

Guidelines for Outbreak Investigations by NJORT

Purpose

This SOP provides standardized, field-ready procedures for the rapid investigation, containment, and reporting of disease outbreaks by the National Joint Outbreak Response Team (NJORT). It is designed to ensure timely decision-making, coordinated action, data quality, and actionable public health recommendations.

Description

The National Joint Outbreak Response Team (NJORT), deployed for outbreak investigation, comprises of experts from various fields, including public health specialists, clinicians, microbiologists, veterinarians, entomologists, and researchers from other non-health sectors as appropriate.

The NJORT is expected to be immediately deployed (within 24-48 hours) to visit the outbreak-affected area and work collaboratively with local authorities to comprehensively investigate the outbreak / unusual incident and suggest containment measures. The NJORT is expected to investigate with a focus on identifying the etiologic agent and the potential risk factors, the source of the outbreak, the mode of transmission, access to treatment, implementation of prevention and control measures and provide basic descriptive epidemiology. The NJORT outbreak investigation report should provide specific recommendations, based on the findings and analysis of data from the investigation for public health action.

Deliverables

- Descriptive Epidemiology
- Analyzed Data Presentation
- Provide specific & actionable recommendations
- Detailed investigation report duly signed by all members with
 - An executive summary
 - Relevant Photographs
 - List of all samples collected
 - Results of all investigations undertaken
 - Relevant Annexures

Composition of NJORT:

The exact composition of NJORT shall depend upon the nature and type of outbreak or unusual incident under investigation. The list may include expert(s) from:

- Public Health / Epidemiology
- Laboratory / Microbiology
- Entomology
- Department of Animal Husbandry
- Wildlife
- FSSAI
- Jal Shakti Ministry
- Clinical specialty
- Any other subject matter expert

This list is not limited to the aforementioned departments / specialties and can be expanded depending on the scenario

Once the deployment orders are issued by MoHFW, one expert - usually senior most public health expert - will be assigned as the team lead, who will be responsible for task assignment among the team members.

Depending on the team composition, team may be organized on principles of incident command system

Role	Responsibility
Team Lead (Incident Lead)	Overall coordination, decision-making, reporting
Epidemiology Lead	Case definitions, data analysis, hypothesis generation
Clinical Lead	Case management review, clinical data abstraction
Laboratory Lead	Sample strategy, biosafety, lab coordination
Environmental/Vector/Zoonotic Lead/ Wild Life/ FSSAI/Entomology/Animal Husbandry	Source and transmission assessment
Logistics & Liaison Officer	Transport, permissions, coordination with state/district
Risk Communication Focal Point	Messaging inputs, community interface

The NJORT members are expected to familiarize themselves with the basics of the disease / incident before going to the field and the potential differential diagnoses and go through NCDC's CD Alert on the health condition if available. The Public Health Emergency Operations Centre (PHEOC) of NCDC shall facilitate the pre-deployment briefing of the NJORT members.

The experts deployed in the NJORT for outbreak investigation should:

- Work together in a multidisciplinary investigation team with the respective expertise
- Follow all the steps of outbreak investigation under the guidance of the PH expert / Team lead
- Be familiar with the descriptive epidemiology skills and analytic statistical methods appropriately
- Coordinate for appropriate laboratory support
- Give recommendations based on the findings of the investigation

SOPs for field investigation of Outbreak

1. After deployment order – officers need to obtain necessary administrative approvals from their division/ department/ Head of Office and submit their tour programme and book travel through proper channel and reach the field at the earliest – preferably within 24 hours of receiving deployment orders
2. The team should first contact the PHEOC In-charge at NCDC and later the concerned SSO/ DSO for relevant information regarding the outbreak / incident.
3. The team should collect relevant data and relevant information from Centre/ State/District for a situational analysis before proceeding into the field, and collect required letters and advisory from the State/Districts IDSP office before visiting the outbreak site.
4. The team should visit the outbreak site to start the investigation along with the assigned State/District officials
5. The team should provide a regular update, at least once a day, of the field activities and outbreak situation to the PHEOC, NCDC via email or teleconference.
6. NJORT should recommend to the Reporting Unit to update the information on the IDSP-IHIP platform.
7. The team should depart from outbreak site only after submitting a preliminary report to NCDC/ MoHFW and seeking necessary approval from competent authority
8. The team should de-brief the State / District administration of the preliminary findings and recommendations before leaving the field.
9. The team should avoid interaction and sharing details of the investigation with “media” at any stage of the outbreak investigation, without prior permission from the competent authority.
10. Team lead will be responsible for regular communication and submitting the final report after the field investigation, at the earliest
11. After departure from the field, the team is expected to follow-up with the State/district, until the outbreak period is over and provide any technical support if indicated.

A. Submission of Outbreak Report

The final report is to be submitted by the team, which should include:

- Descriptive analysis of cases with time, place, person distribution along with any additional investigations conducted- environmental, veterinary, entomological or analytical.
- Give recommendations based on findings from the investigation.
- Should include Executive Summary.
- The final report should be approved and signed by all the team members.

Appendix I: Steps of Outbreak Investigation (OBI)

Steps of OBI	Check-list	Scenario: <i>NJORT for Chandipura Virus Disease OBI, July 2024</i>
Step 1: Field Preparation		
<ul style="list-style-type: none"> • Gather preliminary information/ event alert • Make necessary technical, logistics and administrative arrangements • Team lead to brief team members on their roles and responsibilities 	<ul style="list-style-type: none"> • Prepare an Outbreak Management Kit • Ensure adequate supply of Personal Protective Equipment (PPE) kits • Initiate chemoprophylaxis for personal protection if indicated 	<p>Event alert: <i>Media alert on CSU-IDSP reported clustering of AES cases and 12 deaths in July 2024 in Gujarat. Subsequent media reports confirmed Chandipura Virus diagnosis among the AES cases NJORT was deployed in July 2024 for outbreak investigation</i></p>
Step 2: Confirm the outbreak		
<p>Does an outbreak actually exist?</p> <ul style="list-style-type: none"> • Is the no. of case more than past years or more than the same time last year? • Changes to testing/ reporting? <ul style="list-style-type: none"> ○ More people in the area? ○ New test/ surveillance sites ○ Changed case definition • Are initial reports accurate (check with someone else)? • Do cases all have the same/similar illness? 	<p>Confirm the outbreak – total no. ill, total population, no. hospitalised, no. dead and/or ask different people for info</p> <ul style="list-style-type: none"> • Finding source (consider causes of illness and population)? • Need more help? Vet or human health side, Nurse, lab person, other sectors? • Organise logistics: transport, phone, medicines, laptop, etc • Specimen collection supplies (talk to local/ referral labs) 	<p><i>The team found out that AES and confirmed Chandipura cases were higher than previous years (crossed threshold of mean + 2 SD). It should be kept in mind that threshold for some diseases can be 0</i></p>
Step 3: Establish a diagnosis		
<p>A specific diagnosis (etiology) is useful but not compulsory.</p> <ul style="list-style-type: none"> • Diagnosis can be clinical or lab confirmed (most reliable) • Talk with the: <ul style="list-style-type: none"> ○ clinicians treating the cases ○ or lab before collecting samples • You do not need to confirm all cases by lab 	<p>Ask the lab:</p> <ul style="list-style-type: none"> • Specimens to collect e.g. blood, feces, environmental samples,etc • How to collect the specimens • What personal protective equipment to wear (how to collect specimens safely) • The number of cases to collect specimens from • Photos required?(skin lesions) • How to complete the lab form • How to store and transport specimens back to the lab 	<p><i>Officers visit the affected districts, ensured specimens are collected correctly. The lab confirmed Chandipura Virus</i></p>

Steps of OBI	Check-list	Scenario: <i>NJORT for Chandipura Virus Disease OBI, July 2024</i>																																			
Step 4: Develop outbreak case definitions																																					
<p>A case definition allows everyone to understand what a “case” is and what is not.</p> <ul style="list-style-type: none"> • Should include: <ul style="list-style-type: none"> ○ Clinical/ Lab criteria (e.g. fever, IgM ELISA positive) ○ Person/animal/plant (e.g. age) ○ Place (e.g. village) ○ Time (e.g. onset date) • Definition can be for – confirmed (lab diagnosis)/ probable (epidemiologically linked)/ suspect (syndromic-for active case finding) • 	<p>Check if case definition includes all four components:</p> <ul style="list-style-type: none"> • Clinical symptoms/ Lab criteria • Time • Place • Person 	<p><i>Team created a case definition along with local state officers: CHPV RT PCR or IgM ELISA positive in a child under the age of 15 years in a suspect AES case in Gujarat during July- August 2024.</i></p>																																			
Step 5: Data Collection: Additional cases and info																																					
<ul style="list-style-type: none"> • Existing surveillance systems • Passive or active surveillance • Ask front-line staff (ASHAs, ANMs) • Conduct site visits if possible • Talk to cases – contacts of sick? • Look for clues in rumors • Issue a public alert • Interview cases: name, clinical details, demographics, risk factors (with questionnaire) 	<p>Interviews</p> <ul style="list-style-type: none"> • Form a questionnaire/ Use standard questionnaire, if available • Review background info and literature (disease) • How to conduct interview (phone/in person/etc.) • Find the right place – their home or a quiet location • Be non-judgmental • Introduce yourself and your organisation and purpose • Use simple language • Vary between open and closed questions • Train field health staff 	<p><i>Team collected data through semi structured questionnaire on:</i></p> <ul style="list-style-type: none"> • Socio-demography • Nutritional status • Housing conditions • Environment <p><i>Clinical abstraction tool formed to collect data on:</i></p> <ul style="list-style-type: none"> • Clinical history • Laboratory findings • Hospitalisation • Outcome 																																			
Step 6: Prepare line list																																					
<ul style="list-style-type: none"> • A line list is a spreadsheet/ table where each ‘row’ contains information on individual case • Usually with Excel (or paper) • Makes data analysis easier 	<p>Line list can include: demographics, symptoms, test results, exposures etc.</p> <table border="1" data-bbox="602 1776 1019 1906"> <thead> <tr> <th colspan="3">Demographic</th> <th colspan="3">Signs and Symptoms</th> <th>Lab</th> </tr> <tr> <th>Sex</th> <th>Age</th> <th>Onset Date</th> <th>Nausea</th> <th>Vomiting</th> <th>Jaundice</th> <th>Positive</th> </tr> </thead> <tbody> <tr> <td>M</td> <td>36</td> <td>04/12/2010</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>M</td> <td>68</td> <td>04/12/2010</td> <td>Yes</td> <td>No</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>M</td> <td>37</td> <td>02/12/2010</td> <td>Yes</td> <td>No</td> <td>Yes</td> <td>Yes</td> </tr> </tbody> </table>	Demographic			Signs and Symptoms			Lab	Sex	Age	Onset Date	Nausea	Vomiting	Jaundice	Positive	M	36	04/12/2010	Yes	Yes	Yes	Yes	M	68	04/12/2010	Yes	No	Yes	Yes	M	37	02/12/2010	Yes	No	Yes	Yes	<p><i>Officers created a line list in Excel from case interviews. They recorded an ID, date of illness, age, sex, lab results, and some risk factors e.g. exposures. Created summary tables using the denominator data</i></p>
Demographic			Signs and Symptoms			Lab																															
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Steps of OBI	Check-list	Scenario: <i>NJORT for Chandipura Virus Disease OBI, July 2024</i>
Step 7: Describe and interpret data		
<ul style="list-style-type: none"> • The line list can be used for descriptive epidemiology – time, place, person/animal • You need to interpret data and generate ideas about the: <ul style="list-style-type: none"> ○ Possible cause(s) ○ Method of spread ○ Risk factors 	<p>Descriptive epidemiology:</p> <ul style="list-style-type: none"> • Describe data: Time, place, person • Make Summary tables • Calculate Attack rate= # ill/ # at risk • Epi curve • Spot map or area map 	<p><i>From the data, the investigator realised that cases were spread across multiple districts with no clustering, median age was 4 years (IQR 2-7 years), CFR of 50%, mean of laboratory parameters showed multi-system organ involvement, higher (80%) cases were reported from rural areas, 72% cases houses had exposed cracks (vector exposure).</i></p>
Step 8: Control measures		
<p>Implement control measures EARLY – DO NOT WAIT</p> <ul style="list-style-type: none"> • Use general measures initially • Adapt measures with new info • Measures may include: <ul style="list-style-type: none"> ○ Address source: withdrawal of food, etc. ○ Limit transmission: hand hygiene, cough etiquette, mosquito nets, alternate water supply etc. ○ Reduce susceptibility: vaccination 	<p>Control measures should be identified keeping in mind practical implications. Control measures should not be generic and it will help if implementing agency is identified against each control measure along with timelines</p>	<p><i>Vector control measures conducted based on findings. Risk Communication tool formed and adopted by state for AES. AFI Surveillance established before the next transmission season.</i></p>
Step 9: Communicate findings		
<ul style="list-style-type: none"> • To WHOM? Everyone who needsto know (see checklist) • HOW? Use a variety of approaches. Presentation/ Written report, the community-village meeting • HOW OFTEN? Depends on the person/group – can be every day or less frequently 	<p>Have you communicated with?</p> <ul style="list-style-type: none"> • Local health officials • Other sectors, community, if indicated <p>Have you completed?</p> <ul style="list-style-type: none"> • Debrief to state/ district • Final outbreak report <p>Have you included?</p> <ul style="list-style-type: none"> • Who/What/Where/Why/How in communication? • Details of actions 	<p>Scenario: <i>NJORT submitted a report to the EMR and state officials after outbreak completion and presented findings to state. Based on report control measures and AFI (Acute febrile illness) surveillance for detecting Chandipura disease was established for the next year</i></p>
Do not wait for all answers. Communicate timely to empower stakeholders to make informed decisions.		

Appendix II: Outbreak investigation report outline

1. Executive summary

2. Introduction

- Public health importance of the problem
- Sequence of events leading to investigation (Clearly explain when the outbreak notification was sent, and from where and whom; and what actions were taken to prepare for the investigation)
- Composition of field investigation team]
- Objectives of the investigation (concerning the agent, source of infection, mode of transmission, and risk factors).

3. Material and Methods

- Confirmation of outbreak
- Case definition and case search strategy
- Source and mode of data collected
- Describe the questionnaire, variables used
- Hypothesis generation
- Analytical study design (if applicable/conducted)
 - Type of analytical study (rationale)
 - Case/ control/ cohort definition; Definition of exposures
 - Chosen measures of associations and statistical tests
- Other investigations
 - Laboratory investigation (sample type and test type)
 - Environmental investigation (type of inspection, methods for sampling)
 - Entomological/ Animals sector investigations

4. Results

- Confirmation of outbreak
- Descriptive epidemiology
 - Number of persons meeting case definition
 - Median age and sex distribution
 - Overall attack rate
 - Time (Epi curve), Place (Spot map), Person (Tables)
 - Clinical features and treatment history
 - Identifiable risk groups
 - Mode of transmission

Hypothesis generation and Analytical study results

- Eligibility and response rates
- Describe 2 x2 tables and their results with confidence intervals, Chi-square and the p-value
- Other investigations results (Laboratory/ Environmental/ Entomological/ Animal) (if applicable)

5. Key Conclusions based on the findings

6. Recommendations based on the findings and conclusions

- Every recommendation should be evidence based, feasible and specific
- Avoid generalized recommendations which are not based on your results

7. Annexures:

- Copy of NJORT deployment and recall orders
- Case line list, laboratory reports (if applicable)
- List of key district/ state officials met
- Key discussions/ Minutes of meeting with senior officials [Sec(H)/DHS, District Magistrate, debriefing meetings with State and Districts],
- Field Photographs
- questionnaires used in the investigation (if applicable)

8. Acknowledgments

9. References