5

INTEGRATED DISEASE SURVEILLANCE PROJECT

TRAINING MANUAL FOR STATE & DISTRICT SURVEILLANCE OFFICERS

CASE DEFINITIONS OF DISEASES & SYNDROMES UNDER SURVEILLANCE

Module -5

CONTENTS

1. INTRODUCTION

The emerging and reemerging infections are a cause of great concern all over the world. Out breaks of water borne and vector borne diseases and vaccine preventable diseases affect the rural and urban population equally. Disease surveillance is a very effective tool for early identification and effective control of epidemics.

Strengthening of the surveillance activities should be achieved through capacity building activities such as training medical and paramedical personnel, strengthening laboratory facilities, establishing electronic communication capability, improving reporting systems and IEC activities. Close co-ordination between various governmental departments, non-government agencies and community is absolutely essential for effective implementation of disease surveillance activities.

Case definitions provided by WHO are used in this activity for the purpose of uniformity of reporting both at the national and international level. Case definitions including probable, suspected and confirmed cases as well as syndromes under surveillance are used for classifying the surveillance activities.

2. SPECIFIC INSTRUCTIONAL OBJECTIVES

At the end of the session the participants would be able to:

1. Describe why definitions for diseases are crucial for disease surveillance
2. List the conditions under surveillance in the state under IDSP
3. List the syndromes under surveillance in IDSP
4. Specify the disease which are under consideration within each syndrome
5. Define the Probable case definition of Cholera, Enteric Fever, Viral Hepatitis, Malaria, JE, Dengue, Measles, Tuberculosis and others.
6. List the criteria for Laboratory confirmation of Cholera, Typhoid, Malaria, TB, Measles, Dengue and JE.
7. Describe correctly why Trigger levels are specified in IDSP.
8. What is the response to Trigger level 1 and Trigger level 2?

3. FORMAT OF THE TRAINING SESSION AT A GLANCE

Unit No	CONTENT	METHODOLOGY	TENTATIVE DURATION	TEACHING AIDS
1.	Case definition: Diseases & Syndromes	Lecture -1 Module Reading Lecture-2	30 Minutes 30 Minutes	Training Modules / Slide Projector / Over Head Projector / Power point
2.	Case Studies Threshold Levels	Group Discussion Demonstration	2 hours 1 hour	Case Studies Training Modules Exercises.

4. KEY POINTS TO REMEMBER

- The list of diseases under surveillance must always be remembered.
- The diseases for which vertical Programmes are operative should be clearly known.
- Case definitions are crucial in accurately identifying the epidemic at the earliest.
- Trigger levels are important in initiating response activities.
- Laboratory confirmation is not mandatory to initiate rapid response measures. This is especially so in clinical syndromes. But specimens should be collected as soon as possible for analysis later.
- Clinical Syndromes should be identified.
- Method of transmission of diseases should be clearly identified.
- Different surveillance methods for the different conditions under IDSP should be clearly understood.

5. GROUP ACTIVITIES

Three Groups of 7-8 Participants

The Group Activity:

- Selection of Group Leader
- Selection of Reporters
- Each group will discuss 2 of the 4 Points for Group Discussion given
- At least one of the resource person will join the Group

Points for Discussion

Discussion Point-1

List the major conditions included for surveillance under the category of Water Borne Diseases under IDSP and discuss the method of surveillance:

- Syndromic
- Probable Case
- Definitive Diagnosis

Under each of the major 3 headings list the criteria for diagnosis at 3 levels.

Discussion Point-2

Specify the definitions for diagnosis of Vector Borne Diseases Under IDSP and discuss the method of surveillance

- Syndromic

- Probable Case
- Definitive Diagnosis

What is the meaning of threshold limits in these diseases?

Discussion Point-3

Specify the definitions for diagnosis of Droplet Borne Diseases Under IDSP and discuss the method of surveillance

- Syndromic
- Probable Case
- Definitive Diagnosis

Discussion Point-4

Can the Disease Definition used in IDSP cater to prevent outbreak of serious Diseases of unknown etiology?

- Plague
- Anthrax
- Yellow Fever
- Other serious Virus Infections
- Bio terrorism?

Discussion Point-5

How will IDSP help the surveillance activities of the vertical disease control Programmes?

- Tuberculosis
- Malaria
- Polio
- HIV

Is the disease definition consistent with the existing Programme definitions?

Is there a need to modify this at some time?

Discussion point 6

5 case studies in terms of prolonged fever, Rash, prolonged cough, diarrhea and encephalitis should be provided and discussed in terms of Syndromic, probable and confirmed levels of diagnosis under IDSP.

Discussion point 7:

Present a report of surveillance activity and participants should discuss the case definitions of cases given in the surveillance report.

Discussion point 8:

After going through the case definitions participants should discuss what actions could be initiated for prevention and control E.g., malaria

6. FREQUENTLY ASKED QUESTIONS

- Why different definitions like syndromic, probable and confirmed are given for the same disease?
- Why different trigger levels are given for action?
- At what level of an outbreak laboratory diagnosis is mandatory?
- Should the MO personally verify each case before reporting?
- If patients have symptoms and signs suggestive of more than one diagnosis (e.g. Malaria and Typhoid) how it should be reported?
- What steps have to be taken when there is doubt about the clinical presentations of unusual diseases?
- When is a specialist opinion is required in an outbreak identification?

7. HANDOUT ON CASE DEFINITIONS

NB: These case definitions have been taken from the "WHO Recommended Surveillance Standards". Second edition, 1999.

Modifications have been made by consensus to suit IDSP reporting formats

1. CHOLERA

Epidemiology

Agent: Vibrio cholerae serogroups O1 and O139. Produces diarrhoea by an enterotoxin. Biotype El Tor is less pathogenic as compared to the Classical biotype.

Host: Humans are the only host. Affects all ages and both sexes equally. In endemic regions, children are more susceptible. Natural infection confers effective immunity. Chronic carriers are rare.

Environment: Poor sanitary conditions facilitate the growth and transmission of v.cholerae. Of importance are contaminated water and food. Environmental reservoirs exist in association with zooplankton in brackish waters and estuaries.

Mode of transmission: From human to human through drinking or eating contaminated water or food. Rarely through direct transmission – faeco-oral route.

Incubation period: A few hours to 5 days, usually in the range from 2 to 3 days.

Period of infectivity: From onset of illness to about a week later. Rarely chronic carriers may increase the period of infectivity.

Infectivity rate: Depends on the infective dose. About 10^{11} organisms are necessary to produce symptoms. A patient with cholera excretes an average of 10^7 – 10^9 vibrios per ml of stool.

Signs and symptoms: Abrupt onset of profuse, painless watery diarrhoea with or without vomiting. The stool may have a 'rice water appearance'. Soon the patient becomes severely dehydrated which may lead to death unless rapidly treated. At least 90% cases are mild and remain undiagnosed.

Case fatality ratio: Depending on the effectiveness of the health services, the CFR may range from <1% to 50%.

Epidemic potential: It may cause rapidly progressive epidemics or worldwide pandemics. In endemic areas, sporadic cases& small outbreaks may occur.

Lab confirmation: Isolation of V. cholera O1 or O139 is the gold standard. Specimens may be transported from the field using transport media like Cary-Blair media. Details of transportation of specimens and lab diagnosis are given in laboratory Manuals.

CASE DEFINITION OF CHOLERA

CLINICAL CASE DESCRIPTION

IN AN AREA WHERE THE DISEASE IS NOT KNOWN TO BE PRESENT

Severe dehydration or death from acute watery diarrhea in a patient aged 5 years or more (Severe dehydration- lethargy, altered consciousness, decreased urine)

IN AN AREA WHERE CHOLERA IS ENDEMIC

Acute watery diarrhea, with or without vomiting in a patient aged 5 years or more.

IN AN AREA WHERE THERE IS A CHOLERA EPIDEMIC

Acute watery diarrhea, with or without vomiting, in any patient.

LABORATORY CRITERIA FOR DIAGNOSIS

Isolation of Vibrio cholera O1 or O139 from stools in any patient with diarrhea.

Case classification

Suspect case: **A case that meets the clinical case definition.**

Probable case: **A suspect case diagnosed as Cholera by MO**

Confirmed case: **A suspected case that is laboratory-confirmed**.

Outbreak definition

Trigger-1

- A single case of Cholera /epidemiologically linked cases of Diarrhea
- A case of severe dehydration/death due to diarrhea in a patient of > 5 yr of age.
- Clustering of cases in a particular village/ urban ward where more than 10 houses have at least one case of loose stools irrespective of age per 1000 population

Trigger-2;

More than 20 cases of diarrhea in a village / geographical area of 1000 population

2. TYPHOID/PARA-TYPHOID FEVER

Epidemiology

Agent: Salmonella enteric serotype Typhi, serotype Paratyphoid A, B and C.

Host: In endemic areas typhoid fever is most common in school and preschool aged children i.e. 2 to 19 years.

Mode of transmission: 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 organisms then multiply 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 paratyphoid). About 10% of untreated typhoid fever patients will discharge bacilli for 3 months after onset of symptoms, and 2%-5% become permanent carriers.

Diagnosis: The etiologic organisms can be isolated from the blood early in the disease and from urine and feces after the first week; A fourfold rise in somatic (O) agglutination titers in paired sera appears during the second week in less than 70% of cases of typhoid

fever; when it occurs, it supports the diagnosis, provided vaccine had not been given recently.

Clinical manifestations: Disease is characterized by insidious onset of sustained fever, severe headache, malaise, anorexia, a relative bradycardia, and splenomegaly. Constipation more commonly than diarrhea in adults. In typhoid fever, ulceration of Peyer's patches in the ileum can produce intestinal hemorrhage or perforation (about 1% of cases), especially late in untreated cases. Severe forms have been described with cerebral dysfunction. Paratyphoid fever presents a similar clinical picture, but tends to be milder, and the case-fatality rate is much lower. Relapses may occur in approximately 3%-4% of cases.

Case fatality ratio: The usual case-fatality rate of 10% can be reduced to <1% with prompt antibiotic therapy. It is much lower in Paratyphoid fevers.

Complications: Intestinal perforation, Typhoid encephalopathy and chronic carrier states are some of the complications. Relapses occur in 5%-10% of untreated cases and may be more common (15%-20%) following therapy with appropriate antibiotics.

CASE DEFINITION OF TYPHOID FEVER

CLINICAL CASE DESCRIPTION

Any Patient with fever for more than one week and with any 2 of the following.

- ☞ Toxic look
- ☞ Coated tongue
- ☞ Relative bradycardia
- ☞ Splenomegaly

Laboratory criteria for diagnosis:

- ☞ Serology – Typhi Dot Test + ve / Widal test
- ☞ Isolation of organisms from clinical specimen such as blood

CASE CLASSIFICATION

Probable case: Any case of fever diagnosed as typhoid by MO that is compatible with:

- ☞ Clinical description above
- ☞ Tyhpi Dot / Widal Test +ve (More than 1 week)
- ☞ Exposure to confirmed case
- ☞ Clinical presentation with complications eg. GI Bleeding, Perforation, etc

CONFIRMED CASE: A suspected /probable case that is laboratory confirmed by

- ☞ Isolation of Salmonella typhi / paratyphi from blood or other clinical specimens
- ☞ Four fold rise in the agglutination titre in paired sera taken ten days apart

OUTBREAK DEFINITION:

TRIGGER -1

- ☞ More than 30 cases in a week from the entire PHC area OR
- ☞ 5 or more cases per week from 1 sub centre of 30,000 population OR
- ☞ More than 2 cases from a single village/urban ward/1000 population
- ☞ Clustering of cases of fever

TRIGGER-2*:* More than 60 cases from a PHC or more than 10 cases from a sub-center

3. ACUTE VIRAL HEPATITIS

Acute illness typically including the following:

- ☞ Acute jaundice (Yellow sclera/skin)
- ☞ Dark urine
- ☞ Anorexia, malaise
- ☞ Extreme fatigue
- ☞ Right upper quadrant tenderness

Biological Signs Include:

- ☞ Increased urine urobilonogen
- ☞ >2.5 times the upper limit of serum alanine aminotransferase[1].

Laboratory Criteria for Diagnosis:

Hepatitis A	IgM anti HAV positive
Hepatitis B	Positive for HbsAg or IgM anti-HBc[2]
Hepatitis C	Positive for anti-HCV
Hepatitis D	Positive for HbsAg or IgM anti-HBc Plus anti-HDV
Hepatitis E	Positive for anti-HEV

Case Classification for IDSP

Suspect case	As per clinical case definition
Probable case	Not applicable
Confirmed case	A suspect case that is laboratory confirmed. For Hepatitis A, a case compatible with the clinical description and with epidemiological link with a lab confirmed case of Hepatitis A.

4. MALARIA

Epidemiology

Agent: There are four species of Malarial parasites.

- ☞ Plasmodium Falciparum

1 Most infections occur in early childhood. A variable proportion of adult infections is asymptomatic.
2 The anti-HBc IgM test, specific for acute infection, is not available in most countries. HbsAg, often available, cannot distinguish between acute new infections and exacerbations of chronic hepatitis B, although continued HBsAg seropositivity (>6 months) is an indicator of chronic infection.

- ☞ Plasmodium Vivax
- ☞ Plasmodium Ovale
- ☞ Plasmodium Malaria

a) ***P.Falciparum*** is the species that is responsible for virtually all the mortality associated with Malaria and for substantial portion of its morbidity.

b) ***P.Vivax*** **Malaria**

The classical description of the malaria paroxysm stage is more commonly seen in P.Vivax than in P.Falciparum malaria. The fever is of the Tertian type. The hot and cold stages are more commonly seen. Hepatosplenomegaly occurs frequently. The disease is rarely fatal, responds satisfactorily to combination of Chloroquine and Primaquine treatment.

Vector: Anopheles Mosquito – breeds in fresh water containers in and around the residential areas, water coolers, flowerpots etc.

Environment: The principal aim is to identify worst affected "high risk" malarious areas in the country. The Expert Committee has laid down the following criteria for the same.

1. Rural areas

Recorded deaths due to malaria (on clinical diagnosis or microscopic confirmation) with P.falciparum infection during the transmission period with evidence of locally acquired infection in an endemic area, during any of the last three years.

The Slide Positivity Rate (SPR) is to be used for the identification of areas as follows:

a) Doubling of SPR during the last three years provided the SPR in second or third year reaches 4% or more

b) Where SPR does not show the doubling trend as above but the average SPR of the last three years is 5% or more.

P. falciparum proportion is 30% or more provided the SPR is 3% or more during any of the last three years.

An area having a focus of Chloroquine resistant P.falciparum

A Chloroquine resistant PHC will be characterised by detection of more than 25% of R II and R III level cases in a minimum sample of 30 cases.

Tropical aggregation of labor in project areas

New settlements in endemic/receptive and vulnerable areas.

2. Urban Areas -

A) The SPR 10% and above during any of the last three years is identified as high-risk areas. B) Population of 50000 or more and SPR more than 5% or the ratio of clinical malaria cases to fever cases more than one third as per hospital/ dispensary statistics during the last Calendar year.

Signs and symptoms:

The presentation of uncomplicated PF Malaria is very variable and can mimic many other diseases. Fever - Very common. Initially persistent and may or may not be accompanied by rigors. Jaundice and Anemia may be present with Hepatos-plenomegaly. The early diagnosis and prompt treatment is extremely essential to avoid fatal complications.

Epidemic potential:

For effective control of malaria the following parameters are used.

1) Annual Parasite Incidence (API): -

$$(API) = \frac{\text{Total no. of blood smears +ve for MP in a year}}{\text{Total population}} \times 1000$$

Epidemiological significance

This parameter depends upon the adequacy of case detection mechanism i.e. Annual Blood Examination Rate (ABER). If ABER is adequate, this parameter is the most important criterion to assess the progress of eradication programmeme. At present this parameter is used for determining the areas to be brought under spray operations.

2) Annual Blood Examination Rate (ABER)

$$(ABER) = \frac{\text{No. of blood smears examined for MP in a year}}{\text{Total population}} \times 100$$

Epidemiological significance

This parameter reflects the efficiency and adequacy of case detection mechanism. ABER should not be less than 1% per month during the transmission period. A minimum ABER of 10% per year was fixed under NMEP.

3) P. falciparum percentage (PF%)

$$(Pf.\%) = \frac{\text{Total No. of blood smears found +ve for P. falciparum}}{\text{Total No. of blood smears +ve for malarial parasite}} \times 100$$

Epidemiological significance

This parameter gives the relative proportion of P. falciparum infection and identifies trends of Pf incidence in relation to total caseload of malaria parasite in the community.

4) Slide Positivity Rate (SPR)

$$(SPR) = \frac{\text{Total no. of BS found +ve for MP}}{\text{Total no. of BS examined.}} \times 100$$

Epidemiological significance

This parameter is less dependent on ABER. Whenever the case detection mechanism (ABER) is adequate, this is a dependable parameter for determining the progress of containment measures and gives information of parasitic load in the community. It is more reliable than API even for areas where ABER fluctuates from the year to year.

5) Slide falciparum Rate (SfR)

$$(SFR) = \frac{\text{Total No. of blood smears found +ve for P. falciparum}}{\text{Total No. of blood smears examined.}} \times 100$$

Epidemiological Significance

This parameter also depends less on the case detection mechanism in space and time. If such a mechanism is adequate it pinpoints areas of P.falciparum preponderance and indicates the necessity for intensification of intervention measures on priority basis to control P.falciparum infection, which is responsible for Malaria mortality in India.

CASE DEFINITIONS OF MALARIA

CLINICAL CASE DESCRIPTION

Malaria should be considered in any patient who presents with

Fever and any 2 of the following.

- ☞ Chills, Sweating, Jaundice, Spleenomegaly
- ☞ Convulsions, Coma, shock, pulmonary edema and death may be associated in severe cases

LABORATORY CRITERIA FOR DIAGNOSIS

- ☞ Demonstration of Malaria Parasite in blood film

  OR
- ☞ Positive Rapid Diagnostic Test for Malaria

CASE CLASSIFICATION

- *Suspect case:* *Any Case of Fever **
- *Probable case:* *A case that meets the clinical case definition*
- *Confirmed case:* *A suspected/probable case that is laboratory- confirmed*

OUTBREAK DEFINITION

The states may set their own trigger levels based on the prevalence of malaria in the region.The following is a general guideline.

TRIGGER-1

- ☞ Even single case of smear + ve malaria in an area where malaria was not present for minimum three months.
- ☞ SPR rise more than double over last three months.
- ☞ Single death from malaria (clinical /microscopically proven).
- ☞ Single PF case of indigenous origin in a PF free region

TRIGGER-2:

- ☞ Two fold rise in malaria in the region over the last 3 months
- ☞ More than 5 cases of PF of indigenous origin

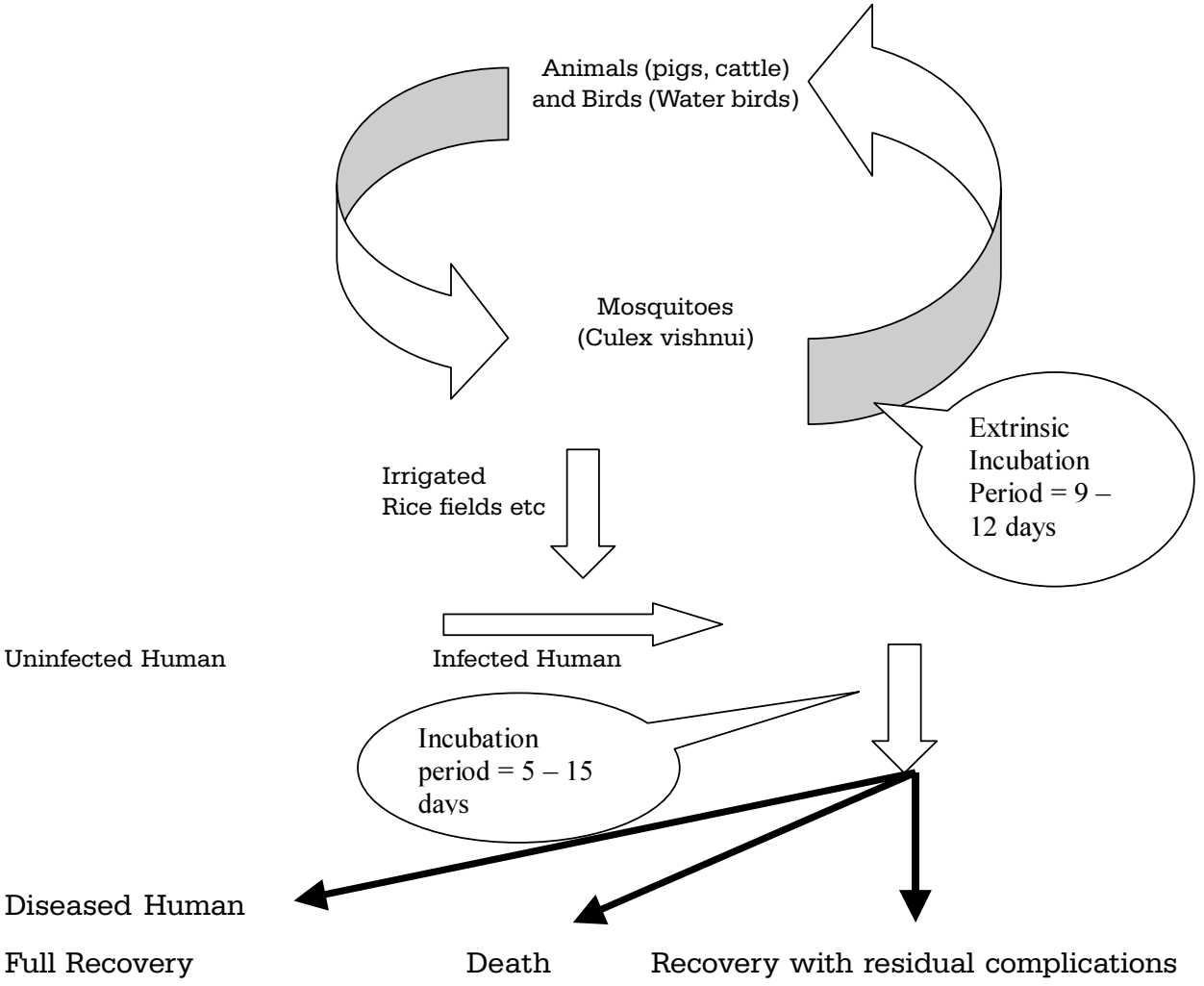
* Any case of fever in an endemic area may be more appropriate

5. JAPANESE ENCEPHALITIS (JE)

Epidemiology

Japanese Encephalitis (JE) is a disease of public health importance because of its epidemic potential and high case fatality rate. In patients who survive, complications may lead to life long sequelae.

Though JE is primarily a disease of rural agricultural areas, where vector mosquitoes proliferate in close association with pigs and other animal reservoirs, its epidemics have also been reported in peri-urban areas where similar conditions may exist.



Agent: JE is caused by a group B arbovirus (flavivirus). The virus is antigenically related to other flaviviruses including dengue, west Nile and yellow fever viruses.

Host: Affects all, especially children under 15 years of age.

Vector: Mosquitoes belonging to the *Culex vishnui* group (*Culex vishnui, Culex pseudovishnui, Culex tritaeneorhynchus*) are the most important vector species in India. 11 more species of mosquito have been incriminated as vectors of JE.

- ☞ These mosquitoes generally breed in water bodies with luxuriant vegetation. Irrigated rice fields, shallow ditches and pools are common breeding places. Culex mosquitoes are zoophilic, feeding primarily on animals and wild birds. They rest outdoors in vegetation and other shaded places but in summer may also rest indoors. The mosquitoes are outdoor as well as indoor feeders.

- ☞ Female mosquitoes get infected after feeding on a viraemic host. They can transmit the virus to other hosts after an extrinsic incubation period of 9 to 12 days. The mosquitoes remain infected for life. The average life period of a mosquito is about 21 days. Culex mosquitoes can fly for long distances (1-3 kms or even more).

Environmental factors: Epidemics usually coincide with the monsoons and post-monsoon period when the vector density is high. However, in endemic areas, sporadic cases may occur throughout the year.

Mode of transmission: The infection is transmitted through the bite of an infected culicine mosquito. In human beings, viraemia is mild and lasts for a short duration. Infection in man is the dead end of transmission. Man to man transmission has not been documented. The transmission cycle is maintained in animals and birds.

Reservoir of infection: JE virus has its natural cycle in wild or domestic vertebrates and mosquitoes. The animal hosts include pigs, cattle and horses. Water birds such as pond herons, cattle egrets, poultry birds and ducks play a significant role in the natural history of JE virus.

- ☞ Pigs are the major vertebrate hosts. Although, infected pigs do not manifest any overt symptoms of disease they develop tremendous viraemia and can infect the mosquitoes. The pigs are considered as amplifying hosts.

- ☞ Infection in man appears to be correlated with living in close proximity with animal reservoirs, especially pigs

Incubation period: The incubation period in man, following mosquito bite varies from 5 to 15 days.

Clinical manifestations: The clinical features of JE are those of encephalitis. The patient will give a history of acute onset with fever and change in behaviour or sensorium lasting for more than 24 hours. Focal neurological deficits may or may not be present. There may also be loss of bladder and bowel control. The focal neurological signs may be stationary or progressive. In majority of the cases, however, the infection is mild with no overt clinical symptoms or mild fever with headache. Individuals develop immunity after infection. In endemic areas cases are, therefore seen more often in children less than 15 years of age.

Patients who recover from the acute episode may have neurological sequelae. These occur with variable frequency and depend on age and severity of the illness. The commonly observed sequelae are:

- ☞ Mental impairment

- ☞ Severe emotional instability

- ☞ Personality changes
- ☞ Paralysis

Case fatality rate and sequelae: Case fatality rate is high in severe cases (20 to 40%).

CASE DEFINITION - JAPNESE ENCEPHALITIS

CLINICAL CASE DESCRIPTION

Febrile illness of variable severity associated with neurological symptoms ranging from headache to meningitis or encephalitis. Symptoms can include: Headache, fever, meningeal signs, stupor, disorientation, coma, tremors, paresis (generalized), hypertonia, and loss of coordination. (The encephalitis cannot be distinguished clinically from other central nervous system infections).

LABORATORY CRITERIA FOR DIAGNOSIS

Presumptive

Detection of an acute phase anti-viral antibody response through one of the following:

- ☞ Elevated and stable serum antibody titres of JE virus through ELISA, haemagglutination or virus neutralization assay, **or**
- ☞ Ig M antibody to the virus in serum (Appears after 1 week of disease)

Confirmatory3

- ☞ Detection of the JE virus, antigen or genome in tissue, blood or other body fluid by immuno-chemistry or immuno-fluorescence or PCR, or
- ☞ JE virus-specific IgM in the CSF, or
- ☞ Fourfold or greater rise in JE virus-specific antibody in paired sera (acute and convalescent phases) through IgM /IgG, ELISA, haemagglutination inhibition test or virus neutralization test

CASE CLASSIFICATION

Suspect case of JE: Any case with fever of acute onset and altered consciousness/ convulsions and change in behaviour

Probable JE:

- ☞ Any suspected cases diagnosed as JE by the MO (or)
- ☞ Any suspect case with presumptive lab results
- ☞ An epidemiologically linked case of fever with proven JE case

Confirmed JE*:* A suspect or probable case confirmed by laboratory tests

Trigger -1: Clustering of two or more similar case from a locality in one week

Trigger-2: More than 4 cases from a PHC (30,000 population) in one week

[1]Antigen for conducting the tests is not yet commercially available. Antigen for detection of IgG antibody is produced in limited quantities for operational research and outbreak investigations at the National Institute of Virology (20-A, Dr. Ambedkar Road, Pune - 411 001; Phone:-020 6127301, 6127302; FAX: 6122669).

6. DENGUE FEVER (DF)

Epidemiology

Agent: The viruses of dengue fever are flaviviruses and include serotypes 1, 2, 3 and 4. The same viruses are responsible for dengue hemorrhagic fever.

Host: Affects all age groups, but children usually have a milder disease than adults. Recovery from infection with one serotype provides lifelong immunity but does not provide protection against other serotypes, and instead may exacerbate subsequent infections

Environment: Outbreaks of dengue are usually reported after rainfall due to collection of artificial water around peridomestic areas. The ambient temperature range for dengue transmission is 16 to 40 degrees C.

Reservoir: The viruses are maintained in a human-Aedes aegypti mosquito cycle.

Mode of transmission: Dengue is transmitted by the bite of infective mosquitoes, principally Aedes aegypti.

Vector: Aedes aegypti mosquito is a day-biting species with increased biting activity for 2 hours after sunrise and several hours before sunset. Both Ae. aegypti and Ae. albopictus are found in urban settings. The mosquito has characteristic white stripes on the back and legs and is also known as tiger mosquito. The mosquito is a domestic breeder and breeds in artificial collection of water, water containers, discarded tyres, coconut shells, desert coolers, overhead tanks, etc.

Incubation period: Three to fourteen days, commonly 5-7 days.

Period of communicability: Not directly transmitted from person to person. Patients are usually infective for mosquitoes from shortly before the onset of fever to the end of the febrile period, an average of about 6-7 days. The mosquito becomes infective 8-12 days after the viremic blood meal and remains so for life.

Clinical signs & symptoms: An acute febrile viral disease characterized by sudden onset, fever for 3-5 days, intense headache, myalgia, arthralgia (Break bone fever), retro-orbital pain, anorexia, In patients with severe or fatal dengue, shock is usually the principal pathophysiologic defect. Coincident with defervescence, the patient's condition suddenly worsens with marked weakness, severe restlessness, facial pallor and circumoral cyanosis. Extremities are cool, skin blotchy, pulse rapid and weak; patients may be hypotensive with a narrow pulse pressure. Hemorrhagic phenomena are seen frequently and include scattered petechiae, a positive tourniquet test, easy bruisability, and less frequently, epistaxis, bleeding at venipuncture sites, a petechial rash and gum bleeding. GI hemorrhage is an ominous prognostic sign that usually follows a prolonged period of shock. The liver may be enlarged, usually 2 or more days after defervescence.

Case Fatality Ratio: CFR is high in DHF and DSS and in untreated or mistreated shock have been as high as 40%-50%; but with good physiologic fluid replacement therapy, rates should be about 3.5 % but low in dengue fever by itself.

CASE DEFINITIONS OF DENGUE FEVER

CLINICAL CASE DEFINITION:

An acute febrile illness of 2-7 days duration with 2 or more of the following:

- ☞ Headache,
- ☞ Retro-orbital pain,
- ☞ Myalgia,
- ☞ Arthralgia,
- ☞ Rash
- ☞ Haemorrhagic manifestations
- ☞ Leucopenia

CASE CLASSIFICATION OF DENGUE.

Probable: A case diagnosed by MO as Dengue fever based on the clinical case definition OR A case with fever with blood negative for MP and not responding antimalarials

- ☞ Supportive serology (reciprocal haemagglutination-inhibition antibody titre, comparable IgG EIA titre or positive IgM antibody test in late acute or convalescent-phase serum specimen).
- ☞ Epidemiologically linked with a confirmed case of dengue fever (occurrence at same location and time as other confirmed cases of dengue fever).
- ☞ High Vector Density

Confirmed:

- ☞ Isolation of the dengue virus from serum, plasma, leukocytes, or autopsy samples
- ☞ Demonstration of a fourfold or greater change in reciprocal IgG or IgM antibody titres to one or more dengue virus antigens in paired serum samples (depending on the diagnostic kit used)
- ☞ Demonstration of dengue virus antigen in autopsy tissue by immunohistochemistry or immunofluorescence or in serum samples by EIA
- ☞ Detection of viral genomic sequences in autopsy tissue, serum or CSF samples by polymerase chain reaction (PCR)A case compatible with the clinical description and confirmed by positive IgM ELISA rapid Test in the laboratory.

ALL ABOVE PLUS EVIDENCE OF:

DENGUE HAEMORRHAGIC FEVER (DHF)

A probable or confirmed case of dengue

1. And Haemorrhagic tendencies evidenced by one or more of the following:
   - ☞ Positive tourniquet test
   - ☞ Petechiae, ecchymoses or purpura
   - ☞ Bleeding: mucosa, gastrointestinal tract, injection sites or other
   - ☞ Haematemesis or melaena
2. And thrombocytopenia (100,000 platelets or less per mm^3)3. And evidence of plasma leakage* due to increased vascular permeability, manifested by one or more of the following:
   - ☞ Pleural effusion,
   - ☞ ascites
   - ☞ hypoproteinaemia

DENGUE SHOCK SYNDROME (DSS)

All the above criteria, plus evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure (<_20 mm Hg) or hypotension for age, cold, clammy skin and altered mental status.

TRIGGER -1:

- ☞ Clustering of two similar cases of probable dengue fever
- ☞ A single case of suspected Dengue heamorragic fever or shock syndrome

TRIGGER-2

More than 4 cases of Dengue Fever in a village / Geographical area of 1000 population

*** >_Signs of plasma leakage (pleural effusion, ascites, hypoproteinaemia)**

7. MEASLES

Epidemiology

Host: Common in children between 9 months to 3 years of age. Newborns and young infants are protected by maternal antibody transferred through placenta. This protective factor is equally effective among male and female infants. Humans are the only known host.

Environment: It is a highly contagious disease and often responsible for epidemics, especially in conditions of overcrowding and poverty, where large numbers of non-immunized children are in close contact. In temperate and tropical climates, measles occurs primarily in the late winter and early spring (November-April).

Agent: Paramyxovirus (Morbillivirus) only one sero type

Mode of transmission: human-to-human via airborne droplet spread, direct contact with nasal or throat secretions, etc.

Incubation period: The incubation period is usually about 10 days and varies from 7 to 18 days. Thus during an epidemic/outbreak, immunization of susceptible can avert more cases.

Period of infectivity: An infected person can infect others from 4 days prior to onset of rash to 5 days after appearance of rash. The vaccine virus has not been shown to be communicable.

Infectivity rate: The agent is highly infectious and most susceptible exposed to the agent acquire the disease.

Signs and symptoms: The first sign of infection is high fever lasting 1-7 days. During this period there may be running nose, cough, red and watery eyes and also Koplik's spots. After a few days (usually 4th day) a slightly raised erythematous rash develops which spreads over the face and upper neck down to the body, then to the hands and feet over a period of about three days. It lasts for 5-6 days and fades successively from the same areas. There may also be loss of appetite and loose stools especially in infants.

Case fatality ratio: Deaths are common in developing countries ranging from 5 – 30% depending on the nutrition status of the patient and the effectiveness of the health services.

Recovery is usually associated with lifelong immunity.

Complications: In developing countries, complication rates can be as high as 75%. Complications occur particularly in children under 5 years and can be diarrhoea, pneumonia, malnutrition,Vit. A deficiency, otitis media, encephalitis (including sub-acute sclerosing pan-encephalitis, SSPE) and deaths.

CASE DEFINITIONS OF MEASLES

CLINICAL CASE DESCRIPTION:

Any person with

- ☞ Fever and
- ☞ Maculo popular rash lasting for more than 3 days
- ☞ Cough or coryza or conjunctivitis

LABORATORY CRITERIA FOR DIAGNOSIS:

- ☞ At least a four fold increase in the anti body titre or
- ☞ Isolation of measles virus or
- ☞ Presence of measles specific IgM anti bodies

CASE CLASSIFICATION

Suspect case: Any case with fever & rash

Probable case: Any suspect case who is diagnosed as measles by MO on basis of clinical case description

Co*nfirmed case*: A case that meets the clinical case definition and that is Laboratory confirmed or linked epidemiological to a lab confirmed case

Trigger Level-1

- ☞ A single case of measles in a tribal area
- ☞ More than 2 cases of fever with rash in a village / geographical area of 1000 population

Trigger Level-2

- ☞ More than 4 cases of fever with rash in a geographical area of 1000 population
- ☞ Similar illness in more than 1 village reported in the same week

8. TUBERCULOSIS

Tuberculosis (TB): TB kills more adults in India than any other infectious diseases. More than 1000 people a day – one every minute – die of TB in our country. It is estimated that there are 14 million TB cases in our country out of which 3.5 million are sputum positive. About 1 million sputum positive cases are added every year.

Agent: M.tuberculosis and M.bovis are the bacteria causing Tuberculosis in humans. M.bovis infections are rare and M.tuberculosis is synonymous with tubercle bacillus. It is an aerobic, non sporing, non motile bacillus. The term acid fast refers to staining characteristics of the bacillus where tubercle bacilli does not decolorize after Zeil Neilson stain when washed with acid alcohol.

Host: Humans are the only reservoir of M.tuberculosis. Tuberculosis has also become concentrated in certain medically underserved populations- the urban poor, alcoholics, HIV infected subjects, migrant workers, Prison inmates

Transmission of TB: When a sputum positive pulmonary TB patient coughs or sneezes, he spreads M.tuberculosis into the air in the form of tiny droplets. If a healthy person inhales these tiny particles, he may contract TB.

Diagnosis: Bacteriological examination of sputum is, as a rule the only way by which diagnosis of pulmonary TB can be confirmed. Diagnosis by X-ray is unreliable because other chest diseases often resemble TB. Patients with abnormal chest X-ray should not be started on treatment until three sputum samples have been examined for AFB.

Clinical Manifestation: Any person with cough of more than 3 weeks should be suspected to have pulmonary Tuberculosis and should be investigated.

Revised National TB Control Programme(RNTCP): The goal of the RNTCP is to ensure that at least 85% of all newly detected sputum positive cases are cured and thus transmission of TB is interrupted.

Clinical case description

Pulmonary tuberculosis

Any person with

- Cough of more than 3 weeks duration and with at least 2 of 3 initial sputum smear examinations (direct smear microscopy) positive for AFB. Often associated with
- Fever
- Weight loss
- X-ray may show infiltration/ fibrocavitary changes

Laboratory criteria for diagnosis:

- Sputum positive for AFB in 2 out of 3 sputum smear examination
- Sputum positive for AFB in at least 1 out of 3 smear examination with X-ray evidence of TB
- Sputum culture grows Acid Fast Bacilli

Case classification for IDSP:

Suspect case	Any patient having cough more than 3 weeks duration
Probable case	Patient with symptoms suggestive of pulmonary TB (cough of 3 weeks with or without fever) diagnosed by MO as TB with or without radiological signs consistent with pulmonary TB.
Confirmed case	A case that meets the clinical case definition and that is positive for laboratory criteria

Trigger Levels: Not Applicable

Additional Definitions RNTCP

CASE DEFINITIONS	TYPES OF CASES	TREATMENT OUTCOMES
Pulmonary TB, Smear positive:	**New:**	**Cured:**
TB in a patient with at least 2 initial sputum smear examinations (direct microscopy) positive for AFB **OR:** TB in a patient with one sputum examination positive for AFB ad radiographic abnormalities consistent with active TB as determined by the treating MO **OR:** TB in a patient with one sputum specimen positive for AFB and culture positive for M.Tb **Pulmonary TB, Smear Negative** TB in a patient with symptoms suggestive of TB with at least 3 sputum examinations negative for AFB ad radiographic abnormalities consistent with active pulmonary TB as determined by an MO, followed by a decision to treat the patient with full course of anti-tuberculosis therapy.**OR:** Diagnosis based on positive culture but negative AFB sputum examinations. **Extra-pulmonary TB** TB of organs other than the lungs, such as the pleura, Lymph nodes, abdomen, genitor-urinary tract, skin, joints and bones, tubercular meningitis, tuberculoma of brain etc.Diagnosis should be based on one culture-positive specimen from the extra pulmonary site, or histological evidence, or strong clinical evidence consistent with active extra-pulmonary TB followed by an MO's decision to treat with full Anti-TB drugs.Pleuracy is classified as extra-pulmonary TB.A patient diagnosed with both pulmonary and extra pulmonary TB should be classified as pulmonary TB	A patient who had never had treatment for tuberculosis or has taken anti-tuberculosis drugs for less than one month **Relapse:** A patient declared cured of TB by a physician, but who reports back to the health unit and is found to be bacteriologically positive **Transferred in:** A patient who has been received into tuberculosis Unit/ District, after starting treatment in another unit where he has been recorded. **Treatment after Default:** A patient who received anti-tuberculosis treatment for one month or more from any source and who returns to treatment after having defaulted, i.e., not taken anti-TB drugs consecutively for two months or more. **Failure:** Smear positive case who is smear positive at 5 months or more after starting treatment. Also a patient who was initially smear negative but has become smear positive during treatment. **Chronic:** A patient who remains smear positive after completing a treatment regimen. **"Other"** A patient who does not fit into the above mentioned categories. Reasons for putting a patient in this category must be specified.	Initially smear positive patient who has completed treatment and has negative sputum smears on at least 2 occasions, one of which was at completion of treatment. **Treatment Completed:** Sputum smear positive case who has completed treatment with negative smears at the end of this initial phase but none at the end of treatment.**OR:** Sputum smear negative TB patient who has received a full course of treatment has not become smear positive during or at the end of treatment.**OR:** Extra pulmonary TB patient who has received full course of treatment and has not become smear positive during or at the end of treatment. **Died:** Patient who died during treatment regardless of cause. **Failure:** A smear positive patient who is smear positive for 5 months or more after staring treatment. Failure also includes a patient who was initially smear negative but who becomes smear positive during treatment. **Defaulted:** A patient who, at any time after registration, has not taken anti-TB drugs for 2 months or more consecutively. **Transferred out** A patient who has been transferred to another Tuberculosis Unit/ District and his/her treatment results are not known.

9. POLIO (AFP SURVEILLANCE)

Epidemiology

Agent: The Poliomyelitis is an enterovirus. There are three serotypes- types 1, 2 and 3, All three can cause paralysis, although type 1 causes paralysis most often, type 3 less frequently, and type 2 rarely. Most epidemics are due to type 1. Cases of paralytic associated with OPV are usually caused by types 3 and 2. The overall risk of vaccine associated with paralytic poliomyelitis (VPP) is extremely low. The overall risk of VPP is one case per 2.5 million doses of trivalent OPV with the highest risk being associated with the first dose. During eradication, the first serotype to disappear is type 2, due to better OPV " take" rates, followed by serotypes 3 and 1.

Environment: Poliomyelitis exits worldwide except where it has been eradicated as in the Americas. In temperate climates as in Europe and North America it is seasonal, occurring more commonly in summer and early autumn. In India, The incidence increases during July to September coinciding with the rainy season. Where poliomyelitis is common, 3 to 10 out of every 1,000 young children will develop paralytic disease without an immunization Programme.

Host: Man is the only reservoir, and infection is spread from person to person. Given the large number of inapparent infections it is difficult to find the source of a case. A long – term carrier state is not known to occur. The half – life of excreted virus in the sewage in warm tropical climate is approximately 48 hours. Spread of infection through sewage can only occur during this period. These facts, apart from the properties of OPV, are the major reasons why polio is a candidate for eradication.

Transmission: Person to person faeco-oral transmission is most common where sanitation is poor. One week after onset, little virus remains in the throat, but it contains to be excreted in stools for 6 to 8 weeks. Cases are most infectious during the first few days before and after the onset of symptoms.

Incubation Period: The incubation period from exposure to the virus till the onset of symptoms is 7-10 days (range of 4-33 days). The initial illness is followed by a few days, which are relatively free of symptoms before the onset of paralysis.

Clinical Presentation: An AFP case is any case of acute flaccid paralysis in a person under 15 years of age for any reason other than severe trauma, or paralytic illness in a person of any age in which polio is suspected. The classification of AFP is temporary. Within 90 days of onset the case should be finally classified as polio, polio compatible or "discarded" as not polio.

It should be stressed that surveillance is carried out for all cases of acute flaccid paralysis (AFP) and not just for poliomyelitis. Therefore, all AFP cases should be reported, regardless of the final diagnosis. Because paralytic poliomyelitis is one cause of AFP, maintaining a high sensitivity of AFP reporting will ensure that all cases of paralytic poliomyelitis are detected, reported, and investigated, resulting in preventive control measures to interrupt transmission of disease. The aim of AFP surveillance is to detect poliovirus transmission and the earlier stool is collected the greater the chance that poliovirus may be detected

Polio is a disease under eradication phase. Acute Flaccid Paralysis is the most common clinical presentation of polio. The medical officer will also undertake AFP surveillance

as part of intensive phase activity. All the surveillance activities under NPSP will be continued and supported by IDSP.

CASE DEFINITIONS POLIO

CLINICAL CASE DESCRIPTION:
A case of AFP is defined as any child aged <15 years who has acute onset of flaccid paralysis for which no obvious cause (such as serve trauma or electrolyte imbalance) is found, or paralytic illness in a person of any age in which polio is suspected.
Cases of AFP without isolation of wild poliovirus may be classified as "polio compatible" if:

- ☞ Stool specimens were inadequate
  AND
- ☞ Residual weakness was present 60 days after onset of paralysis or 60-day follow-up was not done (due to death or absence)
  AND
- ☞ Expert review" concludes that these cases could not be discarded as "non-polio" based on available data.

LABORATORY CRITERIA FOR DIAGNOSIS:

- ☞ Wild poliovirus isolated from any stool specimen

CASE CLASSIFICATION
Suspect case: **Syndromic case of AFP – Fever with abrupt onset of paralysis of leg or arm**
Probable case: **Epidemiologically linked case**
Confirmed case**: A suspected case that is laboratory-confirmed.**
Trigger Level

- ☞ Even a single case of AFP reported will trigger the outbreak investigation

10. PLAGUE

Epidemiology

Agent: The agent is a gram-negative cocco-bacilli – Yersinia pestis; which has a bipolar (safety pin) appearance on aniline staining. Sunlight, high temperatures and desiccation have a destructive effect, and ordinary disinfectants such as Lysol and preparations containing chlorine kill it within 1 to 10 minutes.

Reservoir: Wild rodents are the natural reservoirs. In India the reservoirs are mainly the wild rats – Bandicoota bengalensis, Tatera indica etc. They are susceptible to infection but not the disease. Others like wild squirrels, rabbits and wild carnivores may also be a source of infection. Plague remains in the wild due to various factors – e.g. rat – flea –rat cycle; survival of fleas in rat burrows for long periods of time; survival of plague bacilli in the rat burrows, eating of infected rodents by carnivore, etc.

Vector: The main vector is the Oriental rat flea – Xenopsylla cheopis

Transmission: There are at least 6 potential modes of transmission:

- ☞ Wild rodent > Flea > Peridomestic rodents > Flea > Domestic rodent > Flea > Humans

- ☞ Human with pneumonic plague > droplet infection > Humans
- ☞ Wild rodents > Flea > Humans (when humans enter the forests etc where the sylvatic cycle is maintained)
- ☞ Handling infected rodent tissue (wild / domestic) or any other infected material e.g. pus from buboes
- ☞ Domestic cats eat infected rodents > develop pneumonic plague > Droplet infection > Humans
- ☞ Plague bacilli > Bioterrorism > Humans

Host: All ages and both sexes are susceptible. People with occupations like hunting and grazing are more susceptible. There is no natural immunity and one can contract the disease even after previous illness.

Environment: Plague in North India is seasonal – higher chances in the winter. In the south, there are no definite seasonal trends. Any environmental condition that disturbs the rodent's natural environment e.g. floods and causes the overlap between the wild rodents and the peridomestic rodents is a potential source for plague in humans.

Incubation period: For Bubonic and septicemic plague – 2 to 6 days; for pneumonic plague – 1 to 3 days. The person is not infective during this period.

CASE DEFINITION PLAGUE

Disease characterized by rapid onset of fever, chills, headache, severe malaise, prostration with

- ☞ Bubonic form: extreme painful swelling of lymph nodes at axilla, groin and neck.(buboes)
- ☞ Pneumonic form: cough with blood-stained sputum, chest pain, difficult breathing
- ☞ Septicemia form: toxic changes in the patient.

LABORATORY CRITERIA FOR DIAGNOSIS:

- ☞ Giemsa smear should be positive
- ☞ Direct fluorescent antibody testing of smears (for anti-F1 antibody)
- ☞ PCR test
- ☞ 4 fold increase in antibody titres against F1 antigen (by PHA tests)
- ☞ Isolation of the bacteria by culture and phage lysis

CASE CLASSIFICATION

Probable case: A case consistent with clinical case description with H/0 rat fall**. Or**

- ☞ Y.pestis F1 antigen detected in clinical materials by direct fluorescent antibody testing or by some other standardized antigen detection method, or
- ☞ Isolate from a clinical specimen demonstrates biochemical reactions consistent with Y.pestis or PCR positivity, or
- ☞ A single serum specimen is found positive for diagnostic levels of antibodies to Y.pestis F1 antigen, not explainable on the basis of prior infection or immunization
- ☞ Epidemiological link with a confirmed case.

Confirmed case: a suspected or probable case that is lab-confirmed

- ☞ Isolate identified as Y. pestis by phage lysis or cultures; or
- ☞ A significant (4-fold) change in antibody titre to the F1 antigen in paired serum specimens.

Trigger-1 Rat fall

Trigger -2*: Even* 1 probable case of plague in the community

11. HIV

HIV is not under regular surveillance by IDSP from reporting units. Unlinked anonymous surveillance of sero-prevalence will be carried out as part of the National AIDS control organization at each district. The data will be collected, analyzed and shared with health and non-health sector in each district through the IDSP network.

Clinical case description

There is no clinical description; the diagnosis is based on lab criteria

Laboratory criteria for diagnosis:

- ☞ HIV positive serology (ELISA)
- ☞ Confirmation should be a second ELISA[1].

Syndromes under Surveillance

The paramedical health staff will undertake disease surveillance based on broad categories of presentation. The following clinical syndromes will be under surveillance in IDSP:

1. Fever
    - ☞ Less than 7 days duration without any localizing signs
    - ☞ With Rash
    - ☞ With Altered Sensorium or Convulsions
    - ☞ Bleeding from Skin or mucus membrane
    - ☞ Fever more than 7 days with or without localizing signs
2. Cough more than 3 weeks duration
3. Acute Flaccid Paralysis
4. Watery Diarrhea
5. Jaundice
6. Unusual Events causing death or hospitalization

These syndromes are intended to pick up all priority diseases listed under regular surveillance at the level of the community under the Integrated Disease Surveillance Project.

DISEASES OF INTEREST UNDER EACH SYNDROME

Fever with & without localizing signs	Malaria, Typhoid, JE, Dengue, Measles
Cough more than 3 weeks	Tuberculosis
Acute Flaccid Paralysis	Polio
Diarrhoea	Cholera
Jaundice	Hepatitis, Leptospirosis, Dengue, Malaria, Yellow fever
Unusual Syndromes	Anthrax, Plague, Emerging epidemics

[1] Confirmation by a second serological test is necessary only in settings where estimated HIV prevalence is known to be <10%

SYNDROME OF FEVER -DEFINITION

ALL NEW PATIENTS WITH FEVER SHOULD BE INCLUDED UNDER THIS DEFINITION. FURTHER SUB CATEGORIES ARE AS FOLLOWS

a). Fever less than 7 days with:

- Rash and coryza or conjunctivitis (suspected Measles)
- Altered sensorium (suspected JE or suspected Malaria)
- Convulsions (suspected JE)
- Bleeding from skin, mucus membrane, vomiting blood or passing fresh blood or black motion (suspected dengue)
- With none of the above (suspected malaria) b). Fever $\geq$ 7 days (suspected typhoid)

Trigger: More than 2 similar case in the village (1000 Population)

SYNDROME OF COUGH -DEFINITION

All new patients with cough, as the main presenting symptom should be included. These Patients will be divided into two categories:

a) Short duration cough (Cough 3 weeks). Suspect ARI

b) Long duration cough (Cough of $\geq$ 3 weeks) Suspect Tuberculosis

Note: While there may be other accompanying symptoms e.g. fever and breathlessness, a patient is considered as one suffering from cough, if his/her main symptom is that of cough

SYNDROME OF DIARRHOEA -DEFINITION:

Syndrome of Acute Watery Diarrhea: Any new case of watery diarrhoea (passage of 3 or more loose or watery stools in the past 24 hours) with or without dehydration. The total duration of illness should be less than 14 days.

Trigger: More than 10 houses with diarrhoea in a village or urban ward or a single case of severe dehydration or death in a patient less than 5 years with diarrhoea.

SYNDROME OF JAUNDICE -DEFINITION

Clinical Description:

A New Patient with an acute illness (less than 4 weeks) and with the following symptoms:

- jaundice, dark urine,
- anorexia, malaise, extreme fatigue and
- Pain in the right upper quadrant abdomen.

Trigger: More than 2 cases of Jaundice in different houses irrespective of age in a village or 1000 population

8. EVALUATION QUESTIONS

1. List the conditions under IDSP.
2. Write the case definitions of Cholera, Measles, Jaundice and unusual syndrome.
3. What is trigger level?
4. Describe trigger levels for Japanese encephalitis and typhoid.
5. Describe the laboratory support required for identifying an outbreak of unusual syndrome.
6. Name the diseases under IDSP for which vertical Programmes are present in your district.
7. What are the diseases, which are transmitted by vectors and water?