Issue - 7 Vol. 2

मासिक आई डी एस पी निगरानी विवरणी

Monthly IDSP Surveillance Report

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

July 2017

Inside

Investigation of Hepatitis E Outbreak in Ramnagar, District Jalandhar, Punjab, March-June 2017

Introduction

Disease outbreaks are localized increases in cases of illness clearly in excess of that normally expected. The reason for investigating and responding to outbreaks include the need to halt the outbreak and prevent further illness, to develop recommendations to prevent further outbreaks occurring in future. And to address public concern. Outbreak investigation also help to improve understanding of new and emerging disease agents and transmission mechanism.

Etiology

Cholera is an intestinal infection caused by Vibrio cholera O1 and related strains.

Vibrio cholera: Gram-negative, curved rod with a single polar flagellum that makes it highly mobile. *V. cholera* is divided into more than 70 serogroups, defined by the O antigen. Strains that agglutinate in O1 antiserum are of great interest, whereas other strains are referred to collectively as "non-O1" *V. cholera* strains. Strains in serogroup O1 or O139 are further characterized by biotype, serotype, and whether or not they produce cholera toxin.

There are two biotypes, El Tor, which has been dominant since 1961, and Classical biotype, which was dominant before then. There are also two serotypes, Inaba and Ogawa. Most O1 strains are toxigenic. A few non-toxigenic O1 strains have been found, but they do not cause cholera. Of note, all eight combinations of biotype, serotype, and toxin status exist.

Mode of Transmission

Vibrio cholera is transmitted through contaminated water and food. The source of contamination in epidemics is usually the feces of cholera patients. Because V. cholera O1 has an environmental reservoir, particularly in warm coastal brackish waters, water or food from those reservoirs may also be contaminated. Person-to-person spread through direct contact, as by shaking hands, or by touching or taking care of a patient, has not been shown to occur.

The specific vehicle of transmission in a cholera outbreak is determined by thorough epidemiologic, environmental, and laboratory investigation.

Cholera- Clinical Presentation

The signs and symptoms of cholera are produced by cholera toxin, which causes profound loss of fluid and electrolytes. The incubation period of cholera is typically 1–3 days. After bacteria are ingested and survive passage through gastric acid, they reach the intestine. There they produce cholera toxin, which binds to the epithelial surface of the bowel. The active portion of the toxin (subunit A), enters mucosal cells and activates cyclic AMP. This causes active secretion of chloride, and blocks the normal absorptive function of the cells. Water, potassium, and bicarbonate follow chloride into the lumen of the intestine, and less sodium is absorbed, producing secretory diarrhea.

Loss of sodium, chloride, and water leads to dehydration and vascular collapse. Acute tubular necrosis with transient renal failure may occur as a result of profound shock. Loss of potassium leads to painful muscle cramps, and occasionally to arrhythmias and focal myocardial necrosis. Loss of bicarbonate causes acidosis with hyperventilation, vomiting, and clouded mental status.

Clinical Features

Cholera is a dehydrating diarrheal illness. The symptoms and signs are caused by rapid and profound loss of fluid and electrolytes in watery diarrhea and vomiting. Infection with cholera is associated with a range of clinical symptoms:

- Of total persons with infection, 75% are asymptomatic.
- Most of the 25% with symptomatic infections have mild illness.
- Approximately 2% of those infected will have severe cholera (sometimes called "cholera gravis").
- Another 5% will have moderate illness that brings them to medical attention, but does not require hospitalization.

General Information

- State: Punjab
- District: Ludhiana
- Block Sahnewal
- Colony Makkar and Samrat Colony, Giaspura, Block - Sahnewal, District Ludhiana
- Population: 23195

Background Information

- Person reporting outbreak : Trained Dai
- Date of outbreak start: 23/06/2017
- Date of reporting to health system: 23-06-2017
- Date of investigation started: 23-06-2017
- Person(s) carrying out investigation: District Epidemiologists, Senior Medical Officer, Medical officers, MPW (m), MPW (f), MPHS and Lab technicians.
- Person(s) investigated outbreak: Dr. Ramesh Kumar (District Epidemiologist), Dr Muneer Mohd.(District Epidemiologist - IDSP) and Dr. J P Singh (Senior Medical Officer).

Details of Investigation

- There was a telephonic information from Trained Dai residing in Giaspura to SMO Sahnewal on 23/06/2017 early morning regarding Diarrhoea cases. SMO Sahnewal immediately informed the District Headquarter.
- RRT Team supervised by Dr. Ramesh and Dr Muneer rushed to site.

- Immediately a medical camp established at Vikas Public School.
- Immediate water Supply to the colony stopped and alternate water supply was arranged immediately by informing Local Municipal Corporation.
- Spot map made, source of contamination found and informed to municipal Corporation
- 10 Stool samples and 5 water samples taken. Stool Samples sent to Civil Hospital and CMCH Ludhiana and Water Samples sent SPHL, Chandigarh.
- Diarrhoea corner established in Civil Hospital, Ludhiana and CHC Sahnewal separately to handle any Diarrhoea case promptly.
- 5 water samples from different affected locations were collected on 23/06/2017 for Bacteriological examination and as per report from State Public Health Lab 3 samples were having bacteriological contamination. Later 16 more samples collected and sent to SPHL, Chandigarh.

Total Number of cases - 581
Total Population affected – 23195
Total number of houses surveyed –11879
Total number of chlorine tabs distributed – 9797
ORS Packet Distributed : 1398
Pamphlets Distributed: 3378

A line listing was prepared from the data received during survey, medical camp and hospital admission, which is analyzed and interpreted in this report

Laboratory Investigation

Following samples were taken for the confirmation of an outbreak:

1) Stool sample for pyrogenic growth. (Microbiology department, CMC, Ludhiana)
2) Water sample sent for bacterial examination to the State Public Health Lab (SPHL) Punjab, Chandigarh

Descriptive Epidemiology

Clinical case definition: Acute Watery diarrhea (passage of 3 or more loose or watery stools in the Past 24 hours) with or without dehydration
Person aged over 5 years with severe dehydration from acute watery diarrhea.
Person aged over 2 years with acute watery diarrhea in an area where there is a cholera outbreak.

Confirmed case: Isolation of *Vibrio cholera O1* or *O139* from person with diarrhea.

Epidemiological Results

A. Person wise analysis

- Total number of cholera cases reported were 581 and Incidence was 2.50 per hundred population.
- Incidence of Cholera was higher in age group 6 – 15 years (4.59).
- Incidence of Cholera was higher among females (2.82) than males (2.22).

Table 1: Age wise distribution of cases			
Age Groups	**Total Cases**	**Total population at risk**	**Attack Rate**
< 5 years	118	3089	3.82
6 - 15 years	185	4030	4.59
16 - 30 years	101	4528	2.23
31 - 40 years	79	5422	1.46
41 - 50 years	42	3604	1.17
> 50 years	56	2522	2.22
Total	581	23195	2.50

Table 2: : Gender wise distribution of cases			
Gender	**Number of Cases**	**Population at Risk**	**Attack Rate**
Male	273	12280	2.22
Female	308	10915	2.82
Total	581	23195	2.50

A total of 103 cases were found, 90 suspected cases were from house to house search and 13 suspected cases were from enhanced passive surveillance. Majority of cases were female (54.4 %), median age (range) was 24 year (2-80 years). The attack rate was high among female (14.4 per thousand) than male (11.1 per thousand). Number of affected pregnant women were eight and the attack rate in pregnant women was 127 per thousand (8/63). There was no deaths reported due to jaundice in Ramnagar.

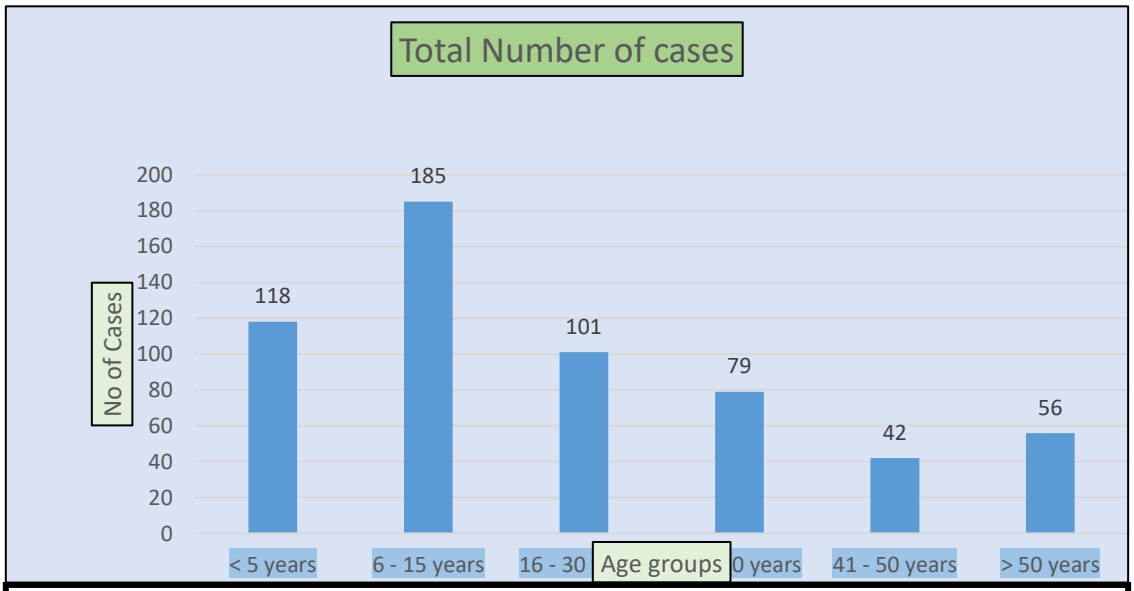


Fig. 1: Age wise distribution of cases

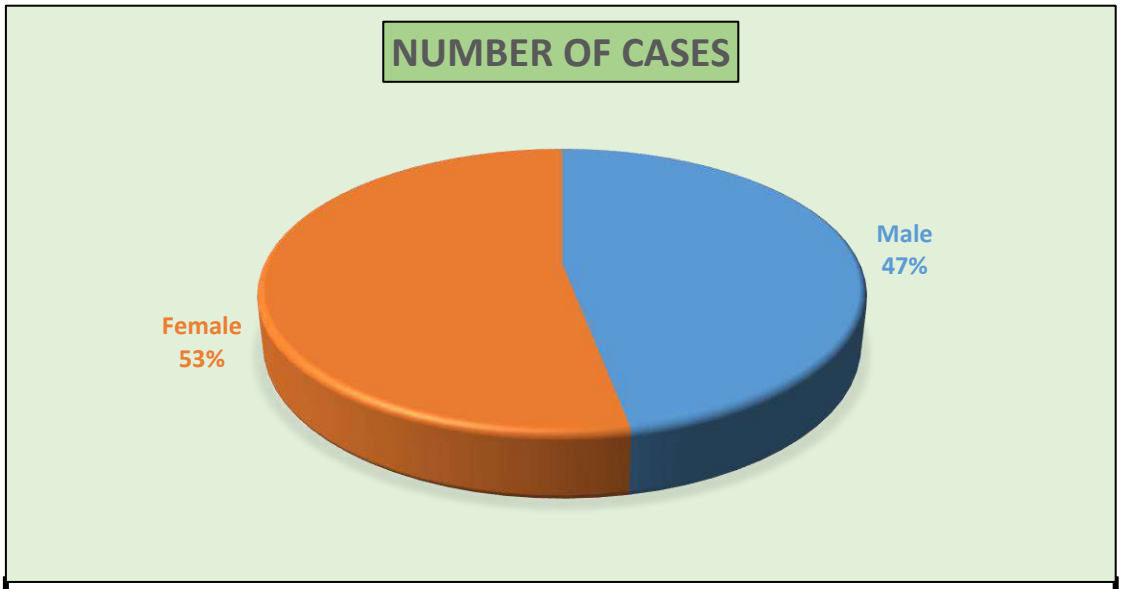


Fig. 2: Gender wise distribution of cases

B. Time wise analysis:

Outbreak started on 23/06/2017(Maximum No. of cases were reported on 24/06/17), after that there was a fall in the number of cases gradually due to prompt action taken by Health department with coordination of other departments

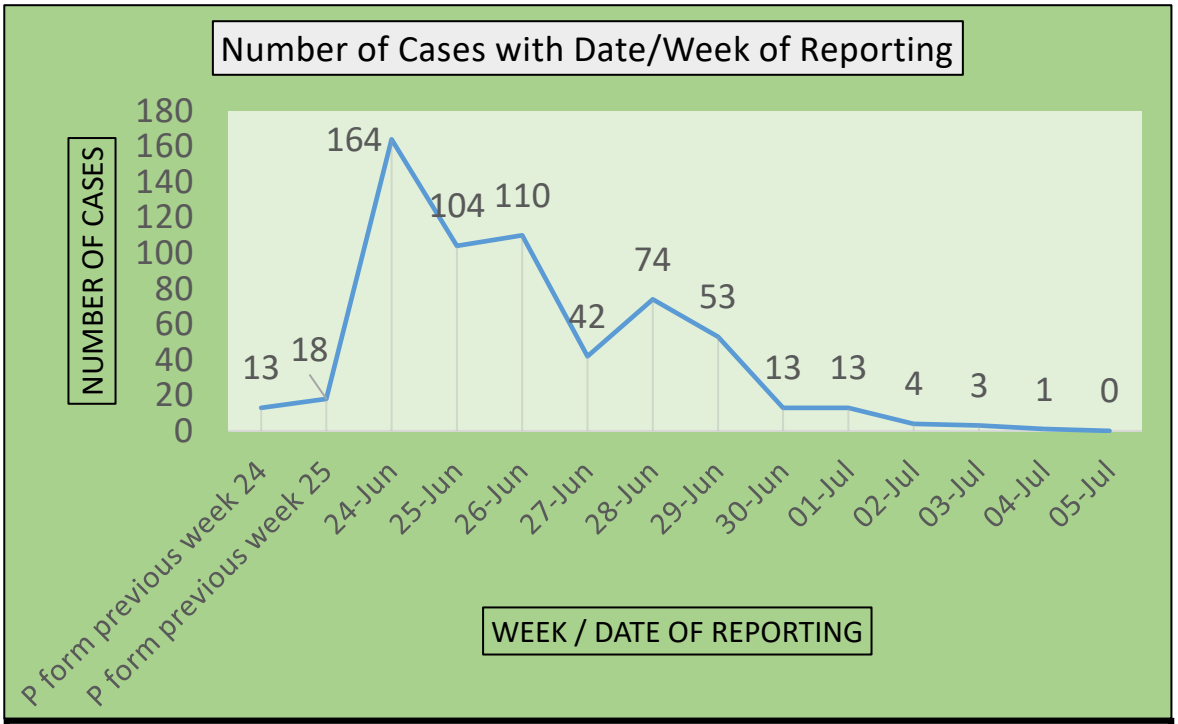


Fig. 3: Cases of Cholera by date of Reporting

C. Place wise analysis

It was found that there was breakage of underground water supply pipes adjoining to Sewerage pipes and many illegal connections which caused mixing of sewerage water with drinking water which led to this outbreak.

Fig. 4: Map of India Showing Punjab

Fig. 5: Map of Punjab Showing Ludhiana

Laboratory result

It was confirmed from the stool culture result obtained from the Microbiology department that the acute diarrhea outbreak was due to the V. Cholera

S. No	Name of Sample sent	Laboratory	Number of sample Tested	Results
1	Stool samples for Pyrogenic growth	Microbiology Department, CMCH, Ludhiana	10	4 positive with growth of Vibrio Cholera O-1 Ogawa (isolated after 24 hours)
2	Water samples	State Public health lab. (SPHL), Sec.11, Chandigarh	5	3 samples showed presence of Faecal Coliform. Report as per Most Probable Number Index (1100/100 ml, 460/100 ml and 1100/100 ml). Normal Value - (<10/100 ml).

Control Measures Taken

1. Survey: House to house active survey was started in Makkar and Samrat Colony and Indra Colony, Giaspura, Block - Sahnewal District Ludhiana, line listing of all the cases was prepared and the treatment was provided to all the patients who were suffering with the mild symptoms of diarrhea. Those who had severe dehydration were shifted to civil hospital Ludhiana and CHC Sahnewal.
2. Alternate water was supplied through water tankers to the affected locality.
3. Chlorine tablets were distributed by the health workers in the affected locality.
4. ORS sachets were distributed in all affected area.

5. IEC activities were done for sanitation and hygiene through mikings, announcements in religious places (Mandir and Gurudwara) and distribution of printed material (pamphlets) and poster fixation.
6. Daily medical camp was organized in the affected locality and treatment was provided to the needed one
7. We intimated Deputy Commissioner, Ludhiana and Municipal Corporation about the leakage and mixing of water in the affected area, which was due to breakage of water pipes adjoining the sewerage pipes, all leakage points were repaired by MC, unauthorized connections were disconnected

Conclusion

Cholera outbreak affected in most areas of Makkar and Samrat Colony, Giaspura, Block – Sahnewal, District Ludhiana. The cause behind the outbreak was mixing of Sewerage water with the drinking water due to breakage of water pipes adjoining the sewerage pipes.

Recommendations

Reason for Cholera in Makkar and Samrat Colony, Giaspura, Block Sahnewal District Ludhiana was due to breakage of water pipes adjoining the sewerage pipes, future following measures to be taken:

1. Regular survey is to be done in the different area by water supply and sanitation department so that unauthorized connection would be disconnected and if there is any leakage it is repaired on early basis.
2. It was found that most of water supply pipe and sewerage pipe are obsolete because of which they get burst they are to be replaced.
3. It was noticed that area where outbreak took place the supplied water was not properly chlorinated so there would be regular monitoring of chlorination of water done at supply point.

Investigating Officer

Divjot Singh, District Epidemiologist cum DSO
IDSP Ludhiana, Punjab

Surveillance data of Enteric Fever, Acute Diarrhoeal Disease, Viral Hepatitis A & E, Dengue Leptospirosis and Chikungunya During July 2015-2017*

* Data extracted from IDSP Portal (www.idsp.nic.in) as on 07 December 2017.

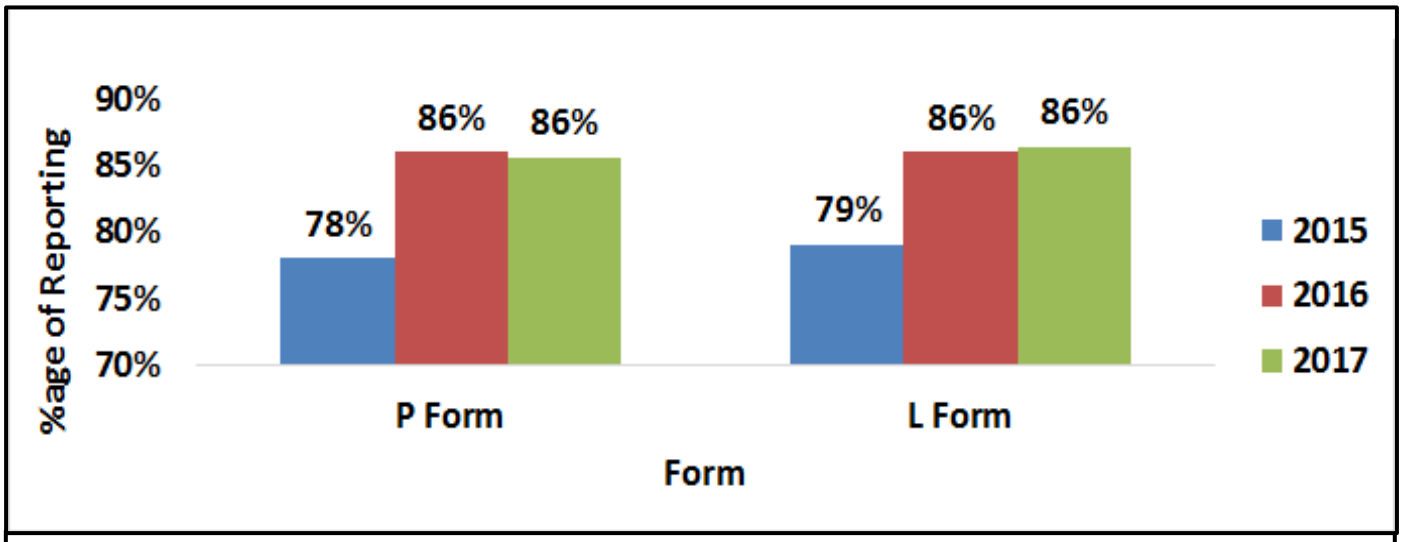


Fig. 6: RU wise Reporting Status based on P & L form during July 2015 - 2017

As shown in fig 6, in July 2015, 2016 and 2017, the 'P' form reporting percentage (i.e. % RU reporting out of total in P form) was 78 %, 86% and 86% respectively across India, for all disease conditions reported under IDSP in P form. Similarly, L form reporting percentage was 79%, 86% 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.

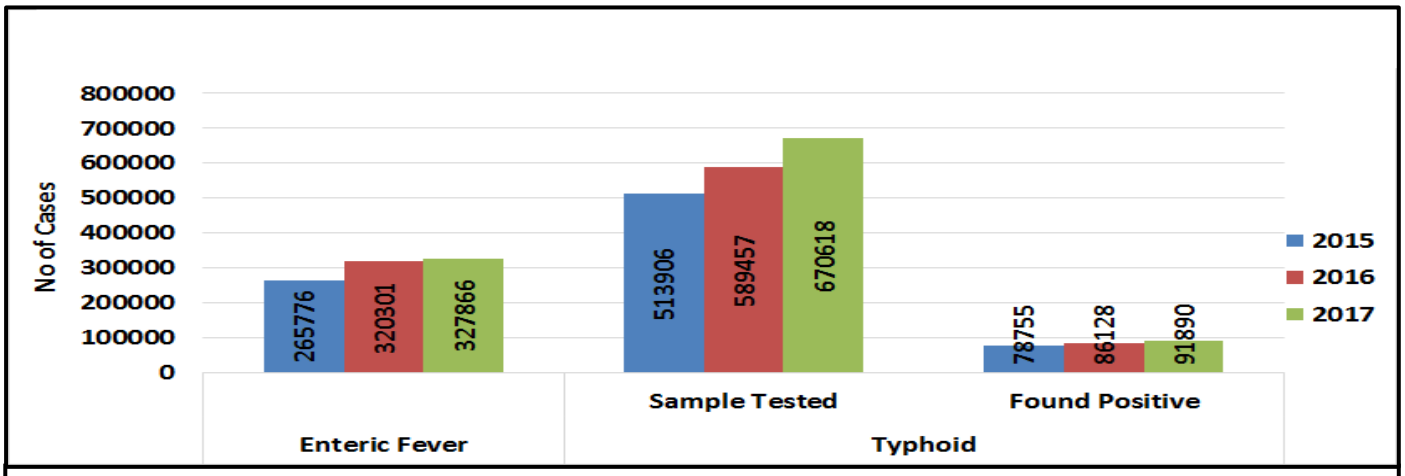


Fig. 7 No. of Enteric Fever Cases reported under P & L form during July 2015 - 2017

As shown in fig 7, number of presumptive enteric fever cases, as reported by States/UTs in 'P' form was 265776 in July 2015; 320301 in July 2016 and 327866 in July 2017. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2015; 513906 samples were tested for Enteric fever, out of which 78755 were found positive. In July 2016; out of 589457 samples, 86128 were found to be positive and in July 2017, out of 670618 samples, 91890 were found to be positive.

Sample positivity has been 15.3%, 14.6% and 13.7% in July month of 2015, 2016 & 2017 respectively.

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

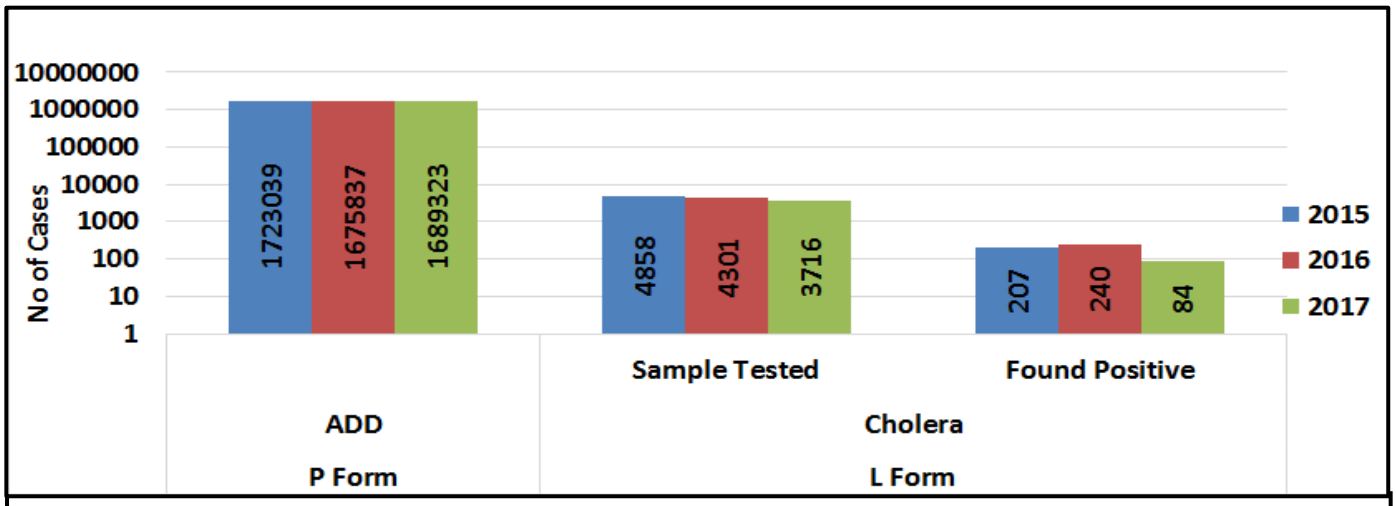


Fig. 8: No. of ADD Cases reported under IDSP in P form & Lab confirmed Cholera cases in L form during July 2015 - 2017

As shown in fig 8, number of Acute Diarrhoeal Disease cases, as reported by States/UTs in 'P' form was 1723039 in July 2015; 1675837 in July 2016 and 1689323 in July 2017. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2015, 4858 samples were tested for Cholera out of which 207 tested positive; in July 2016, out of 4301 samples, 240 tested positive for Cholera and in July 2017, out of 3716 samples, 84 tested positive.

Sample positivity of samples tested for Cholera has been 4.3%, 5.6% and 2.3% in July month of 2015, 2016 & 2017 respectively.

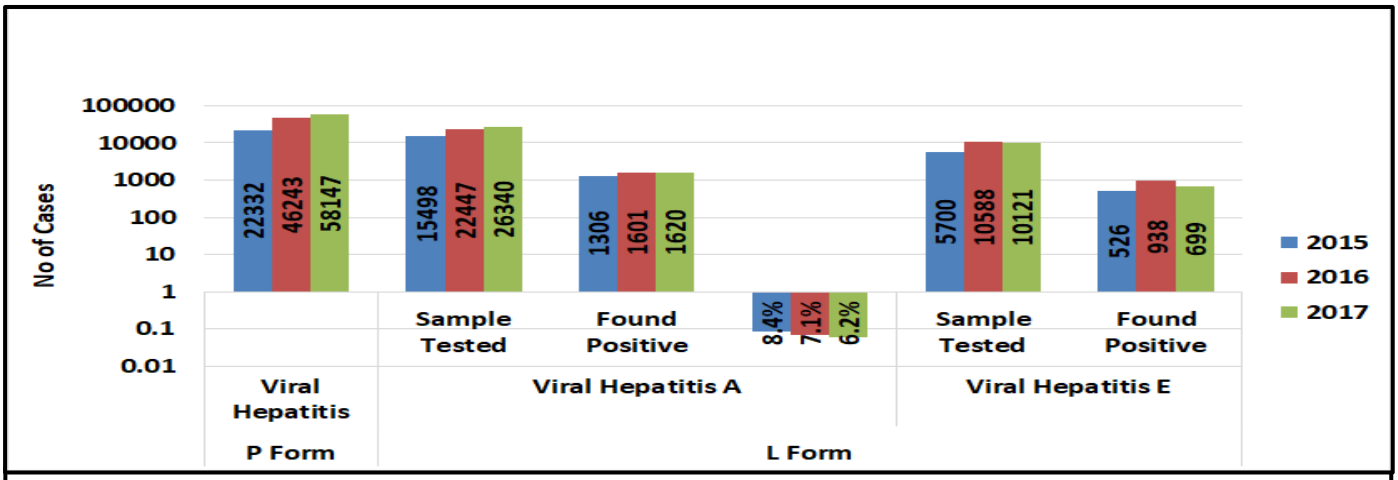


Fig.9: No of Viral Hepatitis Cases reported under IDSP in P form & Viral Hepatitis A & E cases reported under L form during July 2015 - 2017

As shown in fig 9, the number of presumptive Viral Hepatitis cases was 31360 in July 2015, 41616 in July 2016 and 49306 in July 2017. 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 2015; 20966 samples were tested out of which 1643 were found positive. In July 2016 out of 19345 samples, 1346 were found to be positive and in July 2017, out of 22348 samples, 1471 were found to be positive.

Sample positivity of samples tested for Hepatitis A has been 7.8%, 7.0% and 6.6% in July month of 2015, 2016 & 2017 respectively.

As reported in L form for Viral Hepatitis E, in July 2015; 7351 samples were tested out of which 634 were found positive. In July 2016; out of 8960 samples, 734 were found to be positive and in July 2017, out of 10248 samples, 626 were found to be positive.

Sample positivity of samples tested for Hepatitis E has been 8.6%, 8.2% and 6.1% in July month of 2015, 2016 & 2017 respectively.

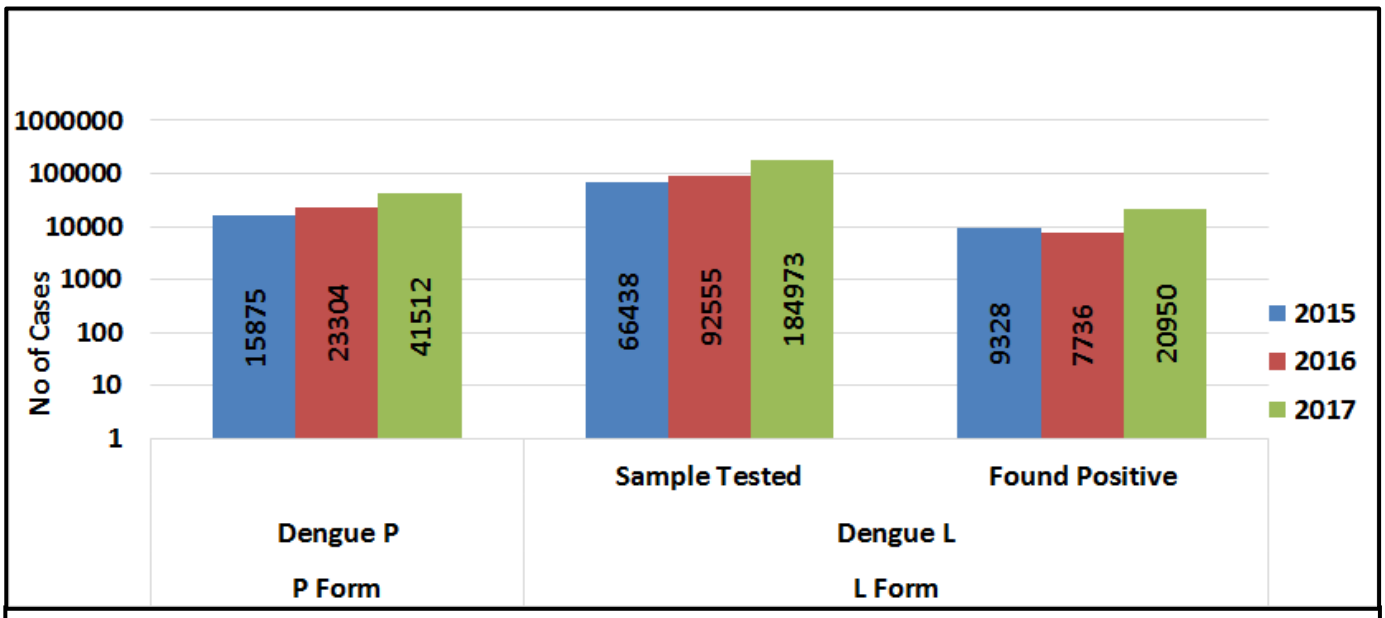


Fig. 10: No. of Dengue Cases reported under IDSP in P & L form during July 2015 - 2017

As shown in fig 10, number of presumptive Dengue cases, as reported by States/UTs in 'P' form was 15875 in July 2015; 23304 in July 2016 and 41512 in July 2017. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2015; 66438 samples were tested for Dengue, out of which 9328 were found positive. In July 2016; out of 92555 samples, 7736 were found to be positive and in July 2017, out of 184973 samples, 20950 were found to be positive.

Sample positivity of samples tested for Dengue has been 14.0%, 8.4% and 11.3% in July month of 2015, 2016 & 2017 respectively.

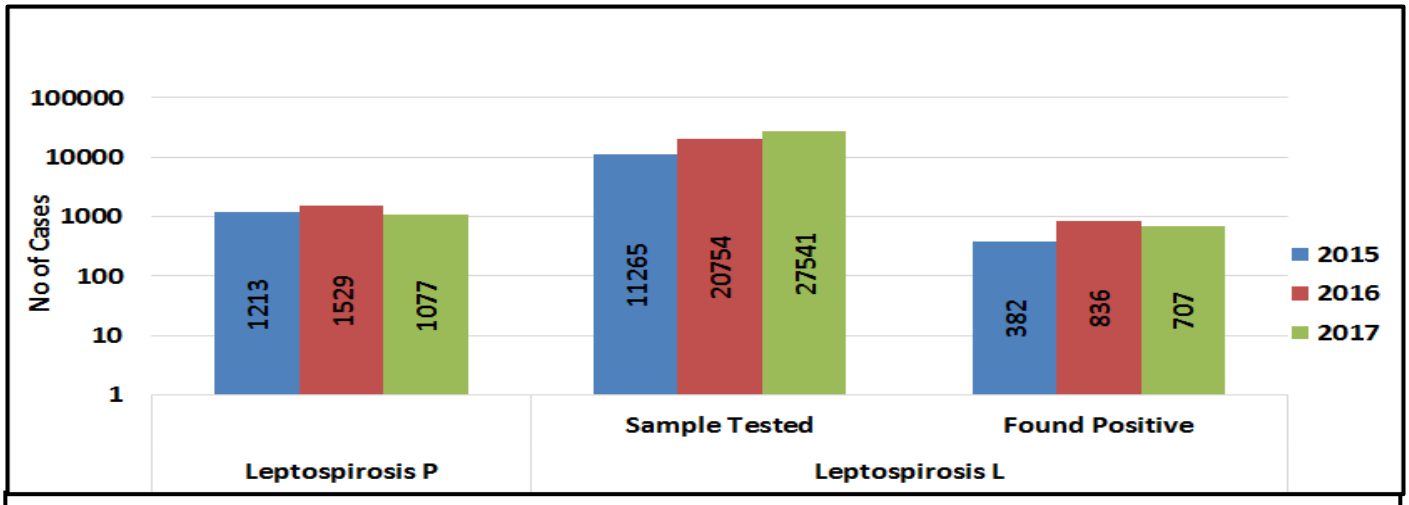


Fig. 11: No. of Leptospirosis Cases reported under IDSP in P & L form during July 2015 - 2017

As shown in fig 11, number of presumptive Leptospirosis cases, as reported by States/UTs in 'P' form was 1213 in July 2015; 1529 in July 2016 and 1077 in July 2017. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2015; 11265 samples were tested for Leptospirosis, out of which 382 were found positive. In July 2016; out of 20754 samples, 836 were found to be positive and in July 2017, out of 27541 samples, 710 were found to be positive.

Sample positivity of samples tested for Leptospirosis has been 3.4%, 4.0% and 2.6% in July month of 2015, 2016 & 2017 respectively.

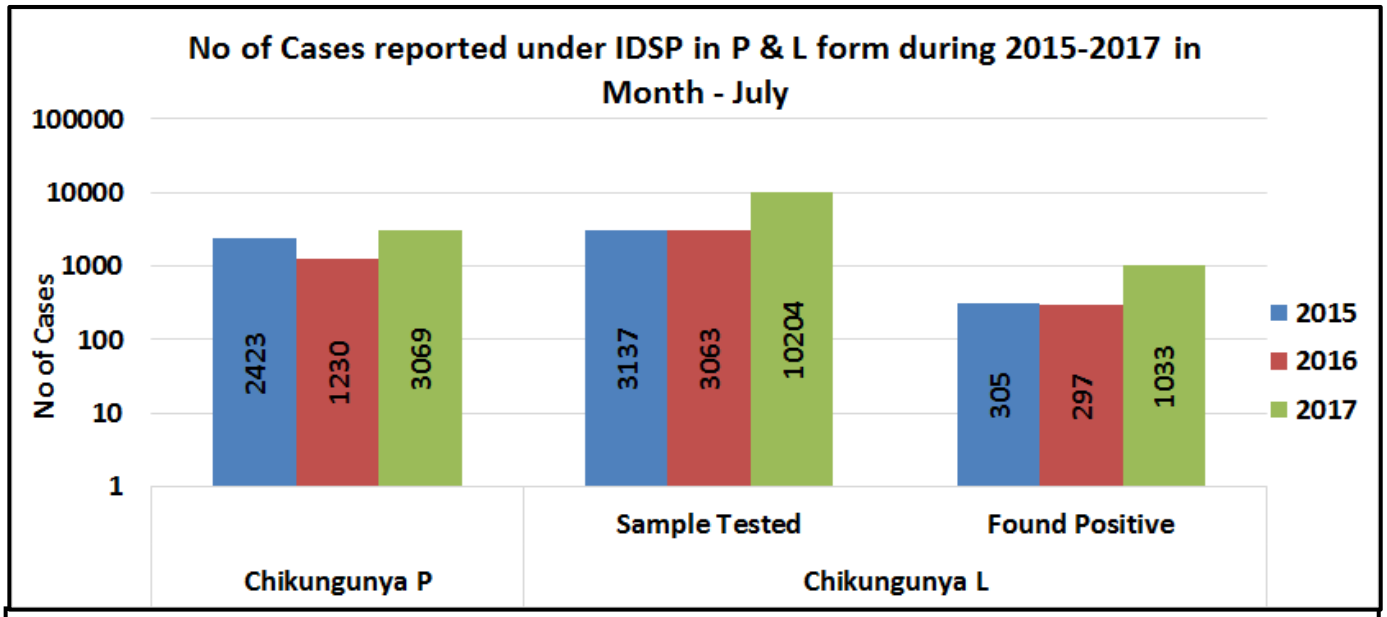


Fig. 12: No. of Chikungunya Cases reported under IDSP in P & L form during July 2015 - 2017

As shown in fig 12, number of presumptive Chikungunya cases, as reported by States/UTs in 'P' form was 2423 in July 2015; 1230 in July 2016 and 3069 in July 2017. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in July 2015; 3137 samples were tested for Chikungunya, out of which 305 were found positive. In July 2016; out of 3063 samples, 297 were found to be positive and in July 2017, out of 10204 samples, 1033 were found to be positive.

Sample positivity of samples tested for Chikungunya has been 9.7%, 9.7% and 10.1% in July month of 2015, 2016 & 2017 respectively.

Fig 13: State/UT wise P form completeness % for July 2017

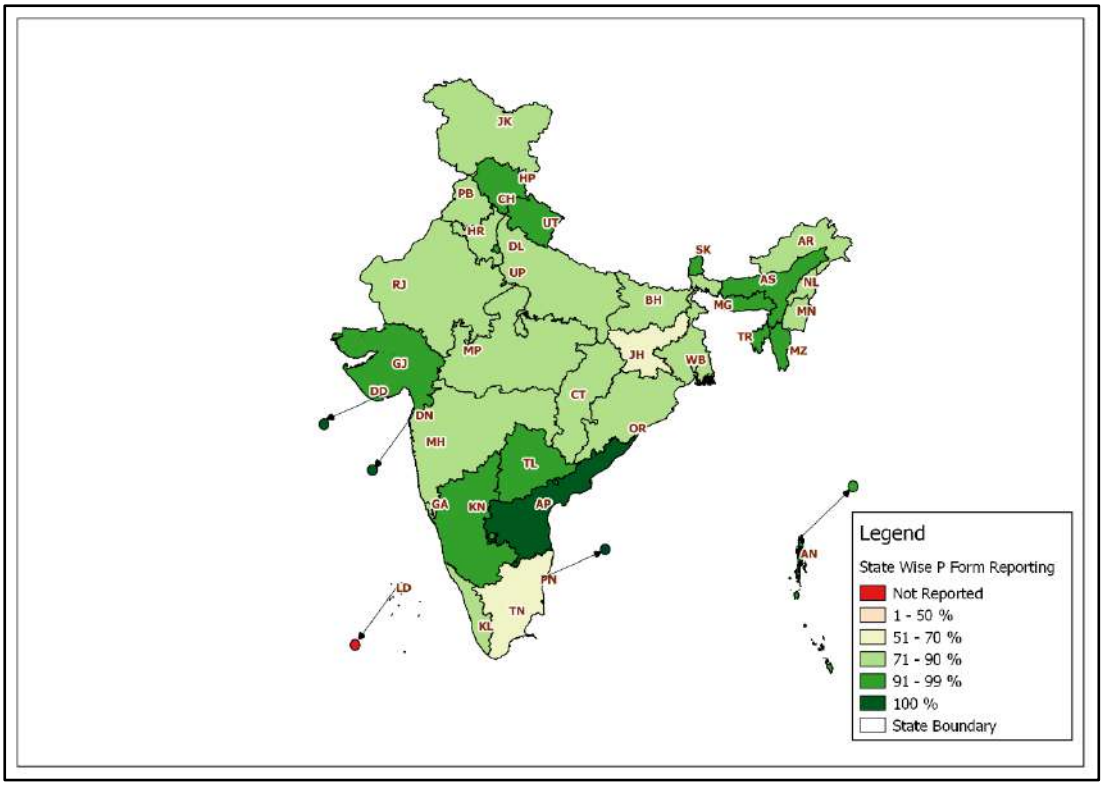


Fig 14: State/UT wise L form completeness % for July 2017

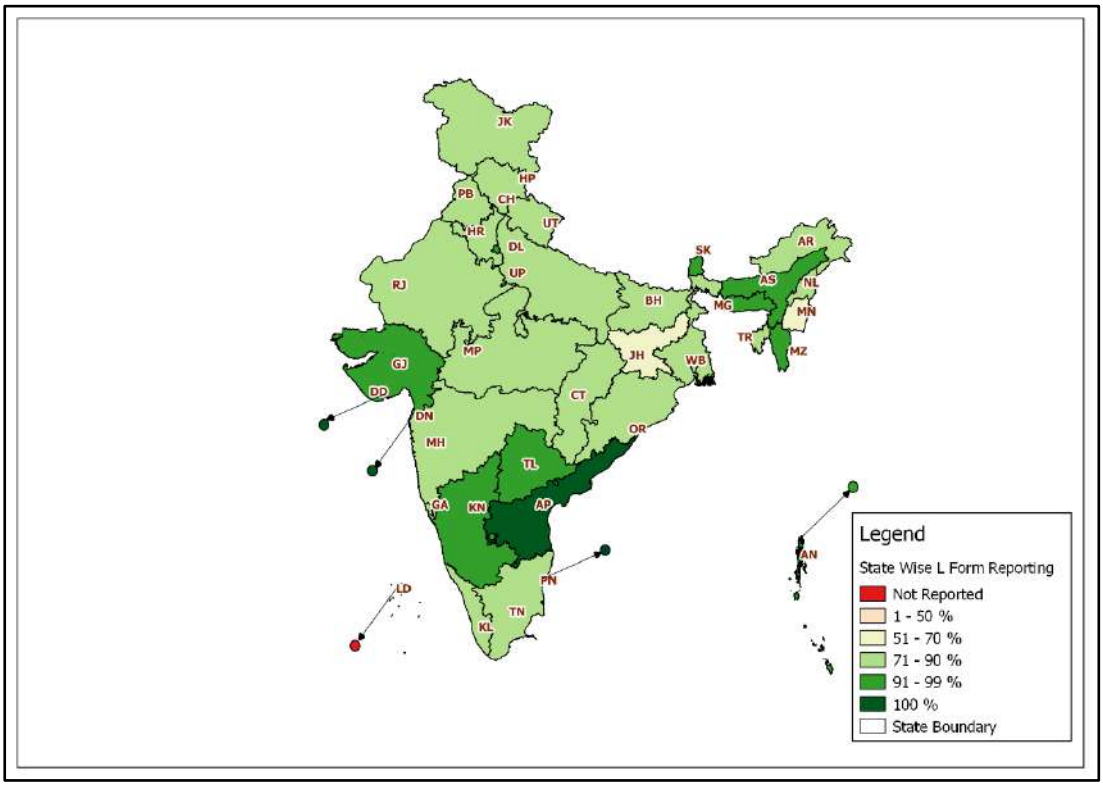


Fig 15: State/UT wise Presumptive Enteric fever cases and outbreaks for July 2017

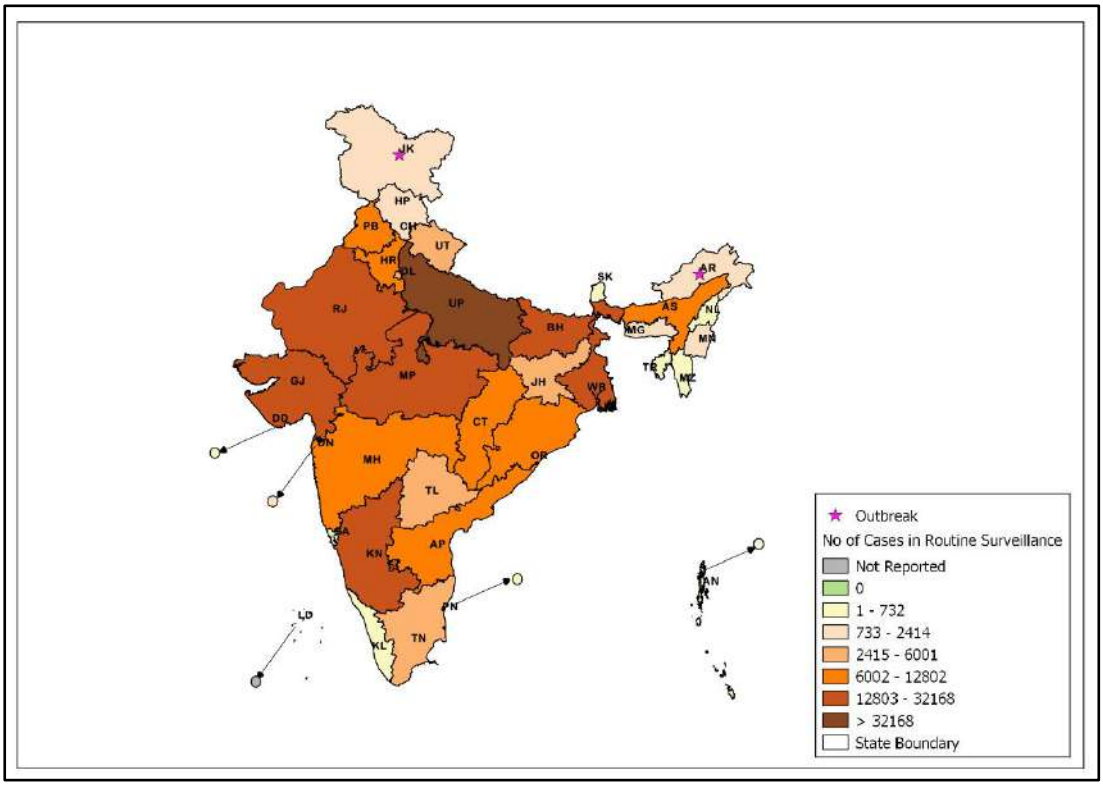


Fig 16: State/UT wise Lab Confirmed Enteric Fever cases and outbreaks for July 2017

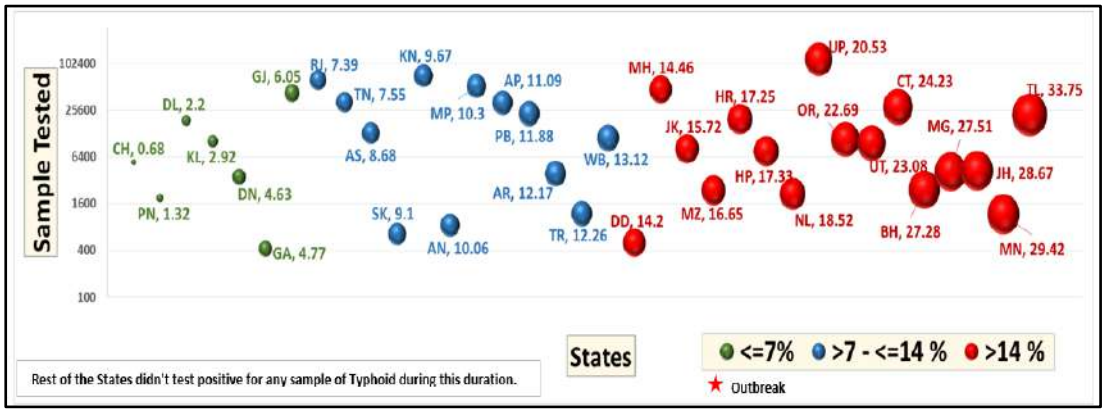


Fig 16: State/UT wise Presumptive ADD cases and outbreaks for July 2017

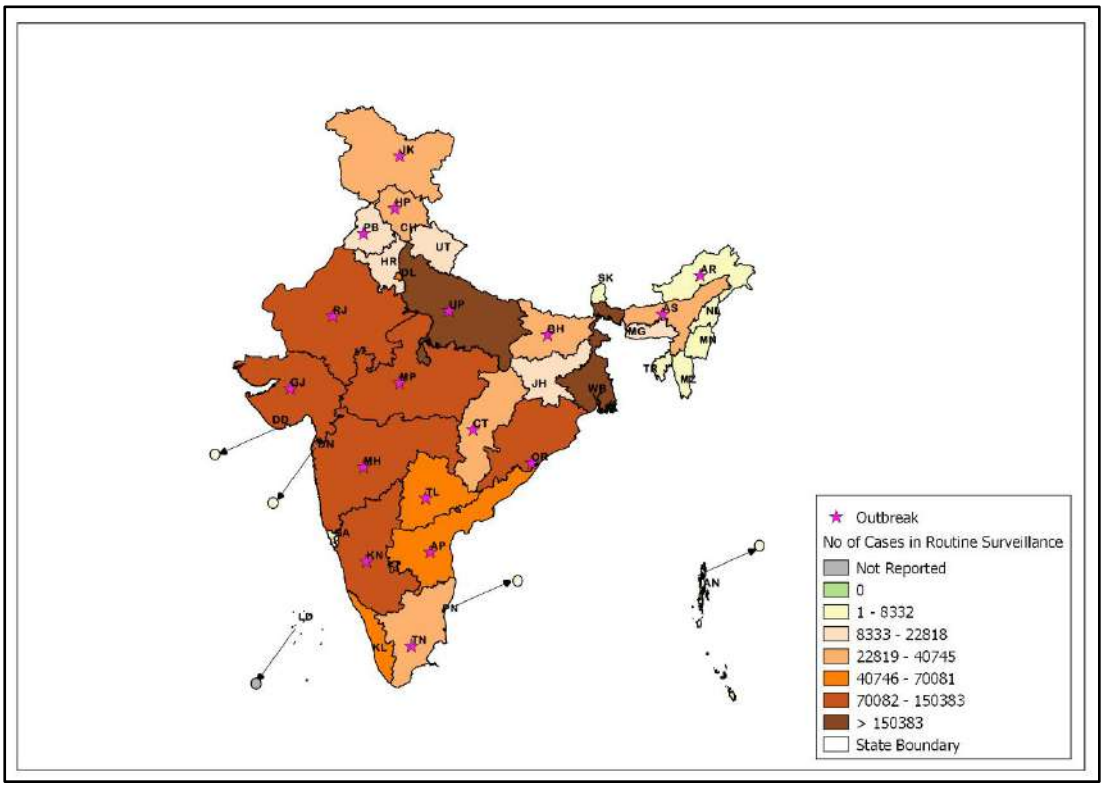


Fig 17: State/UT wise Lab Confirmed Cholera cases and outbreaks for July 2017

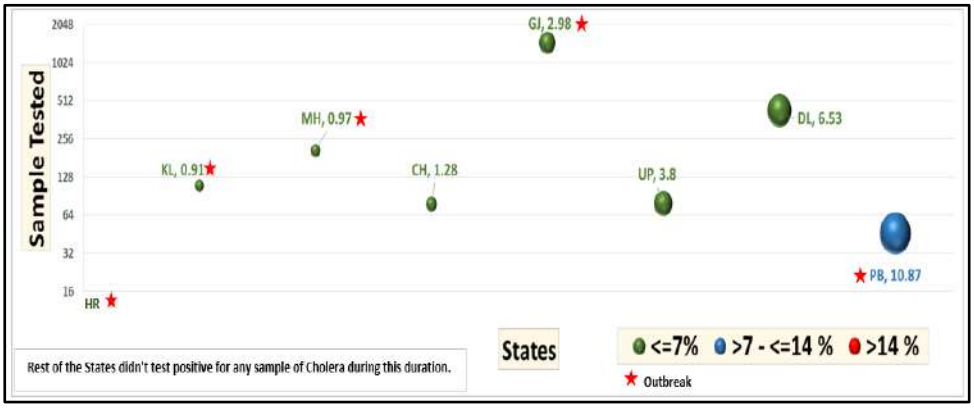


Fig 18: State/UT wise Presumptive Viral Hepatitis cases and outbreaks for July 2017

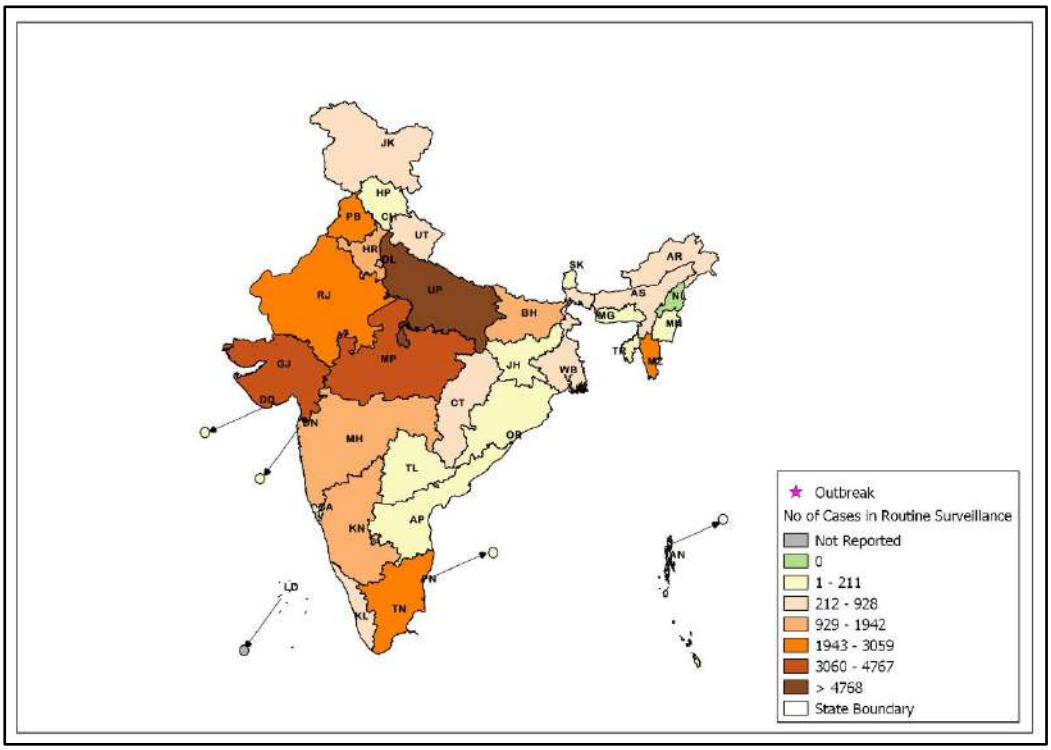


Fig 19: State/UT wise Lab confirmed Viral Hepatitis A cases and outbreaks for July 2017

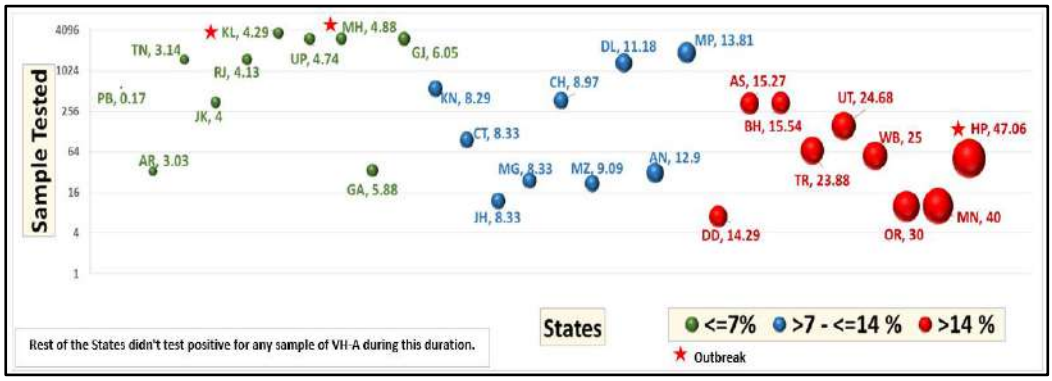


Fig 20: State/UT wise Lab confirmed Viral Hepatitis E cases for July 2017

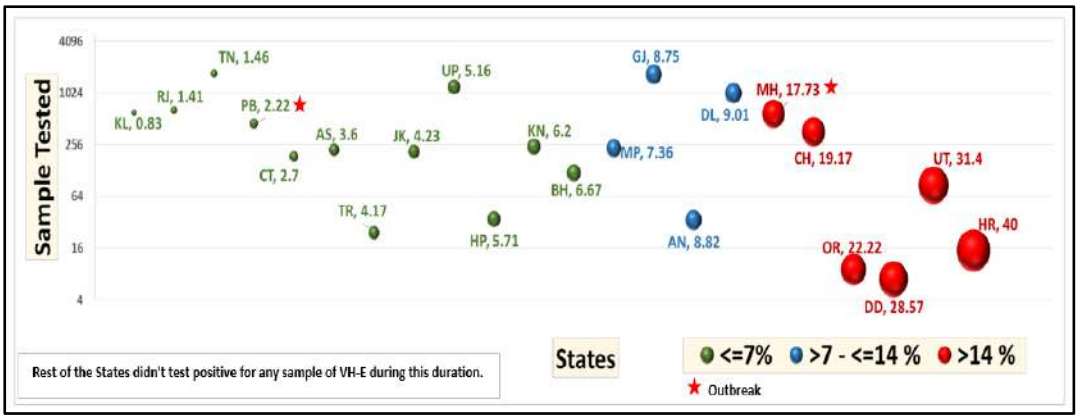


Fig 21: State/UT wise Presumptive Dengue cases & outbreaks for July 2017

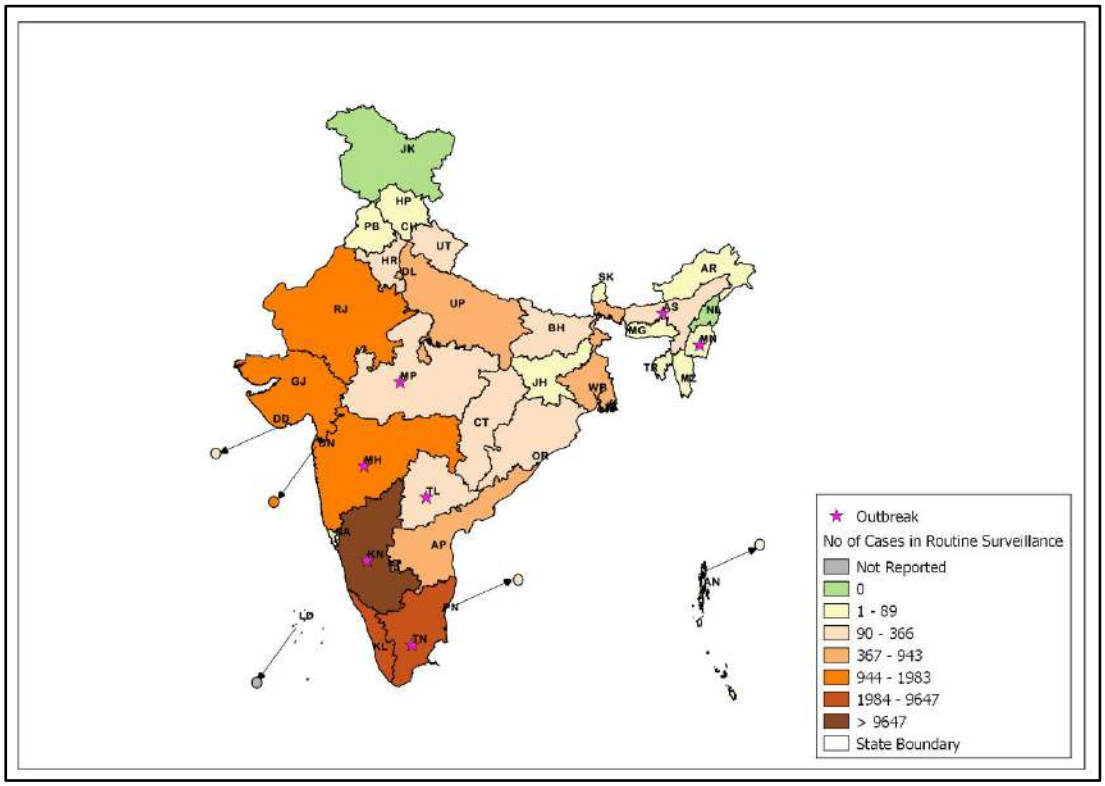


Fig 22: State/UT wise Lab confirmed Dengue cases & outbreaks for July 2017

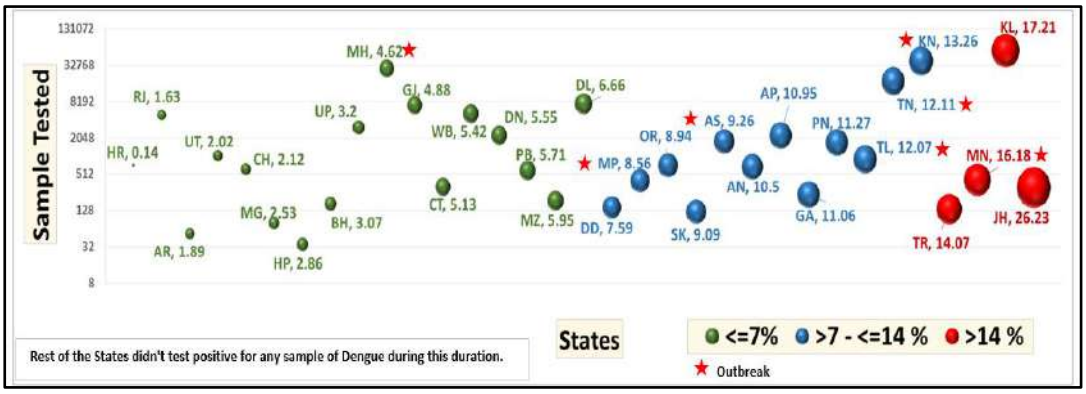


Fig 23: State/UT wise Presumptive Leptospirosis cases for July 2017

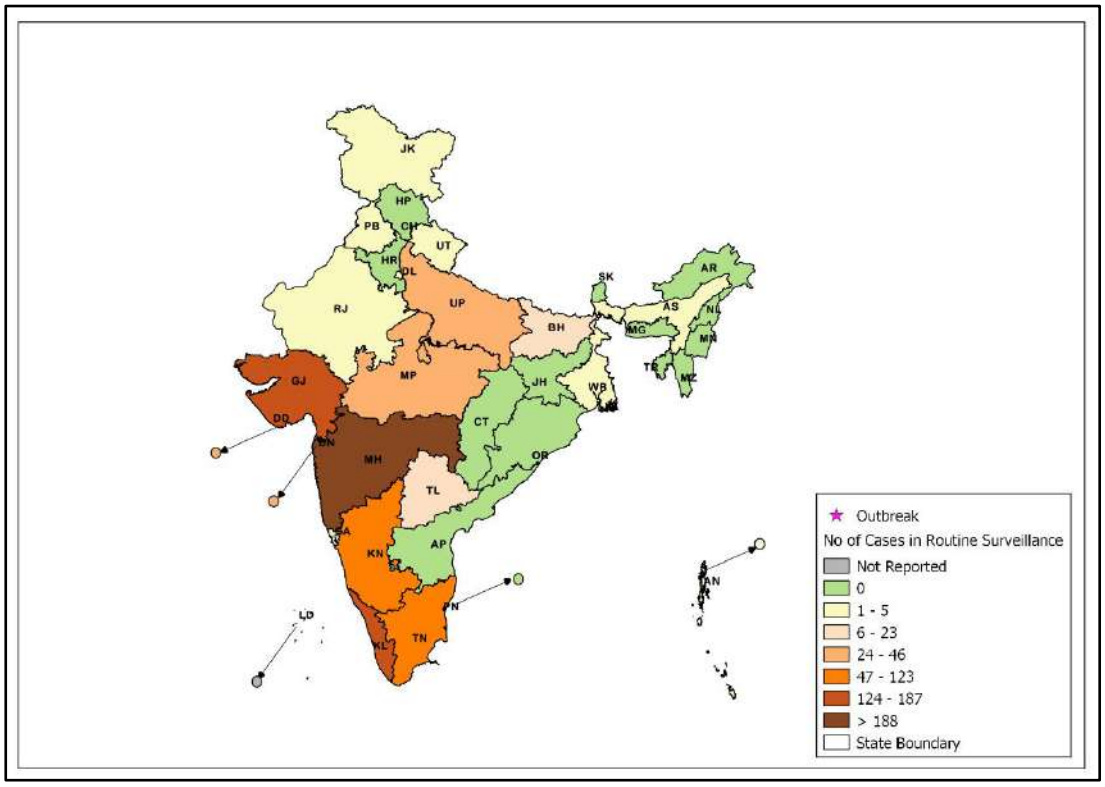


Fig 24: State/UT wise Lab Confirmed Leptospirosis cases & outbreaks for July 2017

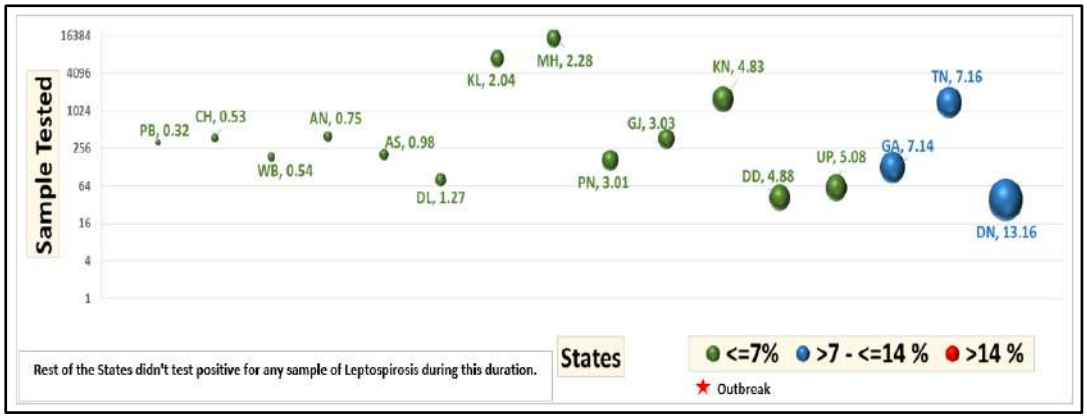


Fig 25: State/UT wise Presumptive Chikungunya cases & outbreaks for July 2017

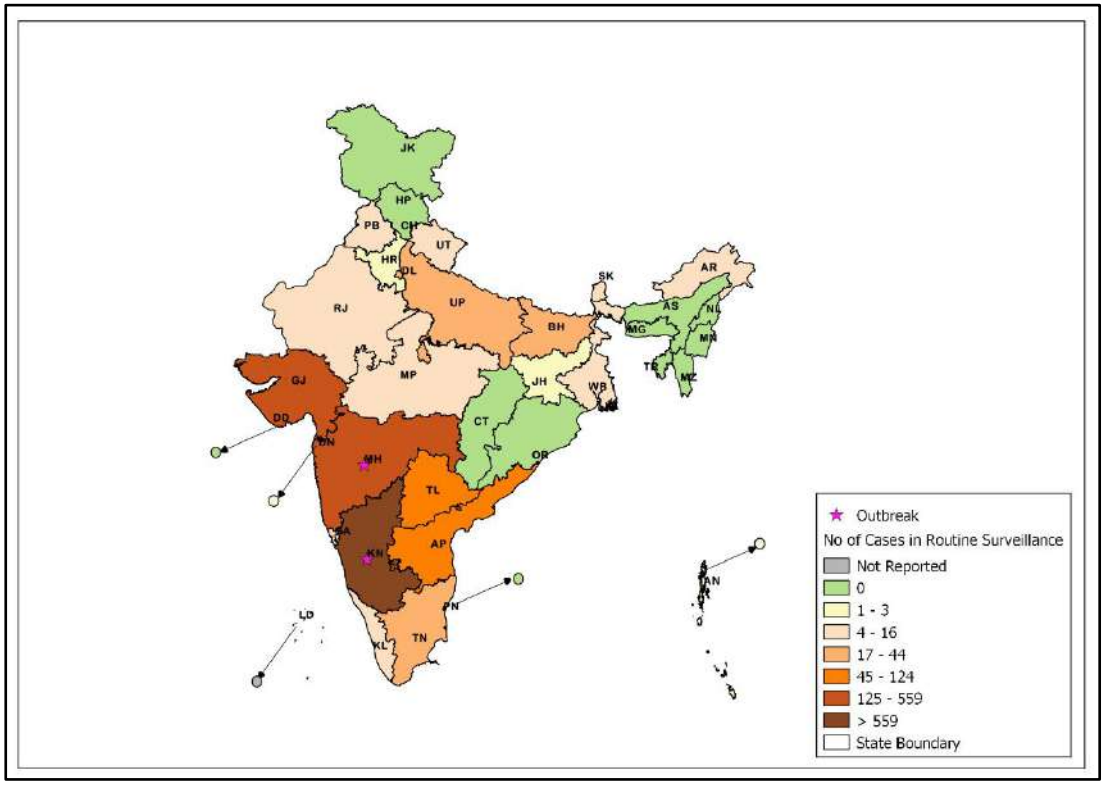


Fig 26: State/UT wise Lab Confirmed Chikungunya cases & outbreak for July 2017

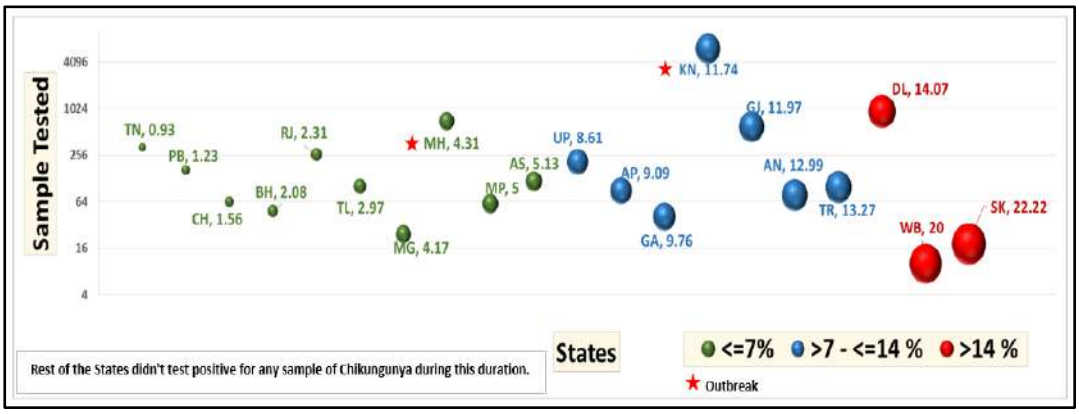
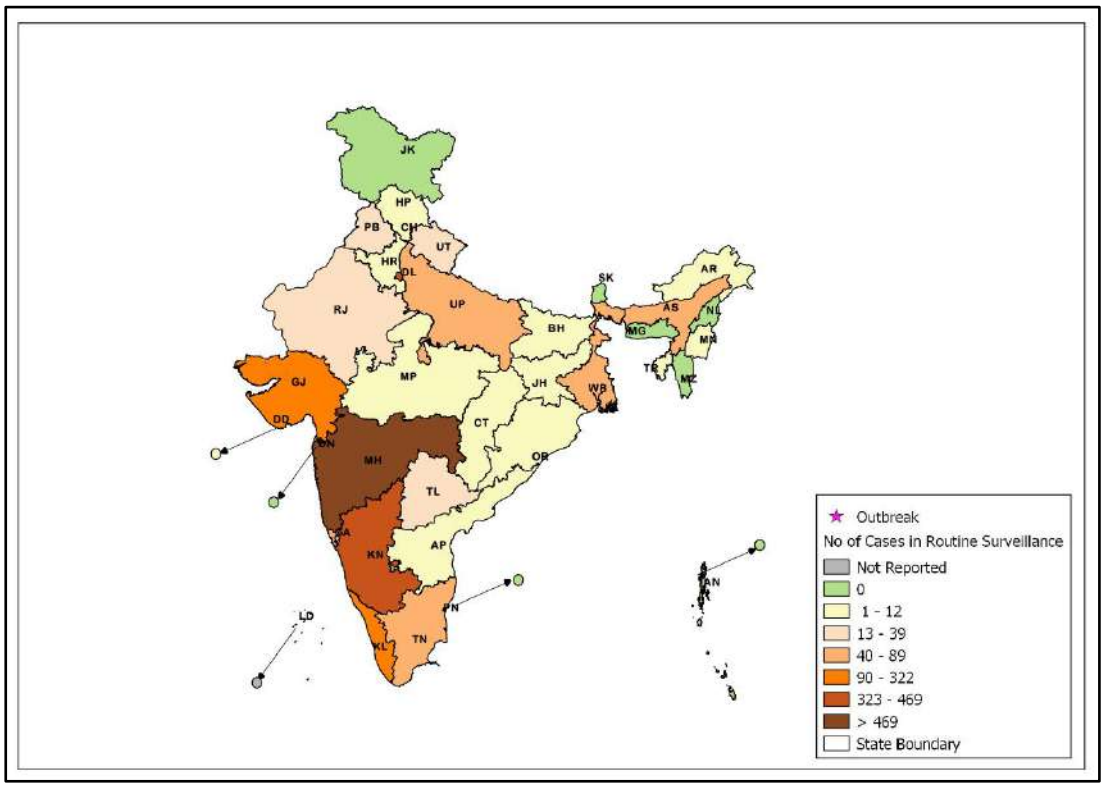


Fig 27: State/UT wise Influenza A (H1N1) cases & outbreak for July 2017



Action from the field

- Dr Pranay Verma Deputy Director IDSP visited Manipur 5th - 7th July to participate in Surveillance Committee Meeting and to visit DPHL, Thoubal, Manipur.
- Mr. Praveen G, Epidemiologist, IDSP visited Kerala to Support the State in outbreak investigation of H1N1, Leptospirosis and Dengue from 29th June – 3rd July 2017
- Dr Ruchi Jain Deputy Director IDSP visited Kerala from 16th July to 19th July 2017 to attend review of Dengue outbreak in Kerala.
- Dr Sanket Kulkarni Deputy Director IDSP visited Maharashtra from 27.06.17 to 04.07.2017 H1N1
- A Central team from NCDC comprising of Dr Nishant Deputy Director (PH) and Dr Partha Rakshit Deputy Director (Microbiology) visited Longding, Arunachal Pradesh to investigate an outbreak of measles in June 2017
- Dr Kajok Engtipi visited Assam from 31.07.17 to 6.08.17 to review of Karbi Anglong IDSP district surveillance unit.

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.

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 leptospires 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 and 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.

Acknowledgement:

This "Monthly IDSP Surveillance Report" acknowledges the contribution of Dr. A. C. Dhariwal Director NCDC, Dr. A. K. Bansal Addl. Director & HoD IDSP, Dr. Pradeep Khasnobis Sr. CMO & Officiating NPO IDSP, Dr. Jyoti Deputy Director IDSP, Mr. Priyank Pandya Communication Officer IDSP, Ms. Ritu Malik Consultant GIS IDSP, Mr. Prasun Sharma Statistician-cum-Programmer IDSP & Ms. Sujata Malhotra Data Manager IDSP.

Data shown in this 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 & idsp-npo@nic.in

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