


# NCDC Newsletter

Quarterly Newsletter from National Centre for Disease Control (NCDC)



## Director's Desk



Public health surveillance is essential to make informed decisions and taking timely and appropriate public health action to control. Our country faces gamut of diseases which may scale up to uncontrolled levels in the absence of surveillance. This issue of newsletter captures the journey of disease surveillance from Integrated Disease Surveillance Programme to Integrated Health Information Platform and its role in revolutionizing disease surveillance.

This issue also presents scrub typhus and suspected scrub typhus and leptospirosis outbreak investigation conducted by NCDC Epidemic Intelligence Officer (EISO) and State health department respectively, highlighting the generation of evidence-based recommendations derived from the investigations.

The other sections of this issue report various activities carried out by NCDC and its branches during the fourth quarter of the year like debate on ‘Community Dog feeding in public places’, webinar on International Day for Disaster Risk Reduction, awareness workshop for School Children on National Pollution Day and cleaner air. Laboratory section presents interesting findings on role of laboratory tests in scrub typhus during outbreak situation. In addition, this issue also captures information broadcast on conducting point prevalence survey and global disease alert. We hope that this newsletter has provided you with valuable insights, and updates. As you read through this newsletter, we encourage you to provide us with inputs and ideas so that we may continue to bring information that is useful and valuable to you.

## Thematic Area: Public Health Surveillance is the Key to Disease Control

**Lead Story: Revolutionizing Public Health Surveillance & Response system in India: Transition of IDSP to IDSP-IHIP**

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**Introduction:** In April 2021, in a landmark move aimed at revolutionizing its public health surveillance & response system, India had embarked upon a transformative journey of migrating the Integrated Disease Surveillance Programme (IDSP) from a weekly paper-based reporting on IDSP portal to a near real time reporting system on Integrated Health Information Platform (IHIP). With the migration of the last batch of States on IHIP platform in 2023 and the older system completely disabled, the IDSP transition has been completed.

Since its launch in 2004, IDSP has played a crucial role in carrying out surveillance for selected epidemic prone diseases in the country and responding to these through establishment of trained Rapid Response

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Teams (RRTs) at the National, State and District levels. Also, IDSP has played a pivotal role in post disaster disease surveillance, extreme health events and special surveillance. In the past, IDSP has shown its robustness during HINI Influenza surge, CCHF outbreaks in Gujarat, Zika in Madhya Pradesh & Rajasthan and Nipah outbreak in Kerala. Since 2020, IDSP has handled the COVID-19 surveillance and response activities in the country thereby firmly establishing itself as the steel frame of public health in India.

In 2015, a collaborative effort between national and international experts, known as the Joint Monitoring Mission (JMM) was constituted to systematically identify gaps in the existing system and recommend strategies to address those gaps. The aim of the JMM was to strengthen the surveillance and response system by leveraging the technological prowess in the Country. The major accepted recommendations of the JMM were:

1. Re-prioritizing the list of diseases under IDSP.
2. Upgrading the existing IDSP portal for real-time visualization of data and key indicators.
3. Exploring the integration of other disease surveillance platforms to contribute towards more efficient Early Warning Alert and Response system (EWAR).
4. Ensuring adequate number of trained human resources.
5. Case-based surveillance.
6. Strengthening of laboratories under zoonosis, influenza and VPD surveillance

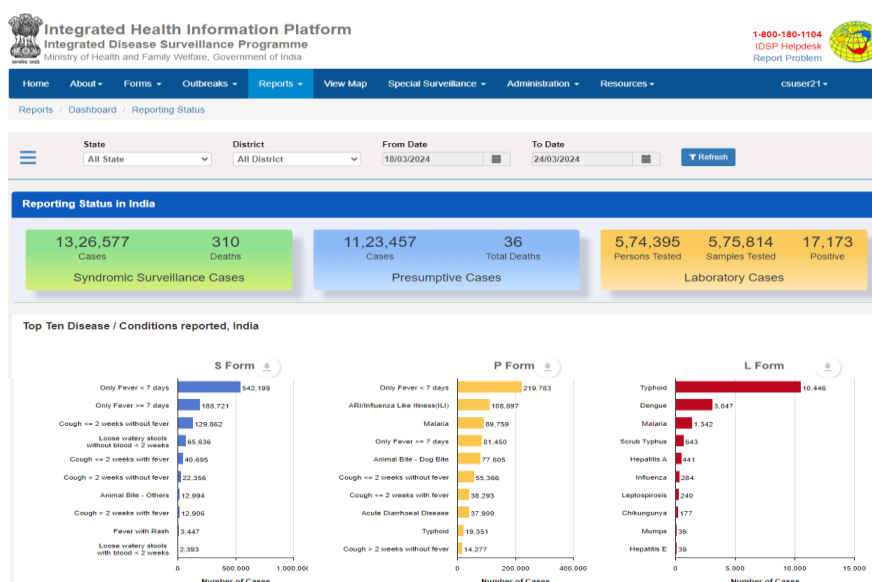


**Fig 1: Meeting of the Joint Monitoring Mission on Integrated Disease Surveillance Programme, Delhi, 2015**

systems.

In December 2016, IDSP, under the oversight of National Center for Disease Control, Government of India, conducted the disease re-prioritization workshop and subsequently identified 33 priority health conditions for surveillance. In May 2017, IDSP conducted a workshop to develop the Minimum Data Set for diseases and health conditions under IDSP.

Subsequently, the Ministry of Health and Family Welfare (MoHFW), Government of India (GoI), launched the Integrated Health Information Platform (IHIP) in April 2021. IHIP was designed to capture real-time or near-real-time data for outbreak prone priority diseases under surveillance across all levels of the health care system. IHIP also facilitates the integration and interoperability of health records through a comprehensive health information exchange within a centralized accessible platform. Through IHIP, the surveillance mechanism of IDSP can conduct both case-based and event-based surveillance.



**Fig 2: Visual Dashboard on Integrated Disease Surveillance Programme- Integrated Health Information Platform (IDSP-IHIP)**

## **The Transition to IHIP: A Paradigm Shift in Public Health Surveillance**

Transition from Paper-Based to Digital Reporting: IDSP relied on paper-based weekly reporting, where health workers manually filled out forms and submitted them to district level. This process was prone to delays, errors, and inefficiencies. With IDSP-IHIP, a digital reporting system, enabling real-time data entry and synchronization where health workers utilize digital platforms such as ANMOL tablets to input syndromic and case-based information directly into the system.

### **Real-Time Data Synchronization:**

Under IDSP, data synchronization occurred through manual processes, while IDSP-IHIP ensures immediate data synchronization, allowing for instant access to updated surveillance data at all administrative levels. This real-time approach enhances the timeliness and effectiveness of public health response efforts.

### **Shift from aggregate to case-Based Surveillance:**

Earlier, IDSP primarily relied on aggregate case numbers of various diseases and syndromes under S, P and L form to identify potential outbreaks. With IHIP, there is a shift towards case-based surveillance, where individual case data on the identified list of diseases and syndromes under S, P and L form are recorded, tracked and analyzed in real-time. This approach provides a more detailed and granular understanding of disease dynamics, enabling early detection and response to emerging threats.

### **Integration of Event-Based Surveillance:**

While IDSP primarily focused on disease-specific surveillance, IHIP integrates event-based surveillance through media-scanning, allowing for the monitoring of various health-related events and hazards including natural disasters, environmental emergencies, and other public health threats beyond traditional disease outbreaks.

### **Geospatial Mapping and Visualization:**

IHIP also incorporates geospatial mapping and visualization tools by geocoding case data and generating epidemiological maps to enhance situational awareness and response planning. It

enables health officials to identify hotspots, track disease spread, and allocate resources more effectively.

The transition from IDSP to IHIP marks a significant milestone in India's public health journey by embracing technology and innovation, to usher in a new era of proactive and data-driven surveillance. This is also a testament to the hard work and dedication of the 250,000+ reporting units and the district and state level surveillance units that made this virtually impossible task into a reality.

The remarkable success of this transition has placed India at a global level in digital public health, leading to the offering of this platform as an International Digital Public Health Good to other nations.

## **Expansion of IHIP: through Integration of National Health Programmes**

**Contributed by:** Dr Himanshu Chauhan<sup>1</sup>, Dr Sanket Kulkarni<sup>2</sup>, Dr Devang Jhariwal<sup>3</sup>, Dr Arushi Ghai<sup>4</sup>

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After successful implementation of IHIP and transition of IDSP from the previous IDSP portal to IDSP-IHIP, some of the national health programmes are already functional on the portal like the National Programme on Climate Change and Human Health, National Malaria Elimination Programme, National One Health Programme for Prevention & Control of Zoonoses (NOHPPCZ) and Guinea Worm Eradication Programme, while some others have started the process of integration on the portal. For certain programmes, case-based disease data reported under IDSP-IHIP on S/P/L forms will be retrieved by API linkage within IHIP, and additional programme-specific data components will be incorporated by the respective programme login IDs within IHIP.

Under the NPCCHH, surveillance is ongoing for air pollution related illnesses and heat related illnesses. Data of the air pollutant illness cases and the Air Quality Index of linked geographical area is captured.

Under the National Vector Borne Disease Control Programme, the National Malaria Elimination Programme is currently reporting cases on IHIP, while the shift in reporting on IHIP for dengue and other vector borne diseases under the programme is

in process. The National One Health Programme for Prevention & Control of Zoonoses (NOHPPCZ) aims to report data on priority zoonotic diseases such as Brucellosis, Scrub Typhus, Leptospirosis etc. from sentinel sites under the programme. As per the objective of integration of data, the data reported on IDSP-IHIP for these vector-borne and zoonotic diseases will be fetched and additional data on programmatic

components will be added by the programmes. Under the Guinea Worm Eradication Programme, erstwhile disease endemic states have started reporting data on the post eradication surveillance and suspect cases of Guinea worm on the IHIP portal. In addition, IDSP has also supported other disease control programmes / departments by offering them technical guidance & resources for their digital transformation.



## Integrated Health Information Platform

Ministry of Health and Family Welfare

Home

### National Health Programmes

#### Programmes for communicable diseases

- National Centre for Disease Control
  - Integrated Disease Surveillance Programme
  - Guinea Worm Eradication Programme (GWEP)
  - Yaws Eradication Programme (YEP)
  - National Viral Hepatitis Surveillance Programme
  - National Rabies Control Programme
  - Programme for Prevention and Control of Leptospirosis
  - National One Health Program for Prevention & Control of Zoonoses (NOHPCZ)
- National Vector Borne Disease Control Programme
  - National Malaria Elimination Program
  - Kala-Azar Control Programme
  - National Filaria Control Programme
  - Japanese Encephalitis Control Programme
  - Dengue and Dengue Hemorrhagic fever
- National Public Health Surveillance Programme
- National AIDS Control Programme
- Revised National Tuberculosis Control Programme
- National Leprosy Eradication Programme
- Universal Immunization Programme

#### Programmes Non-communicable diseases, Injury and Trauma

- National Programme on Climate Change and Human Health
- National Tobacco Control Programme (NTCP)
- National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS)
- National Programme for Control Treatment of Occupational Diseases
- National Programme for Prevention and Control of Deafness (NPPCD)
- National Mental Health Programme (NMHP)
- National Programme for Control of Blindness (NPCB)
- National Nutritional Programmes (NNP)
- National Iodine Deficiency Disorders Control Programme (NIDDCP)
- Mid-Day Meal Programme (MMP)
- National Oral Health Programme (NOHP)
- National Programme for Prevention and Control of Fluorosis (NPPCF)
- Reproductive Maternal Newborn Child and Adolescent Health (RMNCH+A)
- National Rural Health Mission (NRHM)
- National Urban Health Mission (NUHM)
- National Water Supply and Sanitation Programme
- Department of Animal Husbandry Dairying & Fisheries (DADF)
- National Animal Disease Reporting System (NADRS)
- Environment, Forest and Climate Change (MoEFCC)

Fig 3: National Health Programmes on the Integrated Health Information Platform (currently active shown in Blue)

Reporting & Performance Indicators under IDSP Program: Year 2023

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**Background:** The Integrated Disease Surveillance Programme (IDSP) was launched with World Bank assistance in November 2004 to strengthen disease surveillance in the country by establishing a decentralized State-based surveillance system for epidemic-prone diseases to detect early warning signals. IDSP program is now completely supported by NHM. The program is implemented across all the States and UTs and has migrated from the weekly IDSP reporting to the Integrated Health Information Platform (IHIP) phase-wise for all States/UTs from Oct-2021 onwards.

**Monitoring Indicators S P L reporting:** IDSP aims to strengthen/maintain a decentralized laboratory-based IT-enabled disease surveillance system for epidemic-prone diseases to monitor disease trends and detect and respond to outbreaks in the early rising phase through trained Rapid Response Teams (RRTs). Therefore, the main key indicators of IDSP after the migration on IHIP are S P L form-wise reporting, where S form (Syndromic Surveillance), P form (Presumption Surveillance) L form (Laboratory Surveillance) & Outbreak reporting at the States &UTs level.

**Key Observation:** It was observed that at the national level S P L reporting in 2023 was done by all States & UTs. Of the total, 17 states &UTs are found to be reporting 76% or more on all three forms, 12 states are reporting between 51 -75 & 3 are reporting between 25-50. The Top 5 states

were (Dadra &Nagar Haveli and Daman& Diu (97.3%), Telangana (96.9%), Odisha (88.5%), Gujarat (88.4%) & Tripura (87.6%).

SPL form Reporting	National Level	Qtr-1 (Jan-March)	Qtr-2 (April-June)	Qtr-3 (July-August)	Qtr-4 (Sept-Oct)
S	70.01%	65.85%	69.98%	72.47%	71.65%
P	73.97%	71.24%	73.82%	76.40%	74.34%
L	72.13%	69.07%	72.09%	74.57%	72.70%

Table 1: Quarter-wise S P L form reporting performance at the National level

As seen above, there was S P L form reporting has been improved in 3<sup>rd</sup> and 4<sup>th</sup> quarters as compared to 1<sup>st</sup> and 2<sup>nd</sup> quarters.

**Outbreak reporting performance in the IHIP Portal:** monitoring of early warning signals and response to the outbreak is another key indicator under the program. The States response to the outbreak is monitored based on events responded, response time, RRT deployment, RRT composition, RRT updates, line listing, sample collection, result updation, DSO update and outbreak completion.

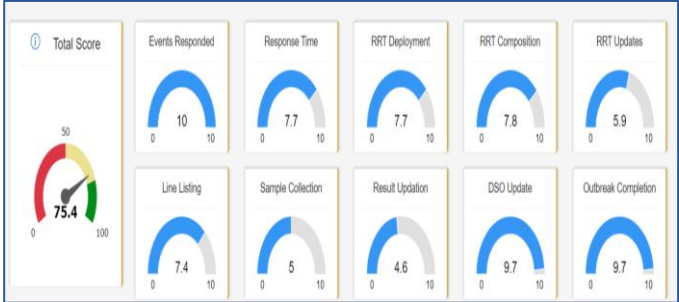


Fig 1: Performance dashboard of Outbreak Reporting of all States/UTs in IDSP-IHIP portal: National Level Year -2023

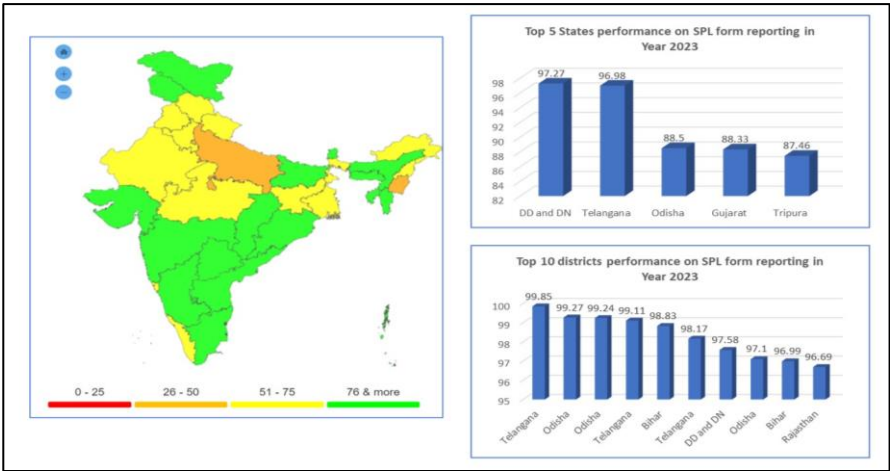


Fig 2: Performance of S P L Forms Reporting at National Level IDSP-IHIP portal, Year -2023

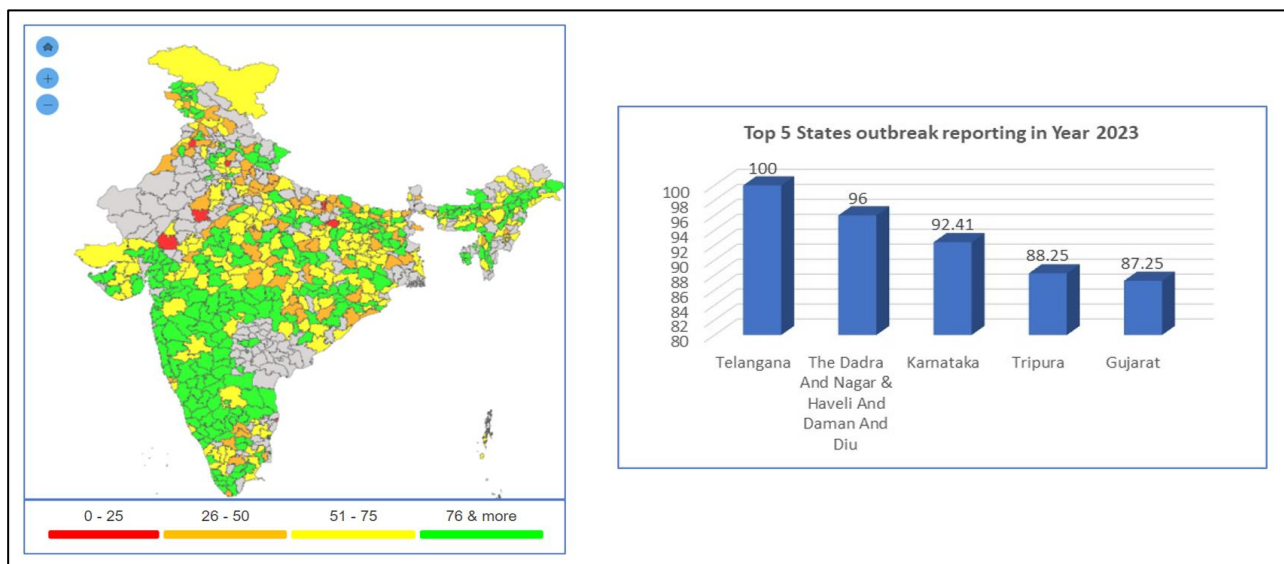


Fig 3: Outbreak Reporting performance at National Level on IDSP-IHIP portal, Year -2023

**Outbreak reporting performance in the IHIP Portal** at the national level -2023 by all States & UTs shows a total score of 74.2% out of which the Top 5 states are (Telangana (99.6%), Dadra Nagar Haveli & Daman & Diu (95.2%), Karnataka (92.2%), Tripura (89.4%) and Gujarat (86.8%). (Fig 3)

The indicators such as RRT update, line listing and sample collection has seen improvement in the fourth quarter as compared to previous quarters. The central Surveillance unit (CSU) of IDSP at NCDC Delhi monitors the performance of States on IHIP reporting in terms of S P L form reporting and response to the outbreak by districts. After the States and UTs migration on IHIP, training was imparted to all levels including data managers,

epidemiologists and DSOs, SSOs. As the transition is a crucial step moving towards digital recording of surveillance data, it was important to provide timely support to the districts and States, which was possible through IHIP performance dashboards. The data is extracted from the IHIP portal and reports are generated on weekly and monthly intervals for all the states and UTs, which has resulted in better performance on key indicators towards 3rd and 4th quarters of 2023. Regular monitoring of these carefully designed performance indicators has therefore helped in keeping a record of all the aspects of S/P/L form reporting and outbreak reporting and the progress in these reporting mechanisms which are crucial to the functioning of the program.

S. No.	Outbreak Performance Indicators	National Level-	Qtr-1 (Jan-March)	Qtr-2 (April-June)	Qtr-3 (July-August)	Qtr-4 (Sept-Oct)
1	Event Responded	98%	99%	99%	99%	95%
2	Response time	66%	59%	65%	70%	72%
3	RRT Deployment	77%	65%	80%	82%	83%
4	RRT Composition	78%	65%	81%	83%	84%
5	RRT update	59%	51%	60%	59%	68%
6	Line listing	74%	67%	74%	75%	83%
7	Sample Collection	50%	46%	45%	50%	62%
8	Result Updation	46%	41%	42%	48%	59%
9	DSO Update	97%	98%	96%	98%	97%
10	Outbreak Completion	97%	98%	96%	98%	94%

Table 2: National level outbreak reporting (overall and Qtr. wise), on IDSP-IHIP, 2023

## Investigation of Scrub Typhus Outbreak, Odisha, India, October 2023

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Scrub Typhus has an estimated one million new cases occurring annually worldwide and was a previously underdiagnosed public health problem in India with recent surges in cases in the last decade. In Odisha, a surge in cases and deaths was reported under IDSP, after which a multi-disciplinary team including EIS Officers was deployed on 29<sup>th</sup> September 2023 in Sundargarh district which reported the highest cases.

**Methodology:** We reviewed past data on Scrub Typhus cases in the district. A case was defined as a resident of or hospitalized in block Sundargarh and Scrub Typhus IgM-ELISA positive between July 1 and October 20. A line-list of IgM-ELISA positives was collected from the District Public Health Laboratory. Data was collected on socio-demographics, exposure factors, and clinical history on a structured questionnaire translated into the local language. An entomological survey was also carried out in the block (around domestic and peri-domestic areas of positive cases) to trap and assess rats for mite-infestation. We calculated entomological indices.

**Results:** The number of Scrub Typhus cases reported in Sundargarh district in 2023 crossed the outbreak threshold (above mean + 2SD using the last 3 years' data) A total of 682 cases were reported in the district from July to November 2023. We interviewed 82 cases in the block (Sundargarh) with the highest incidence (median age: 29 (IQR: 12-50) years, 55% males, and 62% lived in rural areas). Symptoms included fever (100%), headache (65%), cough (37%), myalgia (35%) and eschar (12%). Among two deaths in the block, delay of 5 and 12 days from symptom-onset to health-facility visit was noted. Exposure factors included proximity of houses (<10 meters) to bushes, 85%, recent rodent sightings 71%, walking barefoot 50%, and open defecation 49%.

The percentages of exposures were higher in rural residents. Twenty rodents were captured in 100 traps placed, with trap positivity of 20%, rodent infestation rate was 94%, Chigger infestation rate was 20.12, and Chigger index was 18.94 (>> critical value 0.69). On interaction with frontline healthcare workers, we noticed gaps in their knowledge regarding scrub typhus symptoms and diagnosis and organized an informative session for them using state IEC material. **Conclusions:** This was a laboratory-confirmed outbreak of scrub typhus in Sundargarh block and revealed over half of the cases had rural residences, with rural residents reporting more household, occupational, and behavioral exposure factors. Delays in treatment-seeking and were noted. Frontline healthcare workers had gaps in their knowledge regarding Scrub Typhus.

**Recommendations:** We recommend targeted community awareness on preventive measures and timely medical care-seeking and orienting frontline healthcare workers on scrub typhus, emphasizing early referral and diagnosis of fever cases  $\geq 5$  days.

**Public health action:** We sensitized the frontline healthcare workers on symptoms, exposure and early referral of scrub typhus patients. We organized a virtual training session for a few Jr Entomologists in the district to conduct the Entomological survey and recommended the district to establish ongoing entomological surveillance after proper training of all the entomologists.



**Fig 1:** a) Collection of rodent heart blood, b) Rodent ear pinna showing mite colonies c) Interview with a Scrub Typhus case by EIS Officers

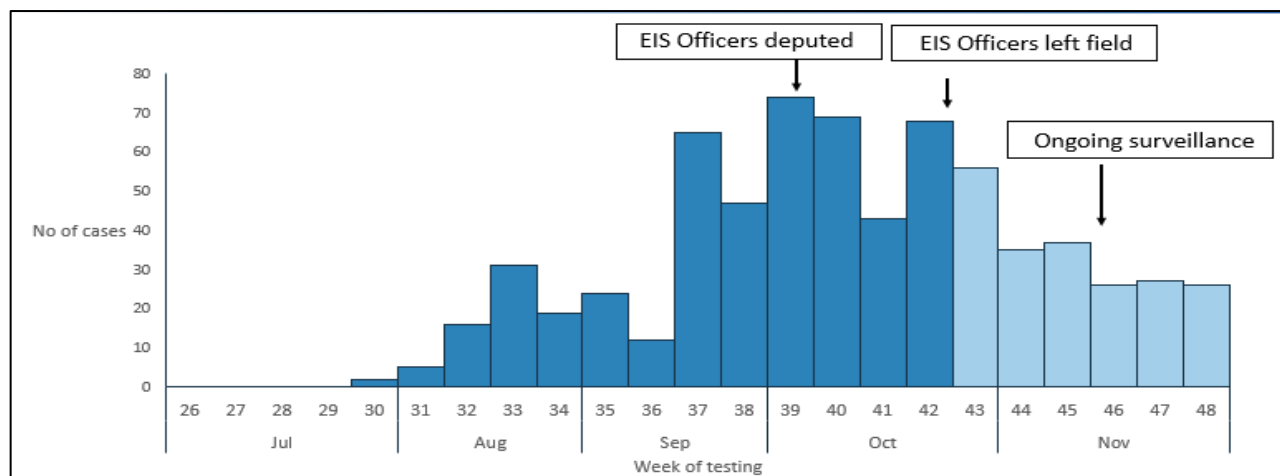


Fig 2: Distribution of Scrub Typhus cases by date of testing, Sundargarh district July-Nov 2023 (N=682)

## Outbreak Investigation of potential leptospirosis and scrub typhus in Nuh, Haryana, October-November 2023

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**Background:** Leptospirosis and scrub typhus are common bacterial infections in India, especially during monsoon and post monsoon period. Both cause fever, headache, and muscle pain. Leptospirosis can lead to kidney failure, while scrub typhus may cause a rash. These diseases can spread through contact with infected animals or contaminated environments. In July 2023, Haryana experienced heavy flood situation due to excessive rainfall in Haryana and the neighboring states with subsequent release of water from dams. Nuh, formerly known as Mewat, is an aspirational district in Haryana which is infamous for vaccine hesitancy and VPD outbreaks. On 30th October 2023 after receiving information of 3 deaths from Chahalka Village, Sondh, MP Ahir, Taoru, Nuh), a rapid response teams including Medical Officers, Epidemiologist, Microbiologist and MPHWS were constituted to investigate the possible outbreak and immediate action plan prepared for case search and to carry out preventive measures.

**Methodology:** The cases (3 death cases and 1 critical at the time) belonged to the same extended family and also resided in one cluster in village Chahalka. On 31st October 2023, the RRT visited Chahalka village, Nuh to investigate the outbreak in while other teams visited the allotted areas and performed fever survey.

**Clinical case definition:** A case was defined as any person who had fever in Chahalka village in last 15 days during the investigation i.e., 31<sup>st</sup> October to 10<sup>th</sup> November 2023.

**Field Visit:** The RRT visited the area and took detailed case histories of the 3 death cases and the 4<sup>th</sup> case, which was in critical condition at the time and later expired. The RRT started an active case search and line listing of cases in Chahalka and neighboring villages covering 3600+ houses. During the course of the investigation, two state teams, one consisting of SNO-IDSP and SEPIO-NHM and the other consisting of NVBDCP officials visited the area on the 3<sup>rd</sup> and 9<sup>th</sup> of November respectively to supervise the investigation and review the situation. Meetings through VC were conducted by the IDSP-CSU to review the situation which was chaired by OIC-IDSP, NCDC.

### Laboratory Investigation:

- A total of 57 slides were prepared from samples of contacts and cases for presence of Malarial Parasite.
- A total of 10 serum samples were taken from the cases detected in the cluster and sent to the IDSP-DPHL Nuh (for Dengue testing) and PGIMS Rohtak (Leptospirosis, Scrub Typhus and Japanese Encephalitis).
- Out of these, samples of 2 cases were also sent to NCDC Delhi (for testing of Leptospirosis

and Rickettsial disease) and MVIDH, Delhi (for Diphtheria testing).

## Results

### Descriptive epidemiology

- The total population of the village was 6332 (approx.)
- Out of which, 14 developed the symptoms of fever with or without vomiting/ seizures/ altered sensorium with attack rate of ~2 (2.2 exact) per 1000 population.
- Median age of cases (range)= 7.5 (1, 45)
- Out of which,
  - 12 (86%) were males and 2 (14%) were females.
  - 12 were below 15 years of age.
  - 4 cases required hospital admission (28.6%) all of which were children <10 years including 3 male and 1 female
- The examination of the clinical records of the 4 deceasedx revealed findings/ clinical features of seizures (in 3 of 4), vomiting (in 2 of 4), thrombocytopenia (in 2 of 4), thrombocytosis (in 2 of 4), multiple organ dysfunction (in 2 of 4),

### Laboratory findings

- All slides examined for presence of malarial parasite were negative
- All 10 samples tested for Dengue NS-1 antigen at IDSP-DPHL Nuh were negative (Clinical records of the 2 of the 4 deceased also mentioned testing negative for Dengue)

- All 10 samples tested at PGIMS Rohtak were negative for Dengue, Leptospirosis, and Scrub Typhus by IgM ELISA. However, 2 of them tested positive and 1 tested equivocal for Japanese Encephalitis by IgM ELISA. However, Japanese Encephalitis was ruled out after consulting NCVBDC as the cases which tested positive/ equivocal did not have any neurological signs or symptoms.
- Out of the 2 samples sent to NCDC, Delhi, 1 tested equivocal for Leptospirosis by IgG ELISA (negative by IgM ELISA) and also tested positive for Rickettsial disease by IgG ELISA and Weil Felix test.
- The trigger event and the causative pathogen that resulted in the current outbreak remains unconfirmed. Japanese encephalitis, leptospirosis and scrub typhus (or combination of the above) were the chief suspects. The district has never reported deaths/ outbreaks of any of these but neighbouring district, Palwal faced an outbreak of leptospirosis in 2021. Neighbouring districts/ state have also reported cases of scrub typhus and Japanese encephalitis.

### Environmental findings:

- Many mosquito breeding sources were identified and larvae were collected for study which revealed presence of Anopheles and Culex mosquito.
- Dead rats were also found in the surrounding areas. Houses had rat holes

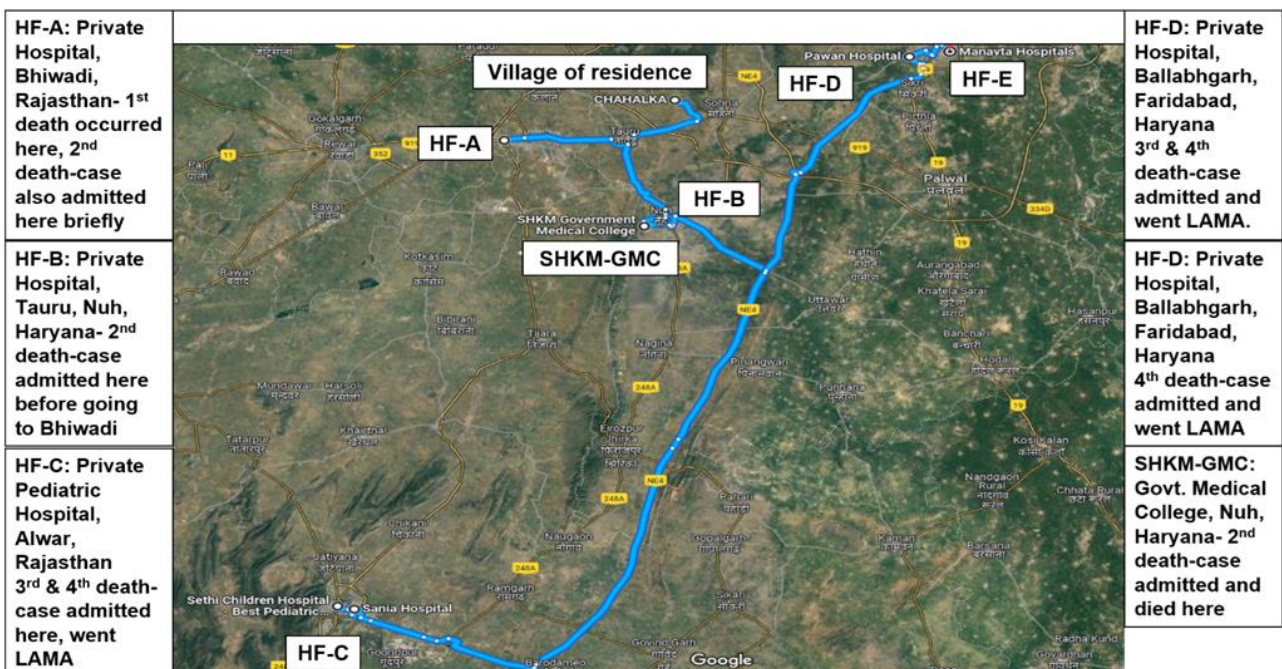


Fig 1: Map of areas travelled by the deceased and their family

## Public Health Action

- Medical camps were organized in Chahalka and adjacent areas. Any fever cases were treated and tested as per protocol.
- IEC activities regarding vector borne diseases were done.
- Source reduction and anti-larval activities were carried out in Chahalka and adjacent areas.
- Special immunization camps were held in village Chahalka, Soondh and Jafrabad for vaccination of leftout and dropout children in which total 243 beneficiaries were vaccinated with MR, Penta, DPT and TD vaccines provided to the beneficiaries.
- Instructions regarding the maintenance of hygiene and sanitation were given.
- Health awareness regarding VBDs were given by the MPHWF and ASHA of the concerned area.
- Follow up of the patients was done by the local health staff of the concerned SC/ PHC.

## Recommendations

### Short term:

- Detailed history of each and every activity of the deceased children should be taken from at least 21 days prior to the deaths.
- A spot map analysis should be done, locating all deceased children and present cases
- Samples of all fever cases detected should be collected and sent for testing of Rickettsia, Leptospira & Japanese Encephalitis
- IEC activities, immunization drives, mass fever surveys, vector detection and control activities should continue till the trigger factor is identified.

### Long term:

- Coordination with wildlife department and centre for one health, NCDC for detailed study of populations of amplifying hosts and animal vectors like migratory birds, bats, rodents etc.
- Routine (monthly) entomological surveys and examination of larval and adult mosquito samples from the common sources in the area. Frequency can be increased if needed during the monsoon and post monsoon seasons.

- Ensure preparedness for testing of Leptospirosis, Scrub typhus and Japanese Encephalitis
- Ensure high index of suspicion for these disease in all fever cases especially during monsoon and post monsoon seasons.



Fig 2: Environmental Investigations and Field Activities (IEC & Active Case Search)

## Webinar on International Day for Disaster Risk Reduction (IDDRR), 2023

**Contributed by:** Dr. Purvi Patel<sup>1</sup>, Dr. Aakash Shrivastav<sup>2</sup>, Dr. Shubhra Josh<sup>3</sup> and NPCCHH Team

<sup>1</sup>Senior Consultant, <sup>2</sup>Additional Director & HOD, CEOH&CCH, <sup>3</sup>EIS Officer

International Day for Disaster Risk Reduction (IDDRR) is observed by the United Nations General Assembly every year on 13th October as a day to promote a global culture of disaster reduction, including disaster prevention, mitigation, and preparedness in line with Sendai Framework. This year the theme was Fighting inequality for a resilient future.

As National Programme on Climate Change and Human Health (NPCCHH), which works on reducing the health impacts of climate change-related extreme weather events (EWE), it observed this year's IDDRR by recommending State/UT and District health departments to carry out various facility/institute and community level activities and exercises that can increase knowledge of healthcare workers and citizens in preparedness and response to specific EWE and other emergency situations. NPCCHH also organised a national-level webinar for state and district nodal officers On 16th October 2023.

The webinar began with opening remarks from Dr. Aakash Shrivastava, Addl. Director & HoD, COEH-CCH, NCDC. This was followed by presentation on "Health Inequality and

Vulnerability to Climate change induced disasters" by Mr. Sarabjit Sahota, representative of UNICEF-India, Disaster Risk Reduction. Dr. Harikumar S, Asst. Director (PH), Directorate of Health Services, Govt. of Kerala, shared the experience of Kerala on "Health facility vulnerability assessment and preparing multi-hazard Hospital Disaster Management Plan". The importance of local administration and support during a disaster was discussed by Ms. Neha Kurian, Programme Coordinator, Legal Resource Centre, Kerala Institute of Local Administration via her topic, "Role of local disaster management and administration in development of multi-hazard Hospital Disaster Management Plans"

The World Bank team from NPCCHH shared "Template of Hospital Disaster/Extreme weather event Preparedness and Response Plan" and the Jhpiego team of NPCCHH provided all attendees with "Checklist demo: Green and Climate Resilient Health Care Facilities"

The webinar was attended by State Nodal officers and District Nodal officers from various states and greatly appreciated by all.



Fig 1: Dr. Harikumar S. presenting his topic at the webinar

## Awareness Workshop for School Children on occasion of National Pollution Day

**Contributed by:** Dr. Aniket Chowdhury<sup>1</sup>, Dr. Aakash Shrivastava<sup>2</sup>, Dr. Shubhra Joshi<sup>3</sup>, Ms. Jayshree Nandi<sup>4</sup> and NPCCHH Team

<sup>1</sup>Assistant Director, <sup>2</sup>Additional Director & HOD CEOH&CCH, <sup>3</sup>EIS Officer, <sup>4</sup>Technical Officer

On the occasion of National Pollution Day, a workshop was organised by National Programme for Climate Change and Human Health (NPCCHH), NCDC at the Central Seminar Hall, NCDC on 23rd November 2023. Engaging the youth of the country is pivotal in creating awareness and driving action to bring about change. Therefore, children from the schools of New Delhi were invited for the programme.

Dr. Aniket Chowdhury, Asst. Director (PH), NCDC gave the welcome address and an overview of the event. The keynote speech was delivered by Dr. Anil Kumar, Addl. DG, NCDC, MoHFW. The programme initiated an online “social media reel and video” competition for all Indian national 12-35 years of age were eligible to participate on the topic with impactful and informative content for the theme, “Go Green and Breathe Pure Air”. This was followed by presentation of IEC material on air pollution and health.

Two of the attending school students were invited to present their views on “Go Green and Breathe Pure Air”. This was followed by a panel discussion and Q&A session on the topic, “Role of Youth in

Climate Action” which was moderated by Dr. Sudhir Nath, Director, Public Health and Development Projects, BCTA. The panel consisted of Dr Shobhana Gupta, Deputy Commissioner and in-charge child health, MoHFW; Dr Aakash Shrivastava, Addl. Director & HoD, NPCCHH division, NCDC; Dr Avinash Sunthalia, SMO, NCD, Dte. GHS; school principals from 2 schools in New Delhi and representative from Lakshay, Youth for Climate India. Other sessions which were conducted to raise awareness were, Yoga awareness session which was conducted by Ms. Aadya Sharma and a group storytelling activity organised by Youth for Climate India.

The workshop highlighted the opportunities to continue partnering with the schools and other educational institutions under the National Programme for Climate Change and Human Health (NPCCHH) with support from the USAID’s Cleaner Air and Better Health (CABH) project to advance initiatives for cleaner air and improved health within the framework of NPCCHH. The workshop concluded with students’ felicitation and closing remarks which were given by Dr. Aniket Chowdhury.



Fig 1: Group photo of all participating school children, faculty with NCDC team



Fig 2: Release of IEC material on air pollution and Effects on health

## NCDC organizes Debate on “Community Dog Feeding in Public Places”

**Contributed by:** Dr. Alka Singh<sup>1</sup>, Ms. Priyanka Yadav<sup>2</sup>, Dr. Rekha<sup>3</sup>, Dr. Monil Singhai<sup>4</sup>

<sup>1</sup>Medical Officer, <sup>2</sup>Technician, <sup>3</sup>Assistant Research Officer, <sup>4</sup>Joint Director & OIC CAZD, NCDC

Centre for Arboviral and zoonotic diseases division organized a debate competition on the topic: “Community dog feeding in public places” in Hindi/English on the occasion of World Rabies Day 2023 with the theme of ‘All for 1, One Health for all’ held at National Centre for Disease Control on 29.09.2023. 11 Participants expressed their views in favour and against the topic.

The summary of thought-provoking ideas which were expressed by participants is worth pondering:

1. Dog is a territorial animal and community should adopt these territorial animals and as we built goshala, we may think of building Dog shelters in RWAs/Public places etc.
2. Community ownership of dogs should not be just restricted to feeding of dogs it must also include providing shelter at times of extreme weather, organizing vaccination and sterilization camps with help of NGOs/ relevant government department. It should be six monthly / annual activity.
3. If dogs are rampantly fed without knowing the dietary requirements of dogs, this at times leads to more harm than good. Dogs are carnivores and the primary component of their diet is prey which could be small animals – mice, insects, rodents etc. So we shouldn't be mindlessly interfering with the food chain.
4. The community dogs are not only carriers of Rabies which is fatal disease but can lead to other Zoonotic diseases such as brucellosis, leptospirosis etc. as health and hygiene of such dogs is quite neglected. Medical camps must be organized further and pet lovers must be encouraged for adoption of community dogs.

Organizing such competitions raises awareness and advocates for rabies prevention and control. Dog vaccination campaign, education initiatives and organizing dog population management campaign can be the other ways to create awareness among the general population.

There is a need for the global community to overcome imbalanced healthcare ecosystems and

strive to achieve our global goal of zero human deaths from dog mediated rabies by 2030 by using one health approach.



**Fig 1: Debate On “Community Dog Feeding In Public Places” by CAZD**

## Youth for Cleaner Air and Better Health- Awareness workshop for school children

**Contributed by:** Dr. Aniket Chowdhury<sup>1</sup>, Dr. Aakash Shrivastava<sup>2</sup>, Dr. Shubhra Joshi<sup>3</sup>, Ms. Jayshree Nandi<sup>4</sup> and NPCCHH Team

<sup>1</sup>Assistant Director, <sup>2</sup>Additional Director & HOD, <sup>3</sup>EIS Officer, <sup>4</sup>Technical Officer

NCDC in collaboration with Vital Strategies organized an awareness workshop on December 15, 2023 at Manekshaw Centre, New Delhi to engage school children from schools in and around Delhi. The objectives of the workshop were to-

- raise awareness about the adverse health effects of air pollution, with a focus on children's health and development,
- encourage Indian youth to utilize their creativity to convey messages around environmental and health impacts of air pollution awareness,
- inspire environmentally responsible behaviour and advocacy among young individuals, and,
- provide a platform for the youth to showcase their skills and engagement

The workshop was chaired by Dr Atul Goel, DGHS, MoHFW and Director NCDC, Dr Sunil Gupta, Additional DGHS, NCDC, Dr Aakash Shrivastava, Head of Department, NCDC, Dr Aniket Chowdhury, Assistant Director, NCDC, Ms Devika Malik, International Para- athlete and co-founder Wheeling Happiness Foundation, Dr Sudhi Nath, Lead Public Health at BCTA, LM Singh, Managing

Director-India and Global Head of Partnerships and Innovative Finance at Vital Strategies. Over 230 students from standard 6-12 from government-aided schools in Delhi, students from the initiative 'Gurukul- Noida Chapter', teachers and co-ordinators from representing schools, and others supporting NPCCHH programme, and Vital Strategies attended the workshop.

- Dr Aakash highlighted the imperative need for clean air to improve the health and development of children. He emphasized on advocating for clean air and that children and youth with their dedication and passion can become change agents inspiring others to do the same. Dr Sunil Gupta highlighted the health implications of air pollution arising from societal changes associated with industrialization, extensive construction, and lifestyle shifts. Dr Sudhi Nath introduced "Project Gurukul," an initiative by Baptist Church Trust Association (BCTA) aimed at delivering education to underprivileged children in the Delhi region. As part of the initiative, students from Gurukul in Noida performed a skit, highlighting the role of diverse stakeholders involved in combating air pollution.
- Ms. Devika Malik conveyed her personal journey, highlighting the obstacles she surmounted to emerge as a disability advocate and a representative of India on diverse national and international platforms. Quoting, 'Since we all share responsibility for the issue of air pollution, we must collectively assume responsibility for the solution,' she motivated children to channel their passion in the fight against air pollution and actively contribute to the cause.
- Dr Sudhi Nath facilitated an interactive session delving into prevalent myths and facts associated with air pollution. The discussions covered a spectrum of topics, including different pollutants, both indoor and outdoor air pollution, key terminology around air pollution, populations most susceptible to its effects, and diverse measures to mitigate exposure and impacts stemming from air pollution.

- Mr. Ronnit Nath, Ms. Varsha Mishra, and Ms. Siya Pal, three students, delivered talks featuring statistical data and insights, shedding light on key pollutants like Particulate Matter (PM), innovative technologies, and the urgency of environmental preservation initiatives. They underscored the significance of incorporating environmental awareness into the curriculum, aiming to empower the youth with knowledge and inspire them to become custodians of environmental awareness.
- Dr Atul Goel urged students to embrace a healthy and sustainable lifestyle, emphasizing the individual responsibility of each child to contribute to pollution control at every level. Additionally, he expressed his commitment to visiting schools, interacting with students, and encouraging them to actively participate in these efforts.
- NCDC also announced and facilitated the winners of the "Go Green and Breathe Pure Air" online campaign launched on November 23, 2023. Ms. Saisha was adjudged the winner for "Go Green and Breathe Pure Air" video competition.

NCDC under the NPCCHH project is committed to bring together knowledge and technical collaboration to support Schools and other educational institutions to effectively combat air pollution and its adverse effects on public health. Over the period of next few months, NCDC would be conducting workshops and meetings at the participating schools to establish partnerships to support the schools in accelerating efforts to effectively respond to air pollution risks and challenges for better health of children.



**Fig 2: Student speakers and winner of 'Go Green and Breathe Pure Air' campaign**

## Role of laboratory tests in scrub typhus: An experience during outbreak situation

**Contributed by:** Dr. Stuti Gupta<sup>1</sup>, Dr. Cordelia Siddiqui<sup>2</sup>, Ms. Jyoti Kataria<sup>3</sup>, Dr. Alka Singh<sup>4</sup>, Dr. Monil Singhai<sup>5</sup>

<sup>1</sup>Assistant Director, <sup>2</sup>Deputy Assistant Director, NCDC, <sup>3</sup>Research Assistant, <sup>4</sup>Medical Officer, <sup>5</sup>Joint Director & OIC CAZD, NCDC

Scrub typhus is a febrile illness caused by bacterial species belonging to the genus *Orientia* (family Rickettsiaceae) transmitted by the larvae (chiggers) of trombiculid mites. Rodents are common host for the chiggers and are crucial for survival of chiggers. Chiggers, small mammals (e.g. field mice, rats, shrews), secondary scrub vegetation and wet season are the four important factors to maintain *O.tsutsugamushi* in nature. The disease has a life-threatening potential and manifestations of severe infection may include acute respiratory distress syndrome (ARDS), meningo-encephalitis, shock and renal failure. The case fatality rate can reach up to 70% if untreated. As the symptoms of scrub typhus mimics the other co-endemic diseases like dengue, leptospirosis, brucellosis, and typhoid, a reliable diagnostic criterion is needed to rule the disease from other. NCDC is equipped to do PCR, Weil Felix test (WFT), IgM & IgG ELISA with an algorithmic diagnostic approach for scrub typhus, spotted fever and typhus group fever of rickettsial diseases. IgM ELISA-based method is most reliable for the diagnosis of scrub typhus but requires optimization and generation of cut-off based on endemicity of the disease. High single OD value of IgM ELISA may be considered for diagnosis if endemic cut-offs are not available.

As there were increase number of media reports from western parts of Odisha in the month of September- October 2023 and few deaths were also reported linked to scrub typhus. State health authorities had sent serum samples from 43 human and 15 rodents serum samples for scrub typhus diagnosis and understanding the epidemiology of disease.

ELISA (*In bios*) for *O. tsutsugamushi* for IgM and IgG antibodies was performed for the serum samples. All 43 samples received were positive for IgM scrub typhus and 31 were found positive for IgG (72.1%). So, 72.2% were positive for both IgM and IgG antibodies. WFT was performed on 15 rodent samples and out of which 5 showed the OXK titer of more than 1:40.

IgG levels alone indicate past infection and endemicity while single high OD value of IgM represents recent infection. Presence of both IgM and IgG has high positive predictive value for complications/ secondary infection. Low OD values of both IgM and IgG may indicate endemicity of the disease and to be clinically correlated with other prevalent endemic diseases of that specific geographical area. There are more than 30 serotypes of *O. tsutsugamushi* that have been reported in endemic areas of tsutsugamushi triangle out of these *Karp*, *Kato*, *Gilliam*, *Boryong*, and *Kawasaki* are the commonly circulating serotypes of *O. tsutsugamushi*. As per experience of NCDC has found strains of *O. tsutsugamushi* in north India are *Gilliam*, *kato*, *karp* and *Boryong* based on serological characterization (Microimmuno fluorescence). However, cross reactivity can be an issue even though *O. tsutsugamushi* has unique profile of antigenic variation and this heterogeneity among strains is greater than that encountered in other Rickettsiales. Infection caused by the one strain does not provide protection to the infection caused by the other strain. It has been observed by some studies that high initial (within ten days of fever) IgG antibodies OD values being associated with the risk of complications and the prior infection may not protect in subsequent infections.

So, for timely diagnosis and management of the disease, both IgM and IgG along with their OD values are important and have high positive predictive value for recent infection, especially in endemic areas. Weil Felix tests in rodents is also required to assess the seropositivity of different rickettsial diseases in the rodent population. The evidence of increased OXK titers in rodents may indicate the presence of infected vectors in a particular area. Therefore, an active entomological, microbiological and epidemiological surveillance especially during outbreak times helps in understanding the disease dynamics and implementation of vectors and rodent control strategies in endemic areas accordingly.

# NCDC Branch Section

## Lymphatic Filariasis Training at NCDC Varanasi Branch

**Contributed by:** Dr. PK Singh<sup>1</sup>

<sup>1</sup>Medical Officer & OIC, NCDC, Varanasi

NCDC Varanasi branch conducted the “Ten working days Lymphatic Filariasis training programme for Filaria Inspectors/Technicians from 09.10.2023 to 20.10.2023. Total 08 participants, 06 from Maharashtra, 01 from UP and 01 from MP attended the training. The key objective of this training was to develop skilled manpower in the field of lymphatic filariasis particularly to support the National Filariasis Elimination Programme.

Didactic classroom lectures were delivered along with entomological field training session. Methodology of Night Blood Survey, Transmission Assessment Survey and preparation of Night Blood Smear, staining and microscopic examination for mf detection were discussed and demonstrated. Morbidity Management and Disability Prevention (MMDP) practices were also discussed and demonstrated to trainees.

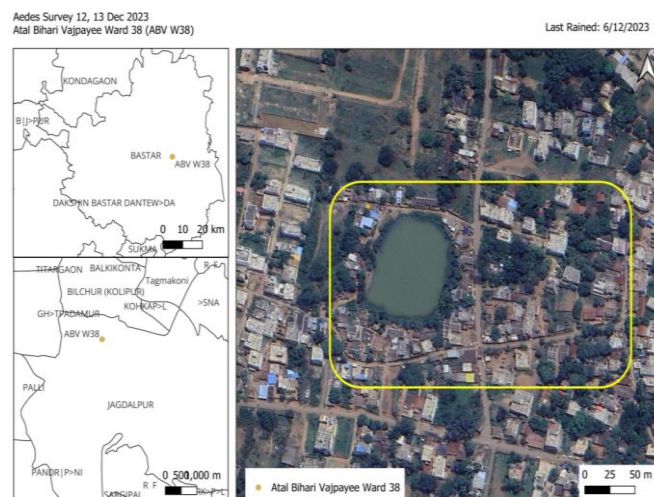
## NCDC Jagdalpur conducts Aedes larval survey

**Contributed by:** Sh. T A Arvind<sup>1</sup>, Sh. Radhey Lal Korram<sup>2</sup>, Sh. KNM Bhuloka Rao<sup>3</sup>, Sh. Vemu Peraiah<sup>4</sup>

<sup>1</sup>Deputy Assistant Director (Ent.), <sup>2</sup>Technician, <sup>3</sup>Technician, <sup>4</sup>Insect Collector

Aedes larval survey was conducted by Entomological team of NCDC, Jagdalpur branch from October, 2023 to December, 2023. The Aedes larval survey revealed a Breteau index (B.I.) of 7%, 4%, and 27% in October, November, and December, respectively. High B.I. reported in December due to rainfall. During the survey, *Aedes albopictus* and *Ae aegypti* species were identified, and a report was shared with CM&HO, Jagdalpur. Brief report, prepared by Sh. KNM Bhuloka Rao, Technician and Sh. Vemu Peraiah, Insect Collector, of the survey conducted is as given below:

Month\Index	House Index (H.I.)	Container Index (C.I.)	Breteau Index (B.I.)
Oct, 2023	6.00%	1.86%	7.00%
Nov, 2023	4.00%	1.32%	4.00%
Dec, 2023	22.00%	5.10%	27.00%



**Fig 1: Field map for the month of December, 2023 – prepared by Sh. T.A. Arvind, DAD (Ent.)**



**Fig 2: Aedes Larvae inspection in outdoor open plastic and metal containers at a household – by Sh. KNM Bhuloka Rao, Technician and Sh. Vemu Peraiah, Insect Collector**



**Fig 3: Aedes Larvae inspection in water cooler at a household – by Sh. KNM Bhuloka Rao, Technician and Sh. Vemu Peraiah, Insect Collector**

## NCDC Varanasi conducted Vector Control and Surveillance Training

Contributed by: Dr. PK Singh<sup>1</sup>

<sup>1</sup>Medical Officer & OIC, NCDC, Varanasi

A vector control and surveillance training was organized from 16.11.2023 to 17.11.2023 for all staff posted at APHO Varanasi. Didactic lectures were taken at NCDC Varanasi branch by Sh. Vetrivel B., DAD (Ent.) and Dr. PK Singh, MO & OIC. Field training was conducted at Vill. Kurmigaon, Baikunthpur, Varanasi where all APHO staff were taken for identification of adult mosquitoes and larvae collection. Total 11 APHO officials participated in the training.



Fig 1: Activities during Vector Surveillance and Control training

# Global Disease Alert

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*Contributed by: NFP IHR Secretariat, Division of Public Health Preparedness & NCD*

## **Influenza A (H1N1) variant virus – Brazil**

**7 February 2024**

On 16 January 2024, Brazil notified the World Health Organization (WHO) of a laboratory-confirmed human infection with swine-origin influenza A(H1N1) variant (v) virus, in the municipality of Toledo, State of Paraná. Local and national health authorities have introduced a series of public health measures to address respiratory infections in the region. These measures include conducting epidemiological investigations, monitoring influenza-like illness (ILI) and severe acute respiratory infections (SARI) in nearby municipalities within the same health region, and analyzing trends of respiratory viruses, particularly influenza.<sup>1</sup>

## **Avian Influenza A (H5N1) – Cambodia**

**8 February 2024**

Between 26 and 28 January 2024, the Cambodia National Focal Point (NFP) for the International Health Regulations (IHR) notified the World Health Organization (WHO) of two confirmed cases of human infection with avian influenza A(H5N1) virus. These cases were reported from Kampong Trabek district, Prey Veng province, and Puok district, Siem Reap province, Cambodia. The Cambodia Ministry of Health's national and sub-national rapid response teams, with support from the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of Environment, have been actively investigating the avian influenza outbreak in the Prey Veng and Siem Reap Provinces. Poultry samples have been collected and testing is ongoing.<sup>2</sup>

## **Western Equine Encephalitis - Uruguay**

**8 February 2024**

On 30 January 2024, the International Health Regulations National Focal Point (IHR NFP) of Uruguay notified the World Health Organization (WHO) of a human case of western equine encephalitis (WEE) virus infection. The patient is a 42-year-old from a rural area in the Department of San Jose, in southern Uruguay. Local and national health authorities have implemented public health measures based on the recently published PAHO/WHO recommendations, with an inter-institutional and comprehensive approach between animal health, human health and environmental health (One Health).<sup>3</sup>

## **Influenza A(H1N1) variant virus – Spain**

**9 February 2024**

On 29 January 2024, the Spanish health authorities notified the World Health Organization (WHO) of a laboratory confirmed human case of infection with swine-origin influenza A(H1N1) variant (v) virus, in the province of Lleida (Cataluña autonomous community), Spain. Epidemiological investigations were initiated by public health authorities in Catalonia. No secondary cases were identified among the three close family contacts. None of the other farm workers have reported symptoms to date, and follow-up of these workers has been completed.<sup>4</sup>

## **Avian Influenza A(H10N5) and Influenza A(H3N2) coinfection – China**

**13 February 2024**

On 27 January 2024, the National Health Commission of the People's Republic of China notified the World Health Organization (WHO) of one confirmed case of human coinfection with avian influenza A(H10N5) virus and

<sup>1</sup>*Influenza A (H1N1) variant virus (who.int)*

<sup>2</sup>*Avian Influenza A (H5N1) - Cambodia (who.int)*

<sup>3</sup>*Western Equine Encephalitis – Uruguay (who.int)*

<sup>4</sup>*Influenza A(H1N1) variant virus - Spain (who.int)*

<sup>5</sup>*Avian Influenza A(H10N5) and Influenza A(H3N2) coinfection (who.int)*

seasonal influenza A(H3N2) virus. The case occurred in a female farmer over 60 years of age, with a history of chronic comorbidities, from Xuancheng Prefecture, Anhui Province. The Chinese government has implemented a range of monitoring, prevention, and control measures in response to a health threat. These measures include conducting risk assessments, enhancing syndromic surveillance in local healthcare facilities, and conducting thorough epidemiological investigations, including contact tracing and monitoring. Retrospective screening, case finding, environmental sampling, and testing have been conducted to identify potential sources of infection.<sup>5</sup>

### **Middle East Respiratory Syndrome Coronavirus - Kingdom of Saudi Arabia**

**16 February 2024**

This is the bi-annual update on the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) infections reported to the World Health Organization (WHO) from the Kingdom of Saudi Arabia (KSA). From 13 August 2023 to 1 February 2024, four laboratory-confirmed cases of MERS-CoV, including two deaths, were reported to WHO by the Ministry of Health of the KSA. Follow-up of the close contacts was conducted by the MoH for all four cases, and no secondary cases were identified. For the two cases reporting direct and indirect contact with camels, the Ministry of Agriculture was informed, and an investigation of camels was conducted.<sup>6</sup>

### **Nipah virus infection – Bangladesh**

**27 February 2024**

Since 1 January and as of 9 February 2024, two laboratory-confirmed cases of NiV have been reported from the Dhaka division of Bangladesh. Both cases have died. The government of Bangladesh, in collaboration with the World Health Organization (WHO), has initiated a comprehensive public health response to address health challenges. This includes nationwide awareness campaigns using various media platforms and distribution of educational materials in endemic districts. Risk communication efforts involve engaging diverse stakeholders such as government officials, healthcare professionals, religious leaders, and farmers. WHO is actively supporting surveillance enhancement, infection prevention and control (IPC), risk communication, and ensuring prompt diagnosis and treatment of infected individuals. Additionally, One Health Partners have been involved and sensitized to address the intersection of human, animal, and environmental health concerns.<sup>7</sup>

### **Psittacosis – European region**

**5 March 2024**

In February 2024, Austria, Denmark, Germany, Sweden and The Netherlands reported an increase in psittacosis cases observed in 2023 and at the beginning of 2024, particularly marked since November-December 2023. Five deaths were also reported. Epidemiological investigations were implemented to identify potential exposure and clusters of cases. National surveillance systems are closely monitoring the situation, including laboratory analysis of samples from wild birds submitted for avian influenza testing to verify the prevalence of *C. psittaci* among wild birds.<sup>8</sup>

<sup>6</sup>Middle East Respiratory Syndrome Coronavirus ([who.int](https://www.who.int))

<sup>7</sup>Nipah virus infection - Bangladesh ([who.int](https://www.who.int))

<sup>8</sup>Psittacosis – European region ([who.int](https://www.who.int))

# Information Broadcast

## Conducting Probability Proportionate to Size sampling for Surveys

Contributed by: Dr Suneet Kaur<sup>1</sup>

<sup>1</sup>Deputy Director, NCDC

Probability proportional sampling is usually used in survey when the sampling units vary in size. In this methodology, the inclusion probability for each sampling unit is different and is proportional to size of each of the sampling units.

Steps in applying Probability Proportional to Size (PPS) and calculating Basic Probability Weights:

- Prepared a list of all the strata along with their respective total populations.
- Choose number of clusters to be sampled (c)
- Cumulative population for each strata is calculated by adding each strata's population from list to the sum of its predecessors.
- Sampling interval (SI) is calculated by dividing total population by c (number of clusters).
- Generate random start (RS) between 0 and SI

using random number generator.

- Cluster Selection: Identify the clusters using the random start point and the cumulative population data.

1st cluster: The random start number (RS) lies between cumulative population corresponding to two strata; the later strata will be chosen as first cluster.

Following clusters: Similarly, second cluster should be chosen by adding the SI to the sum of predecessors, i.e.  $RS + SI$ . Third cluster,  $RS + 2 \times SI$  and so on.

Calculate the proportionate sample size for each cluster using the formula

Proportionate Sample Size (s) =  $\frac{\text{Total Sample Size (S)} \times \text{Population of the selected cluster (p)}}{\text{Total Population of the selected clusters (P)}}$

Examples: This type of sampling methodology can be used while conducting serosurveys, when the population under survey is from diverse geographical areas with wide variation in population size and we want to draw conclusions on the whole population.

**DEPARTMENT OF FISHERIES**  
Government of India

**AVIAN FLU VIRUS**

**AVOID**  
contact with birds

**PREVENTIONS**

- Food hygiene and safety
- Wash hands
- should you wear a face mask in public

**SYMPTOMS**

- Chest pain
- Breathless
- Fever
- Headache
- Diarrhea
- Cough
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