or cefotaxime</td>
<td>Fluoroquinolone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patients with intestinal haemorrhage need intensive care, monitoring and blood transfusion. Intervention is not needed unless there is significant blood loss. Surgical consultation for suspected intestinal perforation is indicated. If perforation is confirmed, surgical repair should not be delayed longer than six hours. Metronidazole and gentamicin or ceftriazone should be administered before and after surgery if a fluoroquinolone is not being used to treat leakage of intestinal bacteria into the abdominal cavity. Early intervention is crucial, and mortality rates increase as the delay between perforation and surgery lengthens. Mortality rates vary between 10% and 32%.

Relapses involving acute illness occur in 5-20% of typhoid fever cases that have apparently been treated successfully. A relapse is heralded by the return of fever soon after the completion of antibiotic treatment. The clinical manifestation is frequently milder than the initial illness. Cultures should be obtained and standard treatment should be administered. In the event of a relapse the absence of schistosomiasis should be confirmed.

### 3.4 Management of carriers

An individual is considered to be a chronic carrier if he or she is asymptomatic and continues to have positive stool or rectal swab cultures for *S. typhi* a year following recovery from acute illness. Overall, some 1-5% of typhoid fever patients become chronic carriers. The rate of carriage is slightly higher among female patients, patients older than 50 years, and patients with cholelithiasis or schistosomiasis. If cholelithiasis or schistosomiasis is present the patient probably requires cholecystectomy or antiparasitic medication in addition to antibiotics in order to achieve bacteriological cure.

In order to eradicate *S. typhi* carriage, and relapse; amoxicillin or ampicillin (100 mg per kg per day) plus probenecid (Benemid®) (1 g orally or 23 mg per kg for children) or TMP-SMZ (160 to 800 mg twice daily) is administered for six weeks; about 60% of persons treated with either regimen can be expected to have negative cultures on follow-up. Clearance of up to 80% of chronic carriers can be achieved with the administration of 750 mg of ciprofloxacin twice daily for 28 days or 400 mg of norfloxacin. Other quinolone drugs may yield similar results.
Carriers should be excluded from any activities involving food preparation and serving, neonatal and pediatric care as should convalescent patients and any persons with possible symptoms of typhoid fever. Although it would be difficult for typhoid carriers in developing countries to follow this recommendation, food handlers should not resume their duties until they have had three negative stool cultures at least one month apart. Vi antibody (Salmonella typhi capsular polysaccharide) determination has been used as a screening technique to identify carriers among food handlers and in outbreak investigations. Vi antibodies are very high in chronic *S. typhi* carriers.
4. PREVENTION AND CONTROL OF TYPHOID OUTBREAK AT COMMUNITY LEVEL

Typhoid is a fecal - orally transmitted disease. The figure 2 here describes the F-diagram\textsuperscript{12} of disease transmission and control elaborated by Wagner & Lanoix, which would simply describe the ways of prevention of the spread of Typhoid.

**The F-diagram of disease transmission and control (after Wagner & Lanoix)**

![F-diagram image]

Spread of fecal-oral transmission could be simply prevented by blocking the above transmission routes. The following sub topics describe the control of spread of typhoid at community level.

**How Typhoid is spread**

![How Typhoid is spread image]
4.1. Safe disposal of human waste

The first and foremost important way of fecal-oral route transmission control is proper disposal of feces. This could be achieved by,

- Using proper construction use and maintenance of latrines.

See annex J

- In case there is no standard latrines; public has to be advised to select a suitable plateau area minimum 50 meter away from the water source and dump the fecal matter beyond 30cm/1feet depth under the ground
- We can also advise the public to use trench latrines prepared in similar location and use soil or ash or lime to cover the fecal matter on daily basis

4.2. Ensure proper hand washing habit

Proper hand washing habit and techniques are the next most important intervention to prevent contamination of Feces, vomit, other soft waste and dead bodies of diseased to fingers of adults and children who live in the house hold or in the neighborhood. The simple act of washing hands with soap at critical moments – such as after using the toilet or before handling food – is an easy and affordable intervention that can reduce the incidence of diarrhoea among children under five by almost 50 per cent\(^{13}\)

The ideal way of proper hand washing can be done if there is running water system (either piped or container with tap) with controlling valves and antiseptic soaps
But it can be adopted in any situation with availability of reasonably clean water, any soap or ash or any traditionally used and scientifically acceptable cleaning agent.

**Steps to encourage hand washing habit among the community**

- First of all every one should be aware of germs/organisms
- Then they should be aware of Typhoid and other important and fatal fecal orally transmitted organisms
- They should be aware that, the final route of contamination of these organisms to the food is hand (In Afghani context)
- They should be informed that, hands are the dirtiest part of the body that touch every where and get contaminated
- They should be informed that, the dangerous organisms can contaminate their hands from the fecal matter, from soil, contaminated water and environment and wastes of a diseased person
- So they have to properly wash their hands with soap/ash/any locally used and effective cleaning agent ,
- after defecation and cleaning of the anus of a person him/her self and after cleaning a child
- Before eating/drinking any food/drink item by hand (particularly drinking water/any drinks from a hand pump/tap/bucket using the hands as a scoop)
- Before cooking
- Before feeding the children
- Always after play (particularly in grounds/soil)
- Always after contamination of any dirt or handling the items left open in the environment (particularly in public places)

While people are washing their hands; most contaminated portions of hands are missed. Taylor (1978) identified that 89% of the hand surface was missed and that the areas of the hands most often missed were the finger-tips, finger-webs, the palms and the thumbs.
So understanding and spreading of messages on proper hand washing technique is much important than simply advice the people to wash their hands.

**Proper hand washing procedures**

- Always use clean water for washing your hands, (the good and cheap way of ensuring clean water for washing purpose is chlorination see table: 5 for water purification)
- Wet and wash your hands with clean water
- Then always use soap or any locally accepted relevant detergent agent to enhance the effect of hand washing
- Thoroughly apply the hand washing agent to all the surface of hand
- Scrub all the surfaces, particularly tips, webs and mid palm using the other hand or using locally available and clean scrubs/brush
- Thoroughly wash your hands again with clean water and dry up with a clean and dry towel/cloth or let it to dry under air

**4.3. Water safety at household and community level**

Water safety or prevention of contamination of water/Drinking water becomes an issue in developing countries, due to lack of sanitation, personal hygiene and water quality.
Water quality depends on water source safety, collection mechanism, storage and handling practice.

Simple techniques for treating water at home and storing it in safe containers could save huge number of lives each year. Recent evidence suggests that “point-of-use” water quality improvements alone result in a one-third or greater reduction in diarrheal disease morbidity.

In most of the developing countries there are few standard public water supply systems operated particularly in townships. Public are not in a situation to develop and maintain safe water collection and supply schemes due to poverty, ignorance and giving low priority. Majority of the public are rely on public water points or wells, rivers, streams, ponds or private wells as their water source.

See annex I for optimum chlorine dose calculation and chlorination of wells.

Therefore they might face all the problems of water quality. This issue could be addressed by efficient community awareness programs and community based water supply and management schemes. But at household level follow the following steps to ensure drinking safe water:

- Identify and use clean water source
- Do not drink any untreated water
- Use regularly cleaned containers for water collection and storage
- Use detergents or chlorine or locally accepted safe and effective substance for cleaning the containers
- Once the water is collected and brought to home; leave the water undisturbed for more than two hours for sedimentation (Overnight sedimentation is better)
- Filter the water through clean cloth/filter or through any accepted filtering mechanism
- Then treat the water under Sun (UV treatment) or boil it or treat with appropriate chemical (Chlorine tablets or solution)
- Store the amount of water needed for 48hrs in a clean container with lid and a simple dispensing valve or small dispensing hole
- Always properly wash hands before handling the drinking water
- Follow the same steps every day

Proper waste management at household and community levels

- Control of breeding of flies is the effective way to prevent contamination and breeding of flies on the human waste and other domestic wastes
- For that we have to properly collect and cover until disposal of the wastes
- In addition to proper human waste management; proper household solid and water waste management would prevent breeding of flies
• Covering the food with fly proof lids and covering all ventilation routes with fly proof net would prevent contact of the flies with the food.

4.4. Domestic waste management and fly control

• Flies are easily bred from wet domestic wastes.
• Any wet organic waste left open for more than 24 hours will become a breeding place for house flies.
• So all the organic wet, solid wastes should be kept in perfectly closed bins and disposed on daily basis (Dumping).
• Special care to be taken about proper disposal of any domestic animal waste (Daily collection and dumping).
• All the waste water from the kitchen and dining area should be collected in a container and disposed in a covered soakage pit or directed into a covered soakage pit.
• Waste water from bathing area and hand washing area also has to be directed into a covered soakage area.
The same principles have to be followed at community level to control the breeding of flies, and to control the contamination of flies with dirt and food.

4.5. Safe food handling, storage and consumption

To ensure the food safety; care must be taken on food handling and consumption habits at household and community level. The following practices would reduce the contamination of the food with Typhoid organism during outbreaks:

• Avoid salads during the outbreaks or Outbreaks of typhoid.
• Avoid aquatic food item during outbreaks or Outbreaks of Typhoid, or take high precaution, clean well and cook well before eating.
• Ensure all the refrigerated food preparations are prepared with clean water.
• All raw vegetables, greens, fruits, and meat of fish must have cleaned with clean and safe water and appropriately covered by a transparent cover to display.
• All sweets and ready to eat preparations should be well covered and displayed for sale.
• Wash the ingredients, cooking utensils and hands well with clean water before starting to cook.
• All food vendors must prepare only the amount of food they can market per each food session, If they keep for long time they have to keep it in a food warmer or refrigerator.
• Eat thoroughly cooked foods only, eat fresh and well cooked food while it’s warm.
• While storing or refrigeration the food items never mix the cooked and non cooked items together.
• Wash and peel off the skin of the fruits before eat them.
• After cooking and while keeping the food outside/ on dining table/mat or in a display area in a restaurant/ cafeteria; keep them in well covered (transparent) containers.
• Every time before handling the food; thoroughly wash hands with soap and water.
• Use clean serving and eating utensils to handle the food.

4.6. Health education and behavioral change
Behavior is the way in which a person behaves in response to a particular situation or living environment. This is determined by several factors, among them preemptive perception of the situation and the sense of experience are much influential. If we wanted to make aware of water and sanitation we have to spread the knowledge of water and sanitation through simple and culturally acceptable mode or media.

- This can be made through child hood or community education or dramas, songs or posters and Media programs and announcements.
- Once the knowledge is repeatedly spread through appropriate Medias among the community it will process into attitude change in the community.
- If the environment is conducive for practicing the knowledge it would make a change in their practice and behavior. (E.g. Outbreaks of diseases and adequate supply of water and soap might improve the hand washing habit)
- Children, women and sensible community members will follow the practice first, and ultimately majority will adopt the healthy habits

To encourage the community on waste disposal, hand washing and water safety; we have select some very important messages and formulate them into attractive messages/posters/songs/dramas and publish among right people at right time.

**Right message** through **right media** at **right place** among **right people** at **right time** will make a **reasonable behavioral change**

4.7. **Use of Typhoid vaccine during outbreaks to enhance immunity and reduce infectivity**

**Currently available vaccines**

The old parenteral killed whole-cell vaccine was effective but produced strong side-effects because of (Lipopolysaccharide) LPS. Two safe and effective vaccines are now licensed and available. One is based on defined subunit antigens, the other on whole-cell live attenuated bacteria.

The first of these vaccines, containing Vi polysaccharide, is given in a single dose subcutaneous or IM Protection begins seven days after injection, maximum protection being reached 28 days after injection when the highest antibody concentration is obtained.

The vaccine is approved for persons aged over two years. Revaccination is recommended every three years for people from non endemic regions

**NB:** Vaccinated people with Vi can be differentiated from S. typhi carriers because of the higher level of Vi antibodies in the carriers.

The live oral vaccine Ty2la is available in enteric-coated capsule or liquid formulation. It should be taken in three doses two days apart on an empty stomach. It elicits protection as from 10-14 days after the third dose. It is approved for use in children aged at least 5 years. Travelers should be revaccinated annually. The protective efficacy of the enteric-coated capsule formulation is seven years after the last dose and is still 62% in areas where the disease is endemic; the corresponding figure for the liquid formulation is 70%.

**Antibiotics should be avoided for seven days before or after the immunization series.**
5. COORDINATION AND MANAGEMENT OF TYPHOID OUTBREAKS

5.1. Management and coordination structures and governance
Under the current coordination system in Afghanistan; Typhoid outbreaks within the provinces could be managed by provincial emergency response and preparedness committee.
The organizational structure of national, provincial and field level outbreak control task force is described here with two way communication (command and feed back) channels this would prevent duplication of commands and feedbacks during outbreaks in figure 3.

Legend: — Command line, — communication line
Members of the National and Provincial emergency response committee, and Outbreak investigation and early response team are summarized in table 4.

Table: 4

<table>
<thead>
<tr>
<th>Position</th>
<th>National emergency response and preparedness commission</th>
<th>Provincial emergency response and preparedness committee</th>
<th>Outbreak investigation and early response team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman</td>
<td>Deputy minister of health</td>
<td>Director of Provincial Health Department</td>
<td>DEWS/ CDC officer</td>
</tr>
<tr>
<td>Committee members</td>
<td>ERP directorate</td>
<td>Provincial DEWS officer or CDC officer</td>
<td>One Medical doctor from the health facility</td>
</tr>
<tr>
<td>Director of DEWS</td>
<td>NGOs (BPHS implementer)</td>
<td>One Nurse from HF</td>
<td></td>
</tr>
<tr>
<td>Preventive medicine directorate</td>
<td>UNICEF</td>
<td>One Lab technician</td>
<td></td>
</tr>
<tr>
<td>Curative medicine directorate</td>
<td>WHO (regional health coordinator, regional health cluster coordinator or provincial polio officer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relevant units of WHO/UNICEF and NGOs</td>
<td>ARCS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RRD and other related ministries</td>
<td>RRD and other related directorate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.2. Steps of outbreak response

- Rapid assessment and reporting by the outbreak investigation and early response team
  For the assessment, use the standard rapid assessment tool and gather the necessary information from appropriate sources.
  Particularly relevant information about all the clinical or confirmed typhoid cases from the health facility and then detailed case history from the cases and their contact is important to detect the affected persons, place, time of onset and the source of infection
- Identify the constrains and shortages regarding management of the cases (including transportation, human resource and their capacity and supplies)
- Analyze the situation, Identify who, where, when and how affected by the outbreak and prioritize necessary interventions and immediate support needed
- Reinforce the response team with necessary, leadership, HR with specific TORs and supplies (Adequate prepositioning of Typhoid kits) and logistic support
- Define a target and timeline for the intervention
- Implement the plan with close monitoring
- Regular review of interventions and outcome (preferably daily for Typhoid outbreak control) with a response matrix update

Sample emergency response committee management response matrix

<table>
<thead>
<tr>
<th>Recommendations of the Rapid assessment</th>
<th>ERC's comments/amendments</th>
<th>Action to be taken</th>
<th>Responsible person/unit</th>
<th>Resources needed and provided</th>
<th>Time frame</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommendation 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Communicate the updates and outcome of the outbreak control activities to the higher authorities and the public through appropriate channels

NB:

You can find a simulation exercise of a practical typhoid outbreak control activity in Chapter 6 of training module for typhoid outbreak control 2012
6. **Post outbreak activities**

6.1. **Continuation of enhanced surveillance and health awareness activities**  
It’s mandatory to continue the enhanced surveillance until complete control of outbreak. The health awareness creating teams should continue to make awareness among the community on control of transmission of Typhoid.

6.2. **Actions to be taken from the lessons learned**  
Once the outbreak is under control we have to review all our activities under each management level and consolidate information about constrains faced by our teams and gaps they observed at the field level. The constrains and gaps should be thoroughly discussed by technical teams and means of preventing such constrains and filling the gaps should be identified and recommendation to be given to the appropriate authorities dealing with such outbreaks in future.

The gaps and weakness of resources should be identified and capacity building programs should be prioritized to successfully face outbreaks in future.

The lessons learned could be used to establish a better outbreak control mechanism in country as well as in countries under similar context.

The identified gaps and recommendations could be used to bring the focus of the donors towards the practical constrains and gaps and plan a better outbreak control mechanism in future.

Long term plans should be developed from the lessons learned, particularly to improve healthy living standards in Typhoid outbreak prone areas with better water and sanitation standards.

Based on the practical legal issues, recommendations to be made to strengthen the current legislation and regulation of food handling establishments/vendors with regular implementation mechanism.

Continue with regular evaluations and strengthen surveillance, prevention, preparedness and control mechanism,
## Annex A: Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>age specific attack rate</td>
<td>The proportion of an age group in a study population that experiences the outcome under study over a given period</td>
</tr>
<tr>
<td>Alert threshold</td>
<td>A pre-determined number of reported cases or a reported incidence rate of a disease, above which the situation is defined as an alert. It can be differ depending on the context of the disease burden of the location</td>
</tr>
<tr>
<td>Attack rate</td>
<td>The proportion of a group that experiences the outcome under study over a given period</td>
</tr>
<tr>
<td>Case definition</td>
<td>A set of criteria (not necessarily diagnostic criteria) that must be fulfilled in order to identify a person as representing a case of a particular disease</td>
</tr>
<tr>
<td>Case fatality rate</td>
<td>The proportion of cases of a specified condition that is fatal within a specified time. Case fatality rate = number of deaths from a disease(in a given period)X 100% number of diagnosed cases of that disease(in same period)</td>
</tr>
<tr>
<td>clustering</td>
<td>A closely grouped series of events or cases of a disease or other health-related phenomena with well-defined distribution patterns in relation to time or place or both</td>
</tr>
<tr>
<td>Codan unit</td>
<td>A wireless communication system used in Afghanistan for communicating daily health emergency information from provinces to central health department</td>
</tr>
<tr>
<td>Complex emergency</td>
<td>situations of war or civil strife affecting large civilian populations with food shortages and population displacement, resulting in excess mortality and morbidity</td>
</tr>
<tr>
<td>Contagious</td>
<td>A disease spread by direct or indirect contact of people or organisms</td>
</tr>
<tr>
<td>Contracted out</td>
<td>Arrange for work to be done by another organization.</td>
</tr>
<tr>
<td>Electrolyte abnormalities</td>
<td></td>
</tr>
<tr>
<td>Encephalitis</td>
<td>Inflammation of the brain.</td>
</tr>
<tr>
<td>Endemic disease</td>
<td>The constant presence of a disease or infectious agent within a given geographic area or population group</td>
</tr>
<tr>
<td>Epidemic</td>
<td>The occurrence of an illness or cases, specific health-related behavior, or other health-related events in a community or region of clearly in excess of normal expectancy</td>
</tr>
<tr>
<td>epidemiology</td>
<td>The study of the occurrence and distribution of health-related states or events in specified populations, including the study of the determinants influencing such states, and the application of this knowledge to control the health problems</td>
</tr>
<tr>
<td>Incidence</td>
<td>The number of instances of illness commencing, or of persons falling ill, during a given period in a specified population</td>
</tr>
<tr>
<td>incidence rate</td>
<td>The rate at which new events occur in a population. The numerator is the number of new events that occur in a defined period or other physical span</td>
</tr>
<tr>
<td><strong>Incubation period</strong></td>
<td>The time interval between invasion by an infectious agent and appearance of the first sign or symptom of the disease in question</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>index case</strong></td>
<td>The first case in a family or other defined group to come to the attention of the investigator</td>
</tr>
<tr>
<td><strong>Infectivity</strong></td>
<td>The characteristic of the disease agent that embodies capability to enter, survive, and multiply in the host</td>
</tr>
<tr>
<td><strong>Informal information</strong></td>
<td>Facts from an informal source that have not been arranged and/or transformed to provide the basis for interpretation</td>
</tr>
<tr>
<td><strong>Morbidity</strong></td>
<td>A measure of a sickness measured by the number of affected person, the illnesses experienced by the persons and the duration of the illness</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>numbers of deaths and/or rates by age, sex, cause, and sometimes other variables</td>
</tr>
<tr>
<td><strong>Notifiable diseases</strong></td>
<td>A disease deemed of sufficient importance to the public health to require that its occurrence be reported to health authorities</td>
</tr>
<tr>
<td><strong>Outbreak</strong></td>
<td>An epidemic limited to localized increase in the incidence of a disease, e.g. in a village, town, or closed institution;</td>
</tr>
<tr>
<td><strong>Outbreak investigation</strong></td>
<td>The investigation procedure undertaken by trained staffs to detect the persons, time, place and source of the outbreak in order to implement an effective control mechanism</td>
</tr>
<tr>
<td><strong>outbreak threshold</strong></td>
<td>The outbreak threshold is a pre-determined number of reported measles cases or a reported incidence rate above which the situation is defined as an outbreak</td>
</tr>
<tr>
<td><strong>Prevalence</strong></td>
<td>A measure of disease occurrence: the total number of individuals who have an attribute or disease at a particular time (it may be a particular period) divided by the population at risk of having the attribute or disease at that time or midway through the period</td>
</tr>
<tr>
<td><strong>secondary cases</strong></td>
<td>The number of cases of an infection that occur among contacts within the incubation period following exposure to a primary case</td>
</tr>
<tr>
<td><strong>Sentinel surveillance</strong></td>
<td>Surveillance based on selected population samples chosen to represent the relevant experience of particular groups</td>
</tr>
<tr>
<td><strong>Surveillance</strong></td>
<td>Systematic and continuous collection, analysis, and interpretation of data, closely integrated with the timely and coherent dissemination of the results and assessment to those who have the right to know so that action can be taken</td>
</tr>
<tr>
<td><strong>Surveillance focal point</strong></td>
<td>The person assigned to do the surveillance activity within an area or an institution</td>
</tr>
<tr>
<td><strong>Transmission</strong></td>
<td>Any mechanism by which an (infectious) agent is spread from a source or reservoir to another person</td>
</tr>
</tbody>
</table>
### Annex B1: Sample Typhoid incidence chart

**Daily Typhoid incidence chart**

**Month_______ Year_______**

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

### Annex B2: Sample Alert notification form

Date: ____________  Region_________________  Province_____________________

District___________________  Health Facility/camp__________________________

Name of focal point_________________  Contact number_____________________

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Age</th>
<th>Sex</th>
<th>Address</th>
<th>Complaints/sig. and symptoms</th>
<th>Suspected disease</th>
<th>Date of onset</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
### Surveillance Reporting Form for Morbidity (Diseases) and Mortality (death)

**Annex B3:** DEWS Weekly reporting format

Surveillance Reporting Form for Morbidity (Diseases) and Mortality (death)  
Bring to PHD office on every Saturday

<table>
<thead>
<tr>
<th>Province Name/Code:</th>
<th>District Name/Code:</th>
<th>Town/Village/Camp:</th>
<th>Facility Name/Code:</th>
<th>NGO/Donor:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Epidemiological Week** from Saturday: ____/____/2013 to Friday____/____/2013

**Contact’s Name & phone #:** …………

<table>
<thead>
<tr>
<th>Events Under Surveillance</th>
<th>Male/Less than 5 years old</th>
<th>Female/Less than 5 years old</th>
<th>Male/ 5 years old and over</th>
<th>Female/ 5 years old and over</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Deaths</td>
<td>Cases</td>
<td>Deaths</td>
</tr>
<tr>
<td>1</td>
<td></td>
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</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Operational guidelines for Typhoid outbreak response in Afghanistan
Pregnancy-related deaths

DEWS Disease

TOTAL New Clients/ Deaths

- Please include only those cases that were examined / admitted during the surveillance week and deaths that occurred during the surveillance week. Each case should be counted only once.
- Write “0” (zero) if you had no case or death of any of the Health Events listed in the form.
- Deaths should be reported only under “Deaths”, NOT under “Cases”, and please fill the following **table for each reported death**.

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Name</th>
<th>Age</th>
<th>Sex</th>
<th>Cause</th>
<th>Residence/ Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Investigate with history and lab specimen single cases of suspected avian influenza, typhoid, measles, pertussis, diphtheria, AFP, meningitis and hemorrhagic fever and search for other cases. Similarly, investigate clusters of pneumonia, bloody diarrhea, hepatitis, malaria, and typhoid and increasing trends of ARI and diarrhea.
Annex D: Surveillance focal points by Regions, Provinces and Districts (To be updated)

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Post Title</th>
<th>Region</th>
<th>Contact No</th>
<th>E-Mail Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dr. Bashir Noormal</td>
<td>General Director ANPHI</td>
<td>National</td>
<td>700281134</td>
<td><a href="mailto:noormalb@yahoo.com">noormalb@yahoo.com</a></td>
</tr>
<tr>
<td>2</td>
<td>Dr. Mir Islam Sayed</td>
<td>Surveillance/DEWS Director</td>
<td>National</td>
<td>700290955</td>
<td><a href="mailto:km_islam2001@yahoo.com">km_islam2001@yahoo.com</a></td>
</tr>
<tr>
<td>3</td>
<td>Dr. Naqibullah Ziar</td>
<td>Deputy Surveillance Director</td>
<td>National</td>
<td>799001491</td>
<td><a href="mailto:nziarhaleem@gmail.com">nziarhaleem@gmail.com</a></td>
</tr>
<tr>
<td>4</td>
<td>Dr. Mohammad Nadir SAHAK</td>
<td>National professional officer</td>
<td>National</td>
<td>708892177</td>
<td><a href="mailto:sahakm@who.int">sahakm@who.int</a></td>
</tr>
<tr>
<td>5</td>
<td>Dr. Ahmad Farid Ghiasi</td>
<td>National professional officer</td>
<td>National</td>
<td>700602174</td>
<td><a href="mailto:ghiasia@afg.emro.who.int">ghiasia@afg.emro.who.int</a></td>
</tr>
<tr>
<td>6</td>
<td>Dr. Nawid Musarat</td>
<td>Regional DEWS Coordinator</td>
<td>Center</td>
<td>799413160</td>
<td><a href="mailto:nawidmusarat@gmail.com">nawidmusarat@gmail.com</a></td>
</tr>
<tr>
<td>7</td>
<td>Dr. Aimal Alkozai</td>
<td>Regional DEWS Coordinator</td>
<td>East</td>
<td>700606303</td>
<td><a href="mailto:aimal.alkozai@gmail.com">aimal.alkozai@gmail.com</a></td>
</tr>
<tr>
<td>8</td>
<td>Dr. Naeem Rahimi</td>
<td>Regional DEWS Coordinator</td>
<td>North</td>
<td>789469 627</td>
<td><a href="mailto:dews.northregion@gmail.com">dews.northregion@gmail.com</a></td>
</tr>
<tr>
<td>9</td>
<td>Dr. Mohd Sarwar Firozi</td>
<td>Regional DEWS Coordinator</td>
<td>South</td>
<td>703009008</td>
<td><a href="mailto:sarwarfirozi@gmail.com">sarwarfirozi@gmail.com</a></td>
</tr>
<tr>
<td>10</td>
<td>Dr. Zarif Ahmad Akbaryan</td>
<td>Regional DEWS Coordinator</td>
<td>West</td>
<td>783734350</td>
<td><a href="mailto:dews.westregion@gmail.com">dews.westregion@gmail.com</a></td>
</tr>
<tr>
<td>11</td>
<td>Dr. M. Afzal Khosti</td>
<td>Regional DEWS Coordinator</td>
<td>Southeast</td>
<td>700933102</td>
<td><a href="mailto:dews.southeastregion@gmail.com">dews.southeastregion@gmail.com</a></td>
</tr>
<tr>
<td>12</td>
<td>Dr. Salim Saha</td>
<td>Regional DEWS Coordinator</td>
<td>Northeast</td>
<td>797367387</td>
<td><a href="mailto:dews.northeastregion@gmail.com">dews.northeastregion@gmail.com</a></td>
</tr>
<tr>
<td>13</td>
<td>Dr. Jamaludin Ahadi</td>
<td>Regional DEWS Coordinator</td>
<td>Central west</td>
<td>783 734322</td>
<td><a href="mailto:dews.centralwestregion@gmail.com">dews.centralwestregion@gmail.com</a></td>
</tr>
</tbody>
</table>
### Annex E: Sample case investigation form

#### Sample case/cluster investigation form

<table>
<thead>
<tr>
<th>Province:</th>
<th>Date/time of first report:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Who Reported?</td>
</tr>
<tr>
<td>District:</td>
<td>Village/town:</td>
</tr>
<tr>
<td>Date of investigation:</td>
<td>Distance from Center of Province:</td>
</tr>
<tr>
<td>Name of the nearest health facility:</td>
<td>Total population of the area:</td>
</tr>
<tr>
<td></td>
<td>Number at risk:</td>
</tr>
<tr>
<td>Name of the team leader:</td>
<td>DPTHH coverage of the area:</td>
</tr>
<tr>
<td>Telephone number:</td>
<td>OPV3 coverage:</td>
</tr>
<tr>
<td></td>
<td>Measles Coverage of the area:</td>
</tr>
</tbody>
</table>

#### Health event/suspected disease

**(tick one box only)**

- □ Acute diarrhoea
- □ Acute bloody diarrhoea
- □ Suspected typhoid
- □ Suspected measles
- □ Suspected rubella
- □ Suspected pertussis
- □ Suspected diphtheria
- □ Suspected meningitis
- □ Acute lower respiratory infection
- □ Acute jaundice syndrome
- □ Hepatitis
- □ Acute hemorrhagic fever syndrome

#### Symptoms and signs

**(several boxes can be ticked)**

- □ 3 or more loose stools per 24 hours
- □ loose stools with blood
- □ fever
- □ rash
- □ other skin lesion
- □ cough
- □ vomiting
- □ yellow eyes and/or skin
- □ neck stiffness
- □ convulsions or seizures
- □ muscle weakness
- □ increased secretions (e.g. sweating or drooling)
- Acute flaccid paralysis (suspected poliomyelitis)
- Suspected malaria
- Adult tetanus
- Typhoid fever
- Unexplained fever
- Unexplained cluster of health events
- Other (specify): ________________

Team Members:

- altered level of consciousness
- other (specify): ________________

GPS
Ev:
N:
L:

Total number of cases reported:

Total number of cases investigated:

Total number of deaths reported:

Response:

<table>
<thead>
<tr>
<th>Surrounding Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

* In case of town please mention the number of street and house
(a) Age: by days (for newborn), months (for infants), and years
(b) Sex: M for male; F for female;
(c) Date (day/month/year)
(d) Records using the following codes: I = currently ill, R = recovering or recovered, D = died, L = lost to follow-up, U = unknown.
(e) Record using the following codes: B = blood, S = stool, C = cerebrospinal fluid, U = urine, R = respiratory specimen, O = other.

**Line list of suspected cases**

Province: _______________ District: ______________ Village: _______________

Estimated population_____________ Informant: _________________________

Nearest health facility______________________

<table>
<thead>
<tr>
<th>No</th>
<th>Full Name</th>
<th>age</th>
<th>sex</th>
<th>Symptom s and signs</th>
<th>Date of onset</th>
<th>Treatment given</th>
<th>history of disease contact or travel or source*</th>
<th>Outcome**</th>
<th>If died; Date of death</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

*= Any relevant case/contact/travel history or suspected source suggested by the informant
**= Sick/Recovered/Died

**Information collected from the health facility registration books on the suspected disease**

<table>
<thead>
<tr>
<th>Number of the cases this week</th>
<th>Total</th>
<th>Death</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>
Operational guidelines for Typhoid outbreak response in Afghanistan

<table>
<thead>
<tr>
<th>Number of the cases for the last week</th>
</tr>
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<tbody>
<tr>
<td>Number of the cases in the same week of the last year (☼)</td>
</tr>
<tr>
<td>Average number of the cases for the last 3 years</td>
</tr>
</tbody>
</table>

☼ please mention if there was an outbreak of the disease in the same weeks of last year

Outbreak investigation (information recorded from the village’s graveyard visit)

<table>
<thead>
<tr>
<th>Number of the new children graves:</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of the new adult graves:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand total</td>
<td></td>
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</tbody>
</table>

Death cases confirmed by the village Mullah Imam in last 2 weeks

<table>
<thead>
<tr>
<th>Number of new children deaths:</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of the new adults deaths:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand total</td>
<td></td>
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Draw Map of the Area below:

N
Sanitation is the efficient disposal of excreta, urine, refuse, and sullage. Initially, indiscriminate defecation is usually the main health hazard in refugee camps. This technical note outlines ways in which excreta and urine can be managed during the early stages of an emergency, while long-term solutions are devised. (See Technical Note 7 for guidance on managing solid waste.) The technical options for emergency excreta disposal are limited and simple. If they are to work, however, they must be properly managed and be understood and supported by the community.

Immediate measures
The immediate tasks after a disaster are as follows:

- Obtain the services of a good translator. Effective sanitation provision has more to do with views and opinions of the user population than the technology. It is very important to have a good relationship with users, and that requires the skills of a competent translator.
- Consult with all interested parties including representatives of the affected population, aid agencies and government officials.
- Survey the site to gather information on existing sanitation facilities (if any), the site layout, population clusters, topography, ground conditions, and available construction materials.
- Prevent indiscriminate defecation. Especially prevent defecation in areas likely to contaminate the food chain or water supplies.
- Select areas where defecation may safely be allowed.

Managing open defecation
People affected by a disaster still need to defecate! They will attempt to follow traditional practices, but if that is not possible they will defecate wherever they can. Your first task is to prevent excreta contaminating water supplies or the food chain, so you must prevent defecation in areas such as:

- the banks of rivers, streams, or ponds which may be used as a water source (and if water is to be abstracted from shallow wells, then it is important to ensure that these wells are situated upstream of the defecation areas);
- agricultural land planted with crops, particularly if the crops are soon to be handled or harvested for human consumption.

Defecation fields
These should be located so that they are easily reached by the community but do not pollute water supplies or sources of food. It is better to provide a number of small fields equally spread around the affected population as this will reduce the walking distance for most users. It will also allow for flexibility of operation and the separation of men and boys from women and girls.

The defecation field should be screened and divided into small strips so that a different strip can be used each day. The area of the field farthest from the community should be used first, so that people do not have to walk across contaminated...
Defecation fields have a short life and are difficult to manage. They should be replaced with more sustainable solutions as soon as possible.

**Shallow family latrines**
Providing each family with its own latrine has many advantages and must always be the ultimate goal of any sanitation programme. In the first few days of an emergency, this can be a simple structure such as shown in Figure 14.3. A key advantage is that providing the affected community with tools to build and maintain the latrines is practically the only input required.

If family latrines are not possible (for example, because of the lack of space) then some form of communal latrines will have to be provided.

**Shallow trench latrines**
Trenches around 0.2m to 0.3m wide, 1.5m deep and 4.0m long are surrounded by a temporary screen (Figure 14.4). Users defecate by squatting across the trench. After use, users cover their faeces with some of the soil dug out of the trench using the spade provided. If the ground is wet or soft, a piece of wood can be laid along each side of the trench. Some trenches should be dug narrower so that they can be used by small children and the elderly.

Shallow trench latrines can quickly become smelly, especially in hot and humid climates. All faeces must be covered at least once a day and trenches closed when the contents reach 0.3m from the ground surface.

**Deep trench latrines**
A trench 0.8m to 0.9m wide, 6.0m long and at least 2.0m deep is covered by a wooden or plastic floor and divided into six cubicles (Figure 14.5). The top 0.5m of the trench walls should be lined with plastic sheeting for ease of cleaning and to prevent the sides from collapsing. The cubicles and privacy screen can be made of plastic sheeting on a light wooden frame. A roof can be provided if necessary. A drainage ditch should be dug around the latrine to divert surface water.

Each day the contents of the trench are covered by a layer of soil approximately 0.1m deep. This will reduce the smell and prevent flies from breeding in the trench.
When the bottom of the trench has risen to within 0.3m of the surface, the trench is filled with soil and the latrine is closed.

A trench latrine system is very labour-intensive and requires constant supervision. Not only must the contents of each latrine be covered each day, but new latrines must be prepared, old ones filled in, and regularly-used latrines must be cleaned. Close supervision is essential. A poorly-maintained latrine will quickly become offensive to the community and will not be used.

Making use of existing facilities

In urban areas, it may be possible to make use of existing facilities such as sewers, public toilets, bucket latrines, or stormwater drains. Temporary latrines, such as the one shown in Figure 14.6, can be constructed over a sewer or drain. Additional water may be required to carry the wastes through the system.

Mobile latrine blocks

In Europe and North America, mobile latrine blocks are common. Typically, these contain a number of toilet cubicles, sometimes provided with urinals and handwashing facilities. A tank is provided for clean water and another to collect waste. The waste tank is emptied using a portable vacuum tanker.

The deployment of mobile latrine blocks is not limited to industrialized countries. Provision for the ultimate disposal of the waste must, however, be part of their deployment.

Borehole latrines

In areas with deep soil, many borehole latrines can be built in a short time using hand augers. The holes are usually 0.3m to 0.5m in diameter and 2.0m to 5.0m deep (Figure 14.7). The top of each hole is lined with a pipe, and two pieces of wood are provided for footrests. Borehole latrines should be closed when the contents are 0.5m from the surface.

Note: Some soil conditions may require a pipe lining greater than 0.5m.

Figure 14.5. Deep trench latrines

Figure 14.6. Temporary toilet over a sewer

Figure 14.7. A borehole latrine
Packet and plastic bags
If the affected population is on the move, or if it is not possible to construct any form of latrine (such as in a flooded area), a simple plastic bag may be the only disposal option. The bags should be strong, water-tight and have a sealable top. Users should defecate directly into the bag and then seal it. The bags need to be collected regularly and taken away for burial. Biodegradable bags are preferred for their limited impact on the environment.

Chemical toilets
Portable chemical toilets have been used in emergencies in South and Central America. Typically, they are light-weight portable cubicles fitted with toilet seats with sealed holding tanks below. To reduce the smell, the tank is partially-filled with chemicals before use. The holding tank must be emptied regularly.

Overhung latrines
Overhung latrines are an option in flood situations as long as water is flowing. A simple wooden structure, either built over the water (Figure 14.8) or floating on the water, allows users to defecate directly into the flowing water. This is rarely a major health problem as the volumes of water involved are large. Besides, the water is likely to be polluted already!

Raised latrines
If the ground is rocky or the water table is high, many of the options described will be unsuitable because they depend on deep pits. An alternative is to raise the pit above ground level (Figure 14.9).

The walls of the pit can be extended above ground level using local materials such as wood, bamboo or stone. The lining is then surrounded by a bank of soil to prevent it collapsing and to support the toilet cubicle. In practice, it is normally only possible to raise latrines about 1 to 1.5m above ground level. Higher latrines are rarely acceptable to users.

Further information
http://wedc.lboro.ac.uk/publications/

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Switzerland

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Telephone (direct): + 41 22 791 3555/3590
Fax (direct): + 41 22 791 4159
Email Coordinator: bosr@who.int
URL: www.who.int/water_sanitation_health

Long-term solutions
Most of the options in this note are only temporary. As soon as it becomes obvious that the community is likely to remain in their new location for any length of time then longer-term solutions should be sought. In most cases, some form of on-site sanitation will be most appropriate. Details of the design and construction of longer-term options are given in the references below.
### Annex K: Broad TORs of stakeholders before during and after outbreaks

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Responsibility</th>
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</table>
| Gov. Health department | **Before outbreak**  
1. Develop an Outbreak preparedness plan and ensure all the resources (Money, man, Material and Management with regular pre seasonal review) are arranged from community to national level,  
2. Ensure routine surveillance system is efficiently functional (train, implement and regularly M&E the process of notification, analysis, alert Investigation and outbreak control activities)  
3. Ensure adequate prepositioning of necessary emergency supplies according to the expected incidence  
4. Ensure existence and functional standard laboratory investigation net working  
5. Train all the clinicians on standard Case management and technical support | **During outbreak**  
1. Efficiently manage the resources allocate and mobilize according to the priorities  
2. Ensure fully functional enhanced surveillance is in place in all affected areas and relevant areas under risk  
3. Ensure necessary supplies and buffer stocks are reached to the affected sites in time  
4. Ensure quick access to sample transport and feedback from laboratory are reached the field in time  
5. Review the case management issues and rectify accordingly and enhance the referral system as well | **After outbreak**  
1. Reorganize the resources and withdraw excess from the affected site or utilize them for long term sustainable solutions  
2. Continue enhanced surveillance until complete control is observed  
3. Keep an emergency stock at risk locations and withdrew back the balance to the provincial stores  
4. Maintain a laboratory investigation data base for future reference  
5. Identify the practical issues faced by the clinical staff on case management and plan to rectify them in future  
6. Appreciate all the work forces and prepare them for future emergencies as well  
7. Evaluate the outbreak response and identify the gaps and utilize the findings to plan and prepare for future |
| Gov. Education department | **Before outbreak**  
1. Participate and contribute to emergency/outbreak preparedness  
2. Hygiene promotion through regular education system and special campaigns  
3. Establish better water and sanitation facilities in the schools  
4. Ensure food hygiene in the school | **During outbreak**  
1. Hygiene promotion campaigns in the school and surrounding community  
2. Volunteer service provision to the health facilities and community | **After outbreak**  
1. Continue the regular hygiene promotion, WATSAN and environmental health activities  
2. Participate and contribute in emergency/outbreak review and planning |
| Gov. Environmental | **Before outbreak**  
1. Ensure at least basic water and sanitation | **During outbreak**  
1. Quickly identify the contaminated sources in the | **After outbreak**  
1. Maintain the water and sanitation activities until |
<table>
<thead>
<tr>
<th>Operational guidelines for Typhoid outbreak response in Afghanistan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gov. Housing and infrastructure development department</strong></td>
</tr>
<tr>
<td>1. Plan, implement and maintain basic housing facilities and road network with prioritize the outbreak prone districts/locations</td>
</tr>
<tr>
<td>2. During planning and constructing public structures like markets, sports complexes, schools and hospitals; Pay attention on waste management system and disease specific treatment units</td>
</tr>
<tr>
<td>1. Ensure functional waste management structures and road networks in outbreak locations</td>
</tr>
<tr>
<td>1. Identify the gaps during outbreak management and rectify them with appropriate measures</td>
</tr>
<tr>
<td><strong>Private business community, funding agents and financial supporters</strong></td>
</tr>
<tr>
<td>1. Support the communities in outbreak prone areas with micro financing/revolving funds to construct their latrines and safe water supply system</td>
</tr>
<tr>
<td>2. Support the small scale food and drinks producers to maintain minimum standard procedures of food handling</td>
</tr>
<tr>
<td>3. Support community based hygiene promotion activities</td>
</tr>
<tr>
<td>1. Support hygiene promotion activities, safe water supply and food handling through the established community organizations</td>
</tr>
<tr>
<td>1. Identify the gaps in the activities and develop appropriate plans to rectify them</td>
</tr>
</tbody>
</table>

- Facilities are available for all urban and rural outbreak prone communities through community based water supply and sanitation schemes
- Well maintain the public water supply schemes
- Prevent pollution of all water sources and treat all drinking water sources
- Preserve natural water sources
- Enforce all available legislatives to control the malpractices and strengthen the legislations

**Preventive measures**

- Complete control of the outbreak
- Properly train the local authority or community and ensure a sustainable mechanism to maintain WATSAN project in the area and hand over
- Closely monitor and evaluate the project
- Capitalize the outbreak and get funds to fill the gap and make necessary improvements to the WATSAN system in the area

**Governor's housing and infrastructure development department**

1. Plan, implement and maintain basic housing facilities and road network with prioritize the outbreak prone districts/locations
2. During planning and constructing public structures like markets, sports complexes, schools and hospitals; Pay attention on waste management system and disease specific treatment units

**Private business community, funding agents and financial supporters**

1. Support the communities in outbreak prone areas with micro financing/revolving funds to construct their latrines and safe water supply system
2. Support the small scale food and drinks producers to maintain minimum standard procedures of food handling
3. Support community based hygiene promotion activities

1. Support hygiene promotion activities, safe water supply and food handling through the established community organizations
1. Identify the gaps in the activities and develop appropriate plans to rectify them
| NGOs and UN agencies | 1. Support relevant Government departments in the process of planning, implementation and maintenance of health, WATSAN and infrastructure development projects with community based development projects by supporting with Fund, HR, Supplies, technical advice and management | 1. Support the government departments with technical advice, HR, supplies and logistics 2. Bring more outbreak control and case management teams 3. Support the monitoring and evaluation of outbreak | 1. Identify the gaps in outbreak control and support for a sustainable solution |
| Community organizations and public | 1. Understand their basic priorities and develop community based organizations, plans and implementation teams 2. Arrange all possible resources from the community and get Support from micro financing agencies, NGOs and UN agencies and Implementation of community based safe water supply and sanitation systems 3. Organize community based hygiene promotion teams and regularly promote hygiene in their community | 1. Support health and WATSAN departments to control the outbreak through supporting all the efforts made by them 2. Follow the instructions given by health department | 1. Support the government and other agencies to identify the gaps and rectify them through appropriate measures 2. Follow all necessary procedures to prevent another outbreak and related losses |
| Gov. Departments of Law and order | 1. Develop and implement necessary public laws related to housing, water supply, sewerage system and food handling 2. Make the public to be aware of the laws and follow | 1. Strictly implement the rules | 1. Identify the gaps in laws and implementation and rectify them |
1 Report of the Meeting on Typhoid Fever, a Neglected Disease: Towards a Vaccine Introduction Policy
Annecy, France, Les Pensières, April 2-4, 2007

2 Report of the Meeting on Typhoid Fever, a Neglected Disease: Towards a Vaccine Introduction Policy
Annecy, France, Les Pensières, April 2-4, 2007

3 5th Global Meeting on Implementing New and Under-utilized Vaccines, 22-24 June 2011, WHO
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4 National Health Management Information system procedures manual, MOPH Afghanistan June 2006
www.whoindia.org/LinkFiles/IDSP_Typhoid_MO_format.pdf

6 Disease early warning system, Ministry of public health of Afghanistan, 2006

7 Mark R. Wallace et al, Endemic Infectious Diseases of Afghanistan, CID 2002:34 (Suppl 5),
http://cid.Oxfordjournals.org

8 http://www.idl.se/index.php?pageId=17

9 Blood Safety and Clinical Technology Guidelines on Standard Operating Procedures for microbiology, SEARO, WHO

10 Background document: The diagnosis, treatment and prevention of typhoid fever, 2003, WHO


12 Sanitation is vital for human health · Factsheet No. 1, UN water 2008

13 News note, UNICEF press center Global hand washing day 2011

14 Combating water born diseases at the house hold, WHO, 2007


16 Communicable disease control in emergencies, A field manual, WHO 2005

17 Technical notes drinking water, sanitation and hygiene, No.14, WHO 2011