

Disease Alert

प्रकोप चेतावनी

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

December 2018

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Investigation of Dengue Outbreak Report of Durg District, Chhattisgarh

Background

An increased number of Dengue cases were reported from Durg District of Chhattisgarh from second half of July 2018. The initial cases were reported from Khursipara Area of Bhilai. Subsequently, high number of cases started being reported from Khursipar Area, Zone 1, Zone 2, Balaji Nagar, Gautam Nagar, and Sector areas.

In response, State and District RRT conducted outbreak investigations in the affected areas. It was carried out to determine the cause and suggest containment measures. Epidemiological, entomological and environmental was undertaken.

Case Definition

A case was defined as a person of any age with fever more than five days and tested positive by IgM ELISA for scrub typhus at GMCH Nagpur from August 1 to September 7, 2018.

Cases were searched from hospital admission records and death records and line list obtained from Microbiology laboratory of Government Medical College and Hospital Nagpur (GMCH) and Indira Gandhi Government Medical College Hospital (IGGMCH), Nagpur. District Entomologists carried out Entomological survey in one affected village from where majority of the cases were reported

Objectives

The area of Durg district is 2238.36 sq. km. The objectives were –

- Entomological investigation of affected area
- Identification of vector species
- Epidemiological investigation of the outbreak
- To give necessary recommendations for control & prevention of outbreak

Case Definition adopted by RRT

It was defined as: “An acute febrile illness of 2-7 days duration with two or more of the following symptoms: headache, retro-orbital pain, myalgia, arthralgia, rash, hemorrhagic manifestations, and leucopenia”.

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Essential Findings

Dengue was reported in all age groups, but more in 11-20 year group (29.50%) followed by 21-30 year group (25.54%). Males were more affected. In the entomological investigations, the house index (HI), container index (CI) and Breteau Index (BI) were all found to be high. Most of the homes stored water due to irregular water supply. This may lead to the growth of *Aedes* larvae.

Epidemiological Findings

Maximum death cases were found in 6 to 10 year age group. Time interval between date of admission & death was also compared. Analysis of death cases revealed that most of the patients died within 24 hours after admission which indicates delay in hospital admission by the patients.

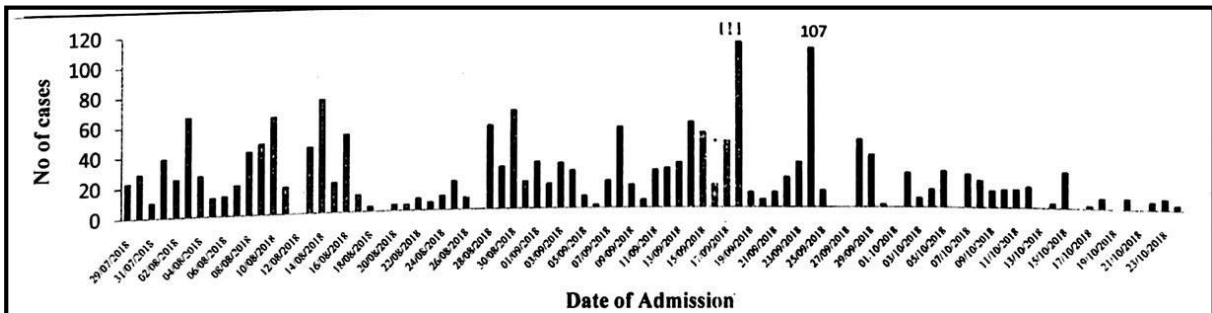


Fig. 1: Epi-Curve of Lab Confirmed Cases at Dengue Outbreak Report of Durg District, Chhattisgarh

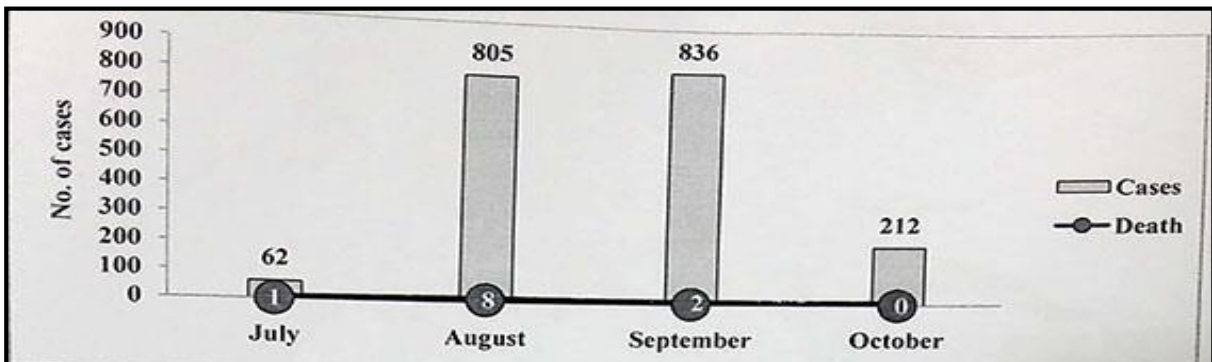


Fig. 2: Seasonal Trend of Dengue Cases at Durg District, Chhattisgarh

The cases were higher among males (1056) compared to females (859). The highest cases were observed in the age group of 11-20 years. Maximum cases of dengue occurred in the months of August & September.

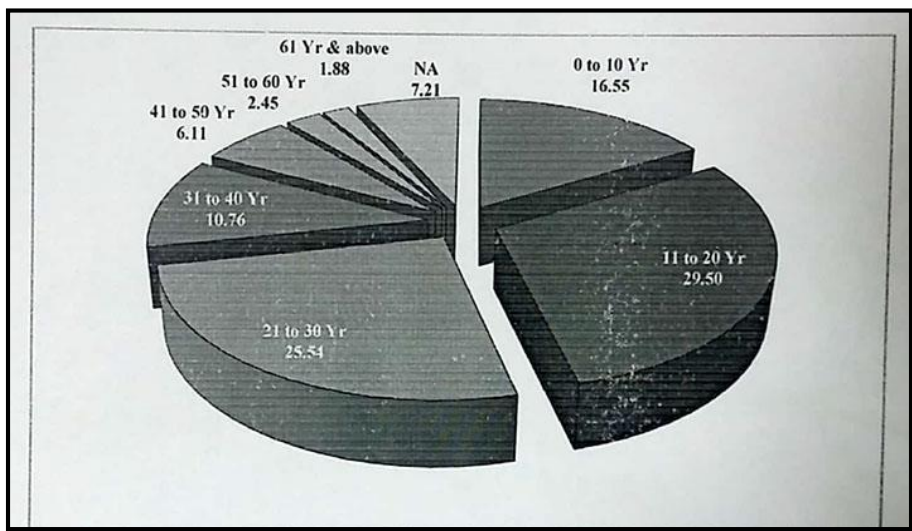


Fig. 3 & 4: Age wise distribution of Cases & Deaths at Dengue Outbreak at Durg District, Chhattisgarh

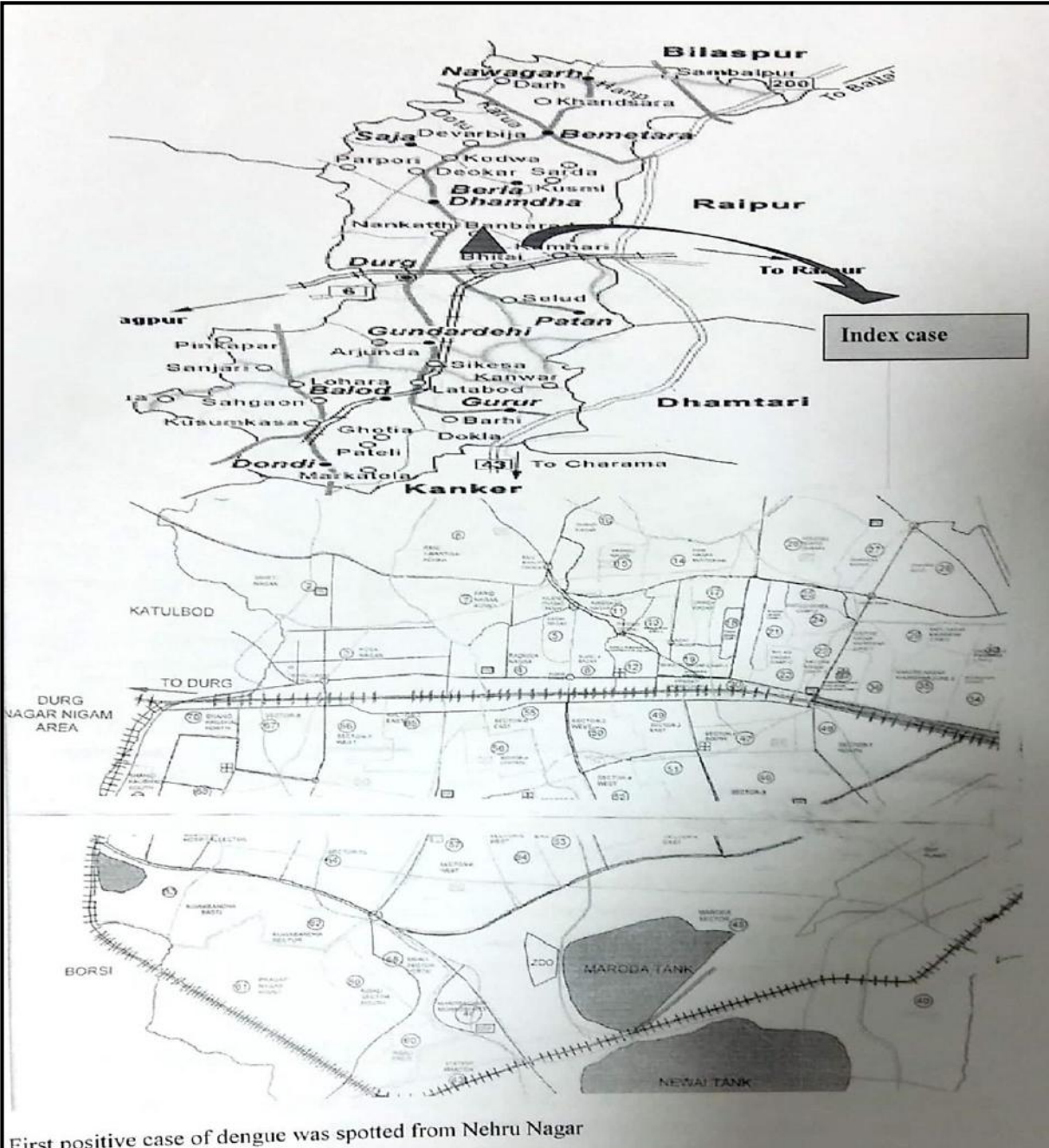
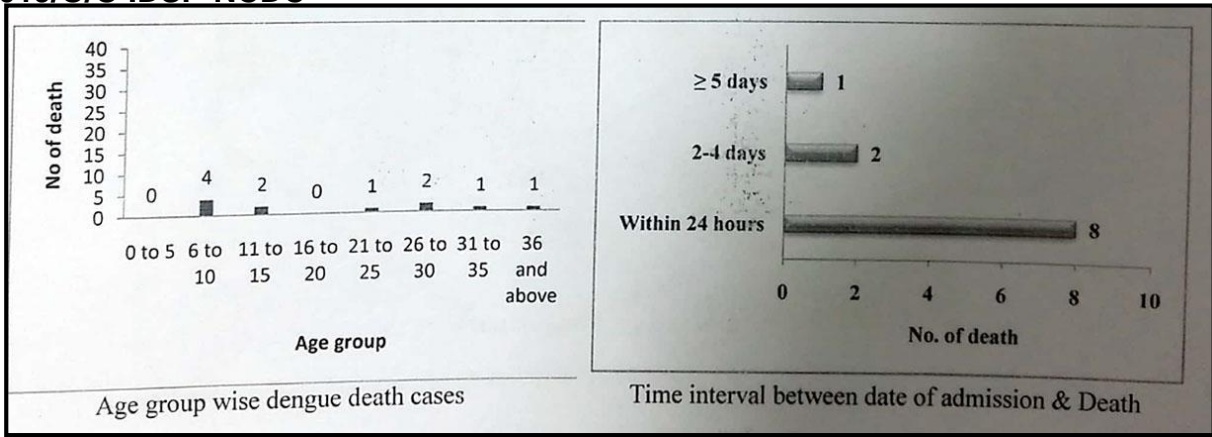


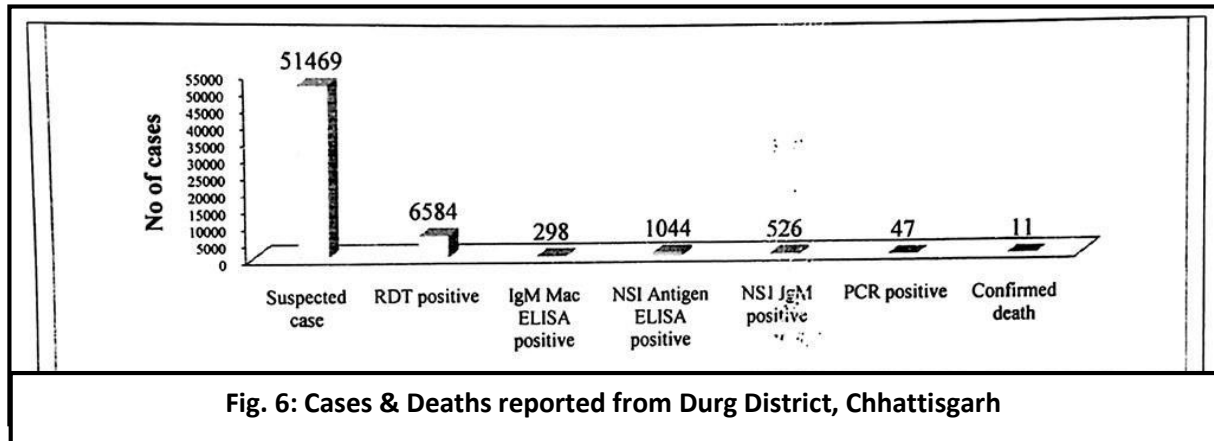
Fig. 5: Site Map of Dengue Outbreak at Durg District, Chhattisgarh

Laboratory Findings

First cases were reported in July from Khursipara area of Bhilai. Blood samples were collected from BM Shah Hospital, Sparsh Hospital, CCM College, Sankaracharya Hospital, CCM Hospital, Sector 9 and Yashoda Nandan hospital.

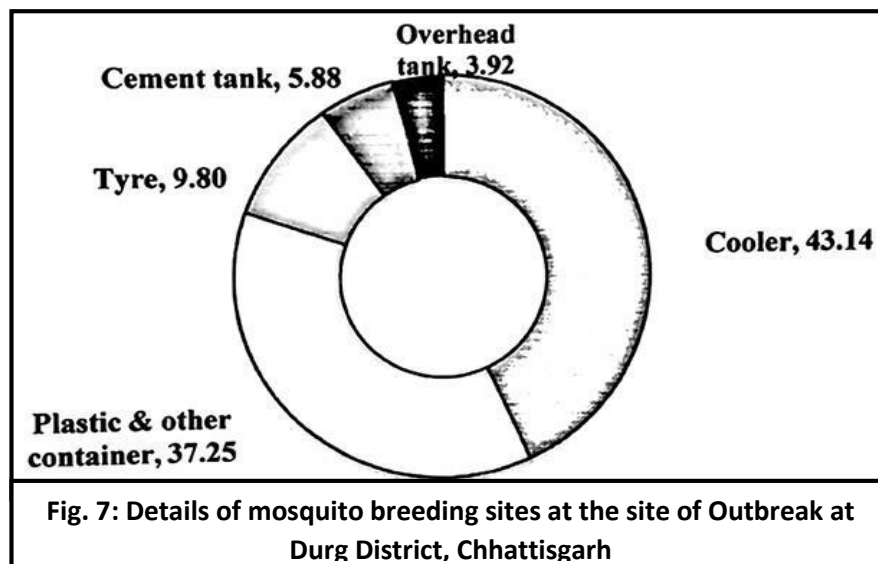
A total of 51469 samples were tested for Dengue. Among them, 298 samples tested positive by Mac ELISA, 1044 by NS1 Antigen ELISA.

National Institute for Research in Tribal Health (NIRTH), Jabalpur isolated Dengue Serotype-3 from 7 Dengue positive samples.

**Entomological Findings**

Water containers were searched for breeding sites of Aedes larvae, from both indoors & outdoors. Containers for larval survey included tyres, flower pots, barrels, plastic bags, small pots, tin, bucket, overhead tanks and cement tanks.

Coolers & plastic containers were found more infested with Aedes larvae.



The adult mosquitoes were identified upto the species level, Aedes aegypti, Aedes albopictus, and Aedes vittatus in the affected area. The Aedes aegypti lives in urban habitats and breeds mostly in man-made containers. Unlike other mosquitos, Aedes aegypti is a day-time feeder; it's peak biting periods are early in the morning and evening before dusk. Female Aedes aegypti bites multiple people during each feeding period.

Investigations showed that breeding sources for vectors of Dengue, Malaria, Filariasis and JE were abundantly reported Environmental Investigations.

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The following 3 indices were evaluated:

- House Index (HI): Percentage of houses infected with larvae and/or pupae.
- Container Index (CI): Percentage of water-holding containers infected with larvae and/or pupae.
- Breteau Index (BI): Number of positive containers per house inspected

The highest HI, CI and BI were found in the Khursipar Area.

	Chhawani			Charoda				Khursipar						Critical value		
Date	(04/08/18)	(21/08/18)	(11/09/18)	(25/08/18)	(29/08/18)	(15/09/18)	(17/09/18)	(05/10/18)	(02/08/18)	(11/08/18)	(03/09/18)	(17/09/18)	(21/09/18)		(26/09/18)	(06/10/18)
House index (HI)	50.0	35.0	28.0	60.00	46.00	10.34	08.4	6.5	90	57	13.23	14	25.71	0	0	HI ≥ 10
Container Index (CI)	30.43	7.27	6.25	40.81	27.84	8.5	2.5	2.0	80	50.70	05.15	22.58	8.66	0	0	CI > 5
Breteau Index (BI)	87.05	40.0	37.0	80.00	78.57	10.34	8.35	6.5	93.33	72	14.70	14	37.14	0	0	BI > 50

	Bapu Nagar, Bhilai	Bapu Nagar, Bhilai	Shyam Nagar, Bhilai	Ahiwara	Ispat Nagar, Risali Bhilai	Vijay Nagar, Supela, Bhilai	Critical value
Date	(20/08/18)	(05/10/18)	(22/09/18)	(04/10/18)	(11/10/18)	(09/10/18)	
House index (HI)	60.71	7.2	10.0	0.0	20.0	43.75	HI ≥ 10
Container Index (CI)	13.49	3.5	2.28	0.0	10.52	16.39	CI > 5
Breteau Index (BI)	60.71	7.2	14.0	0.0	20.0	62.5	BI > 50

Fig. 8: Details of HI, CI and BI found in the Khursipar Area of Durg District, Chhattisgarh

Activities conducted by Health Dept. and Nagar-Nigam, Durg

The agencies carried out the following activities –

- Health camps were organized in affected areas and suspected cases referred to district hospital.
- State govt provided free treatment facilities for dengue patients
- Mobile medical units organized and suspected tested with Dengue RD kits. Reactive samples sent to district hospital for further confirmation
- Awareness created through miking from autorickshaws, distribution of pamphlets
- By district administration, dengue RD kits distributed in all public facilities
- Home visits made by Mitandin and Mahila Arogya Samiti for creating awareness in public about causes, symptoms and prevention of dengue
- Inter-sectorial coordination with ICDS, school and panchayat under the supervision of Dist. Collector, Durg
- Larval surveillance and application of temephos in breeding sources
- Fogging & spraying in affected areas
- Training of MPW for field visits and source reduction activities
- Daily reporting of Dengue cases.

Recommendations

1. Larvivorous fish are recommended for the control of Aedes larva in large bodies or water containers.
2. Fogging should be done during the early morning & late afternoon hours. All doors should be left open to allow dispersal of the fog throughout the house.
3. All windows & doors should be shut for half an hour after the fogging to ensure good penetration of the fog and maximum destruction of mosquitos.

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4. Proper entomological surveillance needs to be established for monitoring various parameters like vector density & timely planning of vector control interventions.
5. Need to conduct dengue awareness among public during rainy seasons
6. Intensified & comprehensive source reduction activities
7. Storage tanks, coolers, drums & jars to be emptied at least once a week
8. Dengue patients should be isolated in a mosquito-free environment (use of net) to prevent the spread of disease
9. Line listing of the probable/confirmed cases should be properly filled in prescribed format.

Conclusions

Bhilai is an industrial town which is also an educational hub. Thus there is lot of migration in & out of the town. This may be contributing to transmission of Dengue.

During surveys, Dengue vectors were observed mostly in different containers such as coolers and plastic containers. Frequency of water supply was also associated with high incidence of Dengue. Water supply to most houses was found to be inadequate. Water scarcity, resulting in increased & prolonged storage of water for domestic usage in various containers subsequently becomes the cause of breeding of *Aedes aegypti*.

In this outbreak, males were predominantly affected. This may be consequent upon high outdoor activities.

Results suggests that proper management of water storage containers may reduce a major portion of *Aedes* larval population.

Surveillance data of Enteric Fever, Acute Diarrhoeal Disease, Viral Hepatitis A & E, Dengue Leptospirosis and Chikungunya During December 2016 - 2018*

* Data extracted from IDSP Portal (www.idsp.nic.in) as on April 10, 2019.

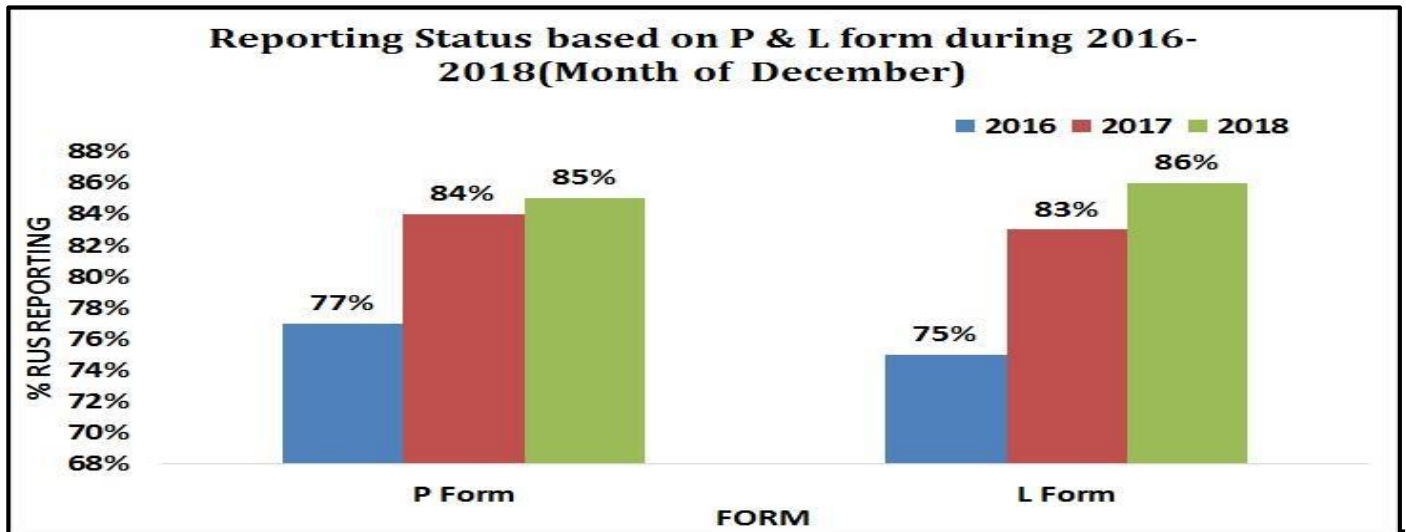


Fig. 9: RU wise reporting based on P & L form during December 2016 - 2018

As shown in Fig 9, in December 2016, 2017 and 2018, the 'P' form reporting percentage (i.e. % RU reporting out of total in P form) was 77%, 84% and 85% respectively across India, for all disease conditions reported under IDSP in P form. Similarly, L form reporting percentage was 75%, 83% 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 increased over the years in both P and L form, thereby improving the quality of surveillance data.

Fig 10: State/UT wise P form completeness % for December 2018

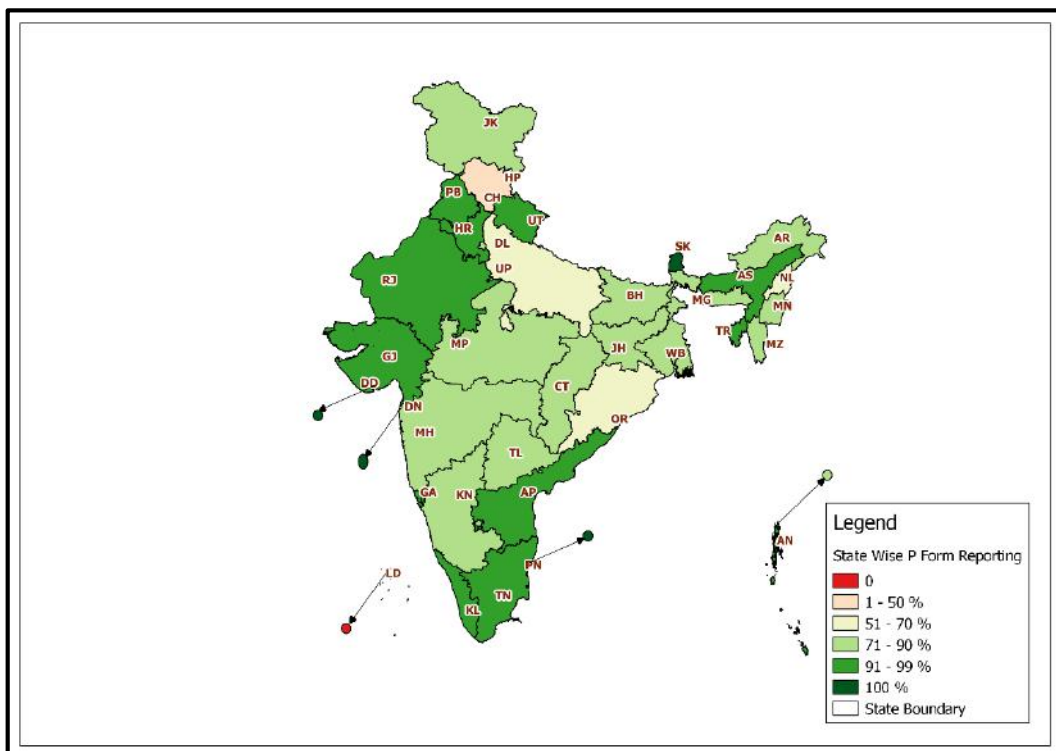


Fig 11: State/UT wise L form completeness % for December 2018

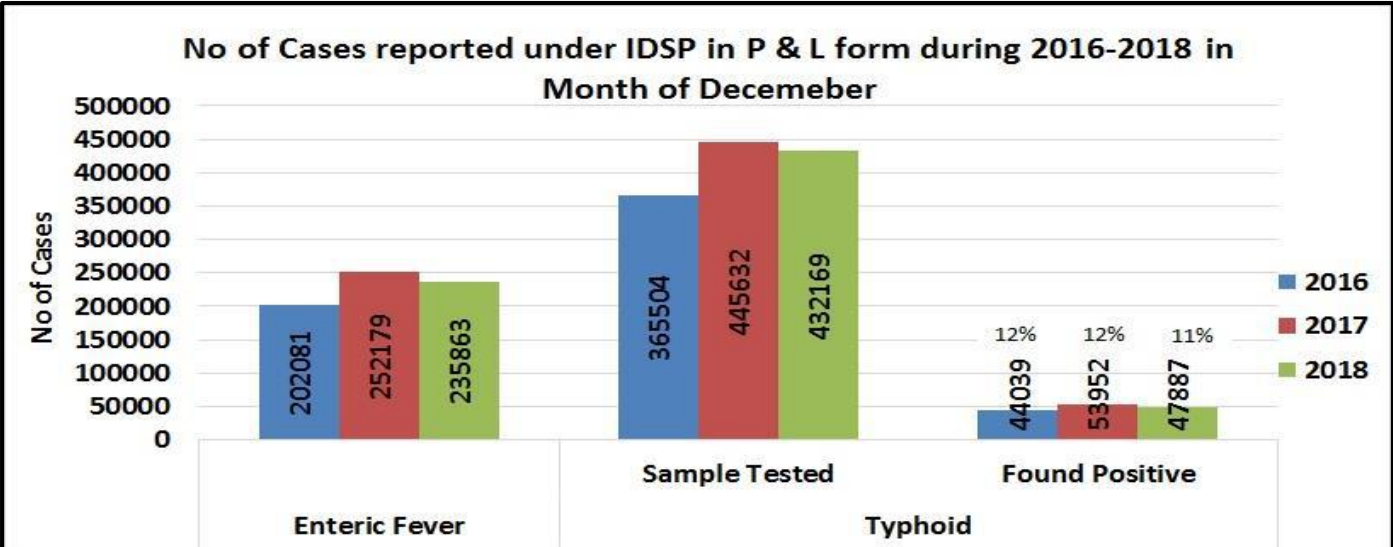
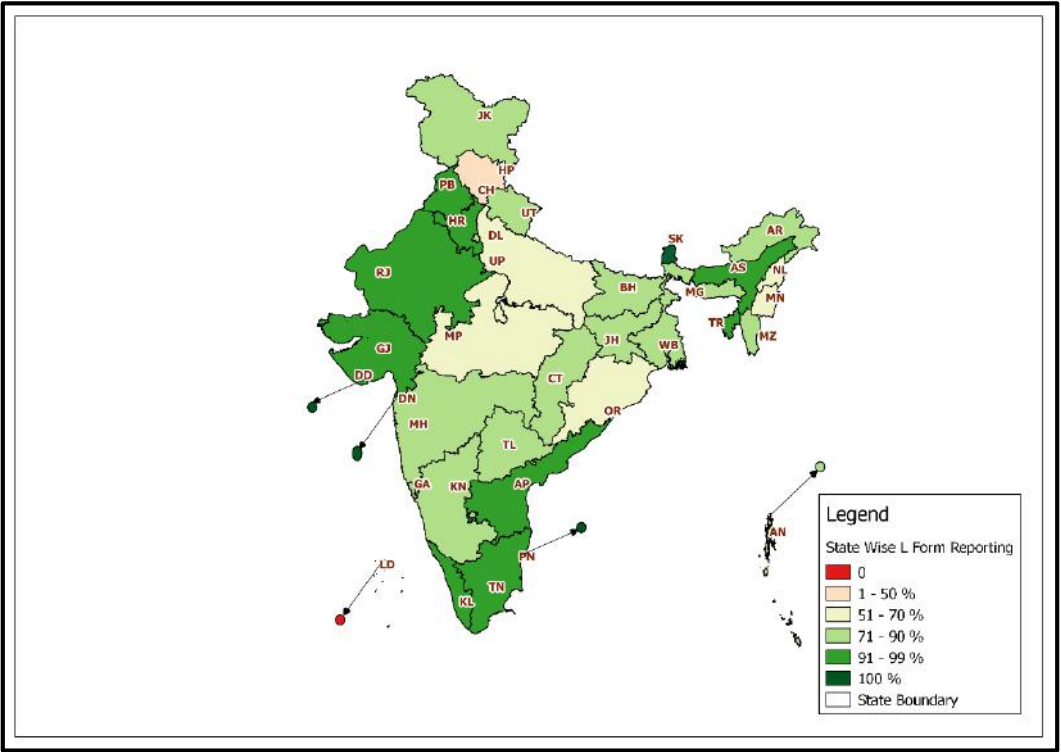


Fig. 12 No. of Enteric Fever Cases reported under P & L form during December 2016 - 2018

As shown in Fig 12, number of presumptive enteric fever cases, as reported by States/UTs in ‘P’ form was 202081 in December 2016; 252179 in December 2017 and 235863 in December 2018. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in December 2016; 365504 samples were tested for Typhoid, out of which 44039 were found positive. In December 2017; out of 445632 samples, 53952 were found to be positive and in December 2018, out of 432169 samples, 47887 were found to be positive.

Sample positivity has been 12.05%, 12.11% and 12.08% in December month of 2016, 2017 & 2018 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 13: State/UT wise Presumptive Enteric fever cases and outbreaks for December 2018

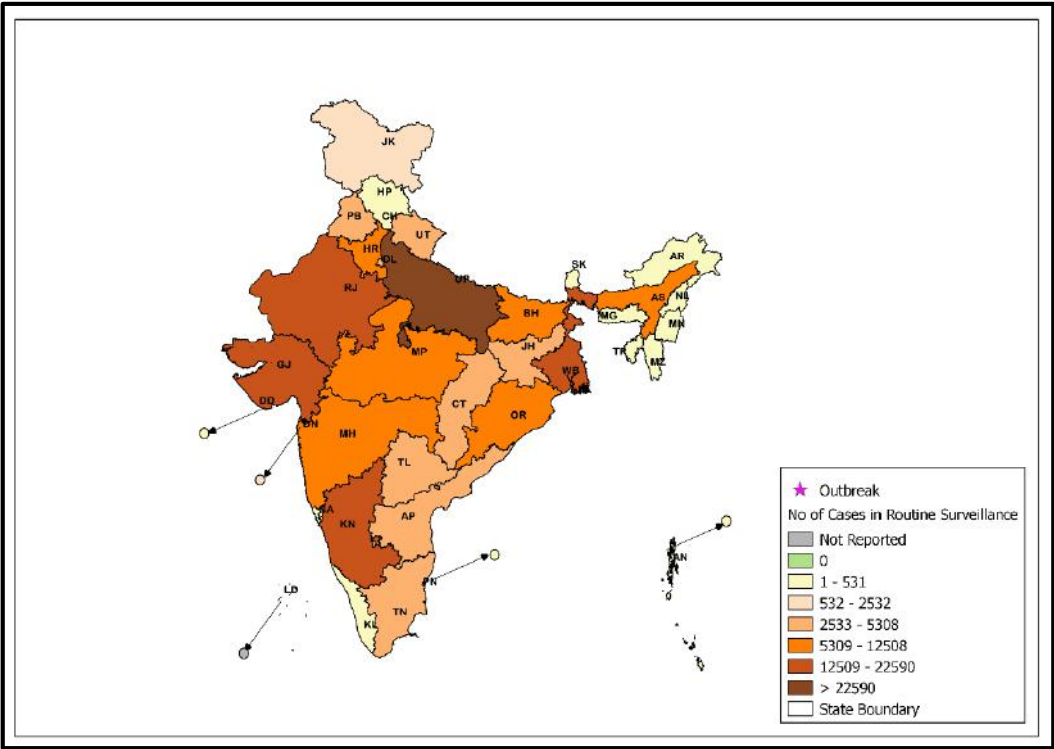
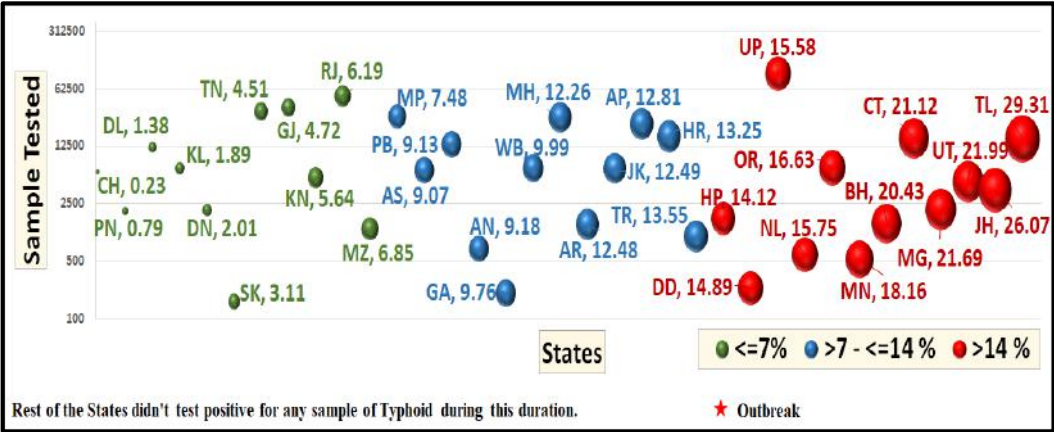
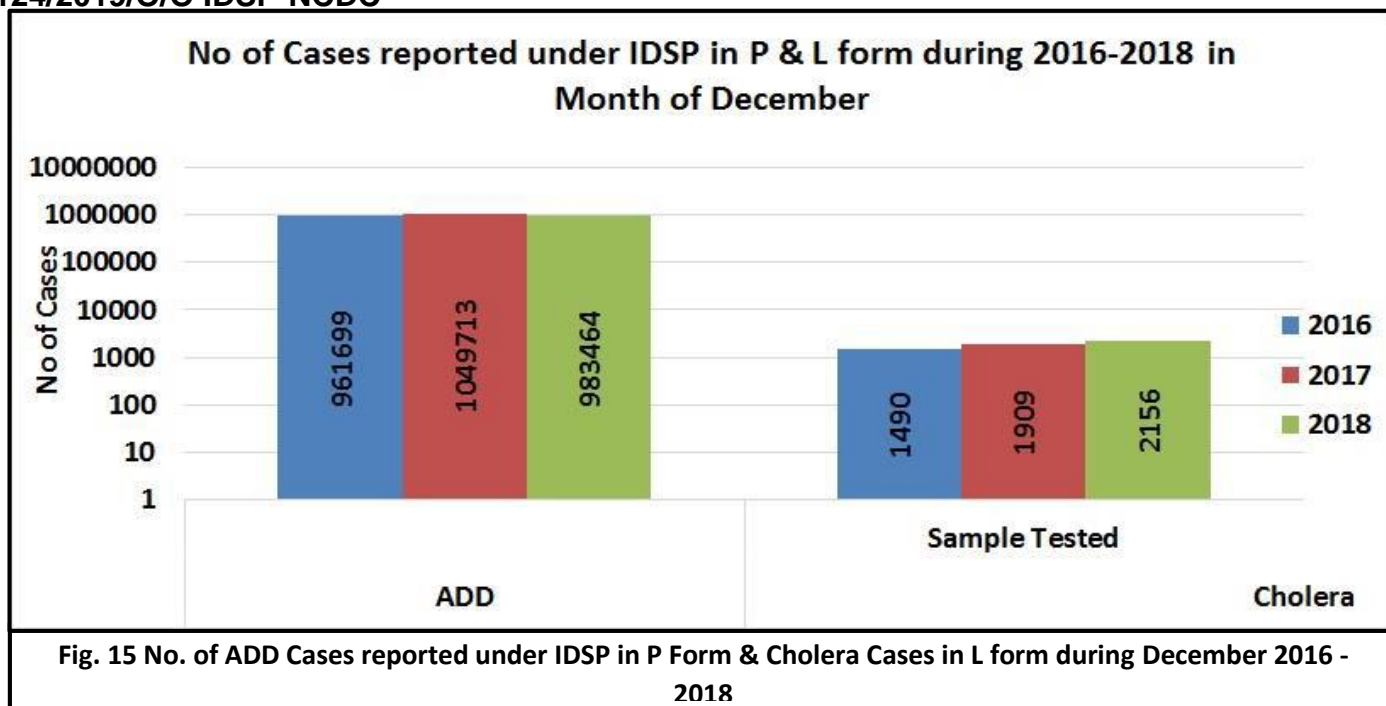


Fig 14: State/UT wise Lab Confirmed Typhoid cases and outbreaks for December 2018





As shown in Fig 15, number of Acute Diarrhoeal Disease cases, as reported by States/UTs in 'P' form was 961699 in December 2016; 1049713 in December 2017 and 983464 in December 2018. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in December 2016, 1490 samples were tested for Cholera out of which 3 tested positive; in December 2017, out of 1909 samples, 18 tested positive for Cholera and in December 2018, out of 2156 samples, 19 tested positive.

Sample positivity of samples tested for Cholera has been 0.20%, 0.94% and 0.88% in December month of 2016, 2017 & 2018 respectively.

Fig 16: State/UT wise Presumptive ADD cases and outbreaks for December 2018

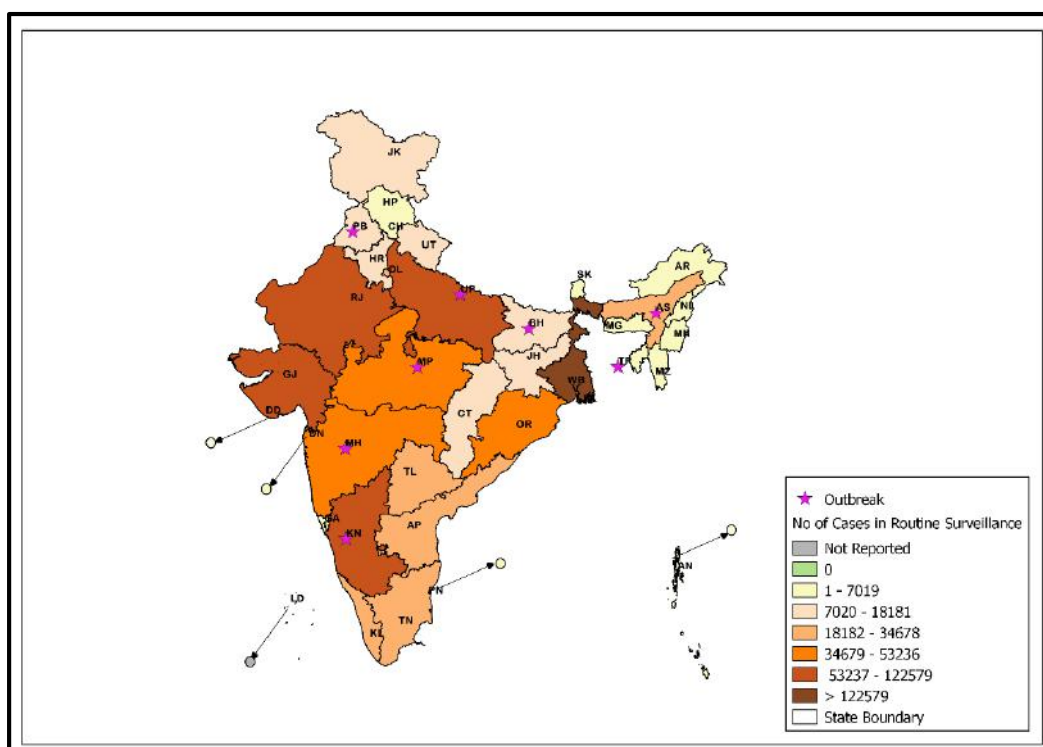


Fig 17: State/UT wise Lab Confirmed Cholera cases and outbreaks for December 2018

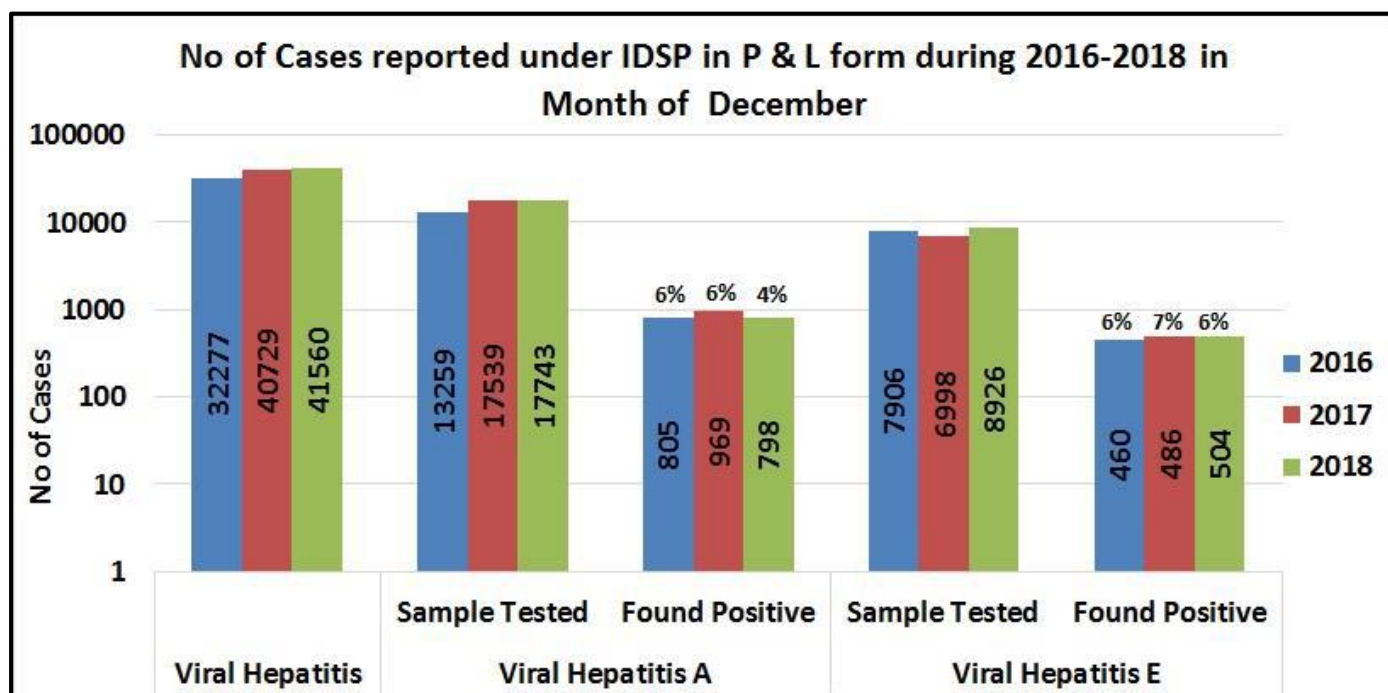


Fig 18: No of Viral Hepatitis Cases reported under IDSP in P form & Viral Hepatitis A & E cases reported under L form during December 2016 - 2018

As shown in Fig 18, the number of presumptive Viral Hepatitis cases was 32277 in December 2016, 40729 in December 2017 and 41560 in December 2018. These presumptive cases were diagnosed on the basis of case definitions provided under IDSP.

As reported in L form for Viral Hepatitis A, in December 2016; 13259 samples were tested out of which 805 were found positive. In December 2017 out of 17539 samples, 969 were found to be positive and in December 2018, out of 17743 samples, 798 were found to be positive.

Sample positivity of samples tested for Hepatitis A has been 6.07%, 5.52% and 5.00% in December month of 2016, 2017 & 2018 respectively.

As reported in L form for Viral Hepatitis E, in December 2016; 7906 samples were tested out of which 460 were found positive. In December 2017; out of 6998 samples, 486 were found to be positive and in December 2018, out of 8926 samples, 504 were found to be positive.

Sample positivity of samples tested for Hepatitis E has been 5.82%, 6.94% and 5.65% in December month of 2016, 2017 & 2018 respectively.

Fig 19: State/UT wise Presumptive Viral Hepatitis cases and outbreaks for December 2018

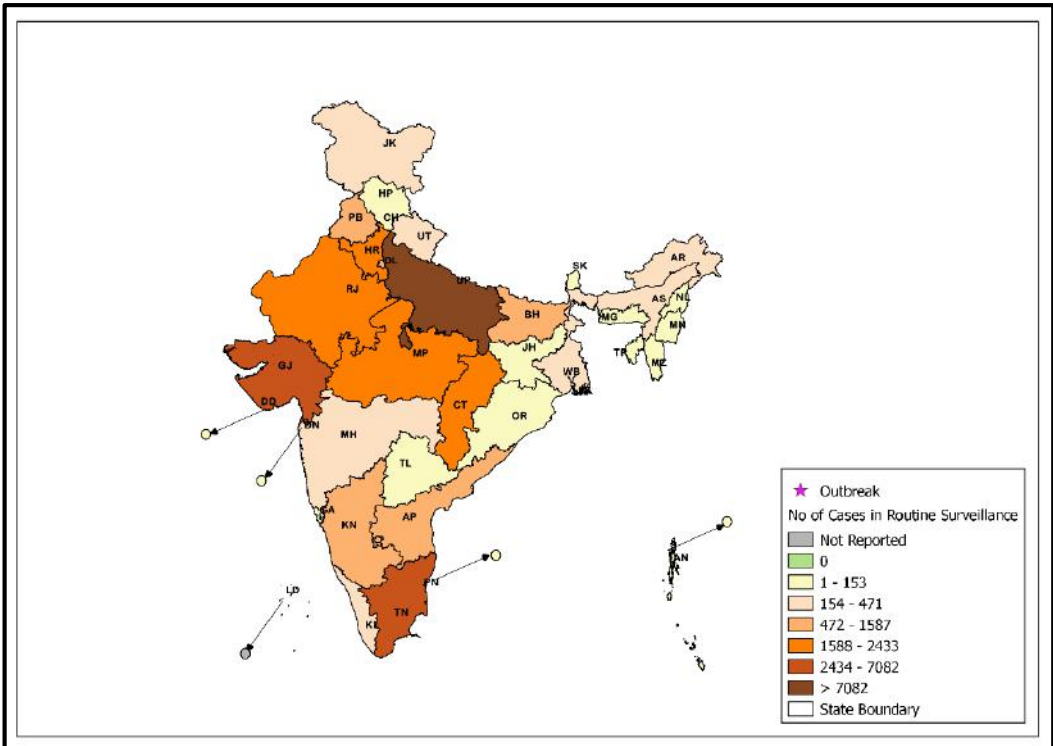


Fig 20: State/UT wise Lab Confirmed Viral Hepatitis A cases and outbreaks for December 2018

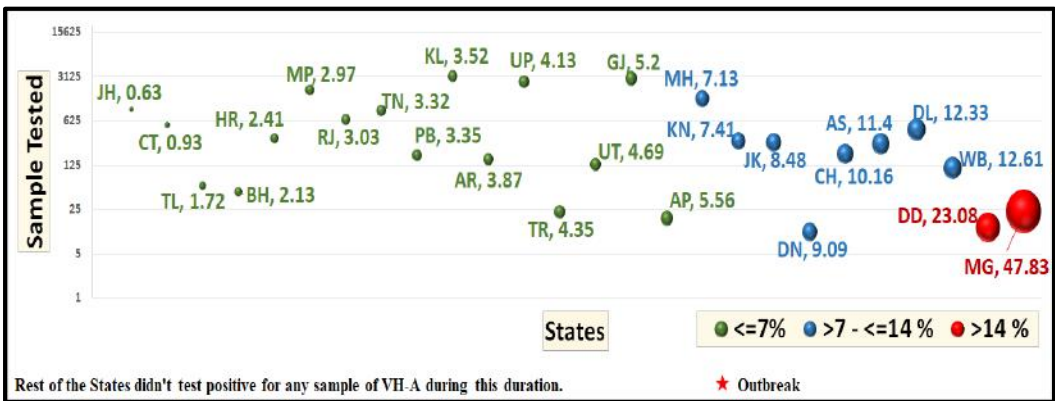


Fig 21: State/UT wise Lab Confirmed Viral Hepatitis E cases and outbreaks for December 2018

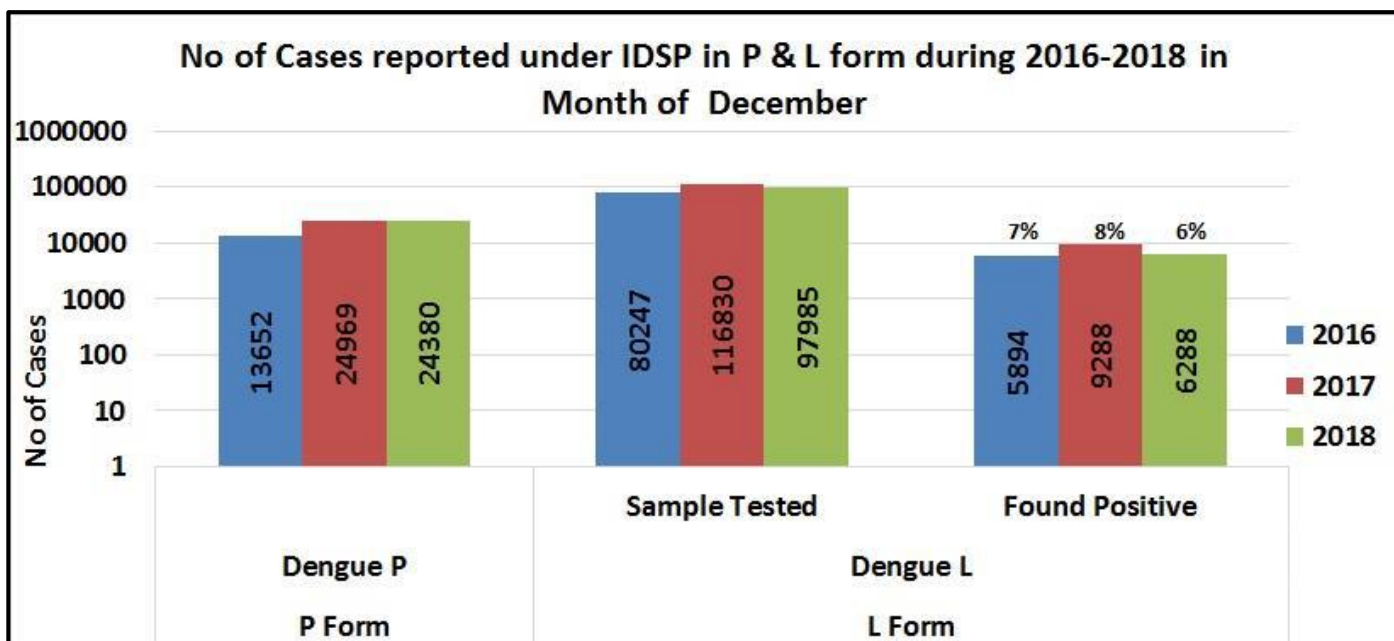
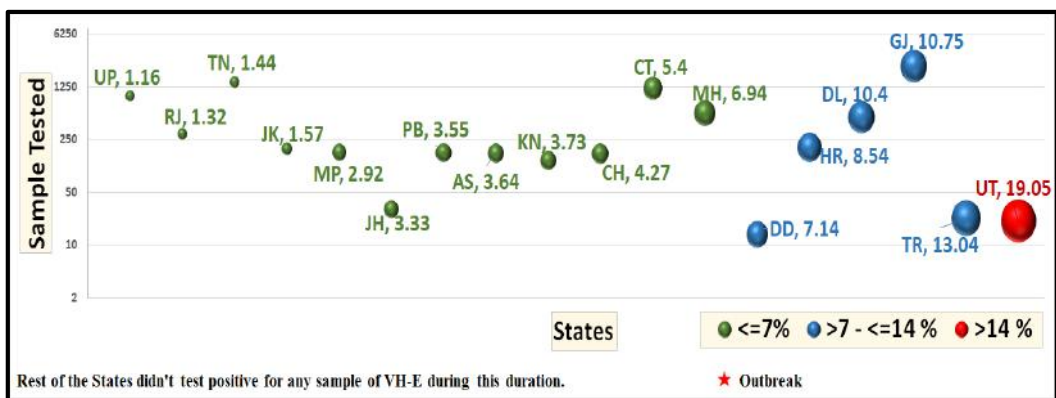


Fig 22: No. of Dengue Cases reported under IDSP in P & L form during December 2016 - 2018

As shown in Fig 22, number of presumptive Dengue cases, as reported by States/UTs in ‘P’ form was 13652 in December 2016; 24969 in December 2017 and 24380 in December 2018. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in December 2016; 80247 samples were tested for Dengue, out of which 5894 were found positive. In December 2017; out of 116830 samples, 9288 were found to be positive and in December 2018, out of 97985 samples, 6288 were found to be positive.

Sample positivity of samples tested for Dengue has been 7.34%, 7.95% and 6.42% in December month of 2016, 2017 & 2018 respectively.

Fig 23: State/UT wise Presumptive Dengue cases and outbreaks for December 2018

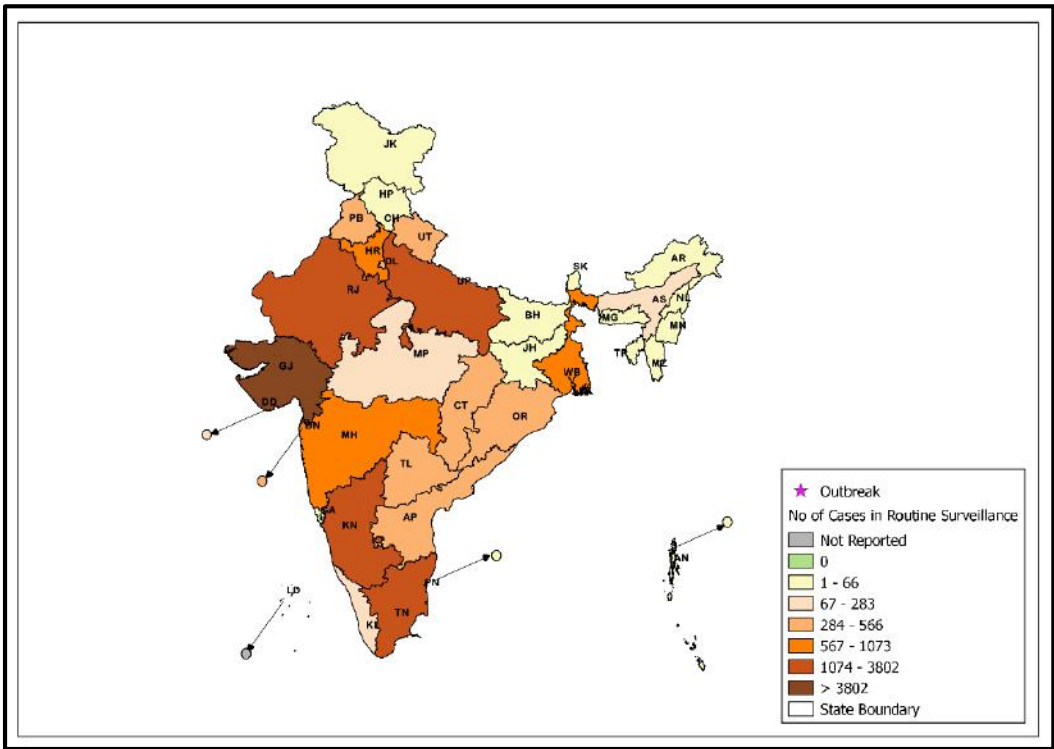
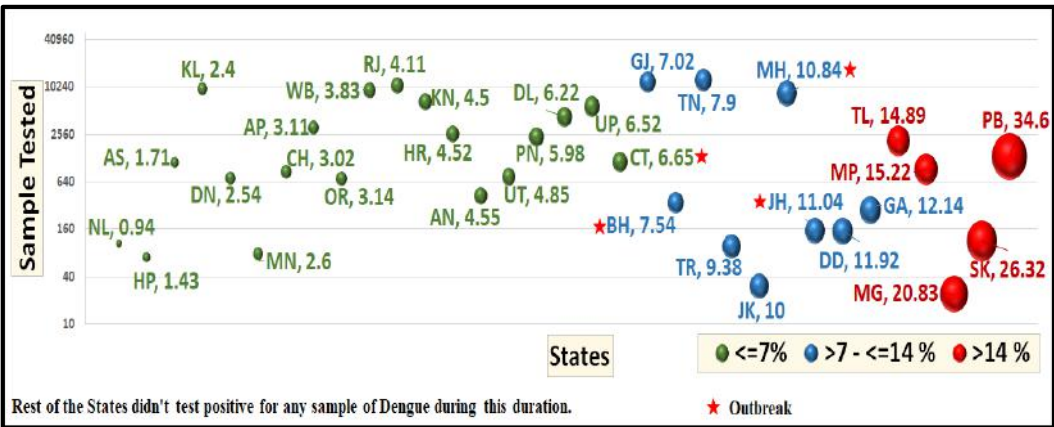


Fig 24: State/UT wise Lab Confirmed Dengue cases and outbreaks for December 2018



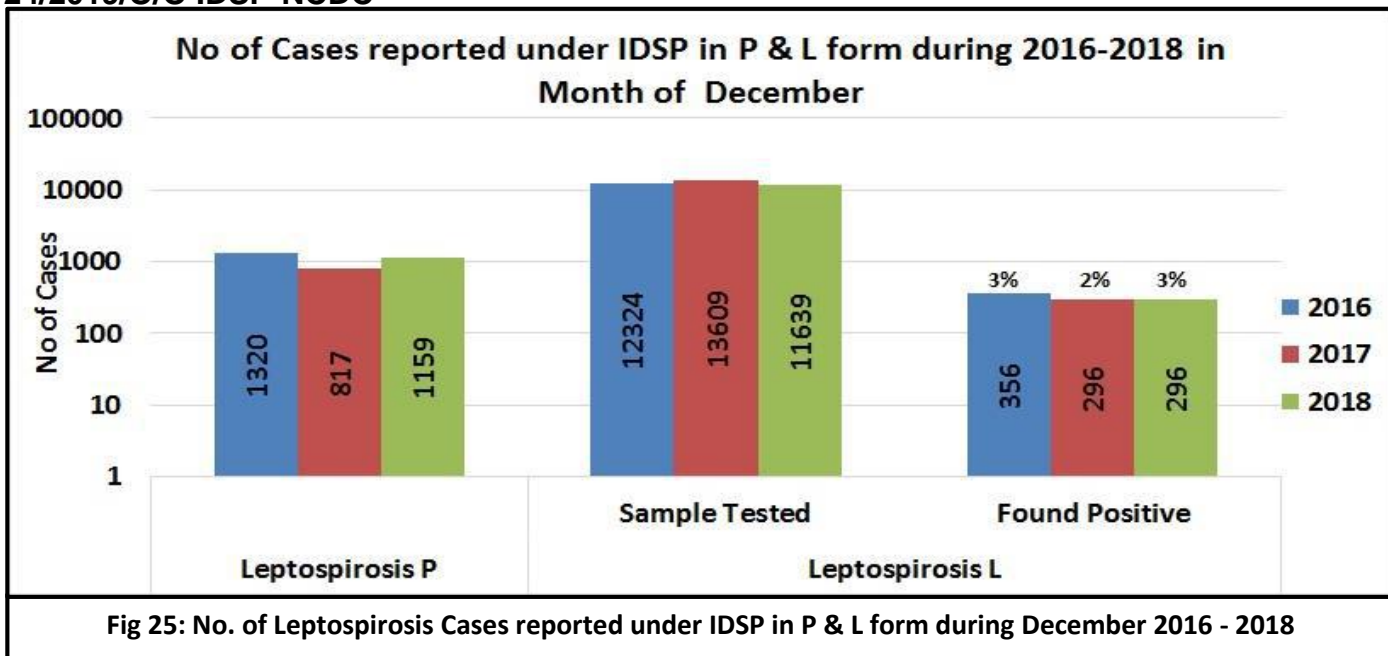


Fig 25: No. of Leptospirosis Cases reported under IDSP in P & L form during December 2016 - 2018

As shown in Fig 25, number of presumptive Leptospirosis cases, as reported by States/UTs in 'P' form was 1320 in December 2016; 817 in December 2017 and 1159 in December 2018. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in December 2016; 12324 samples were tested for Leptospirosis, out of which 356 were found positive. In December 2017; out of 13609 samples, 296 were found to be positive and in December 2018, out of 11639 samples, 296 were found to be positive.

Sample positivity of samples tested for Dengue has been 2.89%, 2.17% and 2.54% in December month of 2016, 2017 & 2018 respectively.

Fig 26: State/UT wise Presumptive Leptospirosis cases and outbreaks for December 2018

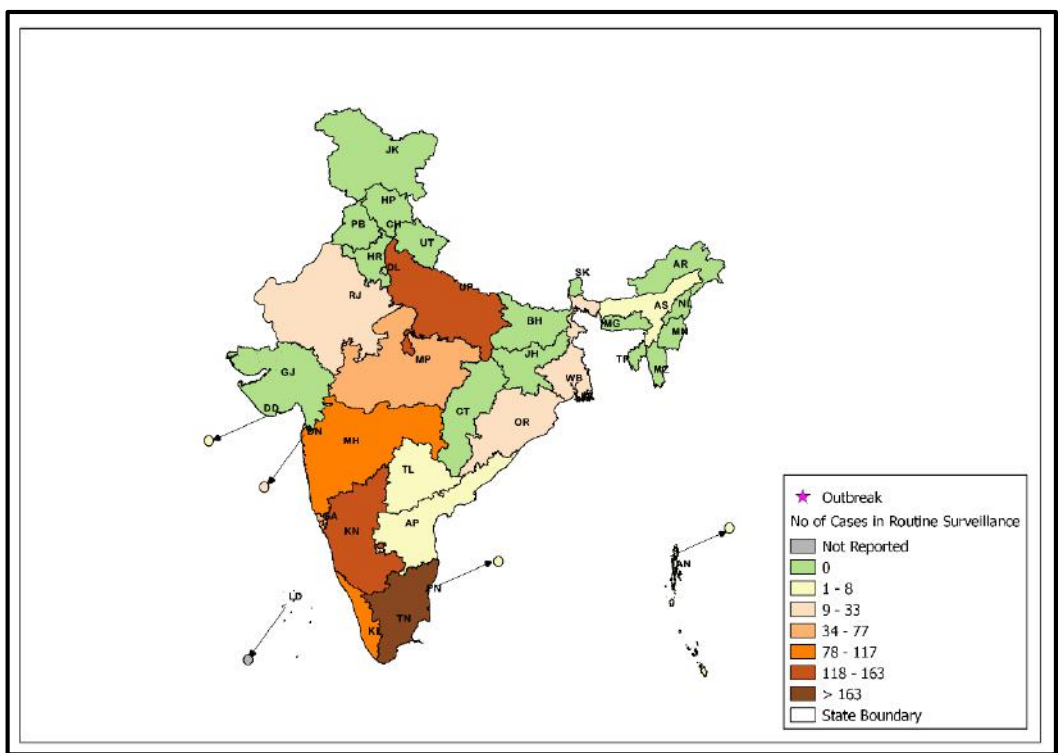


Fig 27: State/UT wise Lab Confirmed Leptospirosis cases and outbreaks for December 2018

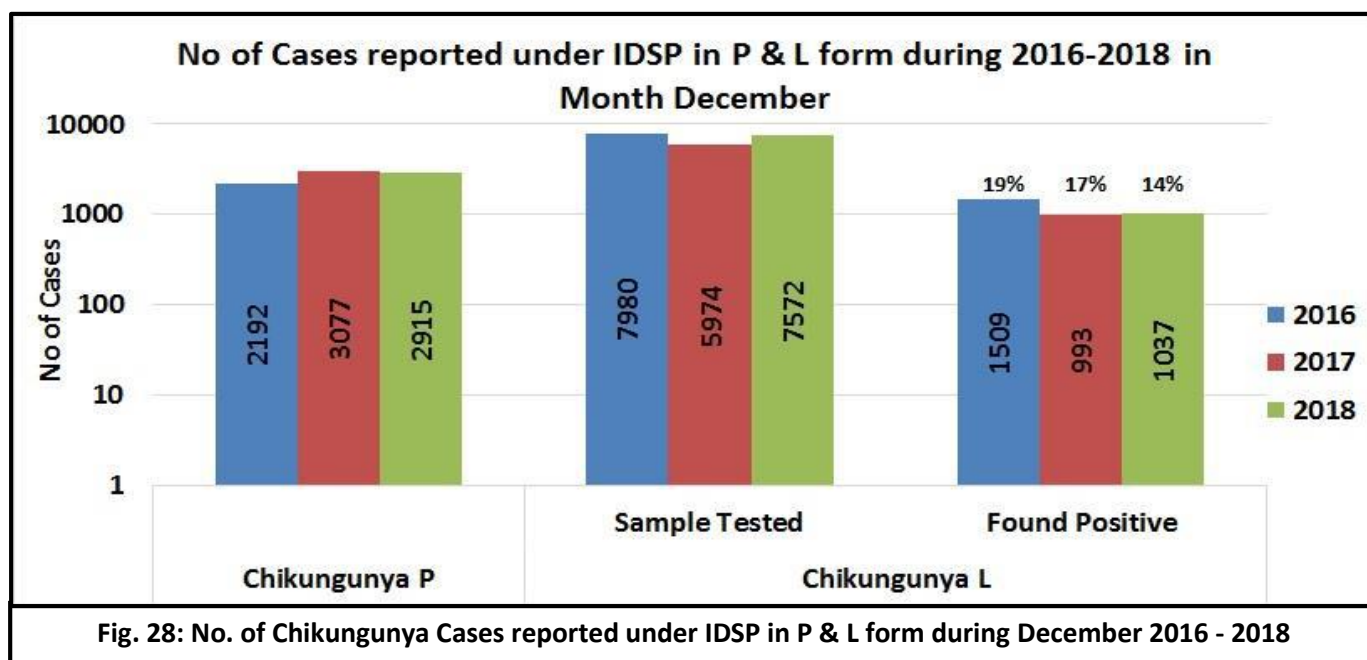
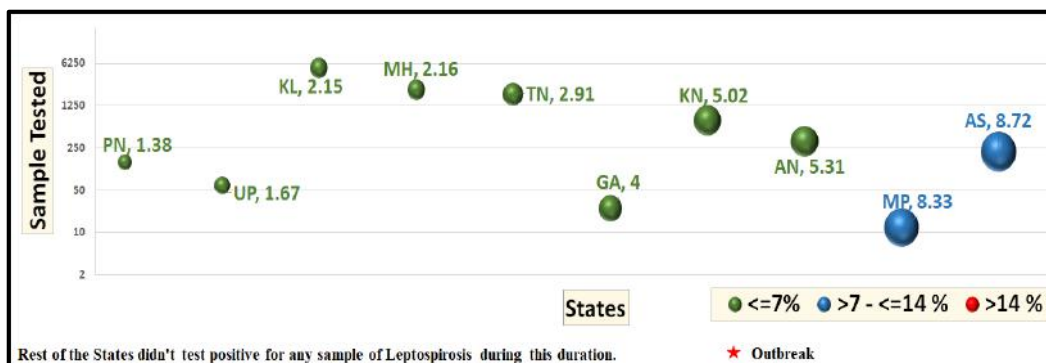


Fig. 28: No. of Chikungunya Cases reported under IDSP in P & L form during December 2016 - 2018

As shown in Fig 28, number of presumptive Chikungunya cases, as reported by States/UTs in 'P' form was 2192 in December 2016; 3077 in December 2017 and 2915 in December 2018. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in December 2016; 7980 samples were tested for Chikungunya, out of which 1509 were found positive. In December 2017; out of 5974 samples, 993 were found to be positive and in December 2018, out of 7572 samples, 1037 were found to be positive.

Sample positivity of samples tested for Chikungunya has been 18.91%, 16.62% and 13.70% in December month of 2016, 2017 & 2018 respectively.

Fig 29: State/UT wise Presumptive Chikungunya cases and outbreaks for December 2018

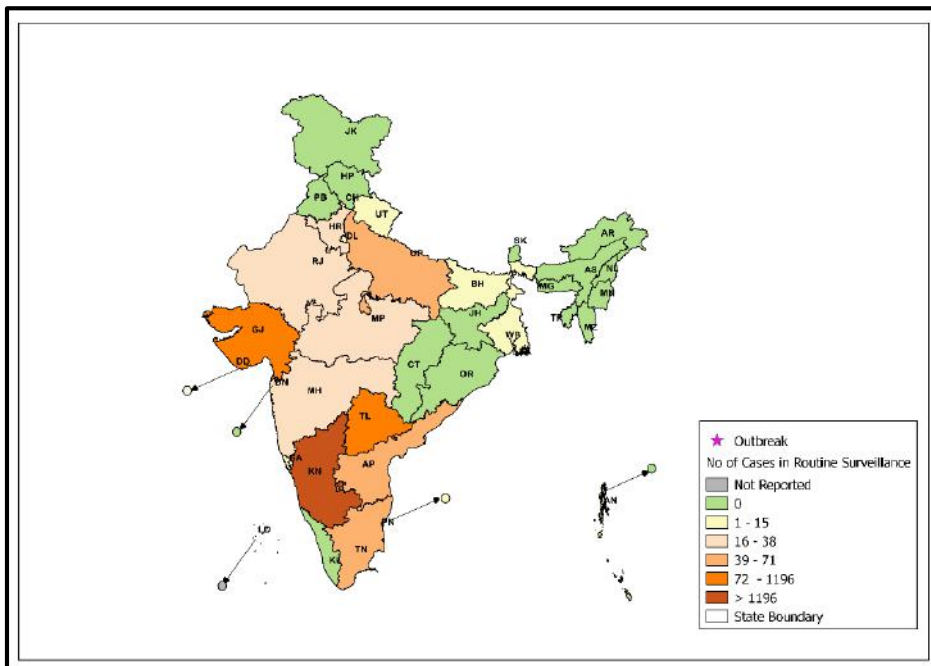


Fig 30: State/UT wise Lab Confirmed Chikungunya cases and outbreaks for December 2018

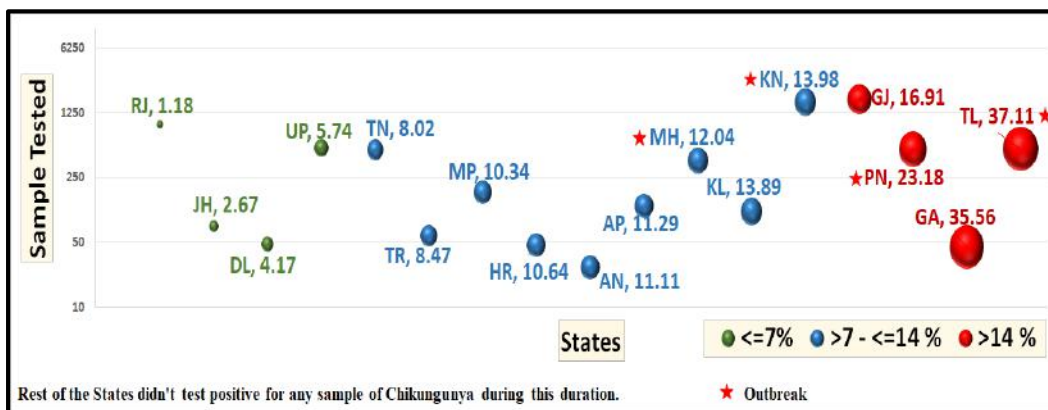
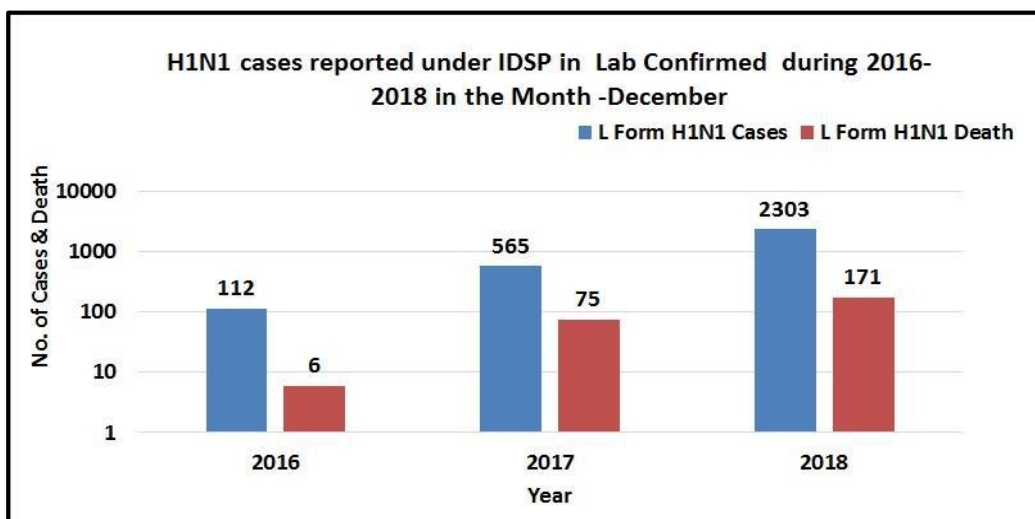


Fig 31: H1N1 cases reported under IDSP in L Form during 2016-2018 in December Month



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As reported in L form, in December 2016; there were 112 cases and 6 deaths. In December 2017; there were 565 cases and 75 deaths and in December 2018, there were 2303 cases and 171 deaths.

Case fatality rate for H1N1 were 5.36%, 13.27% and 7.42% in December month of 2016, 2017 & 2018 respectively.

Fig 32: State/UT wise Lab-confirmed H1N1 cases and outbreaks for December 2018

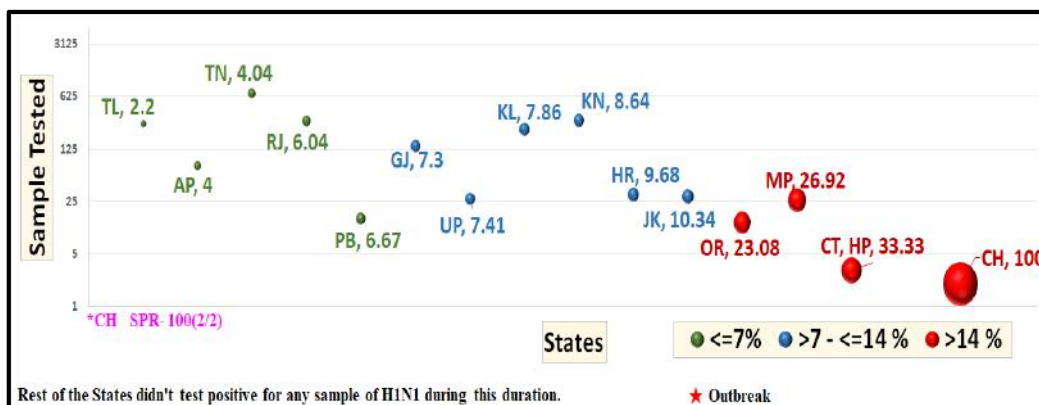
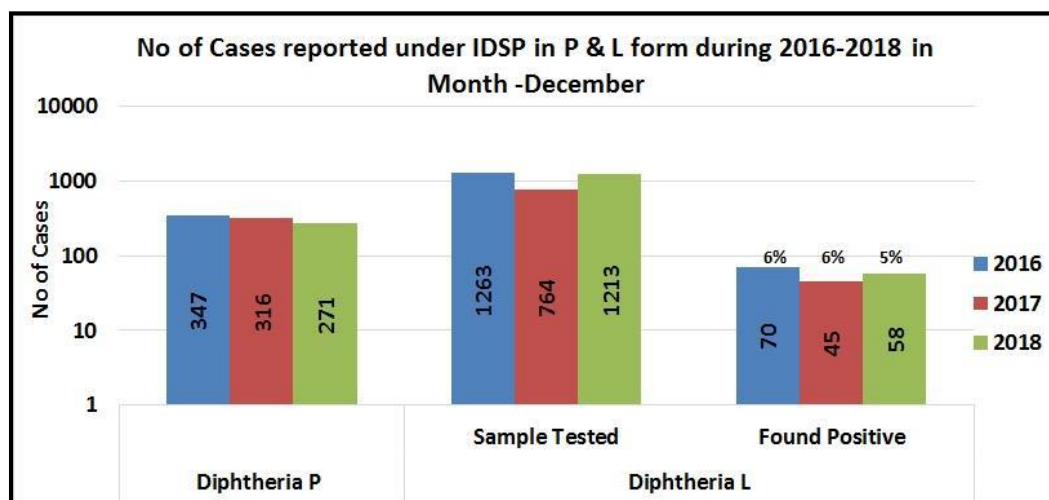


Fig 33: Diphtheria cases reported under IDSP under P & L Form during 2016-2018 in December Month



As shown in Fig 33, number of presumptive Diphtheria cases, as reported by States/UTs in 'P' form was 347 in December 2016; 316 in December 2017 and 271 in December 2018. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in December 2016; 1263 samples were tested for Diphtheria, out of which 70 were found positive. In December 2017; out of 764 samples, 45 were found to be positive and in December 2018, out of 1213 samples, 58 were found to be positive.

Sample positivity of samples tested for Diphtheria has been 5.54%, 5.89% and 4.78% in December month of 2016, 2017 & 2018 respectively.

Fig 34: Presumptive Diphtheria cases reported under IDSP under P & L Form during 2016-2018 in December Month

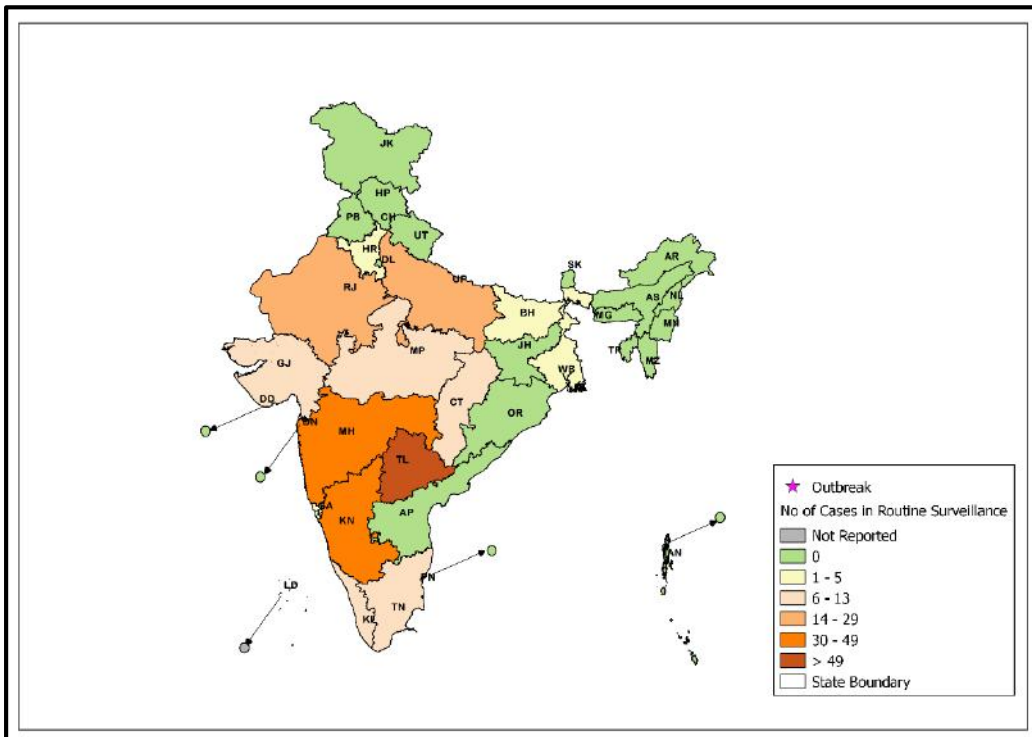
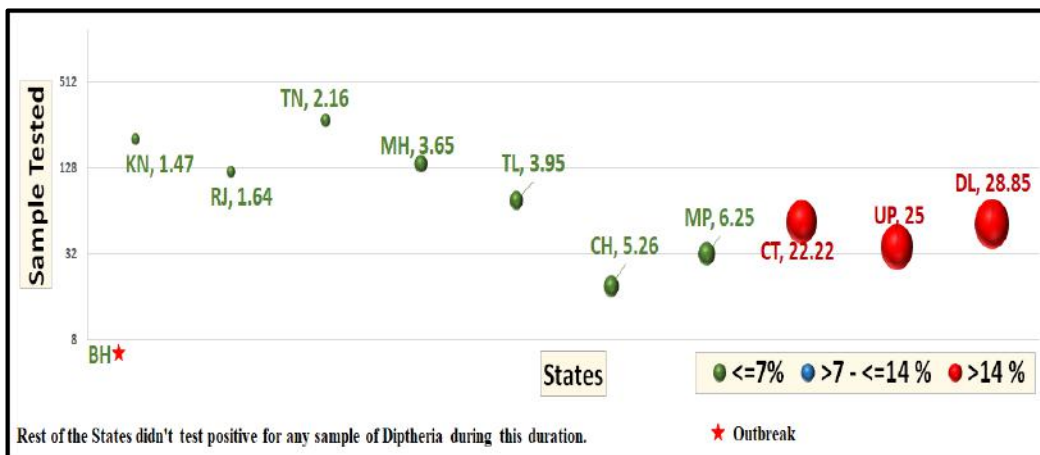


Fig 29: Lab Confirmed Diphtheria cases reported under IDSP under P & L Form during 2016-2018 in December Month



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:

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- 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 leptospire 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).

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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

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