



# Disease Alert

## प्रकोप चेतावनी

A monthly Surveillance Report from Integrated Disease Surveillance Programme  
National Health Mission

July 2016

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### Acute Diarrhoeal Disease Outbreak - Sawargaon, Nagpur District, Maharashtra

#### Introduction

World Health Organisation estimates that globally 1.7 billion cases of diarrhoea occur annually. In 2015, 450 Acute Diarrhoeal Disease (ADD) outbreaks were reported in India by the Integrated Disease Surveillance Programme (IDSP). In July 2016, an outbreak of ADD in Sawargaon village of Narkhed taluka, Nagpur district, Maharashtra was reported to the Central Surveillance Unit (CSU-IDSP) New Delhi by the Nagpur District Surveillance Unit. Until 21st July 2016, 719 ADD cases were reported at Sawargaon Primary Health Centre (PHC) from Sawargaon and neighbouring villages. The CSU-IDSP and the National Centre for Disease Control (NCDC) team assisted the district team with outbreak investigation to determine risk factors and to recommend preventive measures.

#### Methods

District IDSP weekly data of Narkhed taluka was reviewed for year 2015 and 2016 to confirm the outbreak and interviewed key informants such as the District Health Officer (DHO), District Epidemiologist, Taluka Medical Officer (TMO), Medical Officers, Gram Sewaks, and water treatment plant workers using an unstructured open-ended questionnaire.

For case finding, a case was defined as a person who had loose stool from 9-31 July, 2016 and reported to Sawargaon PHC. Cases were searched from the out-patient and in-patient department records of Sawargaon PHC. Records of community halls were checked to ascertain occurrence of community feasts and the managers were interviewed.

Nine stool samples were collected on 12 July 2016 and sent for culture in Cary-Blair (CB) transport medium to the Government Medical College (2 samples) and Regional Public Health Laboratory (RPHL), Nagpur (7 samples). One stool swab sample which was positive for *Vibrio cholera* from the RPHL, Nagpur was transported to the enteric laboratory, NCDC, New Delhi for testing for biotype.

Environmental survey was conducted by visiting water treatment plant, public wells, overhead tanks, and river bed. Total 20 water samples were collected and sent to RPHL, Nagpur for testing. RPHL did the microbiological testing of water using multiple-tube method for thermo tolerant (faecal) coliforms. Data were analysed using EpiInfo7 and OpenEpi. Measures of central tendency, proportions, attack rates (AR) were calculated.

## **Results**

During 9-31 July, 2016 total 1078 ADD cases reported to Sawargaon PHC from Sawargaon and surrounding 29 villages.

- Out of these cases, 51% were female and median age was 21 years (range: 1 to 80).
- Attack rate was highest in village Sawargaon (9.9%, 889 cases) followed by Mhasora (3.5%, 58 cases). All other villages had less than 20 cases each.
- Among the 1078 ADD cases, watery stool (89%) was the most common symptom reported, followed by vomiting (26%), nausea (19%) abdominal pain (16%), blood in stool (12%), and fever (6%).
- Maximum number (193) of cases were reported on 13 July 2016. Last case was reported on 31 July 2016. There were total 285 (27%) cases, treated as inpatients at PHC out of total 1078 ADD cases.
- Total two deaths (0.2%) were reported during this outbreak on 12 July, 2016.
- Of the 9 stool samples, *Vibrio cholera* O1 serogroup was isolated and cultured in 2 (20%) stool specimens.
- One stool swab isolate tested at the enteric laboratory, NCDC was culture positive for Cholera O1 serogroup, biotype El-tor and sensitive for first line drug for cholera except Cotrimoxazole.
- Out of twenty water samples collected, eighteen (90%) failed and found unfit for drinking. Water samples from the two public well located in Sawargaon were found unfit for drinking.

Drinking water to Sawargaon village is supplied through three overhead water tanks. The overhead water tanks get water from the Chikhali dam reservoir and two public wells located in the village. As villagers complained of muddy water supply from the Chikhali dam, water supply was temporarily stopped on 30 July, 2016. In the interim, villagers consumed shallow ground water from 2 public wells, 40 private wells, and 5 hand pumps located at Sawargaon. Both private and public taps were supplied by 2 public wells through overhead tanks. First ADD case was reported to Sawargaon PHC on 9 July 2016.

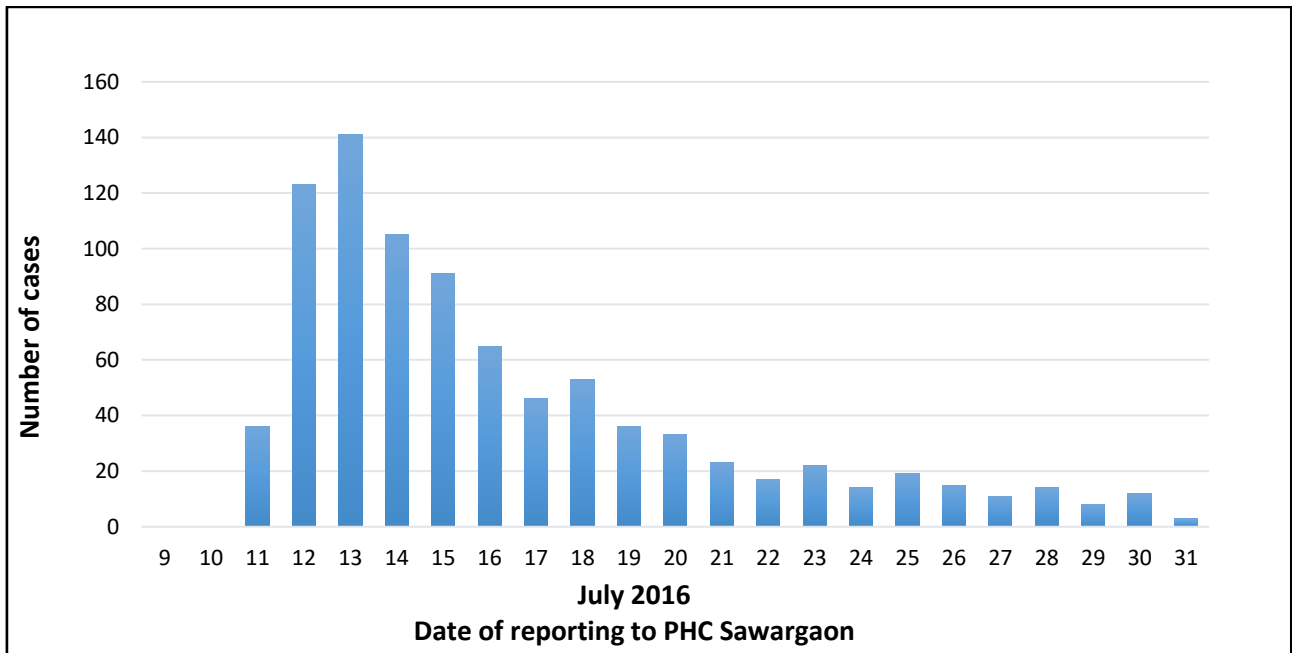
Environmental investigation showed open defecation and breaches in and around ground water sources and no effective water treatment in the households or at the water tank. Village has open drains alongside drinking water sources. Continuous and heavy rainfall was reported from 8 to 12 July 2016 at Sawargaon (184 millimetres).

## **Discussion**

There was a large outbreak of ADD probably cholera in Sawargaon village, Nagpur, Maharashtra and was likely due to consumption of contaminated water. Timely intervention (within 24 hours) by district authorities led to effective control.

Overall, our investigation indicates lack of availability of safe drinking water in Sawargaon village. It is recommended that when drinking water supply is interrupted, the authorities need to provide alternative safe drinking water to all. Water chlorination of the temporary water source at the distribution site and at the site of consumption need to be prioritized. Take measures to prevent contamination of drinking water from open defecation, drains, and other anthropogenic activities.

**Fig 1: Acute diarrhoeal disease cases reported to primary health centre Sawargaon, Sawargaon village, Nagpur, Maharashtra (N=889)**



**Fig 2: Public wells and overhead tanks in Sawargaon Village, Nagpur, Maharashtra**

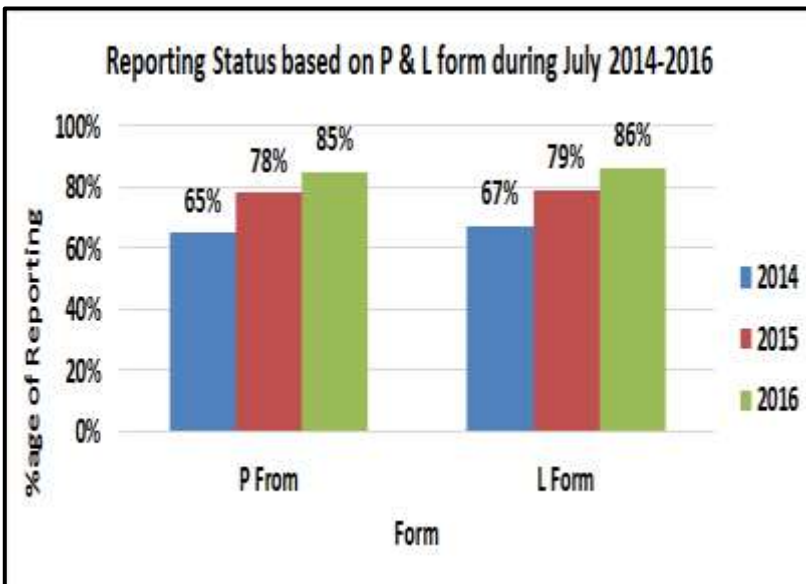


**Fig 3: Open defecation along the river and location of overhead tank, Sawargaon village, Nagpur, Maharashtra**



**Surveillance data of Enteric Fever, Acute Diarrhoeal Disease, Viral Hepatitis A & E, Dengue and Leptospirosis During July 2014-2016\***

\* Data extracted from IDSP Portal ([www.idsp.nic.in](http://www.idsp.nic.in)) as on December 21; 2016.



**Fig. 4: Reporting Status based on P & L form during July 2014-2016**

As shown in fig 4, in July 2014, 2015 and 2016, the 'P' form reporting percentage (i.e. % RU reporting out of total in P form) was 65 %, 78% and 85% respectively across India, for all disease conditions reported under IDSP in P form. Similarly, L form reporting percentage was 67%, 79% and 86% respectively across India for all disease conditions, during the same month for all disease conditions reported under IDSP in L form. The completeness of reporting has significantly increased over the years in both P and L form, thereby improving the quality of surveillance data.



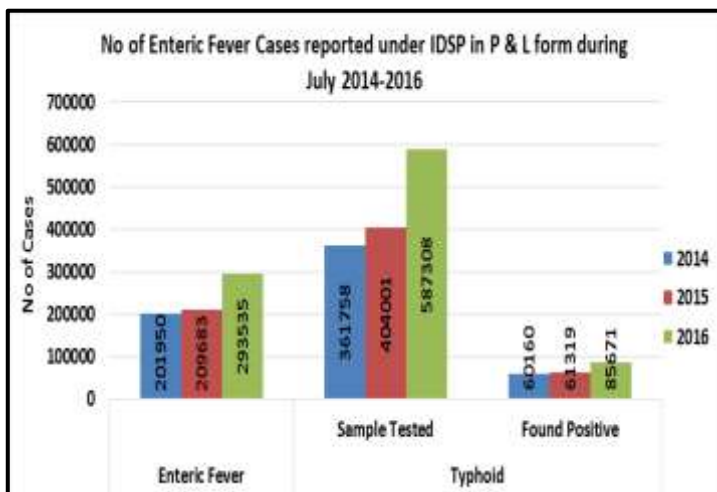


Fig. 5: No. of Enteric Fever Cases reported under P & L form during July 2014-2016

As shown in fig 5, number of presumptive enteric fever cases, as reported by States/UTs in 'P' form was 201950 in July 2014; 209683 in July 2015 and 293535 in July 2016. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2014; 361758 samples were tested for Enteric fever, out of which 60160 were found positive. In July 2015; out of 404001 samples, 61319 were found to be positive and in July 2016, out of 587308 samples, 85671 were found to be positive.

**Limitation:** The test by which above mentioned samples were tested could not be ascertained, as currently there is no such provision in L form.

As shown in fig 6, number of Acute Diarrhoeal Disease cases, as reported by States/UTs in 'P' form was 1252760 in July 2014; 1373525 in July 2015 and 1669447 in July 2016. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2014, 2535 samples were tested for Cholera out of which 89 tested positive; in July 2015, out of 4084 samples, 166 tested positive for Cholera and in July 2016, out of 4301 samples, 240 tested positive.

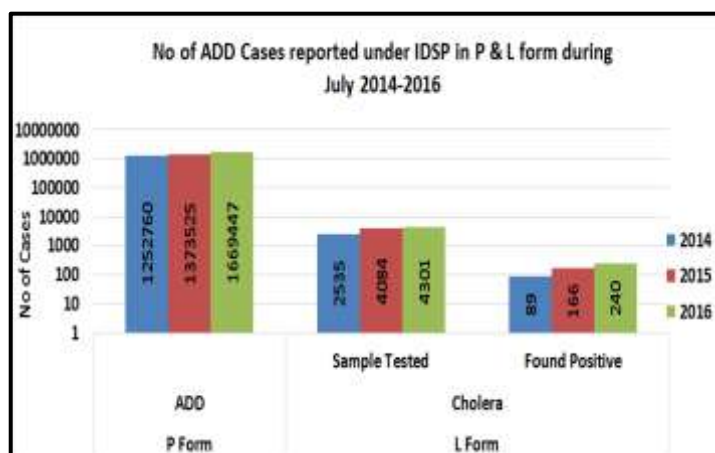


Fig. 6: No. of ADD Cases reported under IDSP in P form & Lab confirmed Cholera cases in L form during July 2014-2016

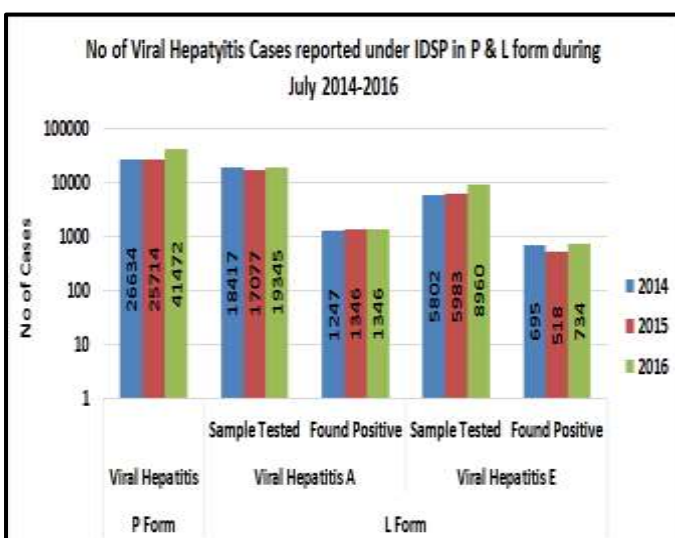


Fig. 7: No of Viral Hepatitis Cases reported under IDSP in P form & Viral Hepatitis A & E cases reported under L form during July 2014-2016

As shown in fig 7, the number of presumptive Viral Hepatitis cases was 26634 in July 2014, 25714 in July 2015 and 41472 in July 2016. These presumptive cases were diagnosed on the basis of case definitions provided under IDSP.

As reported in L form for Viral Hepatitis A, in July 2014; 18417 samples were tested out of which 1247 were found positive. In July 2015; out of 17077 samples, 1346 were found to be positive and in July 2016, out of 19345 samples, 1346 were found to be positive.

As reported in L form for Viral Hepatitis E, in July 2014; 5802 samples were tested out of which 695 were found positive. In July 2015; out of 5983 samples, 518 were found to be positive and in July 2016, out of 8960 samples, 734 were found to be positive.

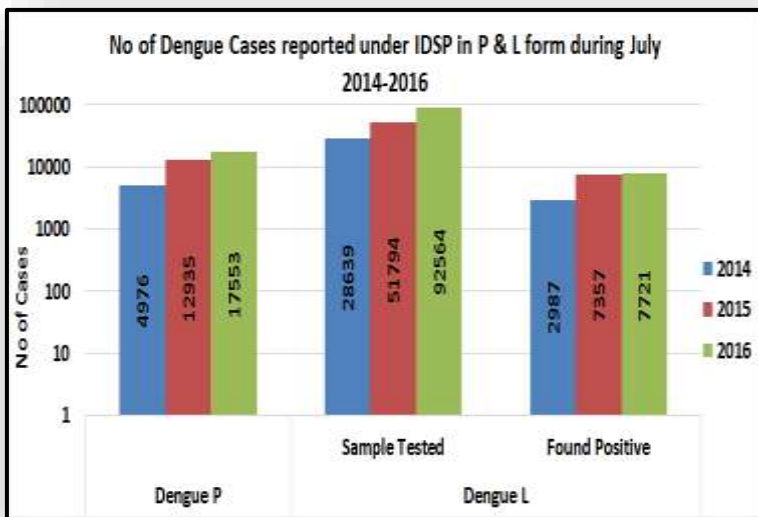


Fig. 8: No. of Dengue Cases reported under IDSP in P & L form during July 2014-2016

As shown in fig 8, number of presumptive Dengue cases, as reported by States/UTs in 'P' form was 4976 in July 2014; 12935 in July 2015 and 17553 in July 2016. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2014; 28639 samples were tested for Dengue, out of which 2987 were found positive. In July 2015; out of 51794 samples, 7357 were found to be positive and in July 2016, out of 92564 samples, 7721 were found to be positive.

**Limitation:** The test by which above mentioned samples were tested could not be

ascertained, as currently there is no such provision in L form.

As shown in fig 9, number of presumptive Leptospirosis cases, as reported by States/UTs in 'P' form was 618 in July 2014; 1018 in July 2015 and 1530 in July 2016. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2014; 9166 samples were tested for Leptospirosis, out of which 329 were found positive. In July 2015; out of 8775 samples, 326 were found to be positive and in July 2016, out of 20754 samples, 836 were found to be positive.

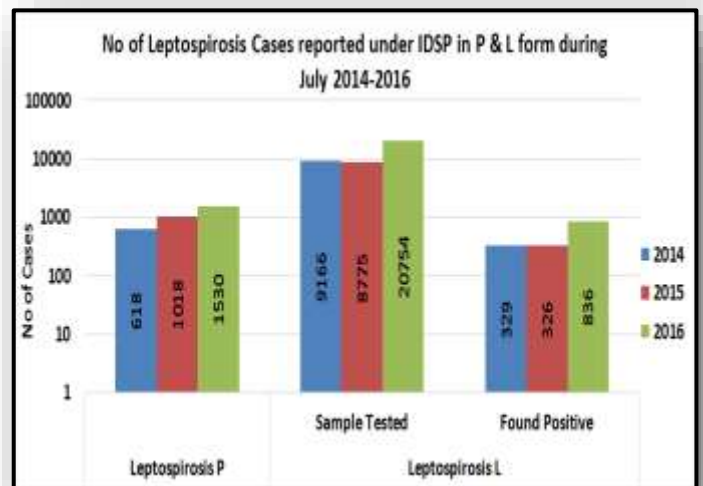


Fig. 9: No. of Leptospirosis Cases reported under IDSP in P & L form during July 2014-2016

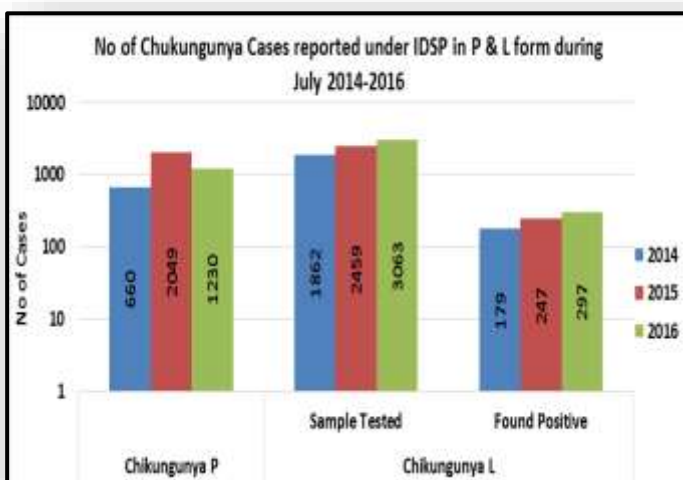


Fig. 10: No. of Chikungunya Cases reported under IDSP in P & L form during July 2014-2016

As shown in fig 10, number of presumptive Chikungunya cases, as reported by States/UTs in 'P' form was 660 in July 2014; 2049 in July 2015 and 1230 in July 2016. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2014; 1862 samples were tested for Chikungunya, out of which 179 were found positive (9.6% positivity). In July 2015; out of 2459 samples, 247 were found to be positive (10% positivity) and in July 2016, out of 3063 samples, 297 were found to be positive (9.6% positivity).

Fig 11: State/UT wise P form completeness % for July 2016

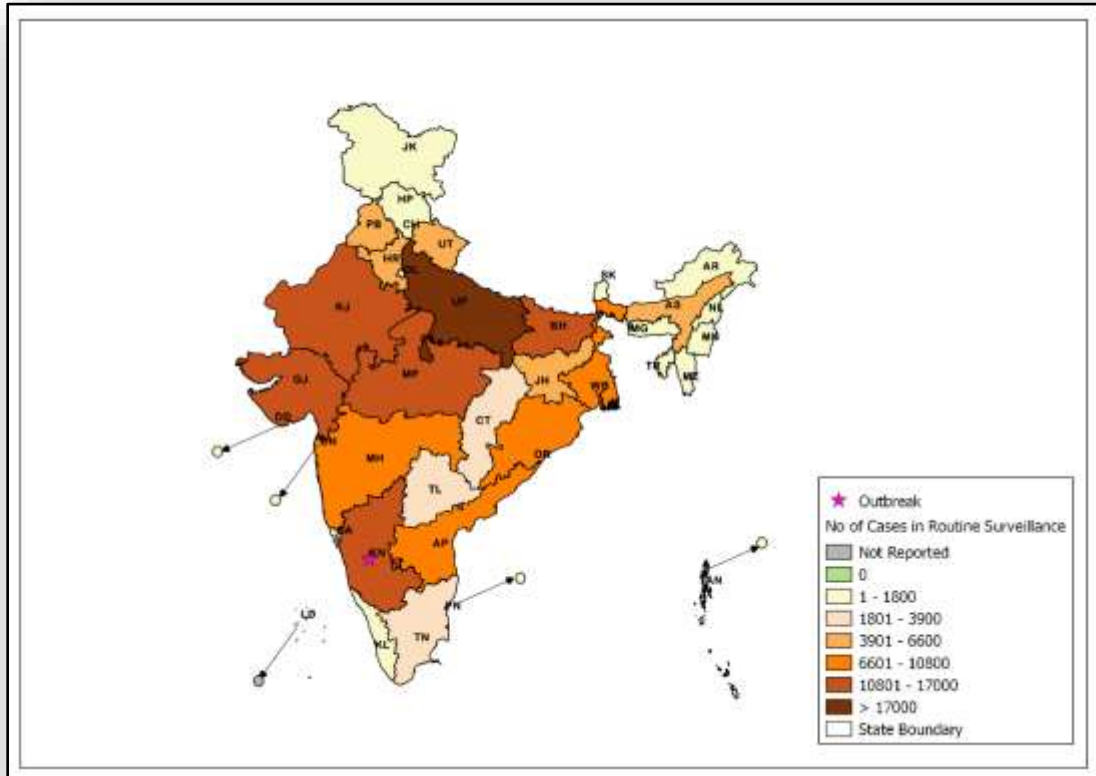
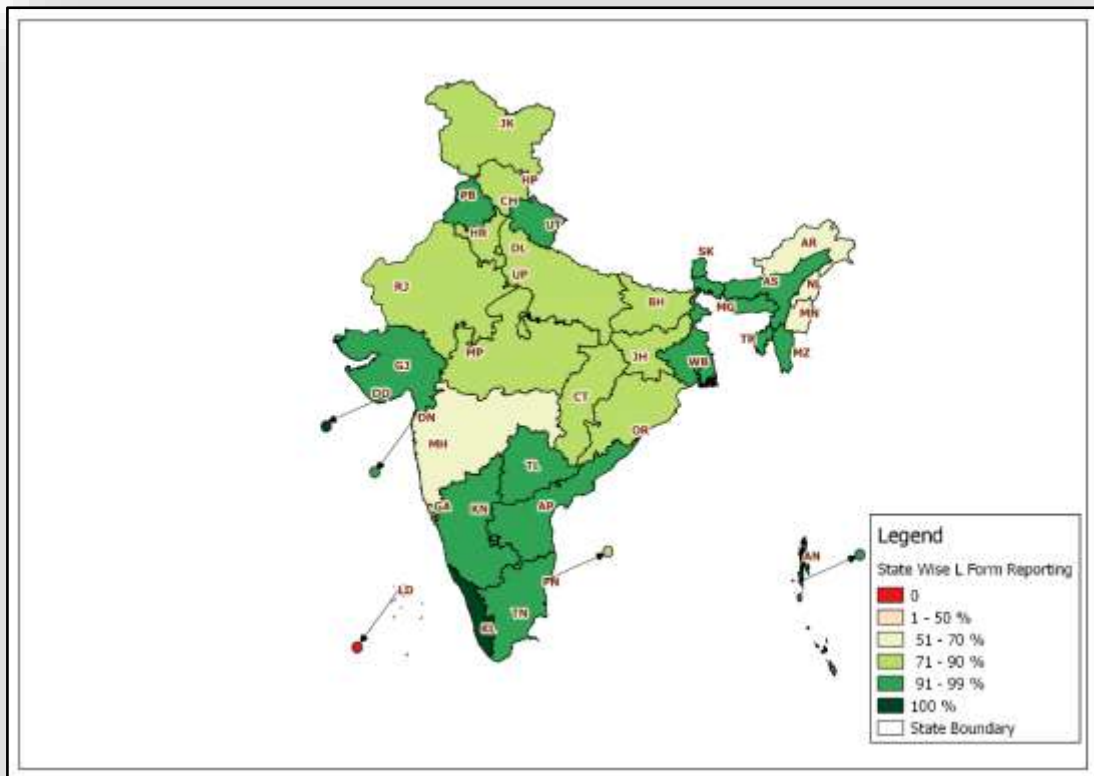
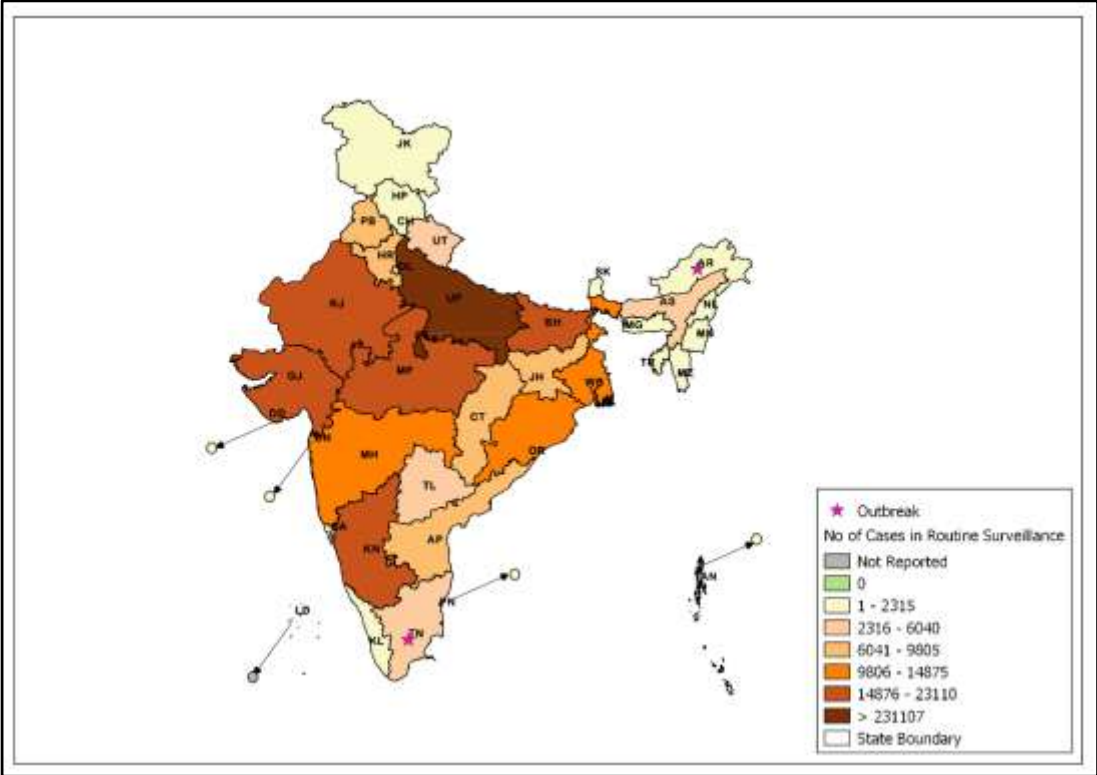


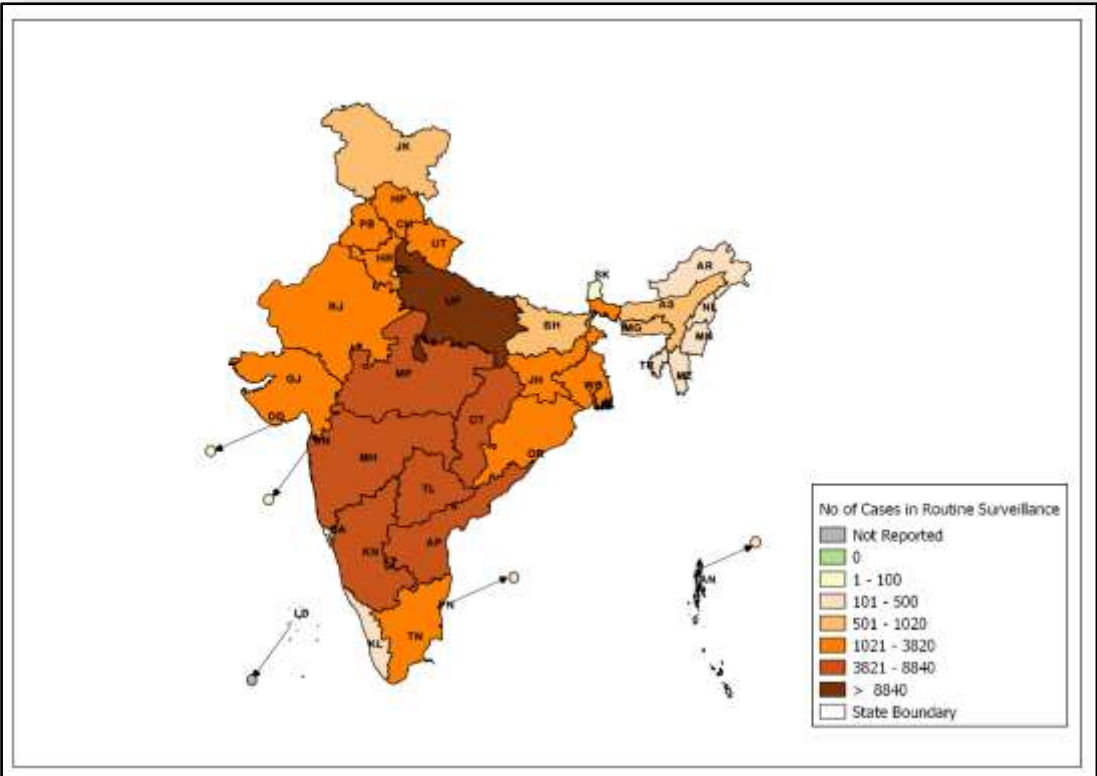
Fig 12: State/UT wise L form completeness % for July 2016



**Fig 13: State/UT wise Presumptive Enteric fever cases and outbreaks for July 2016**

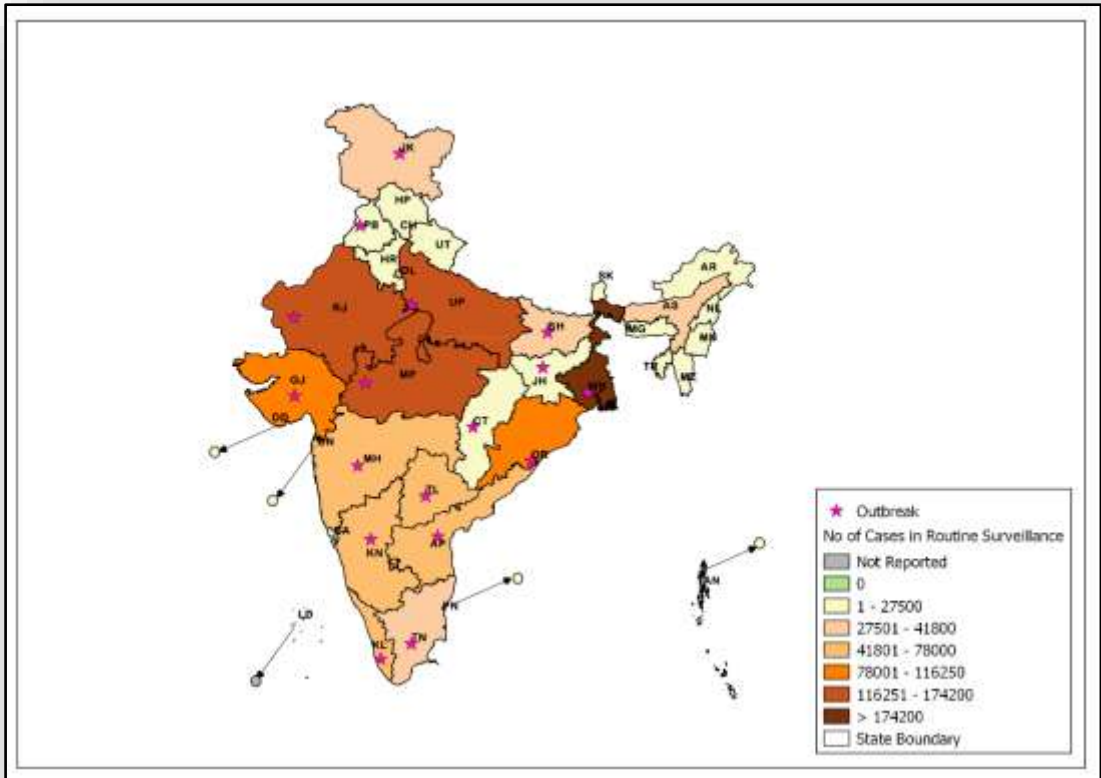


**Fig 14: State/UT wise Lab Confirmed Enteric Fever cases and outbreaks for July 2016**

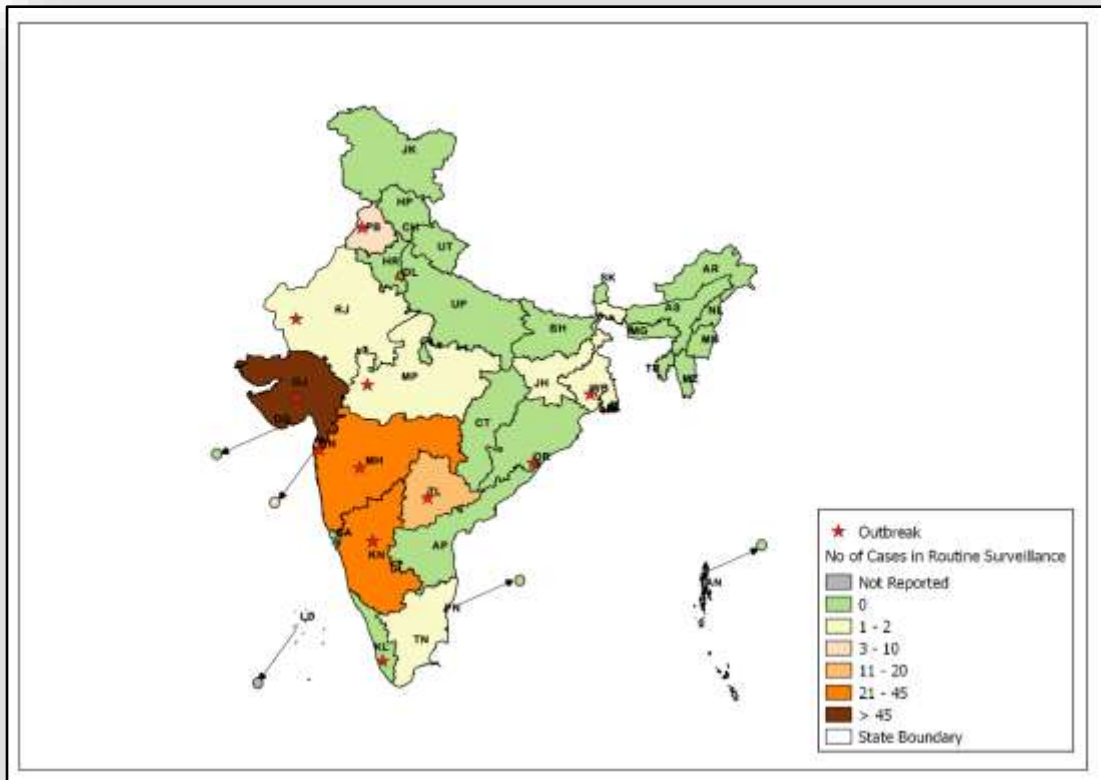




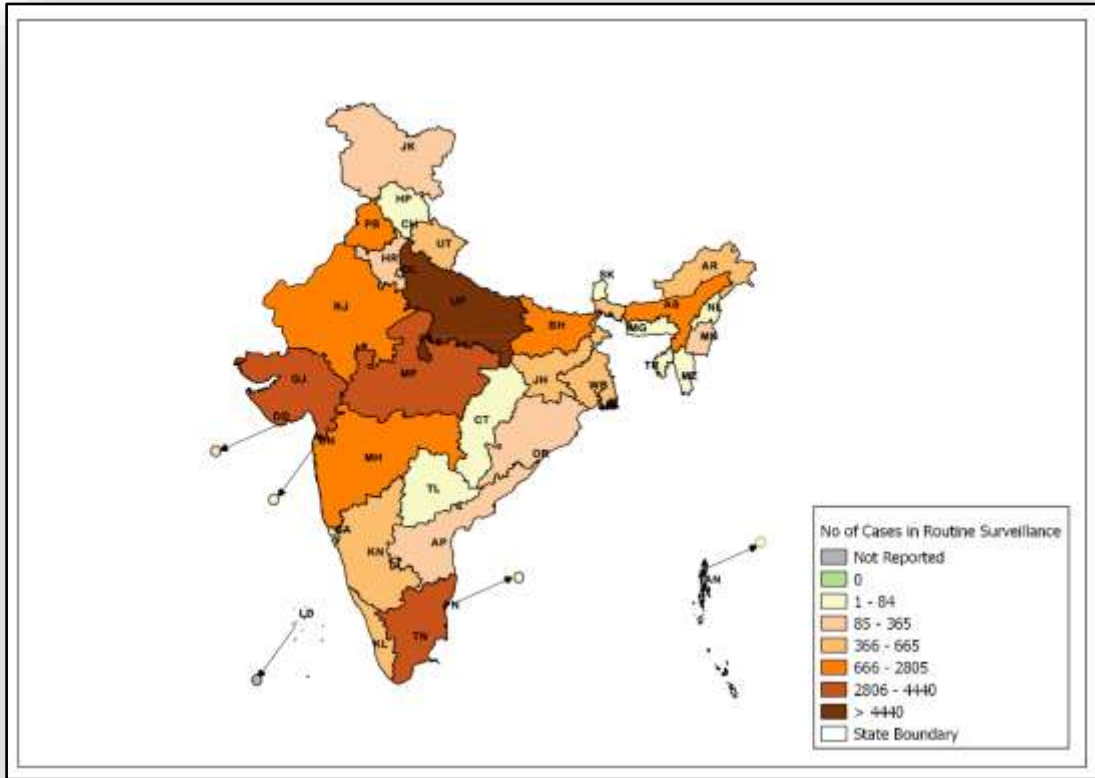
**Fig 15: State/UT wise Presumptive ADD cases and outbreaks for July 2016**



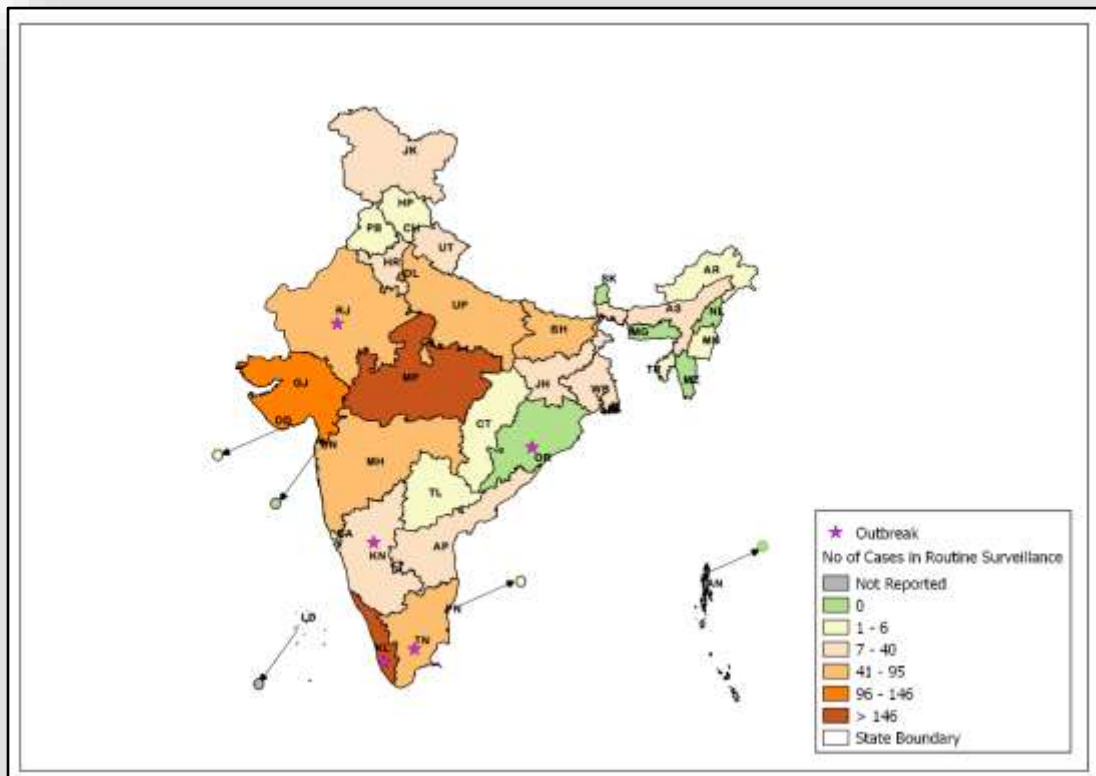
**Fig 16: State/UT wise Lab Confirmed Cholera cases and outbreaks for July 2016**



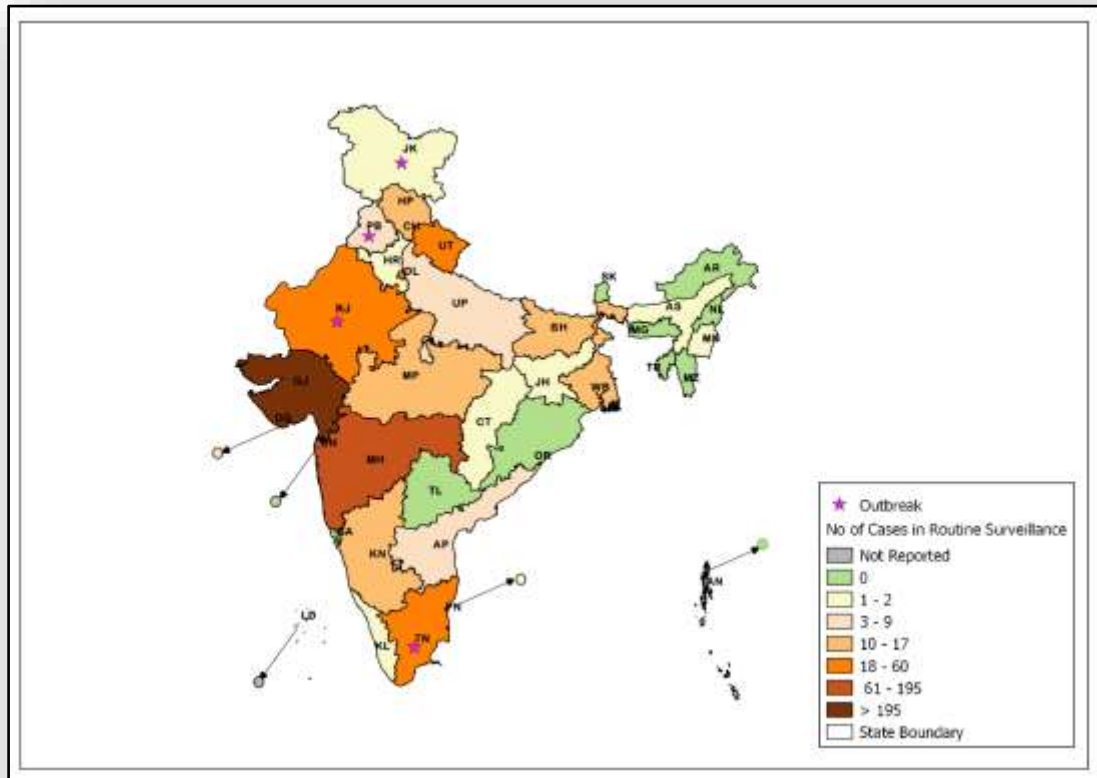
**Fig 17: State/UT wise Presumptive Viral Hepatitis cases and outbreaks for July 2016**



**Fig 18: State/UT wise Lab confirmed Viral Hepatitis A cases for July 2016**



**Fig 19: State/UT wise Lab confirmed Viral Hepatitis E cases for July 2016**



**Fig 20: State/UT wise Presumptive Dengue cases & outbreaks for July 2016**

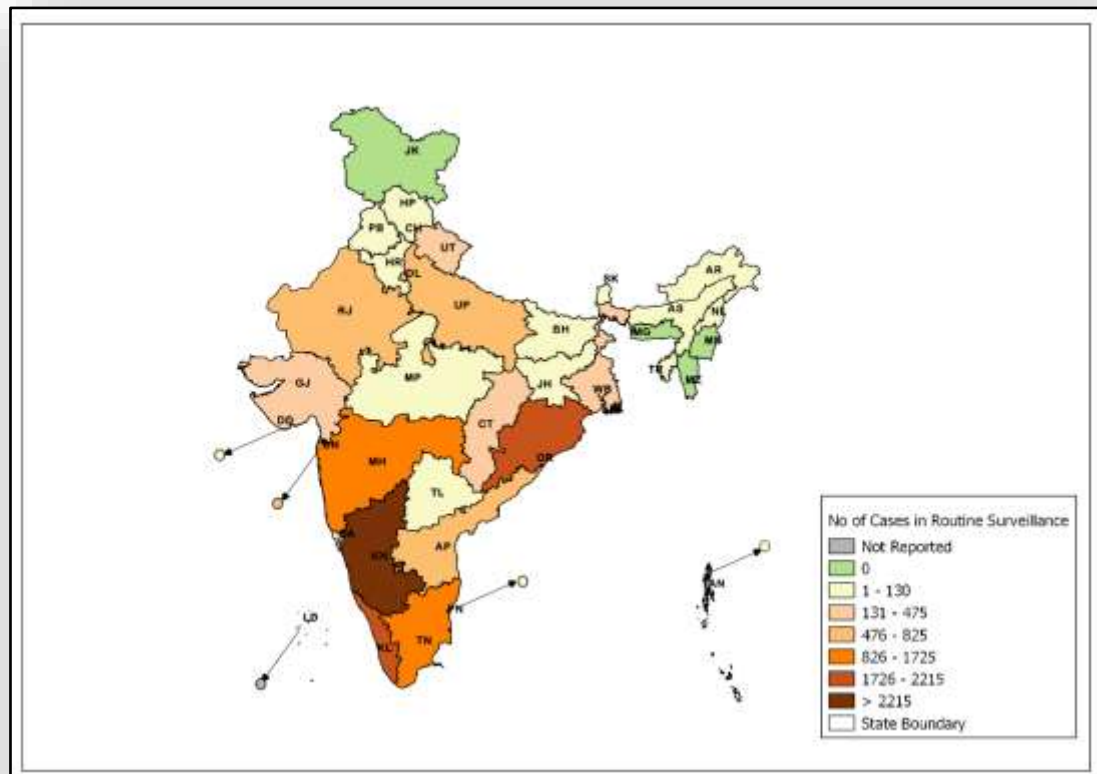


Fig 21: State/UT wise Lab confirmed Dengue cases for July 2016

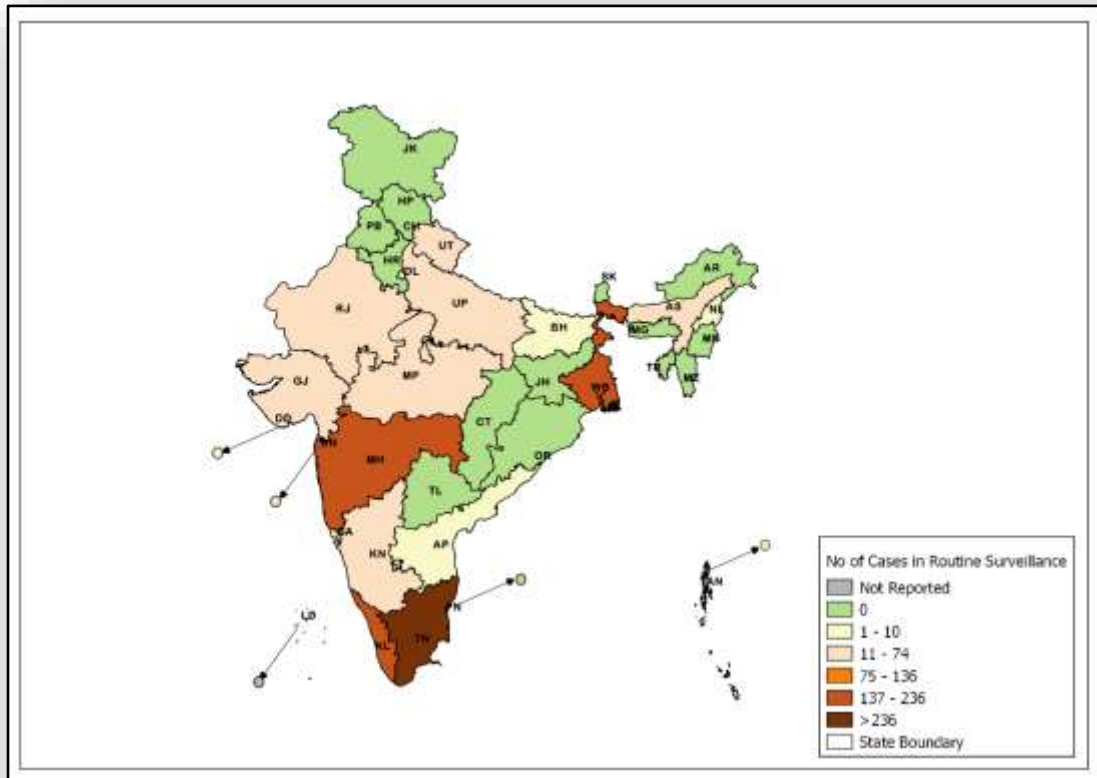
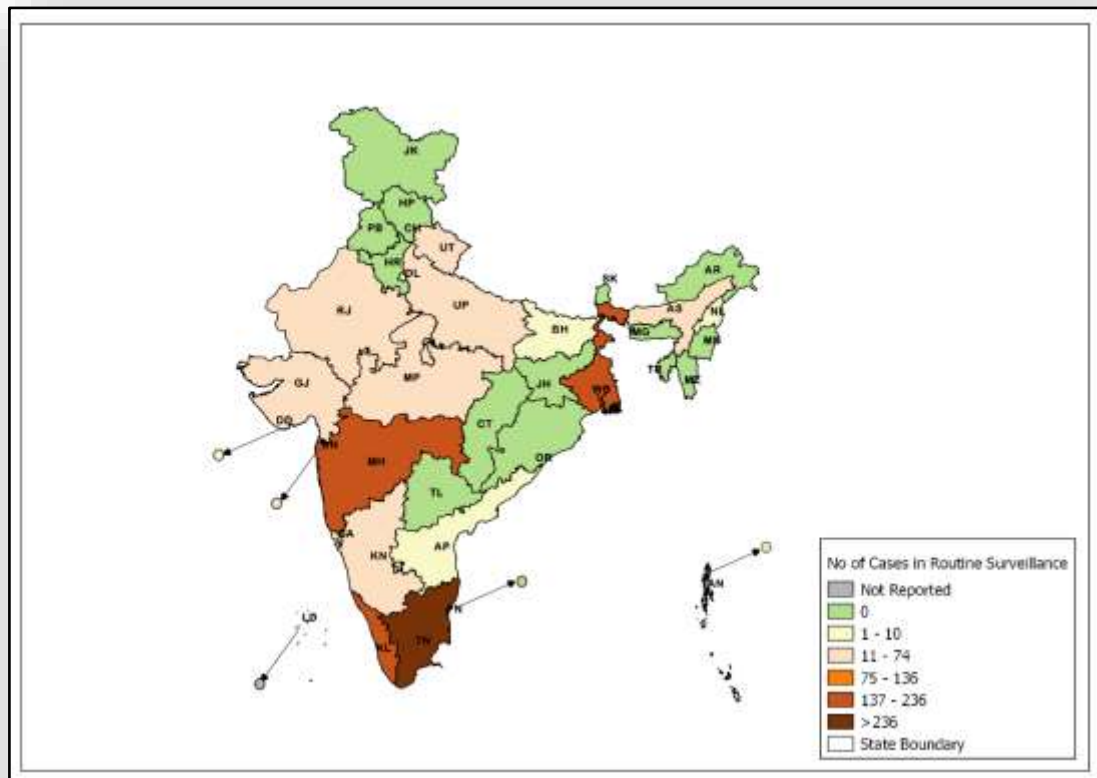
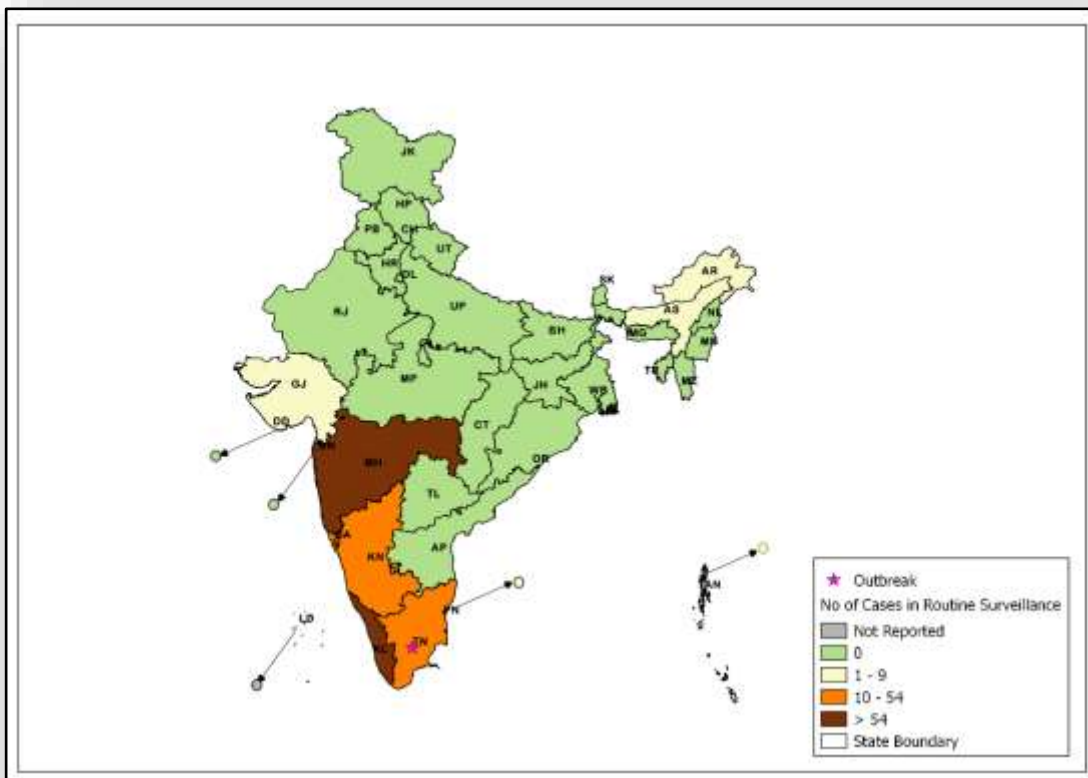


Fig 22: State/UT wise Presumptive Leptospirosis cases for July 2016

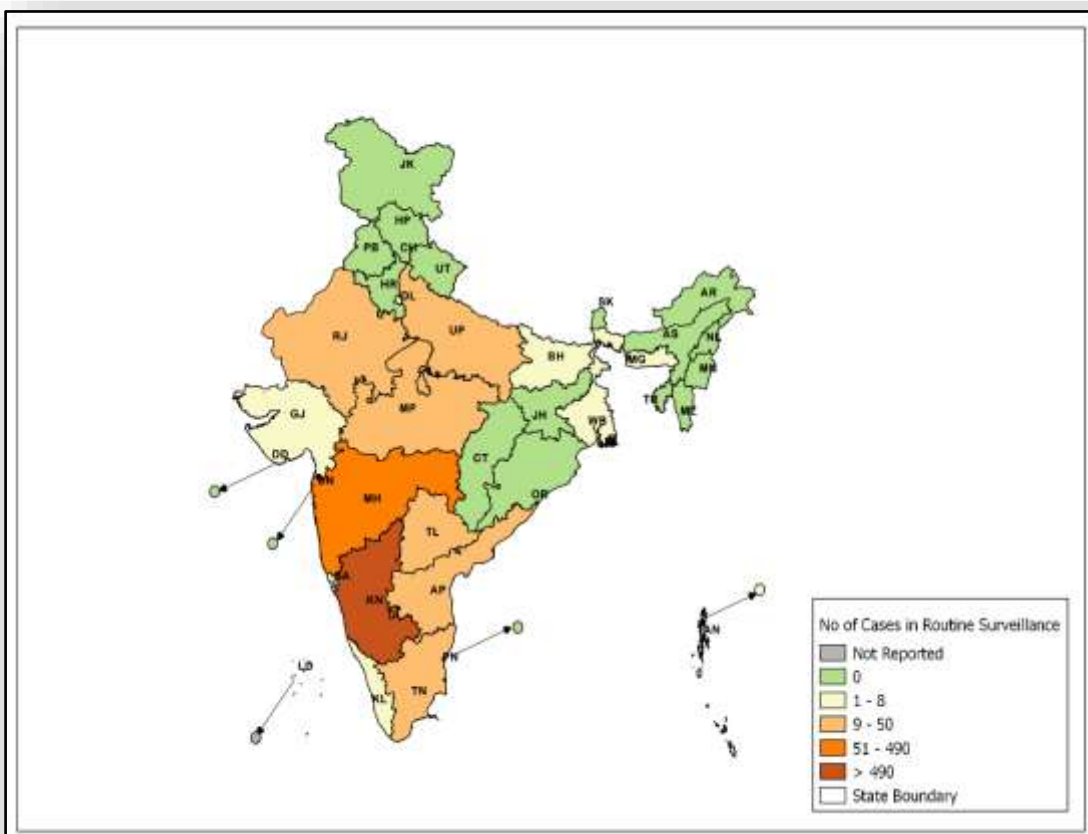




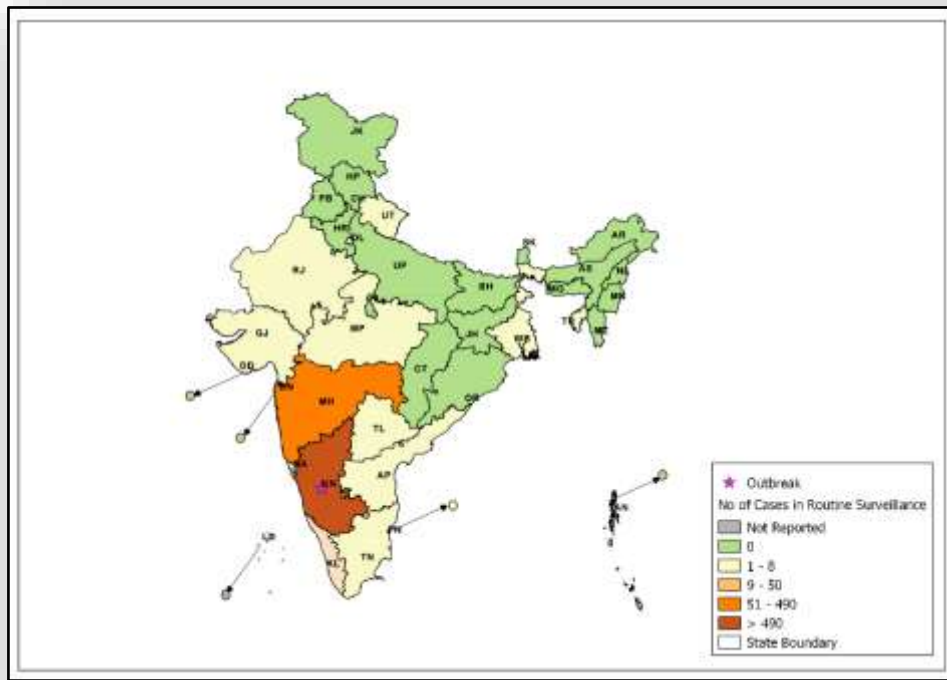
**Fig 23: State/UT wise Lab Confirmed Leptospirosis cases & outbreaks for July 2016**



**Fig 24: State/UT wise Presumptive Chikungunya cases & outbreaks for July 2016**



**Fig 24: State/UT wise Lab Confirmed Chikungunya cases & outbreak for July 2016**



### Action from the field

The BRICS Workshop on Health Surveillance: System and Best Practices was held on 1-2 August, 2016 in Bengaluru. The meeting was organized by MOHFW through NCDC, State IDSP and RD office Bengaluru. The Chinese delegation (with 3 experts) was led by Ms. Rongrong Wang, Deputy Consultant Bureau of Disease Prevention and Control, National Health and Family Planning Commission of the People's Republic of China, South African delegation (with 3 experts) was led by Dr Gail Verah Andrews, Chief Operating Officer, Department of Health, Republic of South Africa and Indian delegation was led by Dr. N S Dharmshaktu, Principal Advisor, Ministry of Health and Family Welfare, Govt. of India.

During the workshop, the delegates agreed that there should be a plan of collaboration with respect to specific areas or activities and a mechanism for institutionalization and collaboration on the communicable and non-communicable disease surveillance systems existing across various BRICS countries.



- Dr Saurabh Goel, Asstt. Director IDSP was at Lucknow, Uttar Pradesh for Workshop on VPD surveillance on 19 & 20 July 2016.
- Dr Saurabh Goel, Asstt. Director IDSP was at Gorakhpur, Uttar Pradesh for AES / JE situational update From 26 to 29 July 2016.
- Dr Pranay Verma, Asstt. Director IDSP was at Dibrugarh District of Assam for JE/AES Situation from 27 to 29 July 2016.
- Dr Pradeep Khasnobis, Sr. CMO & Officiating NPO IDSP, Dr. Sanket Kulkarni, Asstt. Director IDSP, Dr. Nishant Kumar, Asstt. Director IDSP, Ms. Stakshi Taryon Consultant (IT) IDSP and Dr. Ranjeet Prasad, Consultant Epidemiology IDSP were at Bengaluru for BRICS workshop on "Strengthening Health Surveillance: System and Best Practices" from 28 July to 03 August 2016.
- Dr Suhas Dhandore, Asstt. Director IDSP was at Aizwal, Mizoram for State Review Meeting cum Training for the District Surveillance Officers (DSOs) & Data Managers from 27 to 29 July 2016.



### Glossary:

- **P form:** Presumptive cases form, in which cases are diagnosed and reported based on typical history and clinical examination by Medical Officers.
- **Reporting units under P form:** Additional PHC/ New PHC, CHC/ Rural Hospitals, Infectious Disease Hospital (IDH), Govt. Hospital / Medical College\*, Private Health Centre/ Private Practitioners, Private Hospitals\*
- **L form:** Lab confirmed form, in which clinical diagnosis is confirmed by an appropriate laboratory tests.
- **Reporting units under L form:** Private Labs, Government Laboratories, Private Hospitals(Lab.), CHC/Rural Hospitals(Lab.),
- HC/ Additional PHC/ New PHC(Lab.), Infectious Disease Hospital (IDH)(Lab.), Govt. Hospital/Medical College(Lab.), Private Health Centre/ Private Practitioners(Lab.)
- **Completeness %:** Completeness of reporting sites refers to the proportion of reporting sites that submitted the surveillance report (P & L Form) irrespective of the time when the report was submitted.
- **State Code:**  
Andaman & Nicobar Islands AN; Andhra Pradesh AP; Arunachal Pradesh AR; Assam AS; Bihar BH; Chandigarh CH; Chhattisgarh CT; Dadra & Nagar Haveli DN; Daman & Diu DD; Delhi DL; Goa GA; Gujarat GJ; Haryana HR; Himachal Pradesh HP; Jammu & Kashmir JK; Jharkhand JH; Karnataka KN; Kerala KL; Lakshadweep LD; Madhya Pradesh MP; Maharashtra MH; Manipur MN; Meghalaya MG; Mizoram MZ; Nagaland NL; Odisha OR; Puducherry PN; Punjab PB; Rajasthan RJ; Sikkim SK; Tamil Nadu TN; Telangana TL; Tripura TR; Uttar Pradesh UP; Uttarakhand UT; West Bengal WB.

### Case definitions:

- **Enteric Fever: Presumptive:** Any patient with fever for more than one week and with any two of the following: Toxic look, Coated tongue, Relative bradycardia, Splenomegaly, Exposure to confirmed case, Clinical presentation with complications e.g. GI bleeding, perforation, etc. AND/OR Positive serodiagnosis (Widal test)

**Confirmed:** A case compatible with the clinical description of typhoid fever with confirmed positive culture (blood, bone marrow, stool, urine) of *S. typhi*/ *S. paratyphi*.

ARI/ ILI:-An acute respiratory infection with fever of more than or equal to 38° C and cough; with onset within the last 10 days.

- **Acute Diarrheal Disease: Presumptive Acute Diarrheal Disease (Including Acute Gastroenteritis):** Passage of 3 or more loose watery stools in the past 24 hours. (With or without vomiting).

**Confirmed Cholera:** A case of acute diarrhoea with isolation and identification of *Vibrio cholera* serogroup O1 or O139 by culture of a stool specimen.

- **Viral Hepatitis: Presumptive:** Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness.

**Confirmed:** Hepatitis A: A case compatible with the clinical description of acute hepatitis with demonstration of anti-HAV IgM in serum sample.

**Confirmed:** Hepatitis E: A case compatible with the clinical description of acute hepatitis with demonstration of anti-HEV IgM in serum sample.

- **Dengue: Presumptive:** An acute febrile illness of 2-7 days duration with two or more of the mentioned manifestations:

- Headache, Retro-orbital pain, Myalgia, Arthralgia, Rash, haemorrhagic manifestations, leukopenia, or Non-ELISA based NS1 antigen/IgM positive. (A positive test by RDT will be considered as probable due to poor sensitivity and specificity of currently available RDTs.)

**Confirmed:** A case compatible with the clinical description of dengue fever with at least one of the following:

- Demonstration of dengue virus NS-1 antigen in serum sample by ELISA.
- Demonstration of IgM antibodies by IgM antibody capture ELISA in single serum sample.
- IgG seroconversion in paired sera after 2 weeks with fourfold increase of IgG titre.
- Detection of viral nucleic acid by polymerase Chain reaction (PCR).
- Isolation of the dengue virus (virus culture +ve) from serum, plasma, leucocytes.  
(Source – Dengue National guidelines, NVBDCP 2014)

- **Leptospirosis Case Definition: Presumptive Leptospirosis:** Acute febrile illness with headache, myalgia and prostration associated with a history of exposure to infected animals or an environment contaminated with animal urine With one or more of the following:

- Calf muscle tenderness
- Conjunctival suffusion
- Oliguria or anuria and/or proteinuria
- Jaundice
- Haemorrhagic manifestations (intestines, lung)
- Meningeal irritation
- GI symptoms ( Nausea/ Vomiting/ Abdominal pain/Diarrhoea)

- And/or one of the following:-

- A positive result in IgM based immune- assays, slide agglutination test or latex agglutination test or immunochromatographic test.
- A Microscopic Agglutination Test (MAT) titre of 100/200/400 or above in single sample based on endemicity.
- Demonstration of leptospire directly or by staining methods

**Lab Confirmed Leptospirosis:** A case compatible with the clinical description of leptospirosis with at least one of the following:



- Isolation of leptospires from clinical specimen.
- Four fold or greater rise in the MAT titre between acute and convalescent phase serum specimens run in parallel. (Source: -National Guidelines on Diagnosis, Case Management Prevention and Control of Leptospirosis NCDC 2015)
- **Chikungunya case definition: Presumptive Case Definition:** An acute illness characterised by sudden onset of fever with any of the following symptoms: headache, backache, photophobia, severe arthralgia, rash.
  - Lab confirmed: A case compatible with the clinical description of chikungunya fever with at least one of the following: Demonstration of IgM antibodies by IgM antibody capture ELISA in a single serum sample.
  - Detection of viral nucleic acid by PCR.
  - Isolation of chikungunya virus from clinical specimen. (Source – Mid Term Plan Guidelines, NVBDCP 2013)

## The BRICS Workshop on Health Surveillance: System and Best Practices



### **Acknowledgement:**

This Disease Alert from IDSP acknowledges the contribution of Dr. S. Venkatesh Director NCDC, Dr. Pradeep Khasnobis Sr. CMO & Officiating NPO IDSP, Dr. Jyoti Asstt. Director IDSP, Ms. Ritu Malik Consultant GIS IDSP, Mr. Priyank Pandya Communication Officer IDSP, Mr. Prasun Sharma Statistician-cum-Programmer IDSP & Ms. Sujata Malhotra Data Manager IDSP.

**The data shown in the IDSP Surveillance bulletin are provisional, based on weekly reports to IDSP by State Surveillance Unit. Inquiries, comments and feedback regarding the IDSP Surveillance Report, including material to be considered for publication, should be directed to: Director, NCDC 22, Sham Nath Marg, Delhi 110054. Email: [dirnicd@nic.in](mailto:dirnicd@nic.in) & [idsp-npo@nic.in](mailto:idsp-npo@nic.in)**

**Prepared by: Central Surveillance Unit, IDSP under guidance of Director, NCDC**