



Disease Alert

प्रकोप चेतावनी

Monthly Surveillance Report

From

Integrated Disease Surveillance Programme

National Health Mission

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FINAL INVESTIGATION REPORT OF CHOLERA OUTBREAK

SHAM NAGAR, KAPURTHALA, PUNJAB, PUNJAB

BACKGROUND

Phagwara is a Municipal Council city situated in Phagwara tehsil of Kapurthala district. As per the Population Census 2011, there are total 20,719 families residing in the Phagwara city. The total population of Phagwara is 97,864 out of which 51,386 are males and 46,478 are females. The population of Children of age 0-6 years is about 10% of the total population.

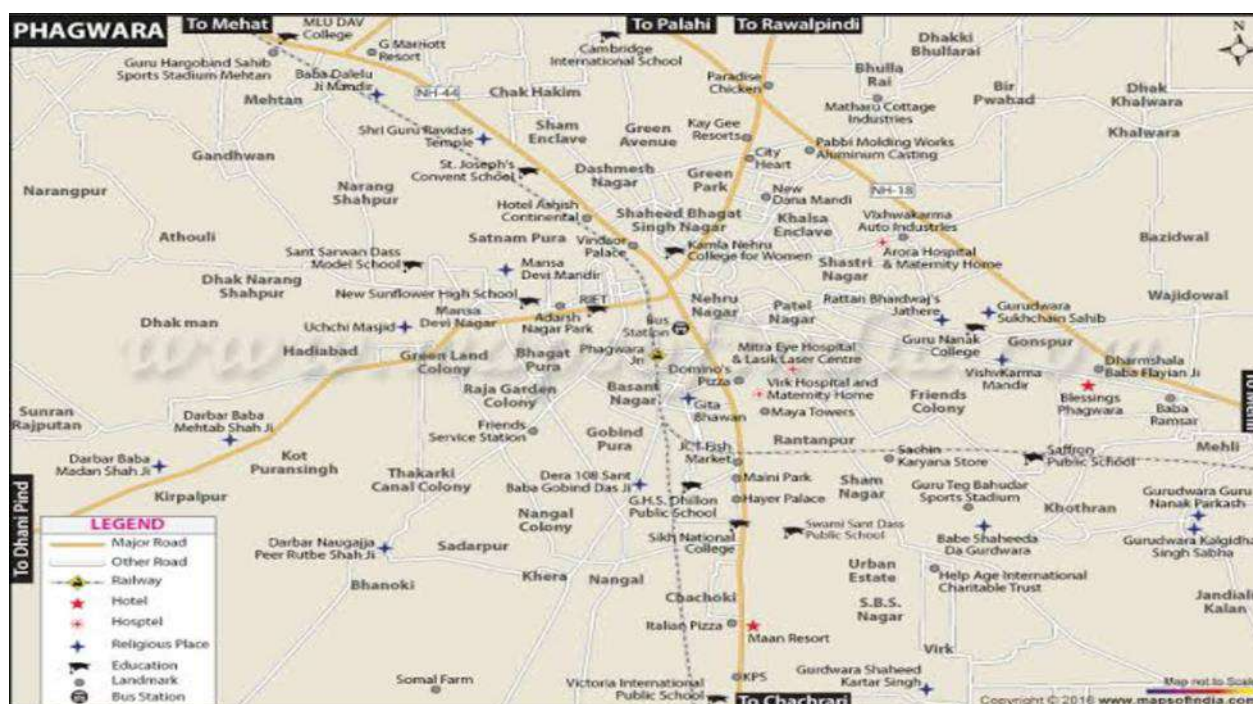


Fig.1 Map of Phagwara Tehsil of district Kapurthala

EPIDEMIOLOGY OF CHOLERA:

Cholera is an acute diarrheal infection caused by ingestion of food or water contaminated with bacterium *Vibrio Cholerae*. It is gram-negative, curved rod with a single polar flagellum that makes it highly mobile.

V. cholerae 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. cholerae* 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.

CASE DEFINITION:

Cholera should be considered when a patient 5 years or older develops severe dehydration, acute watery diarrhea, with or without vomiting. A case of cholera is confirmed when *Vibrio cholera* O1 is isolated from any patient with diarrhea.

OUTBREAK CHRONOLGY:

Under the supervision of Civil Surgeon Kapurthala. District and Block Rapid response team deputed for immediate action in the affected area i.e. Sham Nagar, Shiv puri and Pipa rangi, Phagwara. Few cases of diarrhea were reported in Sham Nagar, Shiv puri and Pipa rangi, Phagwara.

Source of Information: Information received from health worker of concerned area. District Epidemiologist with District Rapid response team and Block Rapid response team surveyed the affected area.

Possible cause of outbreak: - Contamination of drinking water.

Epidemiological Data/ survey data:

- 04 confirmed cases of cholera reported.
- Total of 275 cases of acute diarrhea were identified and two death were reported.

Laboratory Data:

- Total of 08 stool samples tested at DPHL, Kapurthala. Result: 04 samples Positive for *Vibrio Cholera*.
- Total of 17 water samples tested at Bacteriological Lab, Chandigarh. Result: 14 found non –potable.

Action Taken by Block health Team:

Investigation team included District Epidemiologist with District Rapid response team and Block Rapid response team.

The team visited each and every house for doing survey and doing the line listing. Physical examination was carried out with proper history taking of all the probable cases. Team visited all the water sources that are being used for drinking water samples were also collected from pipe water which was circulated in residential area. District health team and Block health team interact with the general public to find out the cause of outbreak and asking from the local residents about the water resources and health status.



Fig. 2: District health team and Block health team interact with the general public to find out the cause of outbreak and asking from the local residents about the water resources and health status.

NUMBER OF DIARRHEA CASES REPORTED DURING SURVEY:

| DATE | SURVEY CASES /CD Sham Nagar | DEATH CASE | MEDICAL CAMP |
|--------------|-----------------------------|------------|--------------|
| 18-10-2021 | 6 | 0 | 0 |
| 19-10-2021 | 114 | 0 | 3 |
| 20-10-2021 | 21 | 0 | 3 |
| 21-10-2021 | 46 | 0 | 3 |
| 22-10-2021 | 36 | 0 | 3 |
| 23-10-2021 | 12 | 0 | 3 |
| 24-10-2021 | 11 | 0 | 3 |
| 25-10-2021 | 15 | 2 | 3 |
| 26-10-2021 | 06 | 0 | 3 |
| 27-10-2021 | 02 | 0 | 3 |
| 28-10-2021 | 03 | 0 | 3 |
| 29-10-2021 | 02 | 0 | 3 |
| 30-10-2021 | 01 | 0 | 3 |
| 01-11-2021 | 00 | 0 | 3 |
| TOTAL | 275 | 2 | 39 |

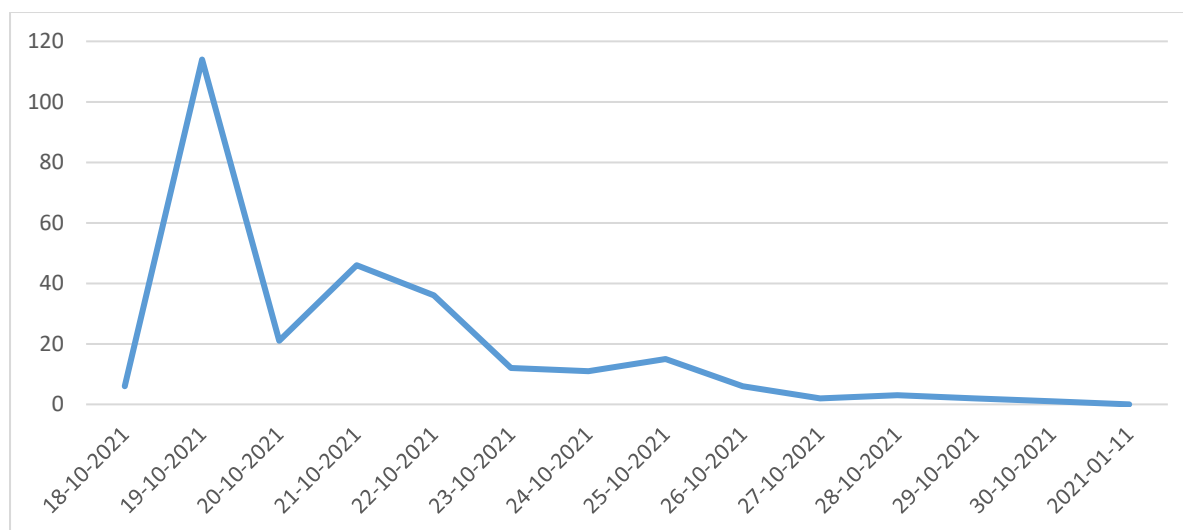
WATER/BLOOD/STOOL SAMPLES:

| Samples | Date | No of samples Collected | Result | Testing Centre |
|---------------|------------|-------------------------|---|-------------------------------------|
| Water samples | 18-10-2021 | 8 | 7 Non-Potable and 1 potable | State Bacteriological Lab Kharar |
| Water samples | 19-10-2021 | 4 | 4 Non-Potable | DPHL, Kapurthala Lab. |
| Stool Samples | 19-10-2021 | 4 | 2 samples - Vibrio cholerae 2-Negative | DPHL Kapurthala |

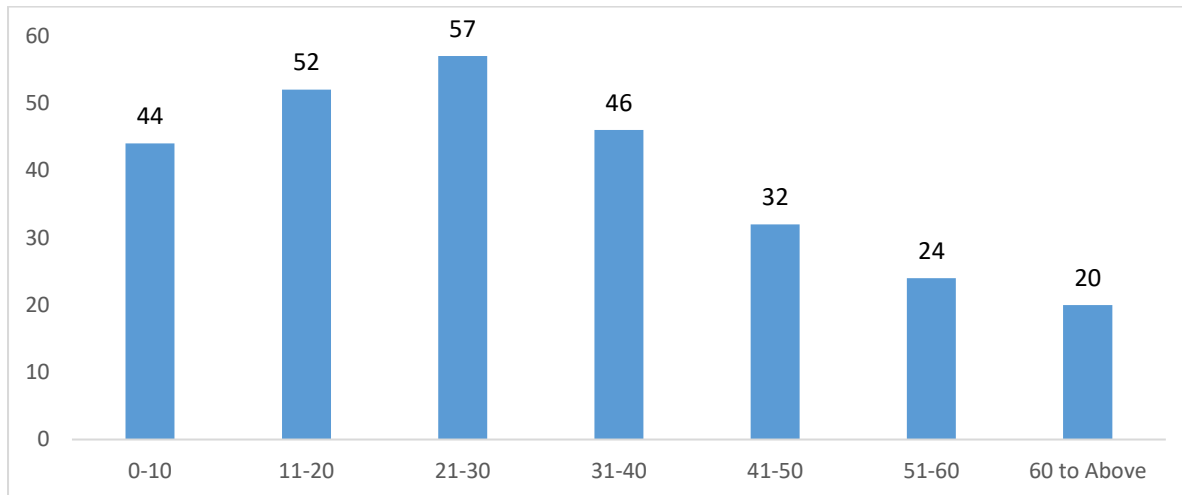
| | | | | |
|---------------|------------|---|---|-------------------------------------|
| Stool samples | 21-10-2021 | 2 | 1 sample - Vibrio cholerae 1 -Negative | DPHL Kapurthala |
| Stool samples | 22-10-2021 | 2 | 1 sample - Vibrio cholerae 1-Negative | DPHL Kapurthala |
| Water sample | 25-10-2021 | 5 | 3 Non-Potable and 2 potable | State Bacteriological Lab Kharar |

DESCRIPTIVE EPIDEMIOLOGY:

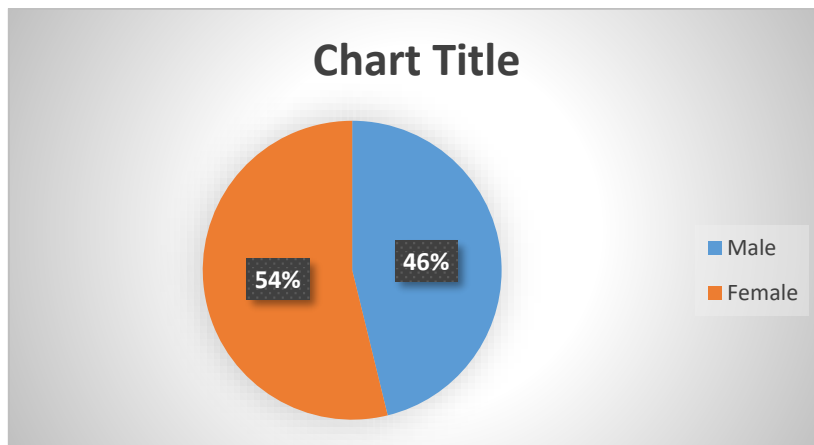
Cases as per Time distribution:



Of a total 275 cases 4 confirmed cases of cholera. Identified 275 Cases with symptoms of dehydration, watery diarrhea and abdominal cramps. There were 2 Deaths reported. As per epidemic curve Outbreak started on Oct 18th 2021 & peaked on approximately 19th and 20th October' 2021. Cases began declining from 23rd October 2021 after chlorination of drinking water sources, alternate water supply tanks and repair of broken pipes in street no 8 and 9 of sham nagar then return to normal level on 1st November 2021 after distribution of chlorine tablets, Zinc, ORS Solution in household. 27 Cases were hospitalized presented with acute water diarrhea with vomiting and Fever treated with IV fluids and antibiotic. All outpatient cases and field survey cases were treated with ORS, Doxycycline in medical camps.

Cases as per Person Distribution (w.r.t age):

Of the total 275 cases 4 confirmed cases of cholera were reported. Overall attack rate was 14.4%. Among the affected population more suspected cases from age group 21 to 30 yrs.

Cases as per sex wise distribution

As per age wise distribution females were more affected when compared with females

RISK FACTORS:

Most of the houses have an individual connection of piped water, in some areas, a series of public water tabs. The striking features in this outbreak is contamination of drinking water either due to sewage or polluted water bodies. We observed two major leaks in the pipes connecting water distribution. These leakage and broken pipes provide entry points for contamination of water.

Discussion

Out of 275 cases we found 4 confirmed Cholera Cases with attack rate 14.4%. Maximum cases from cases in age group 21-30. Female are more affected than male. In our study 27 cases attend hospital full treatment. There was two mortality reported till the date of survey. The contamination water and open defecation were reported as source of infection during outbreak. There were 2 Deaths reported. As per epidemic curve Outbreak started on Oct 18th 2021 & peaked on approximately 19th and 20th October 2021. Cases began declining from 23rd October 2021 after chlorination of drinking water sources, alternate water supply tanks and repair of broken pipes in street no 8 and 9 of Sham Nagar then return to normal level on 1st November 2021. 27 Cases were hospitalized presented with acute watery diarrhea with vomiting and Fever treated with IV fluids and antibiotic. Overall attack rate was 14.4%. As per age wise distribution females were more affected when compared with males

RECOMMENDATIONS:**Short term recommendations –**

- Rapid Response Team (RRT) was immediately sent for investigations.
- Health workers were instructed to daily visit the area and inform about the status of old and new patients, if any.
- Public Health department was involved to get the repair done of the faulty /leakage water pipelines.
- Initiated with Cessation of water distribution to repair breaks and leaks in pipelines followed by flushing of water distribution system and chlorination safe water was provided using water tanks. Medical camp were set in affected localities
- Health Education (IEC) given to all the inhabitants of the area. Information was shared about the effectiveness of ORS, the benefits of early reporting for prompt treatment, hygienic food habits and eating practices, hand washing before and after eating, benefits of cooked food and safe drinking water practices by chlorination and boiling of water.
- Rigorous steps to be taken to avoid open field defecation.
- Regular chlorination of the water sources, especially during rainy seasons.

Long term recommendations –

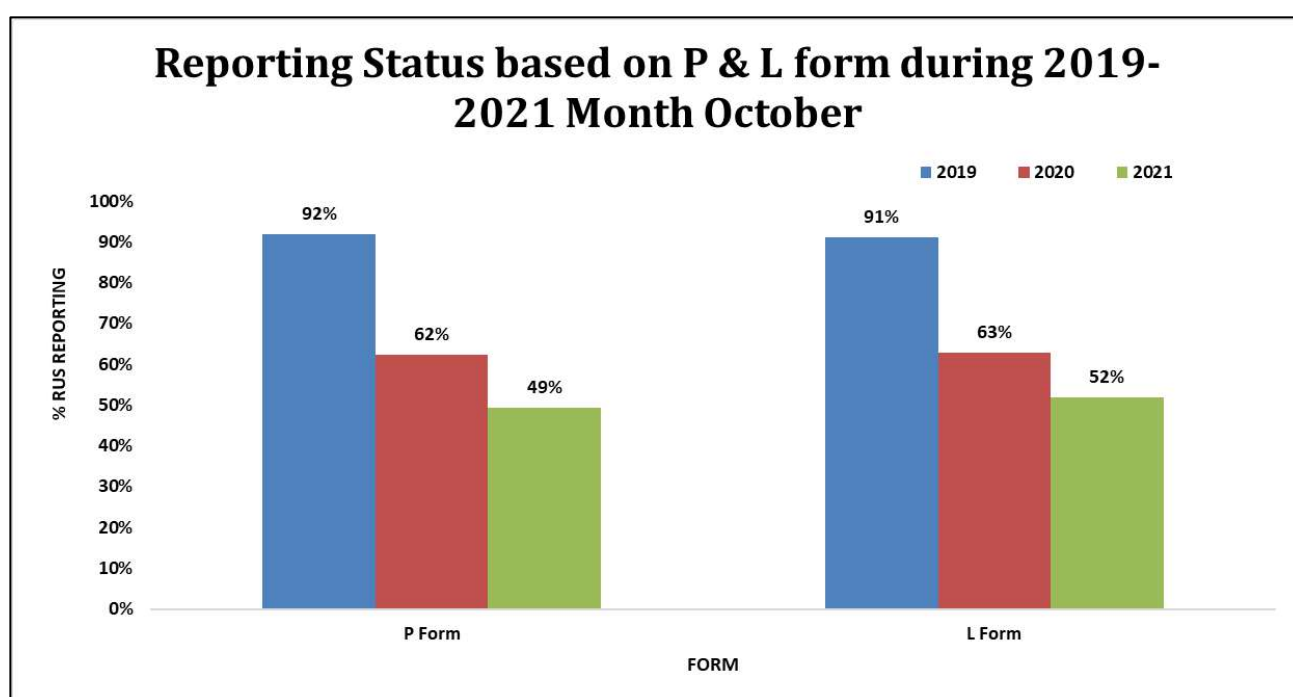
Preventive measures included phased construction of underground drainage system and relaying of water pipelines and domestic connection to run over the closed drainage lines.

CONCLUSIONS:

An outbreak of cholera is an alarming sign of problems in water and sanitation infrastructures, poor hygiene, and not healthy social practices and a weak public health system. Investigation of a cholera outbreak will help identify the cause of the outbreak, which in turn can help in recommending the control measures. Proper allocation of resources for timely detection through surveillance along with health awareness among the common masses can help in the prevention and preparedness against diseases such as cholera.

Surveillance data of Enteric Fever, Acute Diarrhoeal Disease, Viral Hepatitis A & E, Dengue Leptospirosis, Dengue, Chikungunya, Leptospirosis and Seasonal Influenza A (H1N1) During October 2019 - 2021*

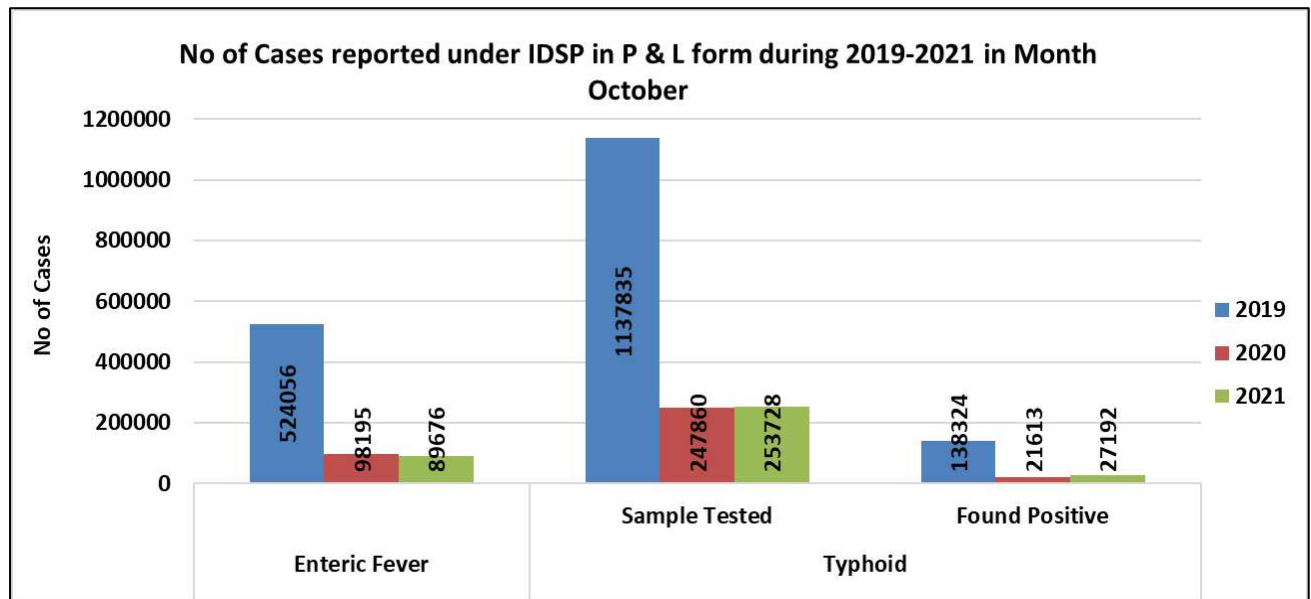
Fig. 3: RU-wise reporting based on P & L forms during October 2021



As shown in Fig 3, in October 2019, 2020 and 2021, the 'P' form reporting percentage (i.e. % RU reporting out of total in P form) was 92 %, 62% and 49% respectively across India, for all disease conditions reported under IDSP in P form. Similarly, L form reporting percentage was 91%, 63% and 52% 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 decreased in *October* 2021 compared to the same month in previous years for both P and L forms, thereby compromising on the quality of surveillance data.

Fig. 6: No. of Enteric Fever Cases reported under P & L form during October 2019 - 2021



As shown in Fig 6, number of presumptive enteric fever cases, as reported by States/UTs in 'P' was 524056 in October 2019; 98195 in October 2020 and 89676 in October 2021. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in October 2019; 1137835 samples were tested for Typhoid, out of which 138324 were found positive. In October 2020; out of 247860 samples, 21613 were found to be positive and in October 2021, out of 253728 samples, 27192 were found to be positive and in October 2021, out of 280579 samples, 21901 were found to be positive.

Sample positivity has been 12%, 9% and 1% in October month of 2019, 2020 & 2021 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. 7: State/UT wise Presumptive Enteric fever cases & outbreaks for October 2021

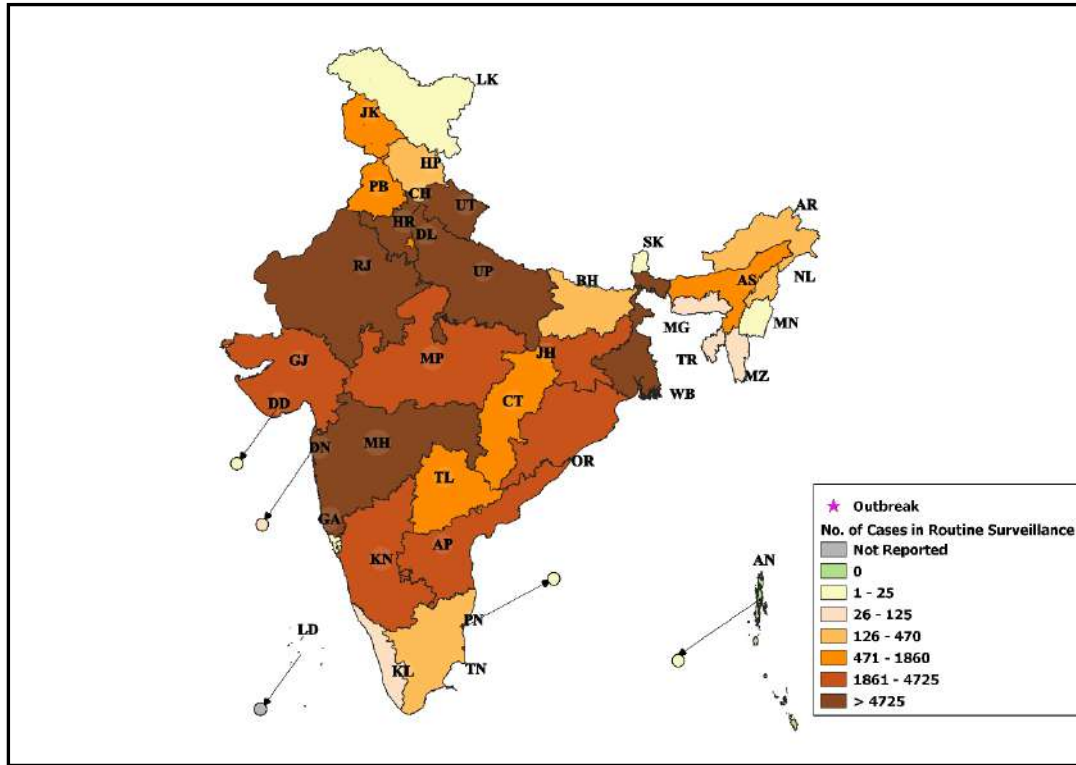


Fig. 8: State/UT wise Lab Confirmed Typhoid cases and outbreaks for October 2021

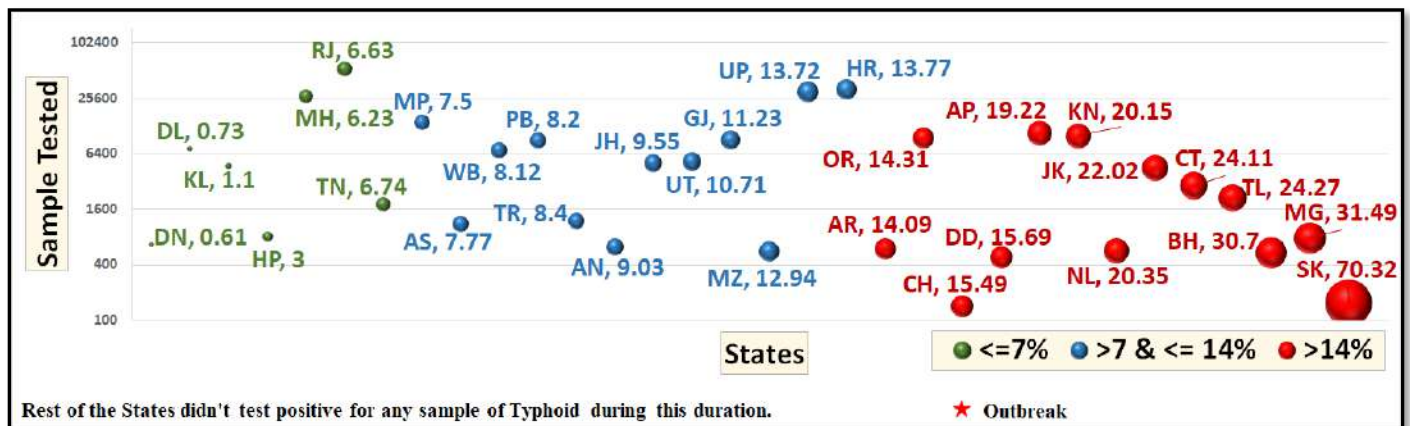
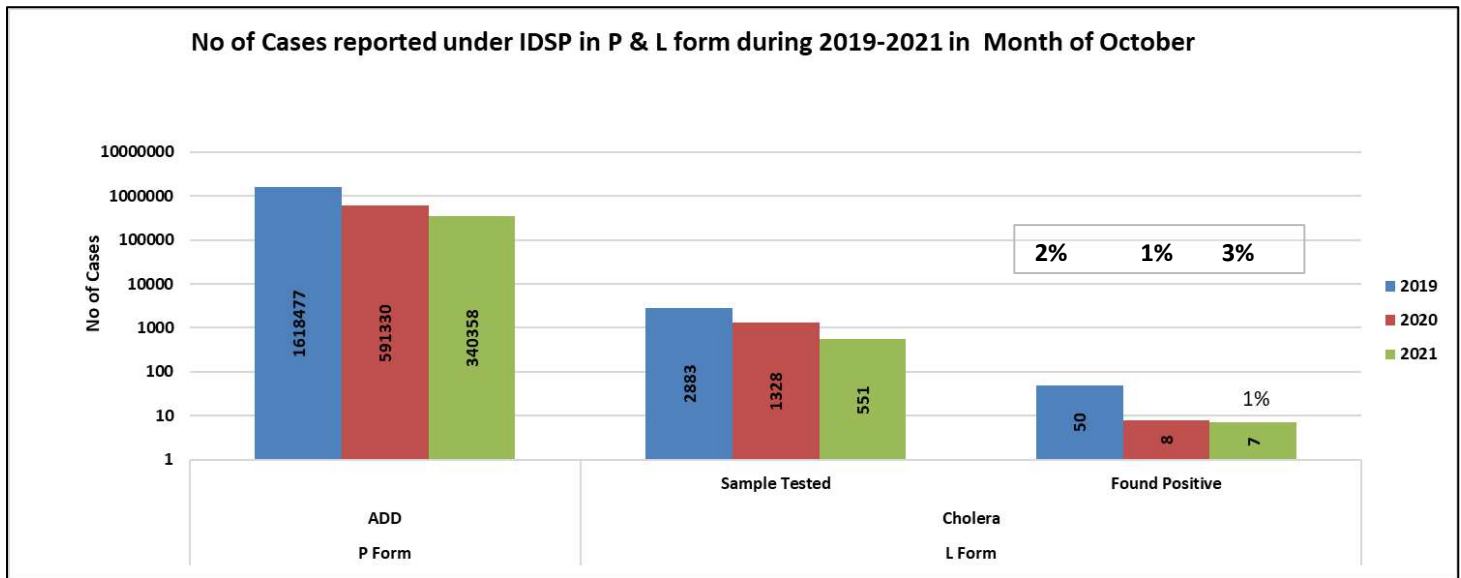


Fig. 9: No. of ADD Cases reported under IDSP in P Form & Lab confirmed Cholera cases in L form during October 2019 - 2021



As shown in Fig 9, number of Acute Diarrhoeal Disease cases, as reported by States/UTs in ‘P’ was 1618477 in *October 2019*, 591330 in *October 2020* and 340358 in *October 2021*. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in October 2019, 2883 samples were tested for Cholera out of which 50 tested positive; in October 2020, out of 1328 samples, 8 tested positive for Cholera and in October 2021, out of 551 samples, 7 tested positive.

Sample positivity of samples tested for Cholera has been 2%, 1% and 3% in October month of 2019, 2020 & 2021 respectively.

Fig. 10: State/UT wise Presumptive ADD cases and outbreaks for October 2021

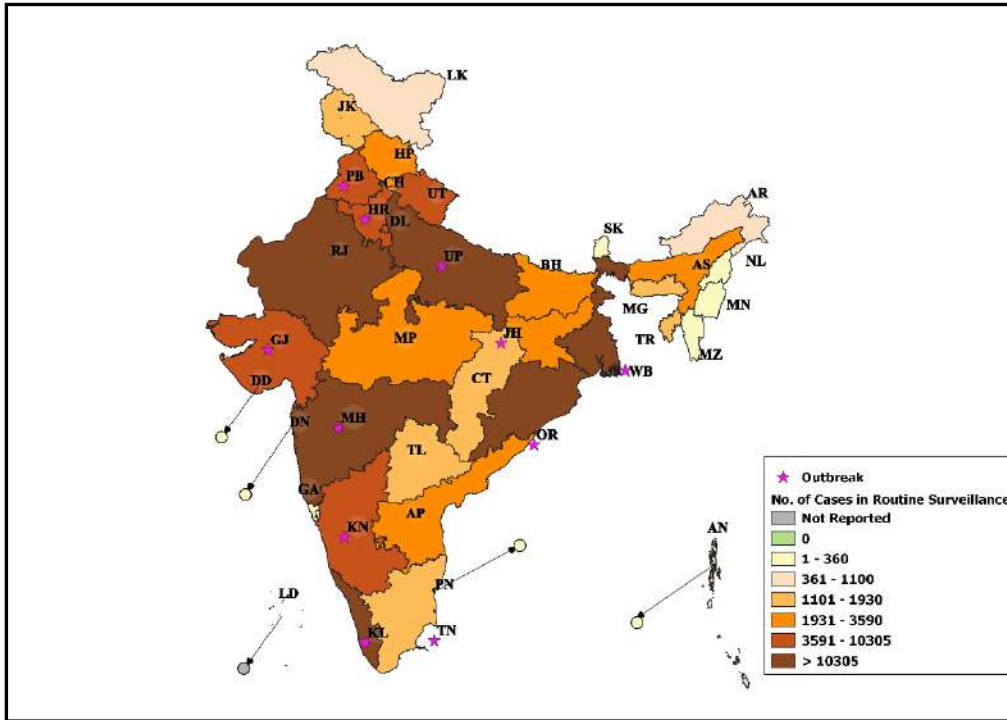


Fig. 11: State/UT wise Lab Confirmed Cholera cases and outbreaks for October 2021

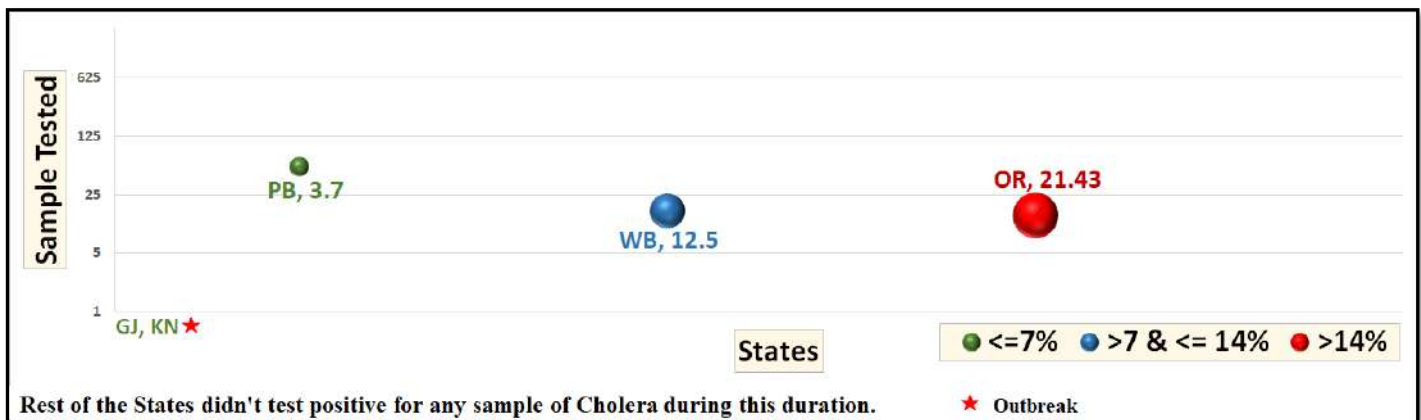
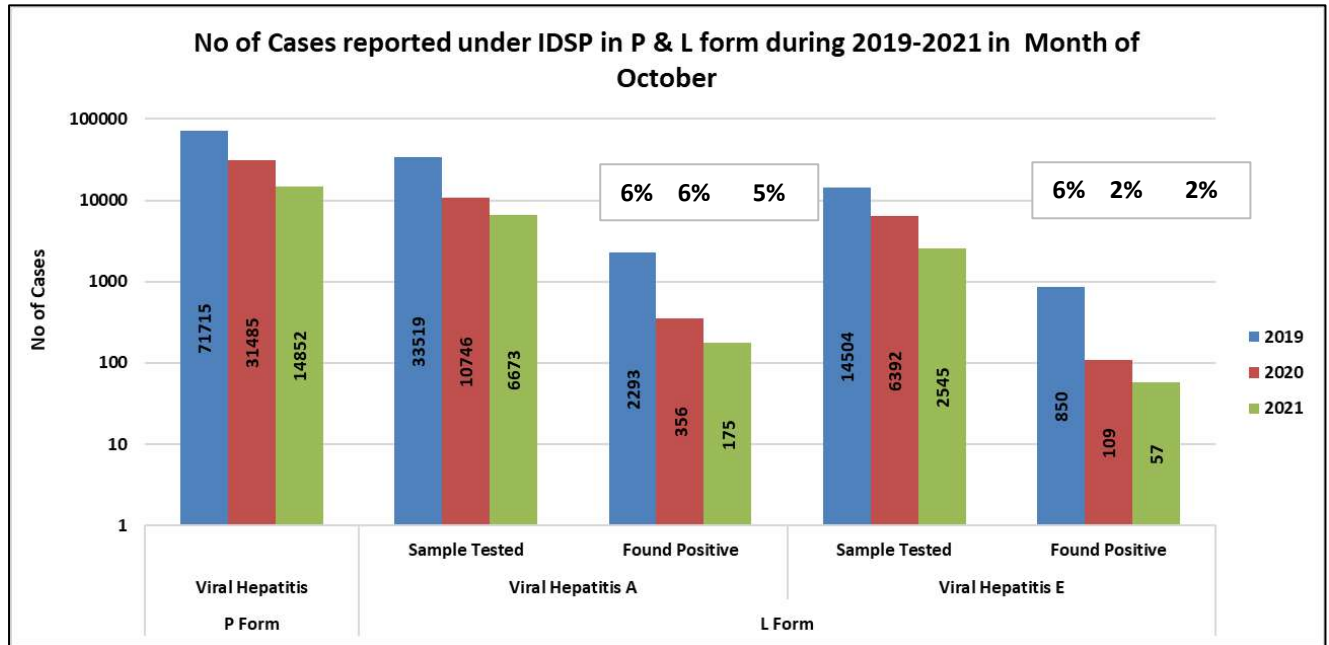


Fig. 12: No. of Viral Hepatitis Cases reported under IDSP in P form & Viral Hepatitis A & E cases reported under L form during October 2019 - 2021



As shown in Fig 12, number of presumptive Viral Hepatitis cases was 71715 in October 2019, 31485 in October 2020 and 14852 in October 2021. These presumptive cases were diagnosed on the basis of case definitions provided under IDSP.

As reported in L form for Viral Hepatitis A, in October 2019; 33519 samples were tested out of which 2293 were found positive. In *October* 2020 out of 10746 samples, 356 were found to be positive and in *October* 2021, out of 6673 samples, 175 were found to be positive.

Sample positivity of samples tested for Hepatitis A has been 6%, 6% and 5% in October month of 2019, 2020 & 2021 respectively.

As reported in L form for Viral Hepatitis E, in October 2019; 14504 samples were tested out of which 850 were found positive. In October 2020; out of 6392 samples, 109 were found to be positive and in October 2021, out of 2545 samples, 57 were found to be positive.

Sample positivity of samples tested for Hepatitis E has been 6%, 2% and 2% in October month of 2019, 2020 & 2021 respectively.

Fig. 13: State/UT wise Presumptive Viral Hepatitis cases and outbreaks for October 2021

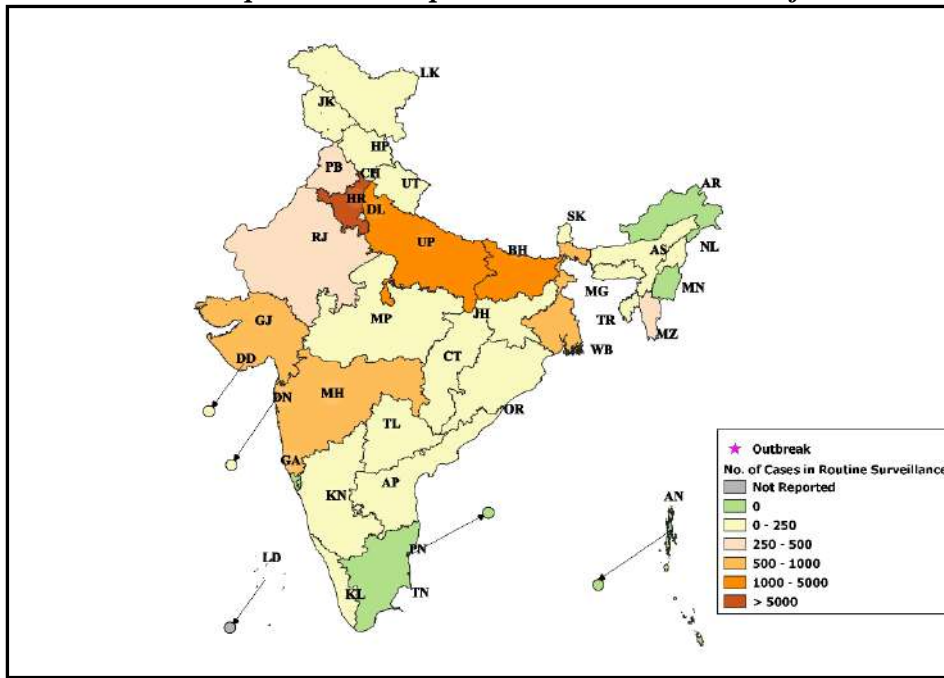


Fig. 14: State/UT wise Lab Confirmed Viral Hepatitis A cases and outbreaks for October 2021

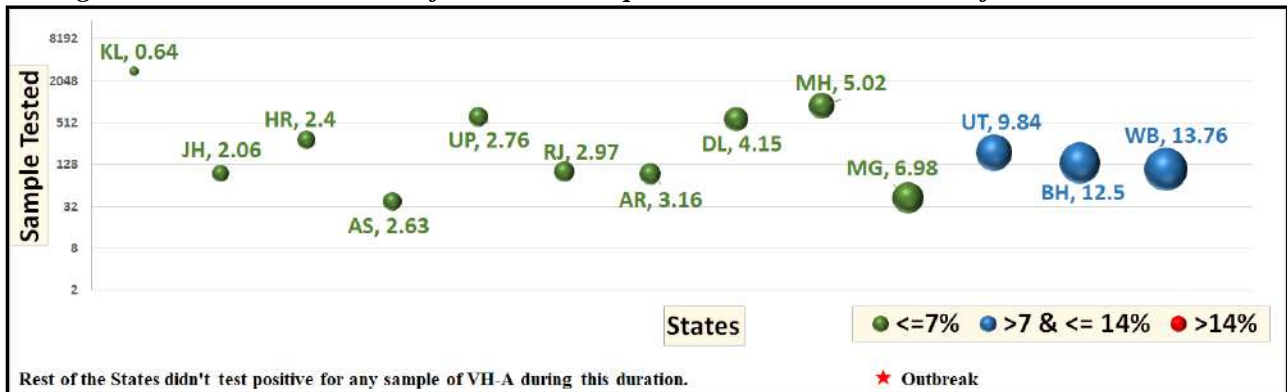


Fig. 15: State/UT wise Lab Confirmed Viral Hepatitis E cases and outbreaks for October 2021

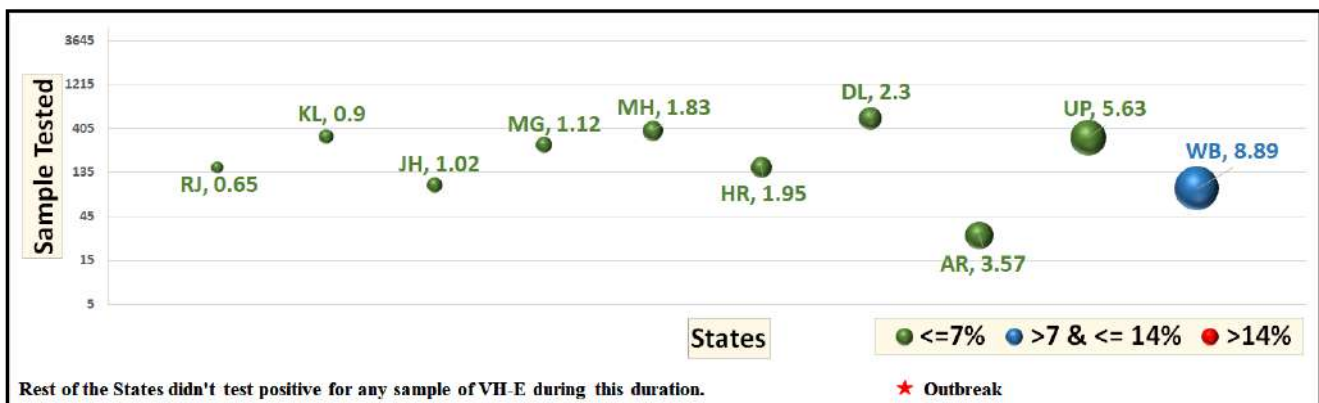
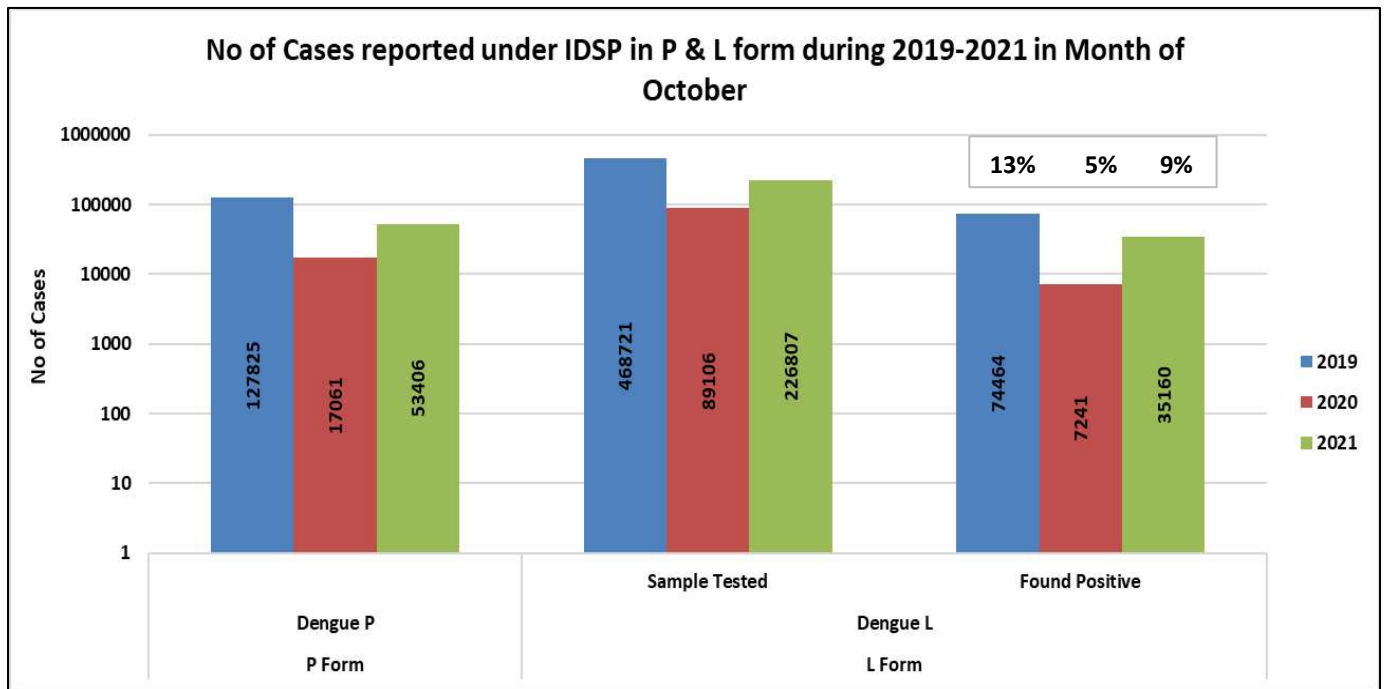


Fig. 16: No. of Dengue cases reported under IDSP in P & L form during October 2021



As shown in Fig 16, number of presumptive Dengue cases, as reported by States/UTs in ‘P’ form was 127825 in *October* 2019; 17061 in *October* 2020 and 53406 in *October* 2021. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in *October* 2019 468721 samples were tested for Dengue, out of which 74464 were found positive. In *October* 2020; out of 89106 samples, 7241 were found to be positive and in *October* 2021, out of 226807 samples, 35160 were found to be positive.

Sample positivity of samples tested for Dengue has been 13%, 5% and 9% in *October* month of 2019, 2020 & 2021 respectively.

Fig. 17: State/UT wise Presumptive Dengue cases and outbreaks for October 2021

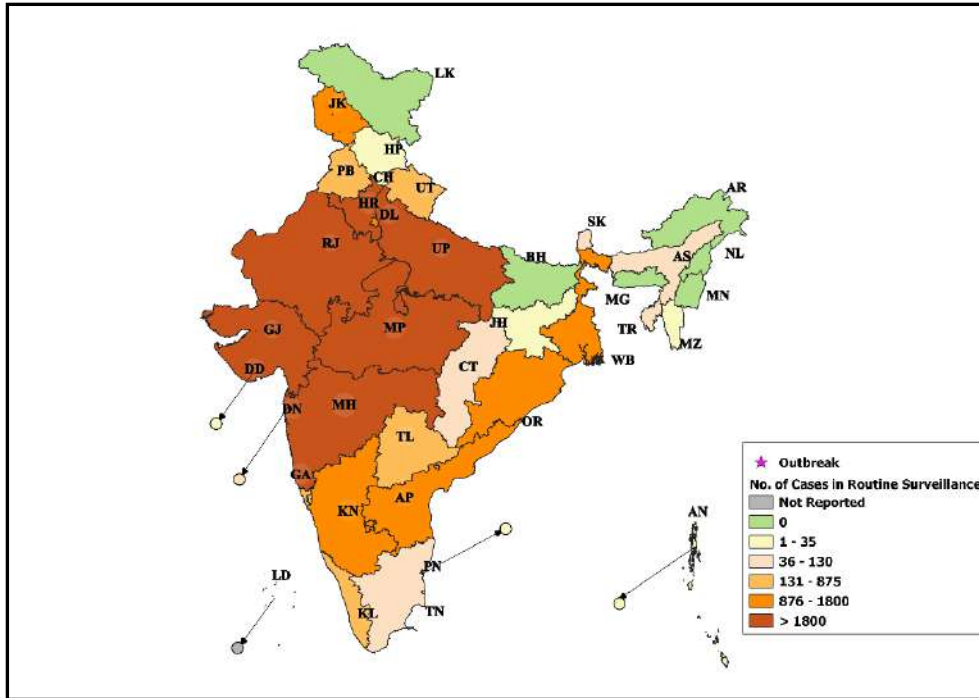


Fig. 18: State/UT wise Lab Confirmed Dengue cases and outbreaks for October 2021

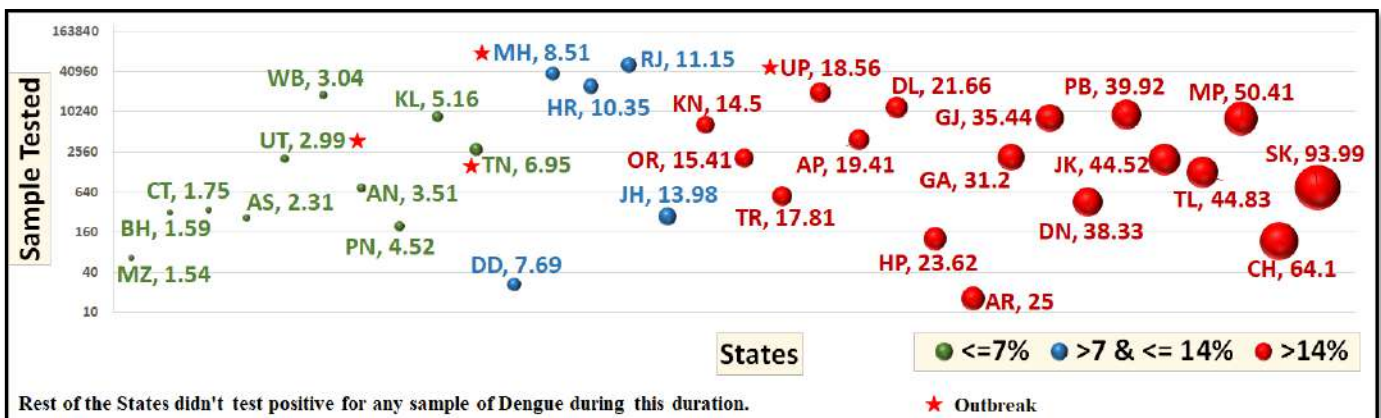
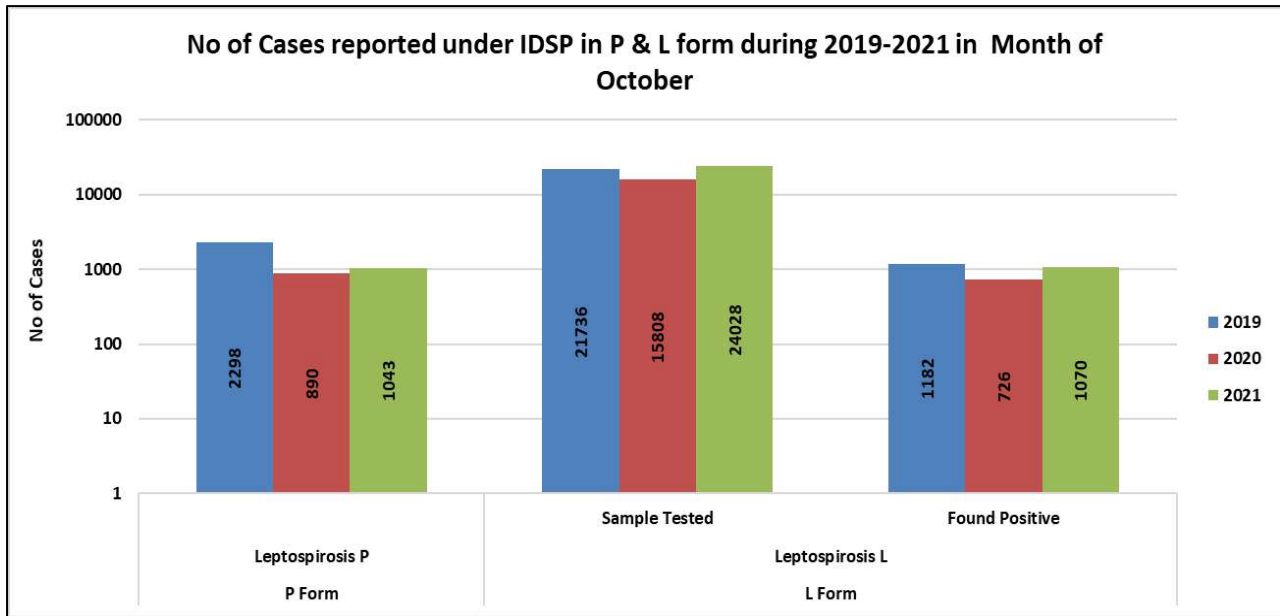


Fig. 19: No. of Leptospirosis Cases reported under IDSP in P & L form during October 2019 - 2021



As shown in Fig 19, number of presumptive Leptospirosis cases, as reported by States/UTs in ‘P’ form was 2298 in *October* 2019; 890 in *October* 2020 and 1043 in *October* 2021. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in *October* 2019; 21736 samples were tested for Leptospirosis, out of which 1182 were found positive. In *October* 2020; out of 15808 samples, 726 were found to be positive and in *October* 2021, out of 24028 samples, 1070 were found to be positive.

Sample positivity of samples tested for Leptospirosis has been 5%, 5% and 4% in *October* month of 2019, 2020 & 2021 respectively.

Fig. 20: State/UT wise Presumptive Leptospirosis cases and outbreaks for October 2021

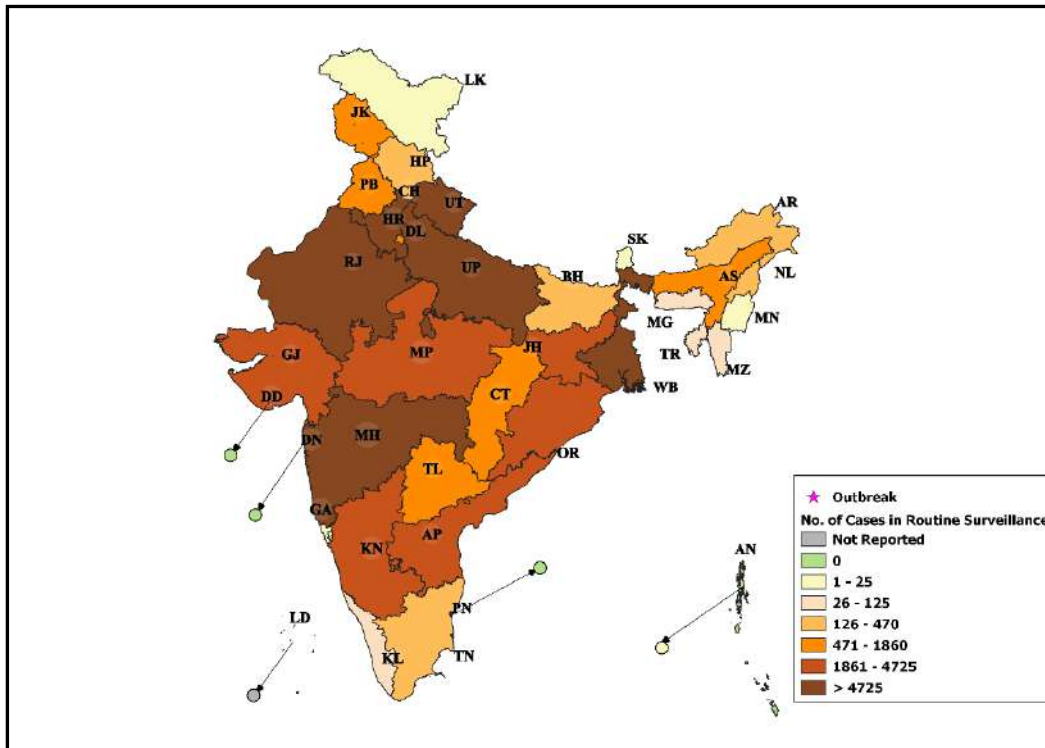


Fig. 21: State/UT wise Lab Confirmed Leptospirosis cases and outbreaks for October 2021

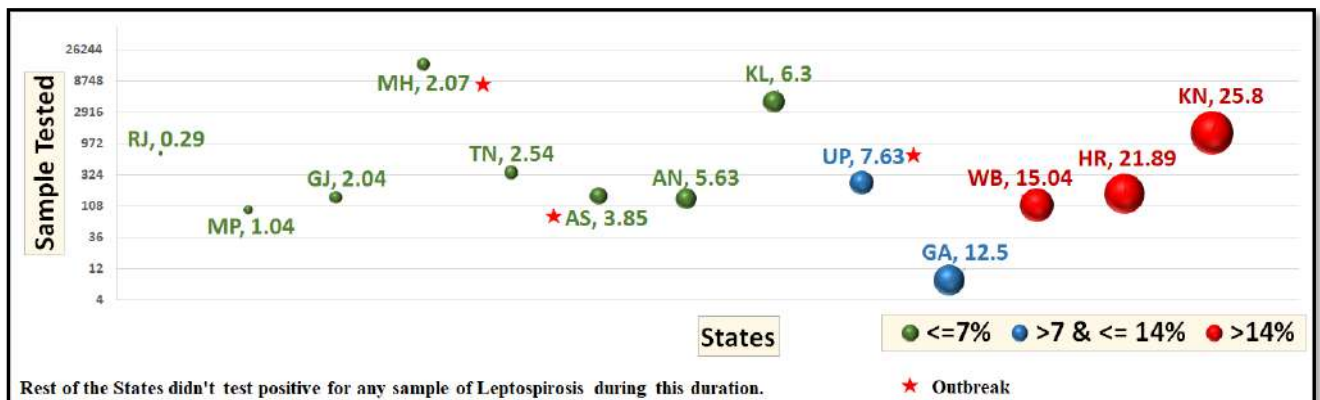
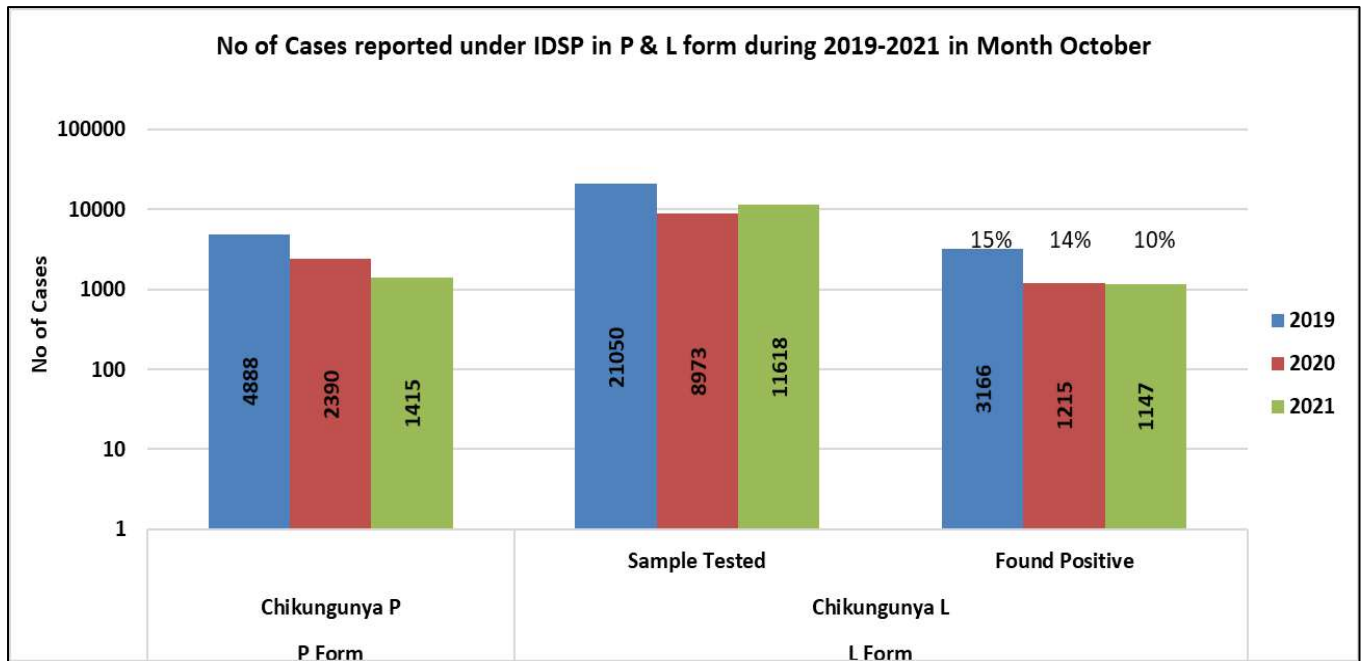


Fig. 22: No. of Chikungunya Cases reported under IDSP in P & L form during October 2019 - 2021



As shown in Fig 22, number of presumptive Chikungunya cases, as reported by States/UTs in ‘P’ form was 4888 in *October* 2019; 2390 in *October* 2020 and 1415 in *October* 2021. These presumptive cases are diagnosed on the basis of standard case definitions provided under IDSP.

As reported in L form, in *October* 2019; 21050 samples were tested for Chikungunya, out of which 3166 were found positive. In *October* 2020; out of 8973 samples, 1215 were found to be positive and in *October* 2021, out of 11618 samples, 1147 were found to be positive.

Sample positivity of samples tested for Chikungunya has been 15%, 14% and 10% in *October* month of 2019, 2020 & 2021 respectively.

Fig. 23: State/UT wise Presumptive Chikungunya cases and outbreaks for October 2021

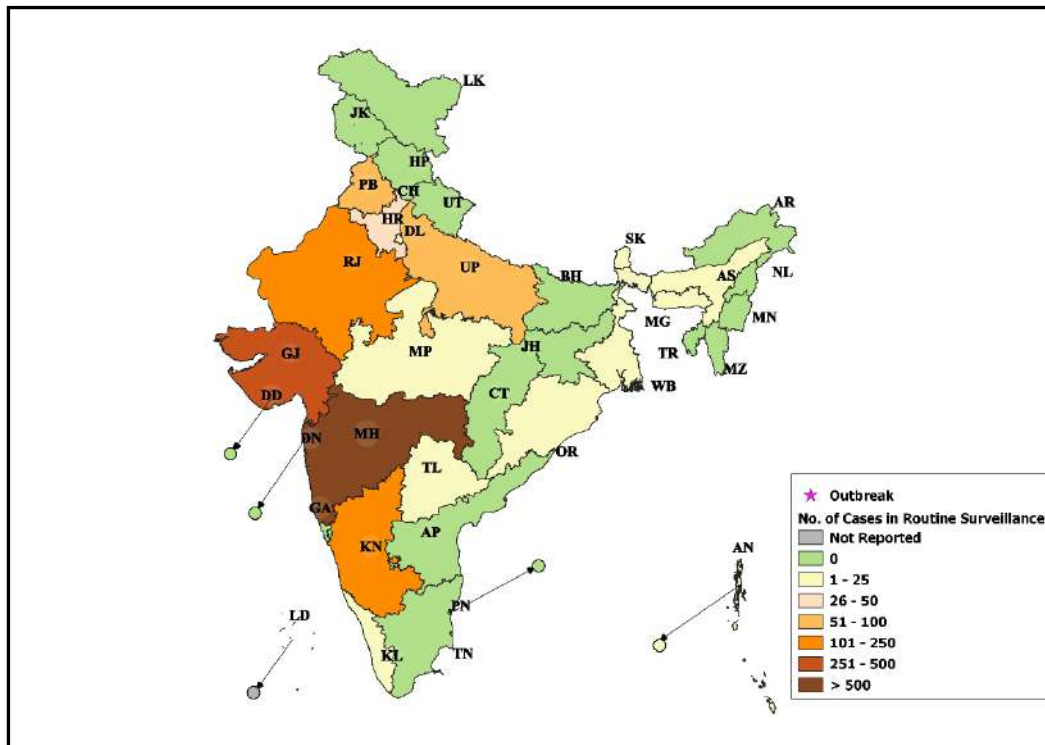


Fig. 24: State/UT wise Lab Confirmed Chikungunya cases and outbreaks for October 2021

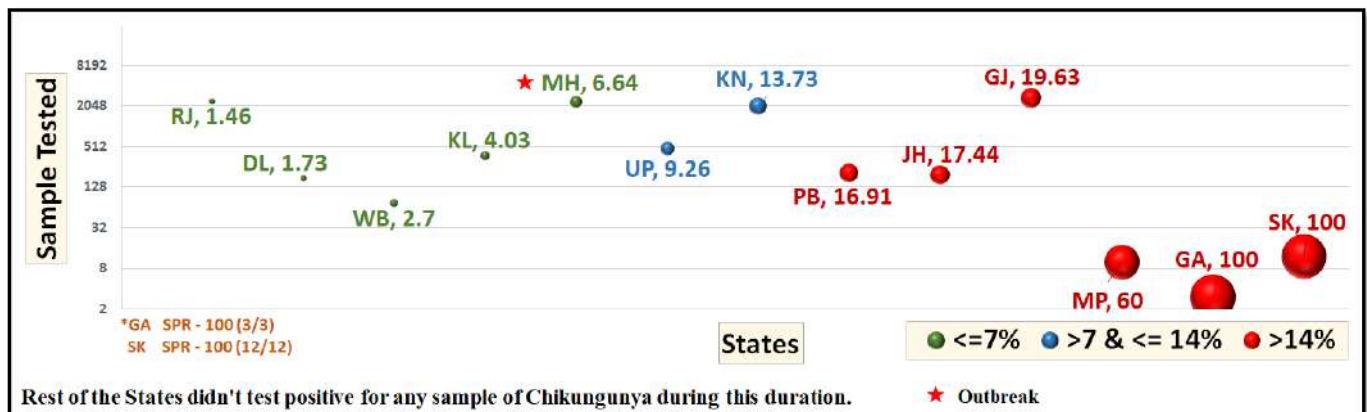
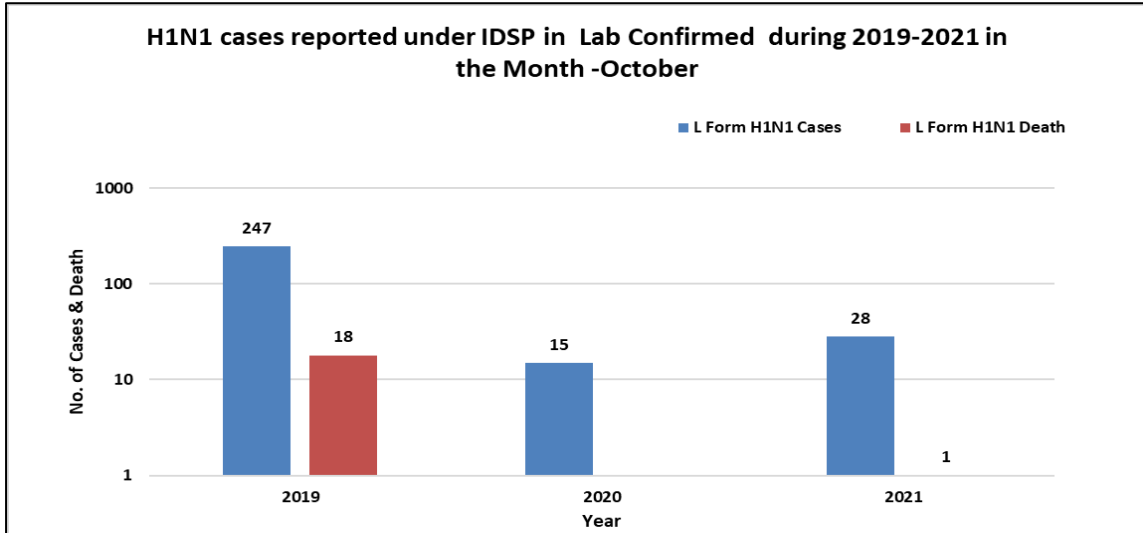
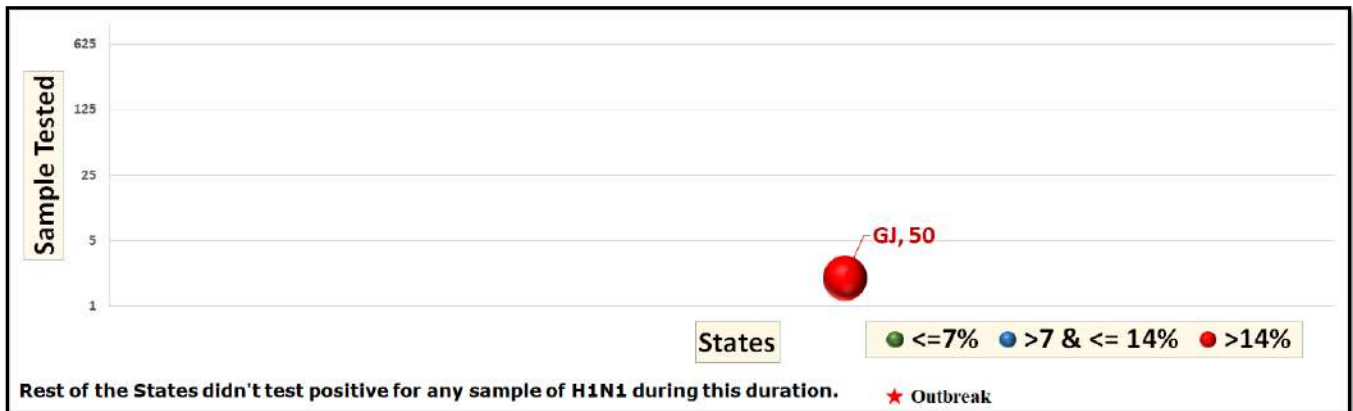


Fig. 25: H1N1 cases reported under IDSP in L Form during 2019-2021 in October 2021



As shown in Fig. 25, as reported in L form, in October 2019, there were 247 cases and 18 deaths. In *October* 2020, there were 15 cases and 0 deaths; and in *October* 2021, there were 28 cases and 1 death. Case fatality rate for H1N1 were 7.3%, 0.00% and 3.6 % in October month of 2018, 2019 & 2020 respectively.

Fig. 26: State/UT wise H1N1 cases and outbreaks for October 2021



Action From The Field

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.

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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: dinricd@nic.in & idsp-npo@nic.in

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