

CDAlert

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LABORATORY SUPPORT IN DISASTER SITUATIONS

COMMUNICABLE DISEASES AND NATURAL DISASTERS

Natural disasters often create an immediate obstacle to response by disrupting vital services (e.g. water, health and security services) as well as key communication and transportation systems in addition to sudden impact of killing and injuring people and causing extensive environmental, social and economic damage.

Communicable diseases are relatively rare in the days immediately following a sudden natural disaster. However, with continuous lack of utilities (such as water supplies and sewage treatment), disrupted health services and poor environmental conditions (such as sanitation, emergence of new breeding sites, overcrowding in shelters and camps, and disruption of vector control activities), there is an increased risk of communicable disease outbreaks. Some of the common communicable diseases with outbreak potential encountered due to the above disruptions include:

- Acute diarrheal diseases (including dysentery and cholera)
- Acute jaundice syndrome
- Acute respiratory infections
- Typhoid/Enteric fever
- Dengue
- Acute encephalitis
- Measles
- Acute pyogenic meningitis
- Malaria

Public health surveillance aims at collection, analysis and dissemination of health information to enable appropriate action to be taken. This is particularly important in disasters and emergencies because of the particular

vulnerability of the affected population, sudden changes that can occur in the health due to unstable nature of the situation, and the need to share quantitative data rapidly with a range of partners to enable rapid and effective action to be taken. Surveillance therefore, is an important strategy for control and prevention of outbreaks due to outbreak-prone communicable diseases.

The introduction of laboratory support in epidemiological services has revolutionized the concept as well as scope of disease surveillance, which means, laboratory support is an integral component of any surveillance system. Laboratories can support the public health surveillance activities in disaster and emergency situations, including prevention and control of outbreaks due to communicable diseases, i.e.

- Early detection of outbreak and assistance in investigation (water borne disease outbreaks, meningococcal meningitis etc.)
- Confirmation of etiology of the outbreak particularly in case of syndromic presentation (acute jaundice syndrome which could be due to acute viral hepatitis or leptospirosis, both of which have an outbreak potential)
- Tracing spread of infection using epidemiological markers
- Detection of carriers (human, animal)
- Detection of new agents introduced into the affected area e.g. by external health workers or displaced persons or migrants from other location.
- Environmental monitoring (water/food bacteriology etc.)

LABORATORY SUPPORT TO DISEASE SURVEILLANCE IN DISASTER

Setting up Laboratory Support to Disease Surveillance

Before setting up a laboratory for surveillance/outbreak investigation following a disaster, it is very important to identify the important communicable diseases, possible etiology/causative agents and the tests to be performed at various levels of laboratories. (For details please refer Table 1).

- Identify priority communicable diseases of public health importance.
- Define the list of tests to be performed at each level of laboratories for the priority diseases (to be determined by the local situation).
- Map and assess the laboratory facilities (and available manpower) that can provide diagnostic support for these diseases. Make an inventory of referral laboratories that can provide a back up to the laboratory activity; ensure networking with these labs even during peacetime for its optimal use in an emergency situation.
- Identify a focal laboratory person at the district level to coordinate the activities.
- Flow of information should be defined.
- Standard guidelines, formats & common strategy for testing should be made available to all concerned including the samples to be collected for various syndromes/illnesses.
- Ensure supplies for collection, transport and storage of clinical samples.
- Proper collection, storage and transport should be the focus & not the final identification.
- Focus more on rapid test that require minimal expertise and have high sensitivity and are good even in adverse field conditions and should not be resource intensive so as to divert the resources from other essential activities.
- Outbreak investigation kits should be made available to the Rapid Response Teams

(RRTs) and constantly replenished and restocked (Table 2).

- During an outbreak only representative samples should be tested in order to avoid unnecessary burden on the laboratory services.
- Monitor the results, trends and unusual findings (early warning signals).
- Ensure rapid communication and regular reporting of results to the epidemiologists for initiating action.

Laboratory support to outbreak investigation

- Laboratories support should be an important component of an epidemic-preparedness plan for epidemic-prone communicable diseases in a disaster situation and preparations should be made accordingly in the inter-epidemic period as outlined above.
- Based on the preliminary information on the syndrome responsible for the outbreak, decide on the possible differential diagnosis for further investigations.
- The quantity and nature of the supplies required in the field such as containers, reagents, rapid kits, transport media etc. and the level of expertise of the laboratory personnel required in the field must be considered before setting out to investigate the outbreak. Keep outbreak investigation kit always ready with team.
- Once in the field, ensure proper collection, storage and transport of the specimen in leak-proof containers labeled properly and accompanied by complete patient information in standard formats.
- Ensure that appropriate bio-safety and waste management measures are followed.
- Inform the receiving laboratory about the tentative date and time of arrival of the specimen.
- The aim should be to reduce the time to confirmation so that timely public health actions can be taken. Only, a few initial cases need confirmation. Rest with similar clinical manifestations should be treated as confirmed.

Table 1 – Possible etiology, laboratory tests to be performed and clinical specimen needed in various disease syndromes

	Suspected outbreak of acute diarrheal disease	Suspected outbreak of fever (Including fever with rash and acute hemorrhagic fever syndrome)	Suspected outbreak of acute neurological syndrome	Suspected outbreak of acute jaundice syndrome	Suspected outbreak of acute respiratory infection		
Possible disease pathogens	<p>Watery diarrhea Cholera, Viral gastroenteritis, Enterotoxigenic Esch.coli</p> <p>Dysentery Shigellosis, Salmonellosis, Enterohaemorrhagic Esch.coli, Amoebic dysentery, Campylobacteriosis</p>	<ul style="list-style-type: none"> • Malaria • Typhoid • Measles • Dengue and dengue hemorrhagic fever 	<ul style="list-style-type: none"> • Meningococcal meningitis • Leptospirosis • Viral/aseptic meningitis • Viral encephalitis 	<ul style="list-style-type: none"> • Acute viral hepatitis • Leptospirosis 	<ul style="list-style-type: none"> • Influenza • Diphtheria • Streptococcal pharyngitis 	Pertussis	Bacterial pneumonias due to <ul style="list-style-type: none"> • <i>Streptococcus pneumoniae</i>, • <i>Hemophilus influenzae</i>
Specimen required	<ul style="list-style-type: none"> • Freshly passed stool • Rectal swab • Fecal swab • Environmental sampling especially water for available chlorine and bacteriological examination 	<ul style="list-style-type: none"> • Blood • Blood smear • Serum • Stool • Urine • Throat swab • Environmental sampling especially water for available chlorine and bacteriological examination 	<ul style="list-style-type: none"> • CSF • Blood • Serum • Stool • Urine • Throat swab • Post mortem tissue • Environmental sampling especially water for available chlorine and bacteriological examination 	<ul style="list-style-type: none"> • Blood • Serum • Urine • Environmental sampling especially water for available chlorine and bacteriological examination 	Throat swab	Per-nasal/nasopharyngeal swab	<ul style="list-style-type: none"> • Sputum • Blood for culture
Laboratory tests to be done	<p>In the field/ peripheral lab:</p> <ul style="list-style-type: none"> • Hanging drop/ Iodine & wet mount of stool specimen • OT test for available chlorine in water • Rapid H2S test for bacteriological examination of water <p>At the district lab:</p> <ul style="list-style-type: none"> • Above tests plus • Toxin detection test for cholera toxin (if kit available) • MPN test for bacteriological examination of water • Stool culture for enteropathogens; sensitivity testing, if available • Referral of samples for further characterization and investigation, if required 	<p>In the field/ peripheral lab:</p> <ul style="list-style-type: none"> • Peripheral smear for malarial parasite, total leukocyte count, differential leukocyte count • Platelet count • OT test for available chlorine in water • Rapid H2S test for bacteriological examination of water <p>At the district lab:</p> <ul style="list-style-type: none"> • Above tests plus • Widal test/ Typhidot test • Rapid test for typhoid (Typhidot) • MPN test for bacteriological examination of water • Stool culture for enteropathogens; sensitivity testing, if available • Blood culture and sensitivity • Rapid diagnostic tests for diagnosis of dengue virus • Referral of samples for further characterization and investigation, if required 	<p>In the field/ peripheral lab:</p> <ul style="list-style-type: none"> • Gram stain of CSF & CSF cytology • India ink mount of CSF • Dark ground microscopy of peripheral blood for leptospira • OT test for available chlorine in water • Rapid H2S test for bacteriological examination of water <p>At the district lab:</p> <ul style="list-style-type: none"> • Above tests plus • MPN test for bacteriological examination of water • Latex agglutination tests for detection of capsular antigen in CSF (if kit available) • Rapid tests for detection of antibodies to <i>Leptospira</i> • CSF for bacterial culture (if facilities available) • Blood for bacterial culture • ELISA for JEV • Referral of samples for further characterization and investigation, if required 	<p>In the field/ peripheral lab:</p> <ul style="list-style-type: none"> • OT test for available chlorine in water • Rapid H2S test for bacteriological examination of water • Dark ground microscopy of peripheral blood for Leptospirosis • Rapid kit test for the diagnosis of viral hepatitis (HBsAg antigen detection and anti-HCV) <p>At the district lab:</p> <ul style="list-style-type: none"> • Above tests plus • MPN test for bacteriological examination of water • Urine microscopy • Rapid tests for detection of antibodies to <i>Leptospira</i> • Blood for bacterial culture • Referral of samples for further characterization and investigation 	<p>In the field/ peripheral lab:</p> <ul style="list-style-type: none"> • Gram's stain of throat swab and sputum* • Albert's stain of throat swab* • Inoculation of blood culture bottles and swabs in appropriate transport media <p>At the district lab:</p> <ul style="list-style-type: none"> • Above tests plus • Bacterial culture (& sensitivity, wherever applicable) from throat swab, sputum, blood • Referral of samples for further characterization and investigation, if required 		* For diphtheria & other org.

Networking of laboratories

Under the Integrated Disease Surveillance Programme (IDSP) of Government of India, a laboratory network has been established at various levels of health care as given below and this network is to be used for disease surveillance/outbreak investigation even during disaster. The network comprises of

- Peripheral Laboratories and Microscopy centers (L1 Labs)
- District Public Health Laboratories (L2 Labs)
- State Laboratories (L3 Labs)
- Regional and Quality Assurance Laboratories (L4)
- Disease based reference Laboratories (L5)

These laboratories will carry out below activities.

1. Peripheral Laboratory (L₁ labs)
Basic lab facilities like microscopy for TB and malaria, faecal contamination of water by rapid H₂S Test etc. However these labs should be equipped to collect, store and transport the relevant clinical samples for the important communicable diseases.
2. District laboratories (L₂ labs)
It is the backbone of the laboratory network. Besides carrying out all the activities of the L₁ labs, these labs will also carry out cholera/typhoid culture, rapid test for HIV, viral hepatitis, antimicrobial sensitivity testing etc. Quality assurance for the L₁ labs will also be carried out.
3. State level laboratories (L₃)
These are mainly in the medical colleges and will carry

out advanced laboratory investigations besides doing all the activities required at district level. It will carry out the quality assurance of the district and PHC laboratories. Some of the advanced tests performed at L₃ labs are mycobacterium culture & sensitivity, serology for measles, leptospirosis, JE/Dengue, Anthrax culture etc.

4. Regional and Quality assurance laboratories (L₄)
There would be 4-5 such labs in the country, which would carry out quality assurance of district and state level labs besides carrying out advanced lab. tests like virus cell cultures, molecular techniques etc.
5. National reference laboratories (L₅)
There are 8-10 laboratories of repute in the country which will be acting as National Reference Labs. These laboratories are: National Institute of Communicable Diseases, Delhi; National Institute of Cholera and Enteric Diseases, Kolkata; National institute of Virology, Pune; PGI Chandigarh; CMC, Vellore; NIMHANS, Bangalore; KIPM, Chennai; SGPGI, Lucknow & will carry out following additional work :
 - Characterization of strains.
 - Maintain a repository of microbial strains and reagents.
 - Production of diagnostic antisera.
 - Development of SOPM's for the lower level of labs
 - Quality assurance of lower level of labs.

Table 2 – Generic Outbreak Investigation Kit

Proposed components of the kit:

• Disposable storage vials (5ml)	• Rubber bands
• Disposable sample collection vials	• Ziploc plastic bags
• Stool culture bottle	• Absorbent material (tissue paper, cotton wool, newspaper)
• Throat swabs	• Labels
• Blood culture bottles	• Glass marking pen
• Viral transport medium	• Adhesive tape
• Cary Blair medium/ Stuart's transport medium	• Scissors
• Vacutainer (plain and EDTA)	• Scalpel/ blade
• Syringes and needles disposable (5ml)	• Spatula
• Tourniquet	• Forceps
• Gloves	• Loop holder
• Masks (triple layer surgical mask)	• Pasteur pipettes/ pipettes and pipette aids (rubber teats)
• Disposable gowns	• Rapid diagnostic kits
• Puncture proof discarding bags (disposable)	• Sodium hypochlorite concentrates (4%)
• Spirit swabs/ alcohol swabs	• Hand disinfectant
• Band-aid	• Stationary (writing pads, pens, pencils, erasers, sharpeners etc.)
• Vaccine carrier with ice-packs	• Calculator
• Spirit lamp/ gas lighter	• Torch with spare batteries/ rechargeable batteries.
• Match-box	• Laboratory request forms
• Test tube rack	• OT test kit
• Centrifuge tubes	• Epidemiological survey formats
• Lancets	• Epidemiological reporting formats
• Slides and cover slips	• Outbreak investigation guide/ module

Selected entomological equipment such as:

- Aspirator and flashlight for indoor/ outdoor mosquito collection
- WHO susceptibility kit for adult & larvae with reagents
- Bioassay kit
- Kit for outdoor mosquito collection
- Ladle bottles for keeping larvae, strainer, dropper, trays and funnel net for wells
- Vector dissection equipment:

• Pyrethrum spray (0.02%) with flit gun	• Physiological saline
• White bed sheet to spread on floor	• Dissecting microscope
• Dissection needle	• Staining equipment & material
• Petridishes	• Filter paper
• Slides, coverslips	• Mosquito net

- Synoptic keys for identification of vectors
- Any other, as per the requirements of the outbreak.

The laboratories which have expertise in investigation of outbreaks are:

- o **National Institute of Communicable Diseases,**
22-Shamnath Marg, Delhi – 110 054
Tel: 011-23971272, 23971060, 23971344 Fax: 011-23972677 Email: dirnicd@bol.net.in
- o **National Institute of Virology,**
20-A, Ambedkar Road, Pune – 411 001 (Maharashtra)
Tel: 020-26126302, 26126304 Fax: 26122669 Email: nivcl@pn3.vsnl.net.in
- o **National Institute of Cholera & Enteric Diseases,**
P-33, CIT Road, Scheme XM, Beliaghata, Kolkata – 700 010
Tel: 033-23501176,23508493 Fax:033-23505066 Email: niced@cal2.vsnl.net.in

COLLECTION, TRANSPORT & STORAGE OF CLINICAL SPECIMEN

For any investigation of outbreak this is very important

A summary of the important clinical specimens, their method of collection, handling and transport is at Tables 3 & 4.

Table 3 – Specimen for virus isolation

Specimen	Transport media Y/N	Storage condition		Purpose/lab investigation
		Transport	Pending test	
Throat swab	VTM* yes	2-8°C	-20°C	Isolation
NPA**/ swab	VTM* yes	2-8°C	-20°C	Isolation
CSF	No	2-8°C	-20°C	Isolation, serology
Faeces	No	2-8°C	-20°C	Isolation
Urine	No	2-8°C	-20°C	Isolation
Serum/ Clotted blood	No	2-8°C	-20°C 2-8°C	Isolation, serology
Whole blood	No	2-8°C	2-8°C	Isolation, serology

* Viral Transport Medium ** Nasopharyngeal aspirate

Note: All the samples have to be collected in a sterile leak proof container & under biosafety precautions & should accompany the detailed clinical information of the patient.

LABELLING AND IDENTIFICATION OF SPECIMENS

In a diagnostic investigation the information contained in the case investigation form is collected along with the specimen. Each patient should be assigned a unique identification number. This unique identification number and the patient name should be present on specimens, epidemiological data forms, and the laboratory transmittal forms.

Glass slides for microscopy must be labeled individually, using glass-marking pencil. This should not interfere with the staining process.

Label on specimen

Patient Name: _____ Identification No. _____

Specimen Type: _____ Date & Time of Collection: _____

Case Investigation Form

A laboratory request form must be completed for each specimen and contain information to interpret the necessary tests. This may include:

- Patient information: age (or date of birth), sex, complete address
- Clinical information - date of onset of symptoms, clinical and immunization history, risk factors or contact history where relevant, antimicrobial drugs taken prior to specimen collection etc.
- Laboratory information - acute or convalescent specimen, other specimens from the same patient.
- The receiving laboratory should record:
 - Date and time when the specimen was received
 - Name and initials of the person receiving specimen
 - Record of specimen quality.

For a large number of patients, it may be practical to submit the requests to each relevant laboratory as a 'line listing'.

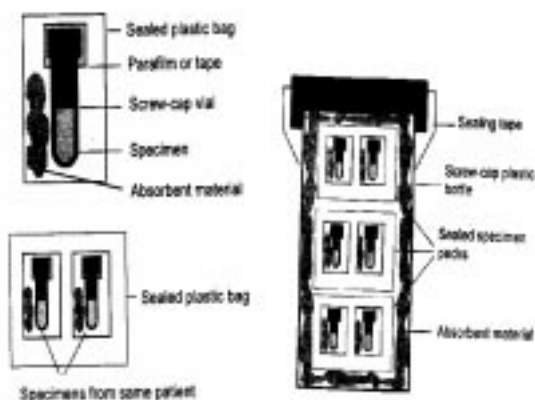
TRANSPORT OF SPECIMENS

Maintain the transit temperature at 2-8°C. The sample should be transported in vaccine carrier with ice packs and triple package box.

Note:-

- Avoid repeated thawing and freezing of specimens.
- Freeze the specimen only if transport is assured at -20°C.
- Store and transport all specimens at 2-8°C, except CSF obtained from suspected cases of pyogenic meningitis.

Basic triple packaging system



The containers and bags used for triple packaging can be any similar items written in diagram which are available. The idea of this packaging is that the infected material should not leak out and infect environment.

Table 4 – Summary of Specimen Collection, Handling and Transport

SPECIMEN	COLLECTION	HANDLING AND TRANSPORTATION
Blood for smears for hemoparasites	Capillary blood from finger prick. Make smear, fix the same in methanol or other fixative.	Transport the slides within 24 hours. They must not be refrigerated.
Blood for pyogenic culture	Venous blood 0.5 – 2 ml for infants 2 – 5 ml for children 5 – 10 ml for adults	Collect into blood culture bottles (With Glucose broth or Bile salt broth) Transport in erect position, and with enough cushion to prevent lysis of cells. Wrap the samples with absorbent cotton to soak any spillage. Transport at room temperature to the testing laboratory within 24-48 hours. If further delay is expected, transport under cold chain at 4°C.
Serum for serology	Venous blood is collected and placed in a sterile test tube. Let the specimen clot for 30 minutes at ambient temperature. Then place in a cool box for clot retraction at 2-8°C for a minimum of 1-2 hours. This is then centrifuged @ 1500 RPM for 5-10 mts. Separate the serum from the clot.	Sera should be transported at 4 – 8°C and Can last at this temperature for up to 10 days.
CSF for culture, microscopy and serology	Lumbar puncture under aseptic conditions by trained medical staff. Collect the CSF in sterile tubes.	If bacterial etiology is suspected (turbid or cloudy CSF), then transport at ambient temperature. However, for viruses (clear and colourless CSF), transport at 4–8°C and the sample must reach the laboratory within 24–48 hours.
Faeces for culture	Collect freshly passed stool (approx. 8 gm) In children, rectal swabs may be collected	Transport at 4-8°C. Process within 1– 2 days. When bacterial etiology is suspected, samples can be transported in Cary Blair's Medium at room temperature.
Respiratory samples (throat swab, per-nasal & post-nasal swab, nasopharyngeal aspirate, sputum)	<p>Throat Swab - Using a tongue depressor and under strong light source, locate areas of inflammation and exudate in the posterior pharynx and the tonsillar region of the throat behind the uvula, collect throat swab by rubbing the area back and forth with a cotton or Dacron swab.</p> <p>Per Nasal Swab - Using a nasal speculum and with the head tilted backwards, insert a flexible calcium alginate/Dacron swab through the speculum parallel to the floor of nose without pointing upwards. Alternately, bend the wire and insert it into the throat and move the swab upwards into the nasopharyngeal space. Rotate the swab on the nasopharyngeal membrane a few times.</p> <p>Post Nasal Swab - Flush a plastic catheter or tubing with 2-3 ml of VTM/sterile normal saline. With the head of the patient tilted slightly backward, instill 1-1.5 ml of VTM /sterile normal saline into one nostril. Insert the tubing into the nostril parallel to the palate and aspirate nasopharyngeal secretions. Repeat this procedure with the other nostril. Collect 1-2 ml in a sterile vial and transport</p> <p>Sputum - Instruct patient to take a deep breath and cough up sputum directly into a wide-mouth sterile container. Avoid saliva or postnasal discharge. Minimum volume should be about 1 ml.</p>	<p>All respiratory specimens except sputum are transported in appropriate bacterial (Amie's or Stuart's transport medium) /viral (Viral transport medium) media.</p> <p>Transport as quickly as possible to the laboratory to reduce overgrowth by commensal oral flora.</p> <p>For transit periods up to 24 hours, transport specimens for bacterial isolation at ambient temperature and for viruses at 4-8 °C in appropriate media.</p>
Water sample for bacteriological examination	Collect at least 200ml of water sample from the source (tap, a pump or a pump outlet, a watercourse or reservoir, dug wells) in sterile glass bottles (alternatively, autoclavable plastic bottles with a tight screw capped lid) with securely fitting stoppers or caps having an overhanging rim.	Test the water sample within 3 hours of collection during which time it can be kept at room temperature. If delay is expected, keep the sample at 2-8°C which should then be tested within 24 hours.
Post mortem samples	<ul style="list-style-type: none"> ● Biopsy of relevant tissues ● Place in formalin for histopathology ● Place in Transport media sterile saline for microbiological testing. 	Fixed specimens can be transported at ambient temperatures Specimens in transport media may be transported within 24 hours at ambient temperature. Specimens in sterile saline should be transported at 4-8°C within 48 hours.

Note: For details please refer to "LABORATORY MANUAL FOR DISTRICT LABORATORIES 2004, NICD, Delhi"

Table 5 – Preparation and use of chlorine disinfectants

Chlorine Product	0.5% available chlorine solution used for disinfecting:	0.05% available chlorine solution used for disinfecting:
Household bleach (5% active chlorine)	<ul style="list-style-type: none"> ▪ Excreta ▪ Cadavers ▪ Spills of blood and body fluids 	<ul style="list-style-type: none"> ▪ Gloved hands ▪ Bare hands and skin ▪ Floors ▪ Clothing ▪ Equipment ▪ Bedding
Household bleach (30% active chlorine)	Add 16 grams or one table-spoon to 1 litre of water	Add 16 grams or 1 table-spoon to 10 litres of water
Calcium hypochlorite powder or chlorine granules 70%	7 grams or ½ tablespoon dissolved in 1 litre of water	7 grams or ½ tablespoon dissolved in 10 litres of water

BIOSAFETY AND DECONTAMINATION PROCEDURES

General bio-safety measures and universal precautions must be followed.

General bio-safety measures

- Use disposable gloves while collection of clinical specimen
- Wear laboratory coats while collection & handling of specimen
- Use protective eyewear or face shields if procedure is likely to generate aerosols
- All laboratory waste should be handled with care to avoid injuries from sharps
- As far as possible manual handling of waste should be avoided
- The waste should be placed in appropriate leak-proof biohazard bags and autoclaved. Before disposal the clinical samples should be processed only in designated laboratory having the proper containment facility.
- A first aid kit is essential, and should be readily accessible at the site of specimen collection.
- Protective clothing, work premises, equipment, and materials may all become contaminated in the field. Disinfection of work areas and decontamination of spills of blood or infectious body fluids is generally achieved by chemical disinfection with chlorine-based solutions (Table 5).
- It is generally not practicable to achieve adequate sterilization of contaminated materials in the field. As incompletely 'sterilized' material may expose both the participants in the investigation and the general public to a real risk of infection, the re-use of contaminated equipment or materials such as gloves or clothing is not

recommended.

- Sharps and soiled glass slides should be discarded directly into a puncture-resistant container, which is then safely disposed.
- Work areas and surfaces should be organized and disinfected with 1% household bleach daily or with a change in collection team. Use 10% bleach to clean up spills after wiping the surface clean.
- Personnel carrying out cleaning or decontamination should wear a protective coat and thick rubber gloves.
- Contaminated non-disposable equipment or materials should be soaked in 1% household bleach for 5 minutes. Before use, wash in soapy water and sterilize if necessary.
- Heavily soiled disposable items should be soaked in 10% household bleach before safe disposal.

Interpretation of Results

While reporting laboratory incharge should ensure that interpretation of test is incorporated. In general whenever any pathogenic organism is isolated from clinical specimen it indicates the causative agent. IgM antibody test positive against any organism gives evidence of acute infection while IgG antibody presence indicates exposure to that organism in past unless four fold rise in antibody titre in two blood samples collected at interval of ≥ 15 days is demonstrated which indicates acute infection.

References:

- *Guidelines for collection of clinical specimen during field investigation of outbreaks.* WHO Geneva 2000.
- *Manual of laboratory techniques for district public health laboratories.* NICD, Delhi 2004.
- *Control of communicable diseases manual.* American Public Health Association 17th edition 2000.

REPORTING FORMATS

Case Investigation form
(To be filled in by the clinician/epidemiologist)

Date: _____

Patient's Name: _____ **Patient's I.D. No.:** _____
Father's/ Husband's Name: _____ **Age/ Sex:** _____
Address: _____
Date of onset of illness: _____
Date of hospitalization/ reporting to the district level: _____
Occupation: _____
Clinical signs & symptoms (with duration): _____
Treatment history: _____
Results of previous investigations (if any): _____
Any other relevant information: _____

Specimen details:

Nature of specimen (s)	Date of collection	Investigation required

Details of sender:

Signature: _____

Name of sender: _____

Address of sender: _____

Fax: _____

E-mail: _____

(NOTE: Please complete all the columns. Always send the sample under cold chain unless specified otherwise)

Laboratory Reporting form

Patient's Name: _____ **Patient's I.D No.:** _____
Age/ Sex: _____ **Laboratory Reference No.:** _____

Specimen details:

Type of Specimen	Date of Collection	Date of Receipt in lab	Type of test	Result	Remarks (if any)

Interpretation:

Details of Investigator:

Name: _____

Signature: _____

Address: _____

Telephone No.: _____

While reporting laboratory incharge should ensure that interpretation of test is incorporated.

...about CDAlert

CDAlert is a monthly newsletter of the National Institute of Communicable Diseases (NICD), Directorate General of Health Services, to disseminate information on various aspects of communicable diseases to medical fraternity and health administrators. The newsletter may be reproduced, in part or whole, for educational purposes.

Chief Editor: Dr. S.P. Agarwal

Editorial Board: Dr. Shiv Lal, Dr. Usha K. Baveja, Dr. R. L. Ichhpujani, Dr. Shashi Khare, Dr. A.K. Harit

Guest Editor: Dr. Sunil Gupta, Dr. Manish Kakkar

Publisher: Director, National Institute of Communicable Diseases, 22 Shamnath Marg, Delhi 110 054

Tel: 011-23971272, 23971060 Fax : 011-23922677

E-mail: dirnicd@bol.net.in and dirnicd@del3.vsnl.net.in

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