



All India Coordinated Research Project
ON
Animal Disease Monitoring and Surveillance
(AICRP on ADMAS)

Annual Report
2014-15



**ICAR-NATIONAL INSTITUTE OF VETERINARY EPIDEMIOLOGY
& DISEASE INFORMATICS**

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It is the determined, persistent and untiring endeavor of the Principal investigators and Co-Principal Investigators and their dedicated team members who collected the data for the epidemiological understanding of the livestock diseases in the country which in turn help to formulate the disease control strategies.

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H. RAHMAN
DIRECTOR
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AICRP ON ADMAS



PREFACE

The new initiatives started in our institute at the beginning of the 12th five year plan have begun to yield results. At the outset, the NADRES monthly report that is being sent to the Directors of all AH departments in the country over one year have started generating results. Some of the states which do not have AICRP on ADMAS centers have also started sending monthly disease reports. Further, the Institute has taken initiative in roping in Krishi Vigyana Kendras (KVK) of the country. In this regard, the veterinarians of KVKs (Zone II, Zone IV and Zone VII) have been apprised of basic epidemiology and sampling techniques; with little more encouragement we are hoping to cover more areas for surveillance.

Further, ten more centers will be added, thus making it a family of 25 centers thereby majority of the country will be under livestock disease surveillance.

One more feather has been added to NIVEDI's hat in the form of publication of EpiNET.India, a monthly e-publication. This has received good response from planners and researchers.

Perusal of the records shows that there is a decline in the number of livestock diseases being reported. This could be a first step in control of the diseases in our country. The centers of AICRP on ADMAS have a major role to play in this regard.

The sero-epidemiology of diseases has led to understand the extent of the disease in the country. The National Livestock Serum Repository, an offshoot of AICRP on ADMAS has been tremendously enriched by participation of the centers. New sampling frames have been developed which gives due weightage to livestock population of the village.

The ICAR sponsored training programmes on **Livestock disease informatics and biostatistics** and **Field epidemiology** training programmes were conducted for the benefit of scientists of AICRP on ADMAS centers and other veterinarians of the country.

Overall the performances of the centers are good and such cooperation from them will help in further improving the programme. This will in turn help in better surveillance of livestock diseases in our country thus reducing the incidences of diseases and finally benefit the livestock farmers of the country.

I once again congratulate all the centers and solicit continued support for the programme.

DR. H. RAHMAN

DIRECTOR
NIVEDI & PROJECT COORDINATOR
AICRP ON ADMAS

Central Laboratory Report

National Livestock Disease Profile

The central laboratory has the responsibility of collating the data submitted by the 15 AICRP on ADMAS centers and formatting it for epidemiological analysis. It will analyse the data for major livestock diseases of the country and presents it on monthly basis as a e-bulletin. The data consists of major livestock diseases reported by the animal husbandry department of the state governments. This data is compiled by them at monthly intervals on four major heads viz., Number of outbreaks, Number of attacks, Number of deaths and Number of vaccinations. Occasionally the number of susceptible animals during the particular outbreak event is also mentioned. This data is arranged species-wise and disease-wise used for the analysis. The data is also uploaded to the National Animal Disease Referral Expert System (NADRES) database for use at the national level. As on 31st March, 2015 the data base has 102,252 data from 1987 to 2015. During the year under report (2014) 7,586 data have been received and compiled for analysis. The following is the analysis carried out using this data.

Livestock Disease Ranking:

The cumulative monthly livestock disease data was pooled and the sum of the outbreak reports of each disease was tabulated in descending order. The top ten diseases were taken as the top diseases reported in the country. The following graph shows the top ten diseases (Fig. 1 & 2). It may be noted that top positions are parasitic diseases. Amongst the infectious diseases, foot rot and Foot and Mouth Disease are at the top. The probable reasoning for more parasitic diseases being reported could be that the government is implementing stringent control measures for the infectious diseases but there is no or limited national control programme. Second reason could be that the parasitic diseases are easy for diagnosis which can be done at dispensary / hospital level with minimum equipment and reagents and thirdly, the diagnosis can be done without submitting the clinical samples to either district or central diagnostic laboratory which takes more time to get the confirmation.

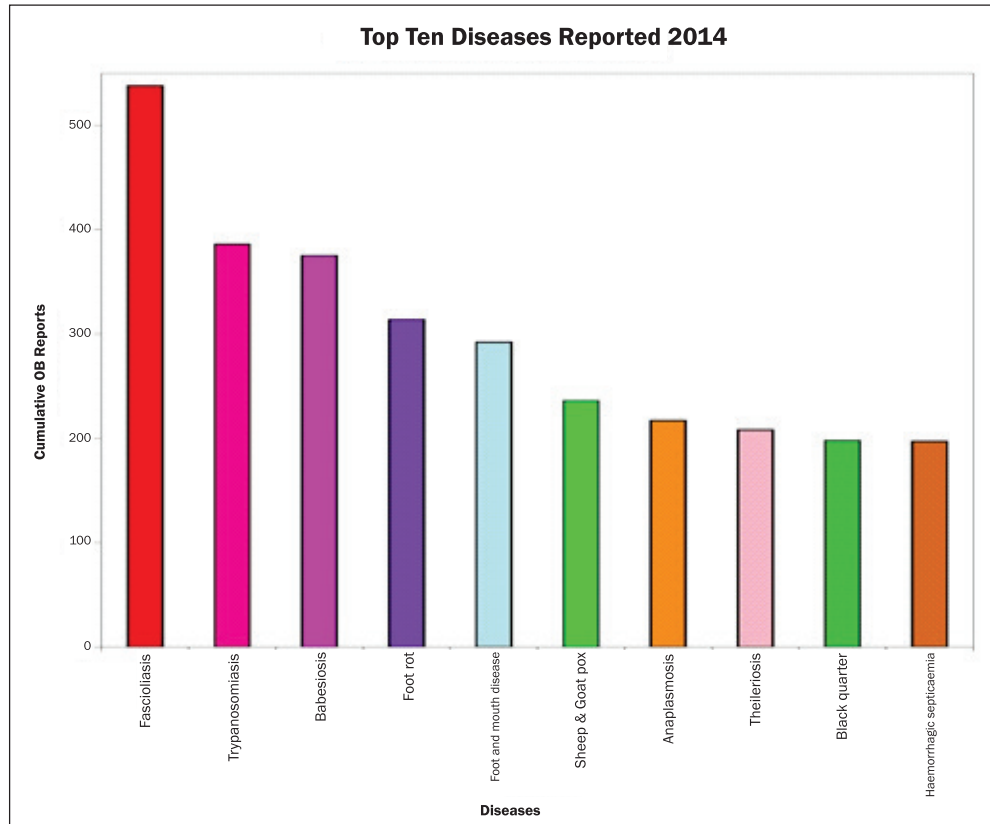


Fig. 1: Top diseases of the country

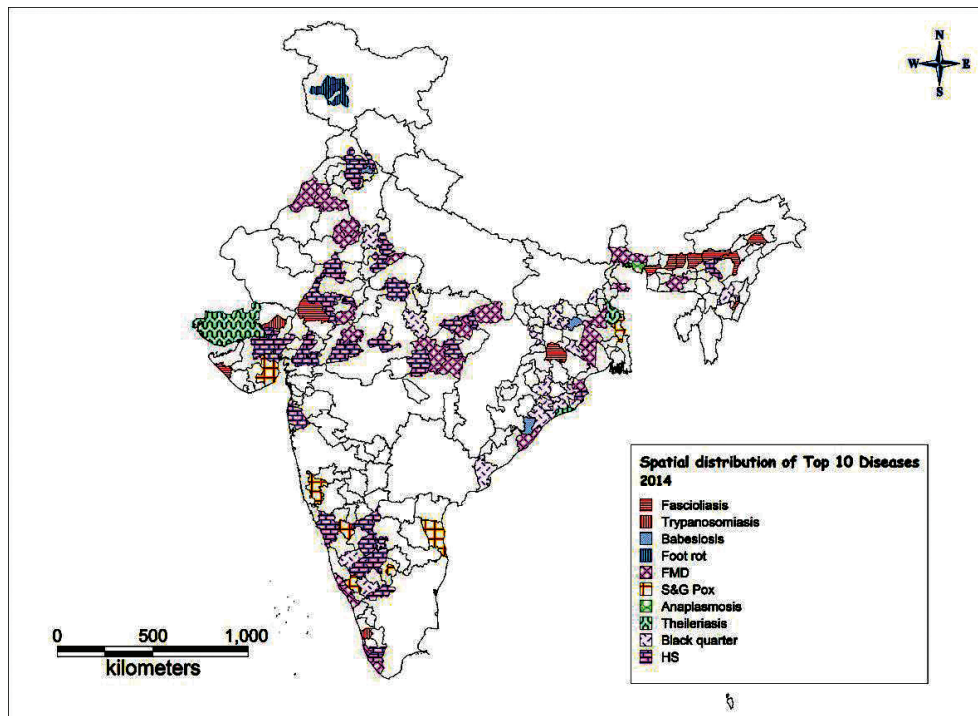


Fig 2 : Spatial distribution of top ten diseases during 2014.

Bacterial Diseases:

The data was analysed to know the status of the bacterial diseases that were reported during 2014. Although it was reported only from the state of Jammu and Kashmir, it occupies the first place. Black quarter, a neglected disease from the point of national control programme, takes the second place. It has been reported by 12 AICRP on ADMAS center. This signifies two issues. The foremost is that BQ is an important disease which needs to be tackled to reduce its incidence as well as the economic loss and secondly, there will be a need for a thorough epidemiological investigation in the light of the risk factors such as soil type and characteristics, metrological parameters, species involvement etc. Haemorrhagic septicaemia, hitherto used to occupy the first position, has moved to third position (Fig. 3). This could be due to the control measures taken up not only for HS but also for FMD since these two diseases co-occur significantly (M.R. Gajendragad, K. P. Suresh, G.B. Manjunatha Reddy, Sandip Santra and H. Rahman (2015) Epidemiology and modeling of co-occurrence of Foot and Mouth Disease and Haemorrhagic Septicaemia : An Indian scenario. [Sent for publication](#)). Anthrax and Enterotoxaemia, although occur sporadically, are significant since they occupy fourth and fifth position under national ranking. Hence, a detailed epidemiological study was undertaken for Anthrax and the resulted in a scientific publication (Gajendragad, M.R., Suresh, K.P., Manjunatha Reddy, G. B., Gowri Yale, Blessy, R. and Rahman, H. (2015) Epidemiology of Anthrax in India and outbreak prediction using poison, negative binomial and zero inflated models. Sent for publication)

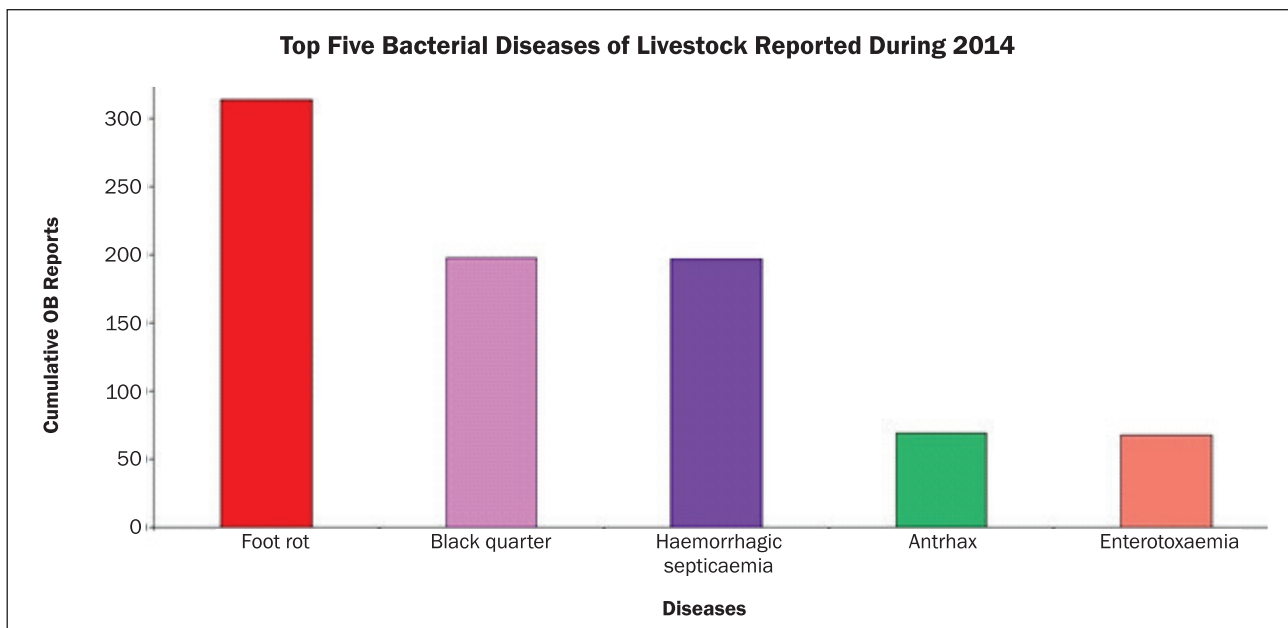


Fig.3: Top Bacterial Diseases

Foot rot has been recorded throughout the year with a peak during the month of March (Fig. 4). Since it has been observed only in one state (Jammu and Kashmir), the occurrence of the disease during the month of March could be attributed to the local climatic conditions. It was observed that the temperature varied from 20°C to 24°C which could be conducive for the organism to grow and cause the disease.

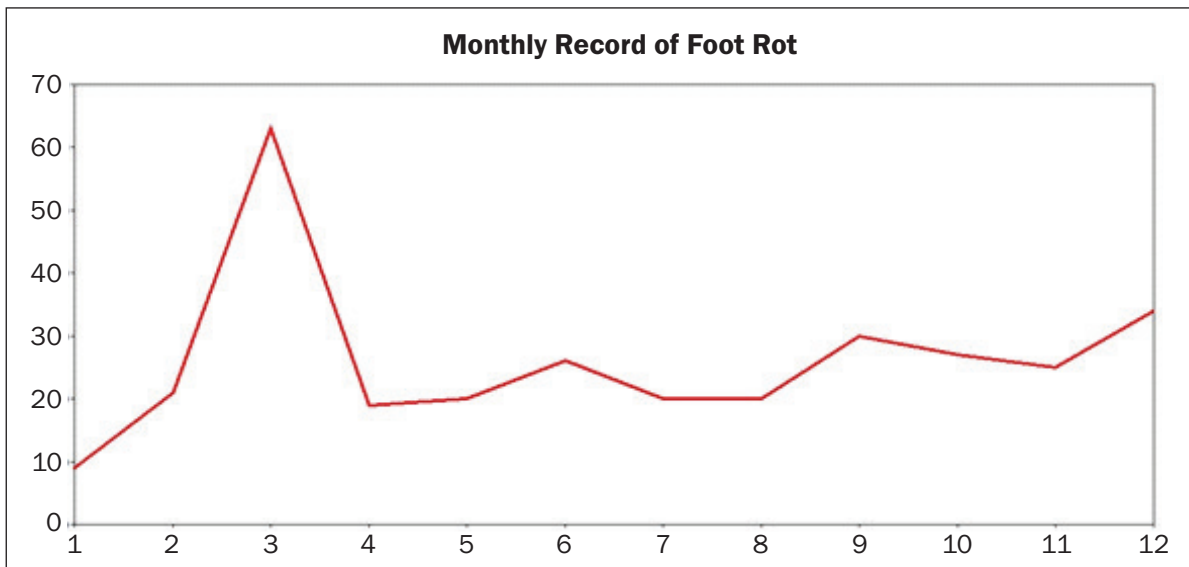


Fig 4 : Seasonal occurrence of Foot rot.

Black quarter has been recorded throughout the year with peaks during January, March and September (Fig. 5). This shows that there is no particular season for its occurrence. If the occurrence of the disease is attributed to rains in September and cold conditions in January, the summer peak can be reasoned out to be due to non availability of greens. This could have led to the animals to graze on whatever available leading to digging out the soil that could have brought out the organisms out and cause the disease. However, this hypothesis needs a thorough epidemiological investigation. The disease has been recorded by 15 states with highest number of cases from Karnataka followed by West Bengal. Karnataka has recorded highest number of cases in the month of September whereas majority of the other states have recorded it during winter. Orissa, Assam and Rajasthan recorded it the month of May.

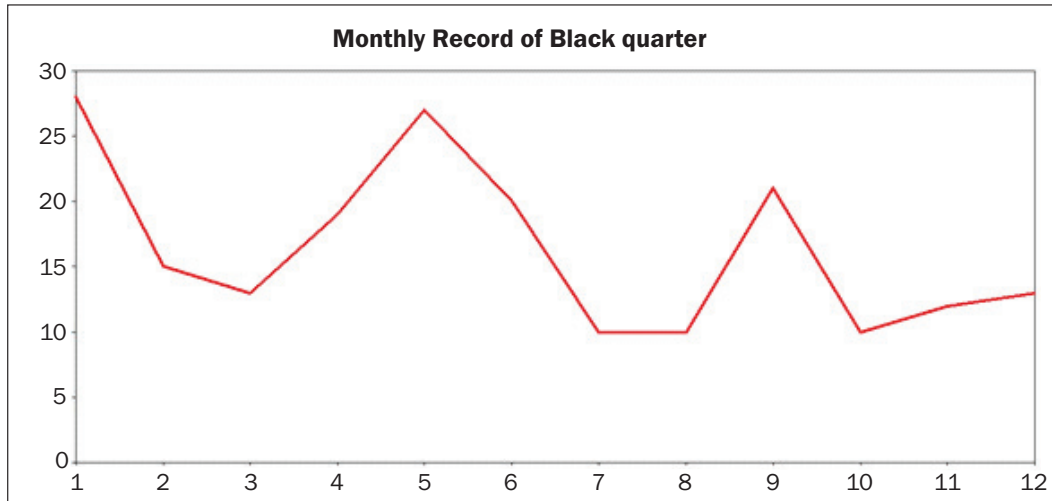


Fig 5 : Seasonal occurrence of Black quarter.

Haemorrhagic septicaemia has shown two clear peak, one during rainy season and other immediate post rains (Fig. 6). This pattern could be viewed as the stress conditions leading to the organisms to take up upper hand. The highest incidence of the disease has been recorded from Karnataka followed by West Bengal and Madhya Pradesh (Fig. 7). Maximum number of cases were seen during the month of August and September in these states indicating the monsoon stress in occurrence of the disease.

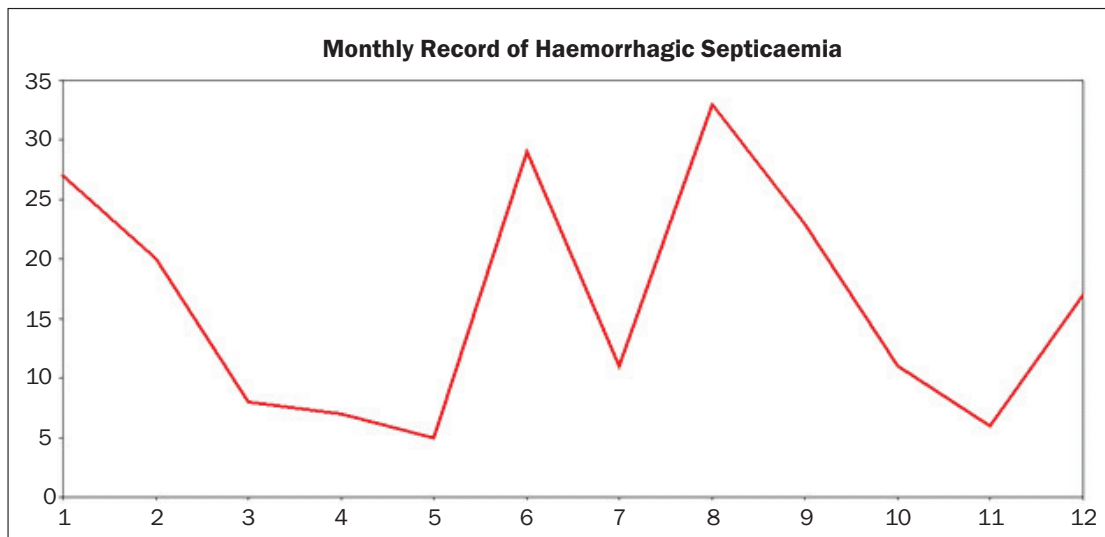


Fig 6: Seasonal occurrence of Haemorrhagic septicaemia.

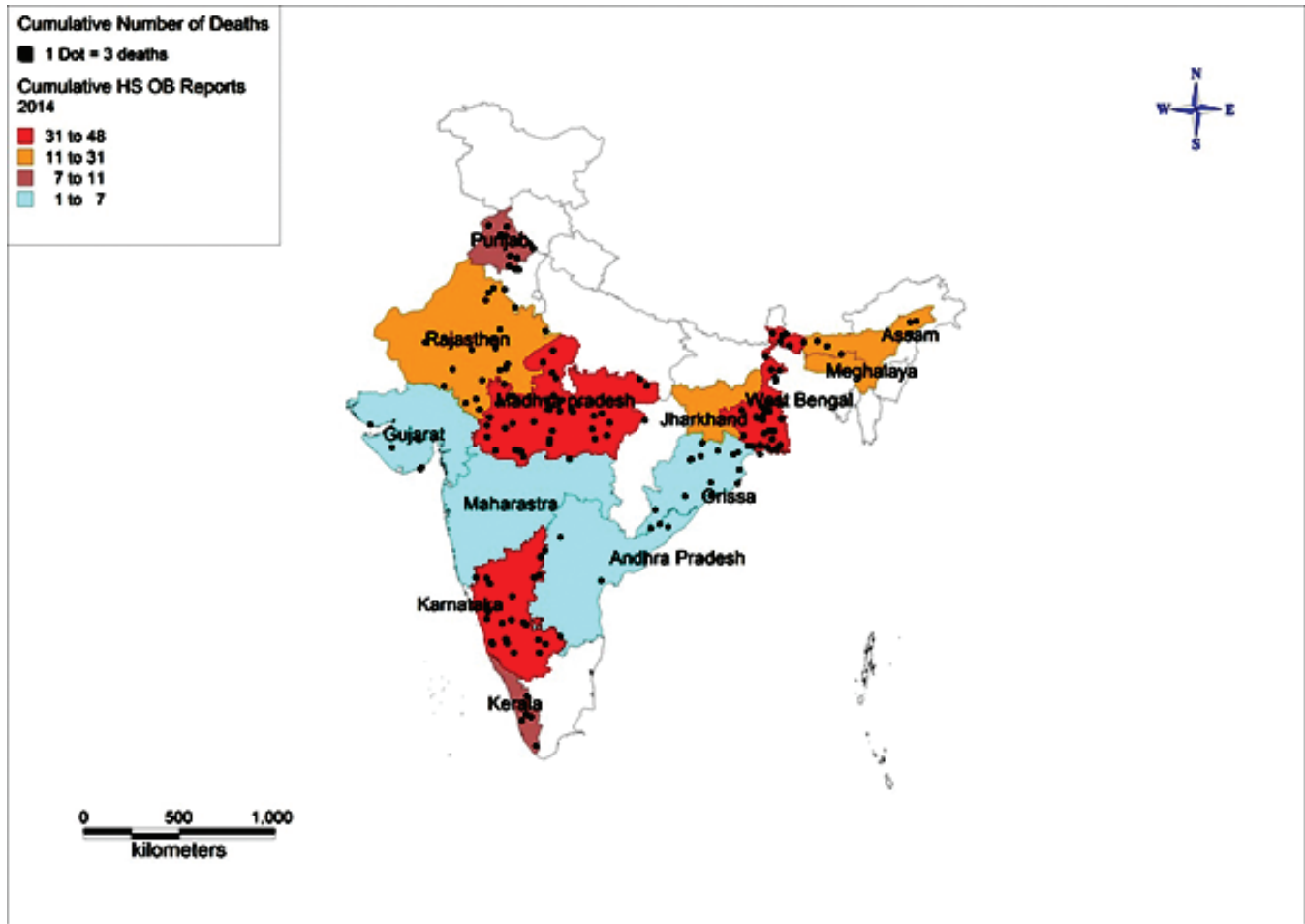


Fig 7: Spatial analysis of Haemorrhagic septicaemia.

Anthrax has also been recorded throughout the year with a prominent peak during the month of October (Fig. 8). West Bengal recorded the highest cases followed by Orissa and Karnataka (Fig. 9). West Bengal recorded maximum number of cases during August, September and October whereas Orissa recorded it June. Large number of incidence of the disease occurred in October in Karnataka.

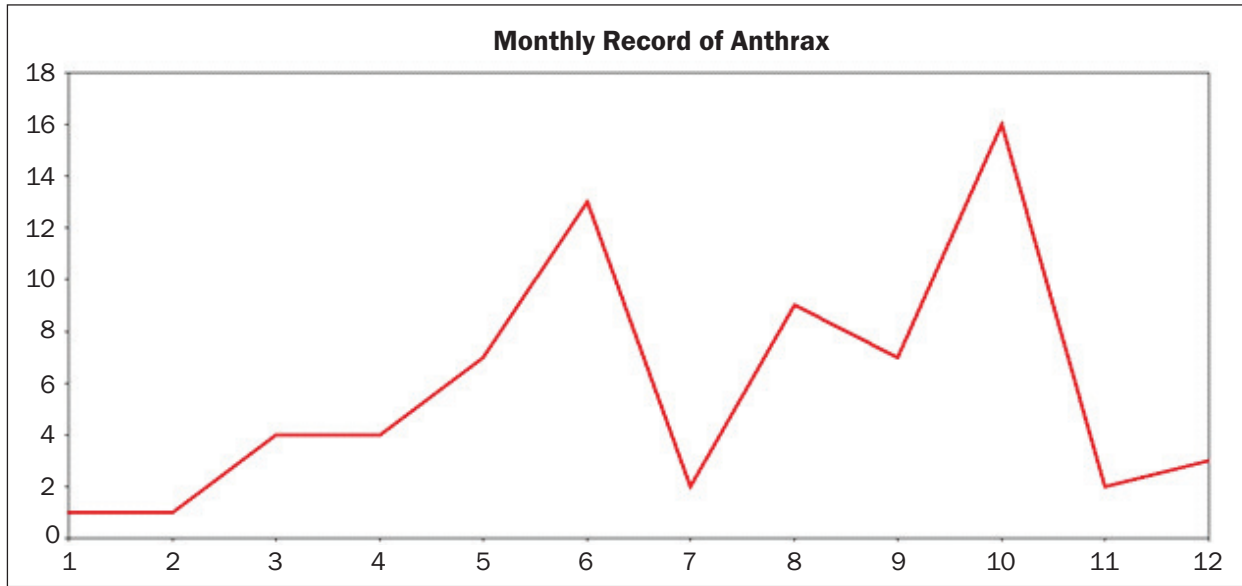


Fig 8: Seasonal occurrence of Anthrax.

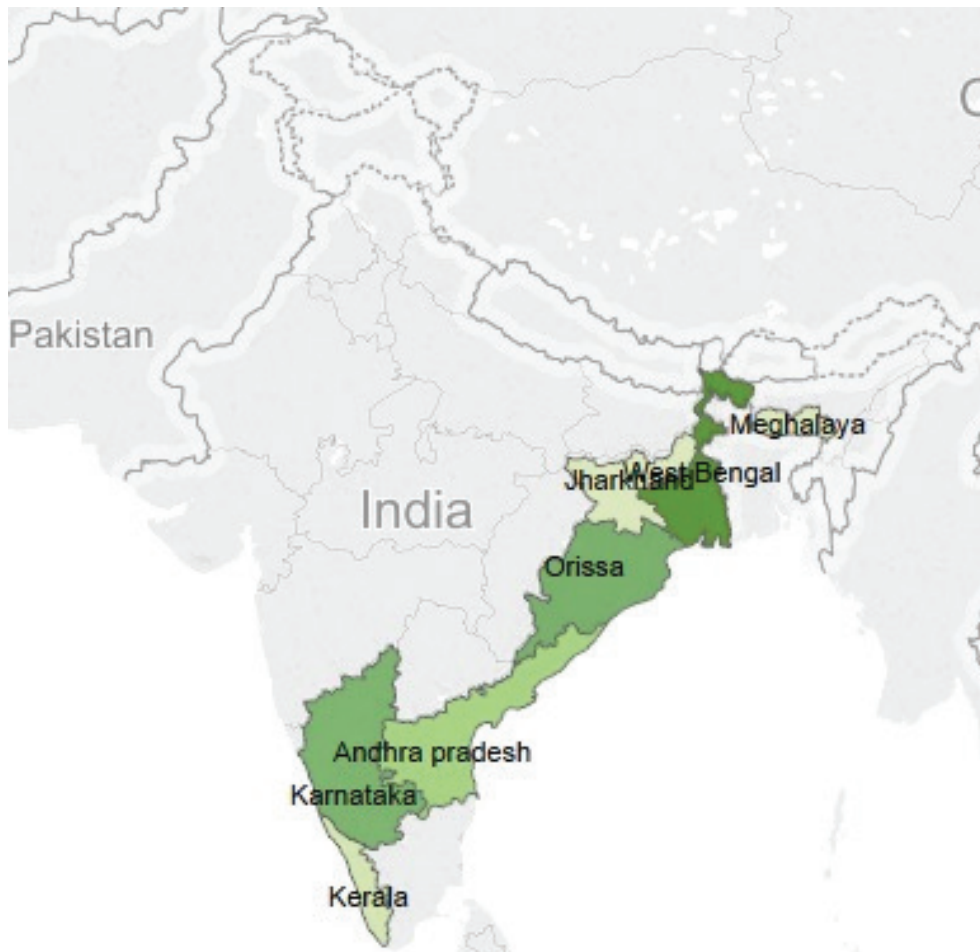


Fig 9: Spatial depiction of occurrence of Anthrax.

Enterotoxaemia occurred throughout the year as a low incidence however a sudden peak was noticed during the month of May. The disease has been mainly reported by south Indian states like Karnataka (43%), Andhra Pradesh (38%) and Kerala (2%). Andhra Pradesh reported maximum outbreaks of the disease during the month of May whereas Karnataka during the month of December. Of the six states reporting the disease during 2014, five of them have reported it in the month of May (Fig. 10). Thus it is difficult to assign the seasonal impact on the disease.

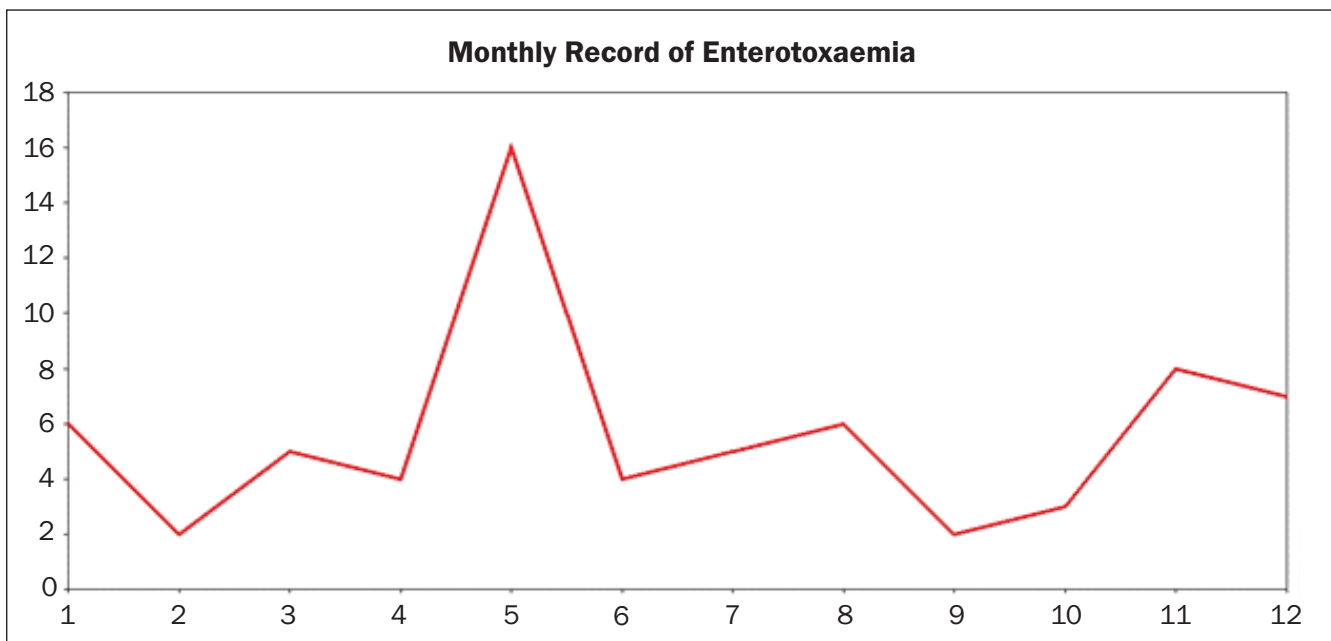


Fig 10: Seasonal occurrence of Enterotoxaemia.

Viral Diseases:

Continuing its dominance as in previous years, Foot and mouth Disease still remained the top disease reported during the year 2014 in the country (Fig. 11). Of the five top viral diseases reported, two of them, Sheep and goat pox and PPR affect the small ruminants and one in swine. This calls for attention to control these diseases along with large ruminants. FMD has been reported in 11 states with maximum number from Karnataka followed by Kerala and Jharkhand. The other states reported a low intensity disease. Sheep and goat pox has been reported by nine states of which maximum number of outbreaks were recorded in Jammu and Kashmir followed by Karnataka. The disease has been reported throughout the year in these states. The disease has been recorded from Andaman and Nicobar islands also. Peste des petits ruminants has been reported from 12 states. It has been reported throughout the year from Jharkhand and Karnataka together account for 82% of the cases in the country. Again, Jharkhand and Karnataka top the list of states reporting Rabies with Jharkhand reporting the maximum.

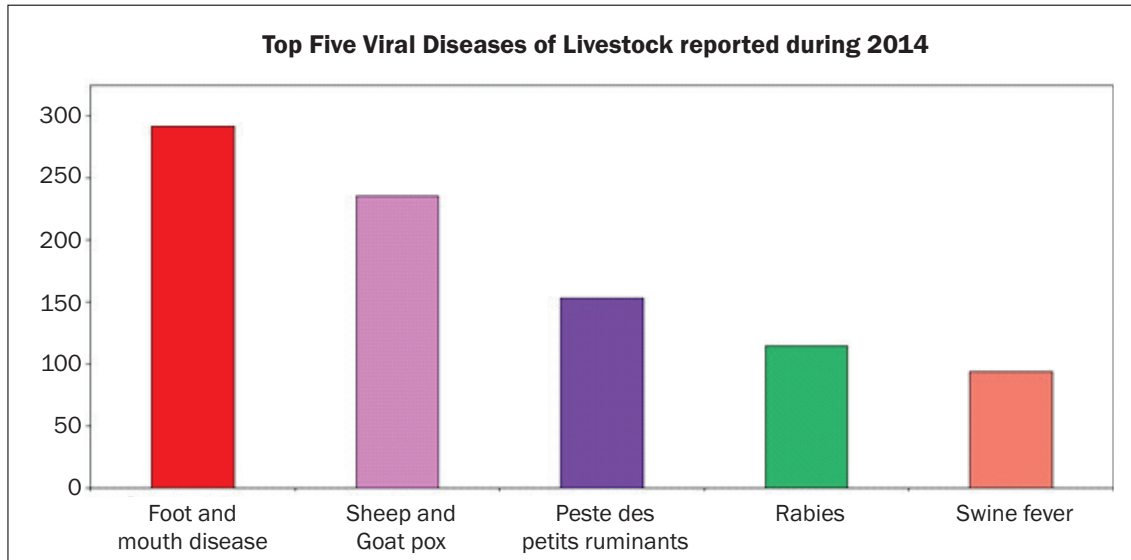


Fig. 11: Top Viral Diseases

Foot and Mouth Disease occurred throughout the year but with a marked decline in the incidences. The peak seen during the months of January to March could be due to the residue of the previous year’s severe outbreak especially in the states of southern India. The disease has been seen in 11 states. although the disease is mostly seen in the winter months (Fig. 12), Meghalaya has recorded the disease during all the months of the year. The continued decline of the incidences throughout the country indicate that the FMD control measures taken up by the government is effective.

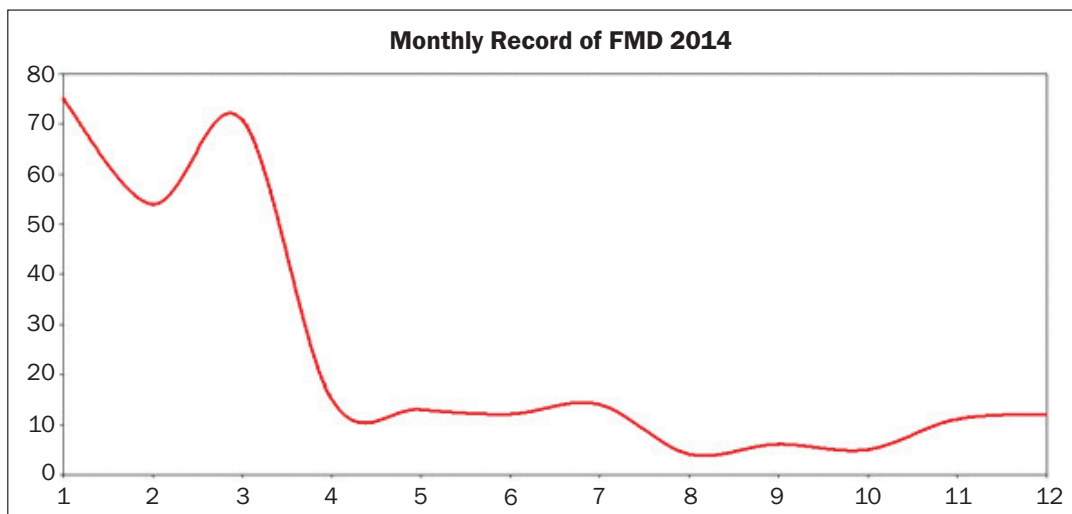


Fig 12: Seasonal occurrence of FMD.

Sheep and Goat Pox has been reported from eight states with nearly 70% of the reports from Jammu and Kashmir alone. The disease, being highly contagious and economically important, needs attention of the policy makers

in that a good vaccine is the need of the day. The incidence of the disease is maximum from October to March (Fig. 13). The reason could be that during these winter months the outside temperature will be minimal and the animals are herded in close proximity leading to easy spread of the disease to the healthy animals. The peak seen during the month of June could be due to rains which will also make the animals herd together.

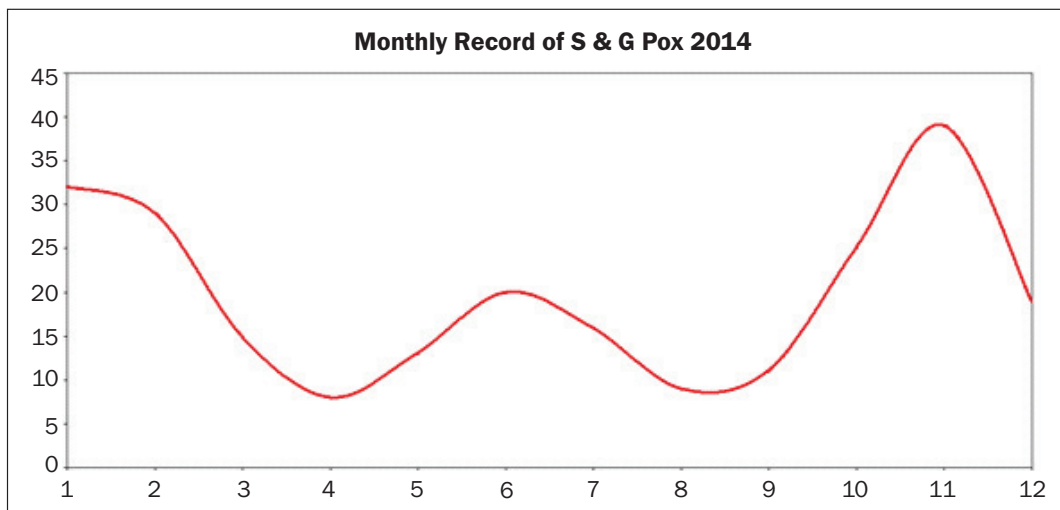


Fig 13: Seasonal occurrence of Sheep and Goat Pox.

Peste des petits ruminants has been reported from 12 states with maximum number of reports from West Bengal followed by Jharkhand. Although a clear peak of incidence of the disease has been observed during October, the disease has been seen throughout the year with not much of variation between the months (Fig. 14).

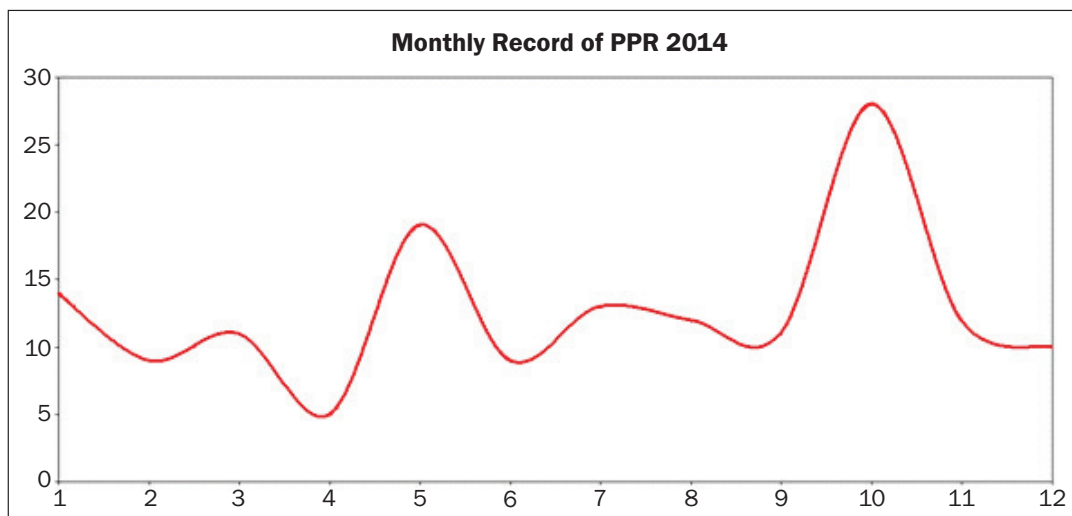


Fig 14: Seasonal occurrence of PPR.

Rabies occurs as sporadic case. However, its frequent occurrence places it amongst the top five diseases that are being reported in the country (Fig. 15). Apart from the disease in canines, has been recorded in cattle,

buffaloes, sheep, goats and pigs. Since Rabies is an important zoonotic disease, it is right time to take up its control measures at much higher level.

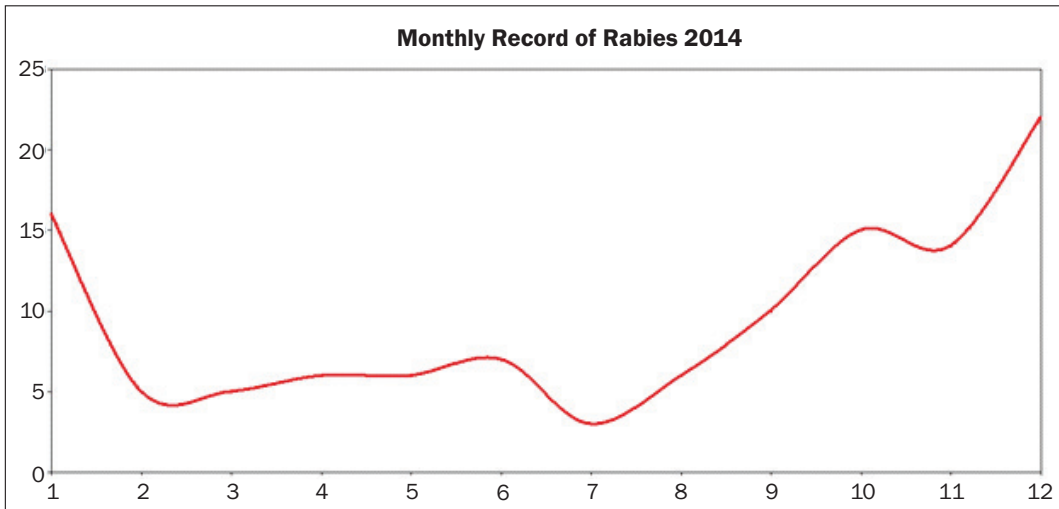


Fig 15: Monthly Occurrence of Rabies

Classical Swine Fever has been recorded by three states of North East region (Assam, Manipur and Meghalaya). CSF presents a wavy pattern when plotted against the month (Fig. 16) and does not clearly indicate the seasonality of the disease. Like any other viral diseases, its maximum occurrence has been recorded during winter months. It has been observed that of the 23 districts reporting CSF, eight districts have reported only one outbreak; three have reported two outbreaks, four have reported three outbreaks and five reported four outbreaks and only three districts have reported more than four outbreaks (Fig. 17). These outbreaks have spread over one year thus the disease occurs throughout the year.

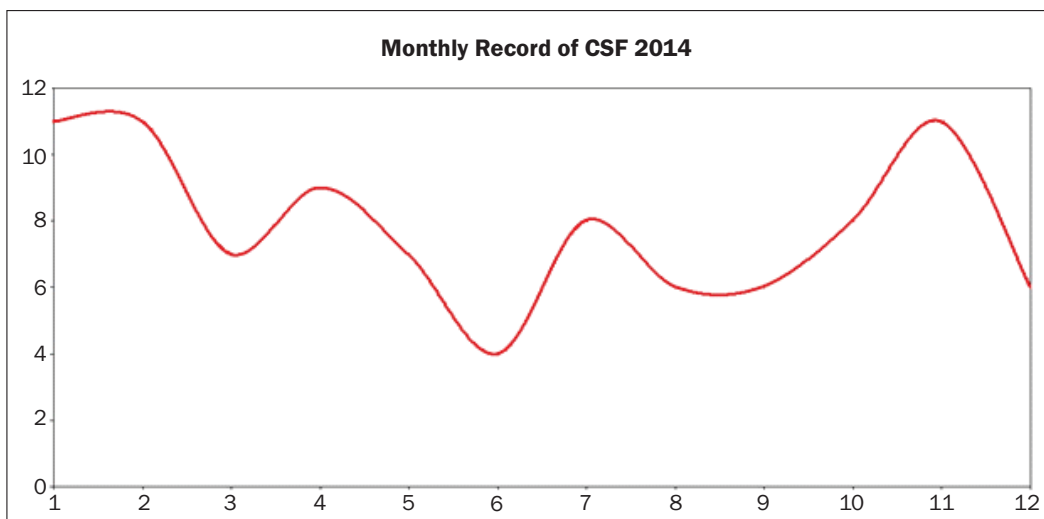


Fig 16: Seasonal occurrence of CSF.

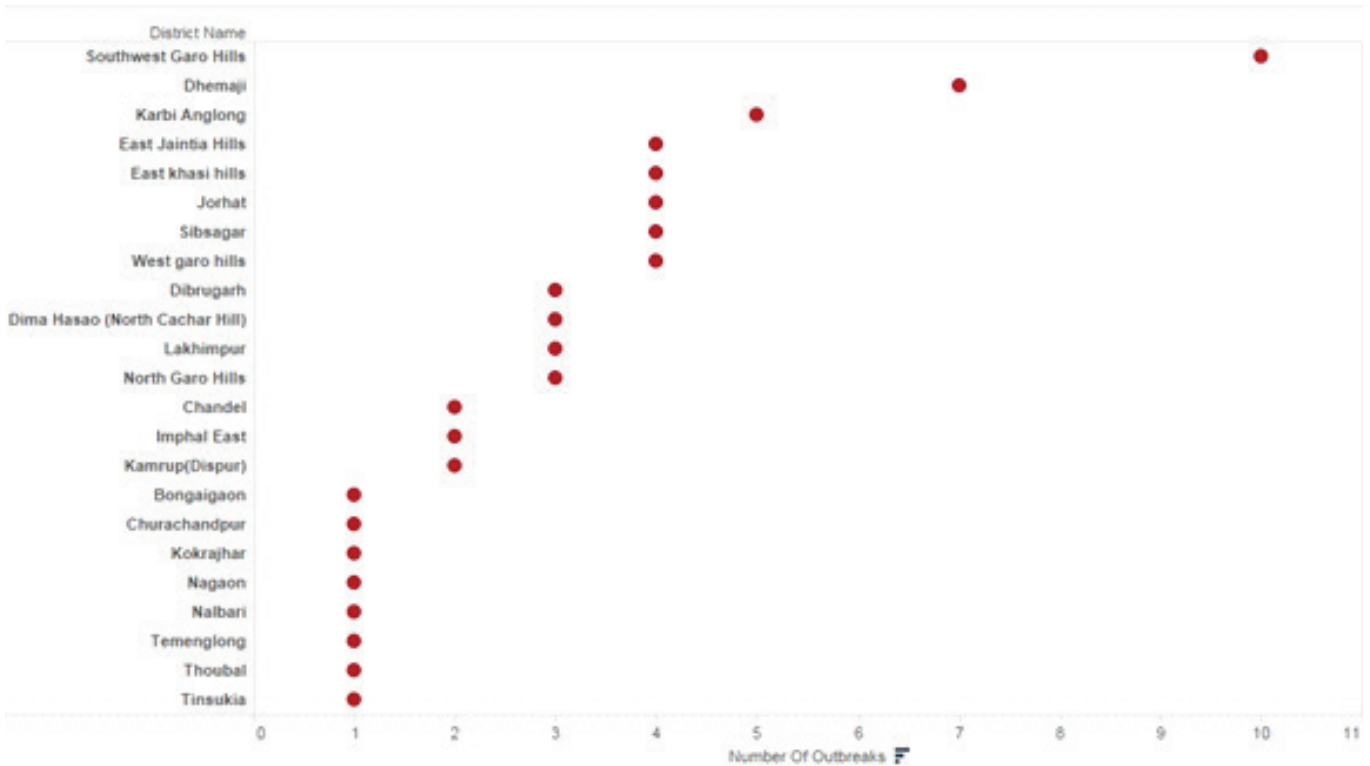


Fig 17: District-wise occurrence of CSF.

Parasitic Diseases:

Unlike previous years, parasitic diseases are being reported regularly from almost all the states of the country. This could be due to the fact that they are comparatively easy to diagnose and do not require highly sophisticated laboratory facilities. The top three positions in the national disease ranking are being occupied by parasitic diseases shows the intensity of their occurrence (Fig. 18). But for Fascioliasis, four of the five top diseases are haemoprotozoan parasites. It is well known that the parasitic diseases are, many times the sole, cause of economic loss to the farmers. A nationally approved package of practice is necessary for the control of these parasitic diseases, either in the form of preventive dosing or vaccinations.

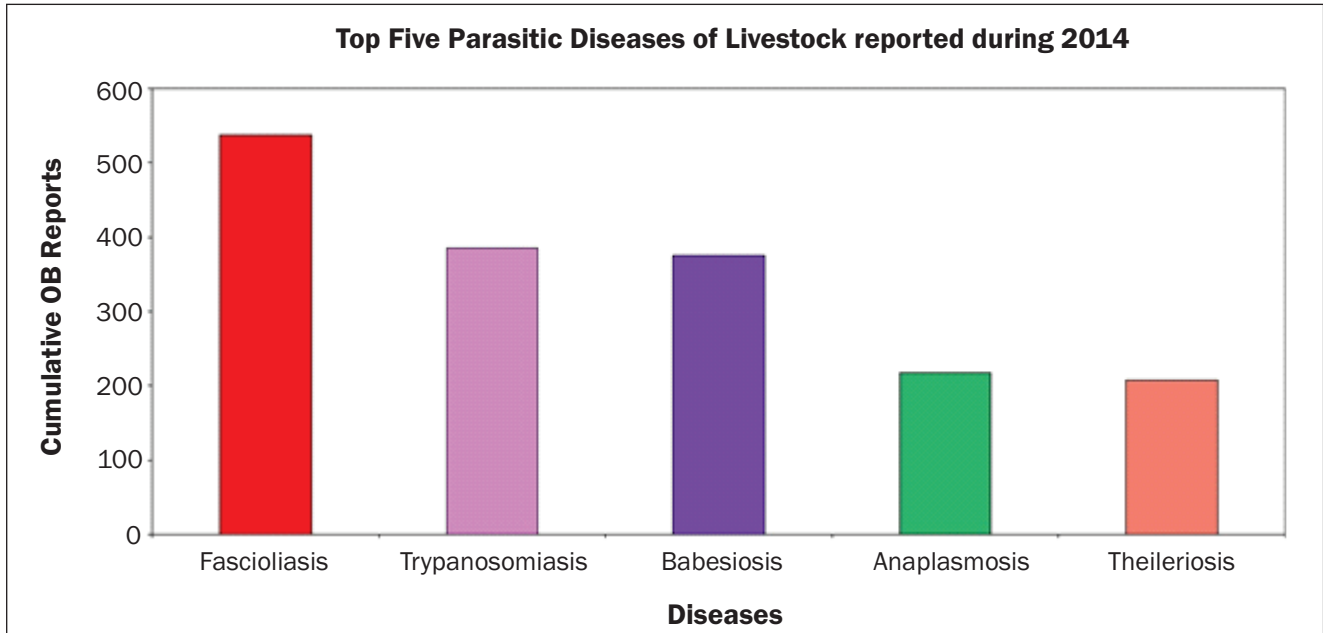


Fig. 18: Top Parasitic Diseases

Parasitic diseases did not show any particular seasonality and were recorded throughout the year with equal severity (Fig. 19). Hence it is necessary to study the epidemiology of vector population of these diseases.

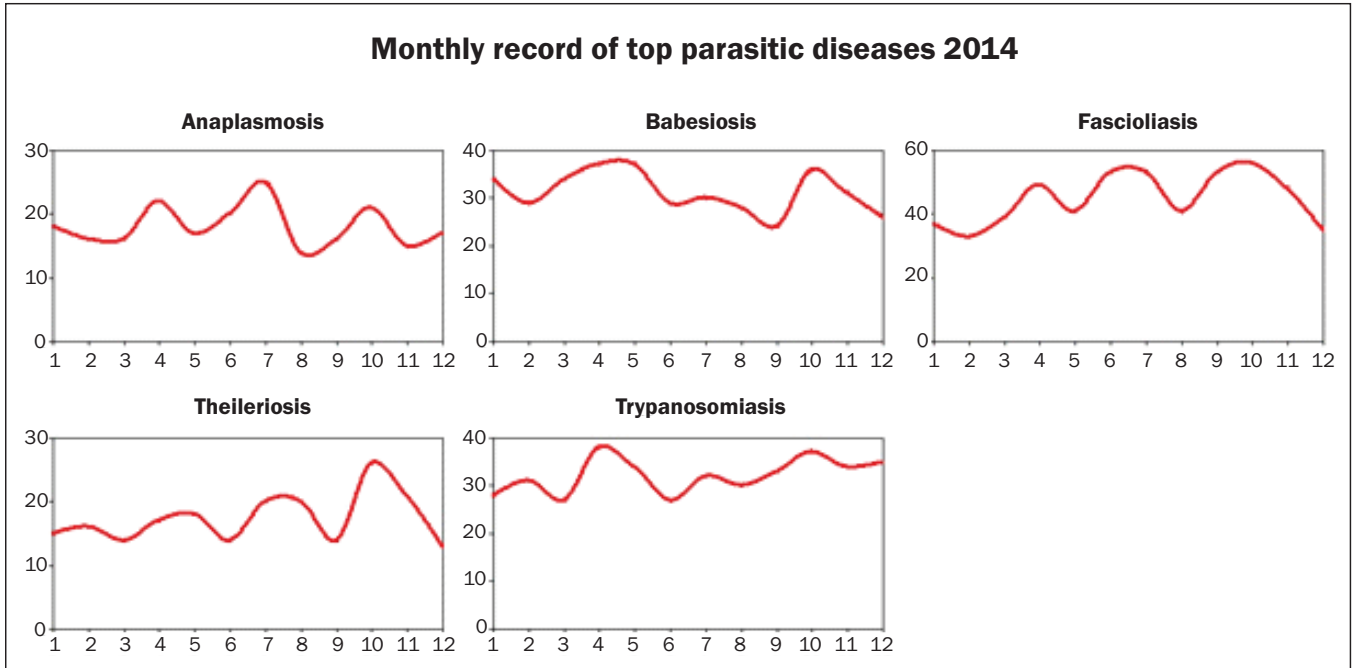


Fig 19: Seasonal occurrence of Major Parasitic Diseases.

**Concise reports of
AICRP on ADMAS centers**

01. ANDAMAN AND NICOBAR ISLANDS

- ◆ Andaman & Nicobar Islands witnessed no major livestock disease outbreaks during the year 2014. Parasitic diseases (80%) were of major diseases recorded followed by bacterial (12%) and viral (8%) diseases. Fascioliasis and Amphistomiasis were the top diseases reported followed by Babesiosis, Goat pox and Classical Swine Fever.
- ◆ Among mandated parasitic diseases, 5,119 cases of Amphistomiasis, 64 cases of Babesiosis, 7,260 cases of Fascioliasis were reported.
- ◆ Similarly, among viral diseases Classical Swine Fever (1) and Goat pox (8) were recorded.
- ◆ 28 cases of Leptospirosis were reported with no deaths.
- ◆ Out of 64 reported outbreaks, 67% cases were recorded in North and Middle Andaman and 33% were found in Nicobar Islands only in cattle and goats.
- ◆ Fascioliasis affected on a monthly average of 320 cases in cattle, 85 in buffaloes and 150 in goat. The peak occurrence of Fascioliasis was reported in buffaloes during May 2014.

02. ANDHRA PRADESH

- ◆ Top diseases reported during 2014-15 were Anthrax, Haemorrhagic septicaemia, Enterotoxaemia, Black Quarter, Ranikhet disease, Pesti des petits Ruminants, Sheep and Goat pox (Fig. 20).
- ◆ Two outbreaks of Haemorrhagic septicaemia was reported with 5 attacks and caused 3 deaths in the districts of Nellore and Kurnool in the state of Andhra Pradesh. However, in the state of Telangana, HS was reported with 3 outbreaks, 52 attacks and 12 deaths in the districts of Khammam, Karimnagar and Medak. The disease was in decreasing trend when compared to previous years because of mass vaccinations conducted in all the endemic areas.
- ◆ During the year under report, Pasteurellosis in small ruminants was reported in Ovines and caprines in Khammam district of Telangana. The pattern of the disease in ovines was with 6 outbreaks, 16 attacks and 8 deaths and similarly in caprines with 4 outbreaks, 15 attacks and 6 deaths. No outbreaks were reported in Andhra Pradesh.

- ◆ During the current year (2014-15) two outbreaks of BQ were recorded. Black Quarter disease was reported in Khammam district of Telangana with 1 attack and 1 death and in East Godavari District of Andhra Pradesh with 2 attacks and 2 deaths with economic loss of ₹18,000 in Telangana state and in Andhra Pradesh ₹66,000.
- ◆ During the current year, 30 in ovines and 4 in goats ET outbreaks were recorded in Telangana state with 60 attacks and 58 deaths in Khammam (24) and Mahabubnagar (10) districts with economic loss of ₹1,50,800 due to deaths of sheep and ₹20,400 due to death of goats. Similarly, one outbreak of ET in ovines was recorded in Andhra Pradesh with 7 attacks and 2 deaths in Prakasam district with economic loss of ₹9,200 due to death of 2 sheep.
- ◆ Two outbreaks of anthrax in ovines was recorded in Nalgonda district of Telangana with 3 attacks and 2 deaths and caused economic loss of ₹5,800/- due to death of 2 sheep. Sixteen outbreaks of anthrax in ovines was recorded in (Kurnool-7, Nellore-3, Kadapa-3 and Ananthapur-3) Andhra Pradesh with 177 attacks and 168 deaths with economic loss of ₹5,04,000/- due to death of 168 sheep.
- ◆ During the year 2014-15, 3060 heads of cattle and 1090 heads of buffaloes have been screened against Brucellosis. Out of which 145 cattle and 63 buffaloes have been found positive for Brucellosis i.e., 4.73% in cattle and 5.77% in buffaloes.
- ◆ Serum samples were screened against Leptospirosis by ELISA and 11.62% positivity was observed.
- ◆ Three outbreaks of PPR were recorded in Telangana state, (Khammam district) with 11 attacks and 5 deaths. One outbreak of PPR was recorded in (Kurnool district) of Andhra Pradesh with 10 attacks and 2 deaths.
- ◆ Among 65 samples tested for CSF, (23 samples from Telangana State and 42 samples from Andhra Pradesh) only five samples were found to be positive.
- ◆ Two outbreaks of Goat pox was recorded in Telangana state, in Khammam and Warangal districts with 54 attacks and 21 deaths. Four (4) outbreaks of Sheep pox were recorded in Telangana state, in Karimnagar and Warangal districts with 32 attacks and 8 deaths. Similarly, Three (3) outbreaks of Sheep pox were recorded in Andhra Pradesh, in Prakasam district during the year 2014-15 with 43 attacks and 17 deaths. Two outbreaks Goat pox was recorded in Nellore district with 32 attacks and 8 deaths.

- ◆ During the year under report Trypanosomiasis, Microfilariasis, Theilariasis and Amphistomosis was reported in bovines from different districts of AP and Telangana.

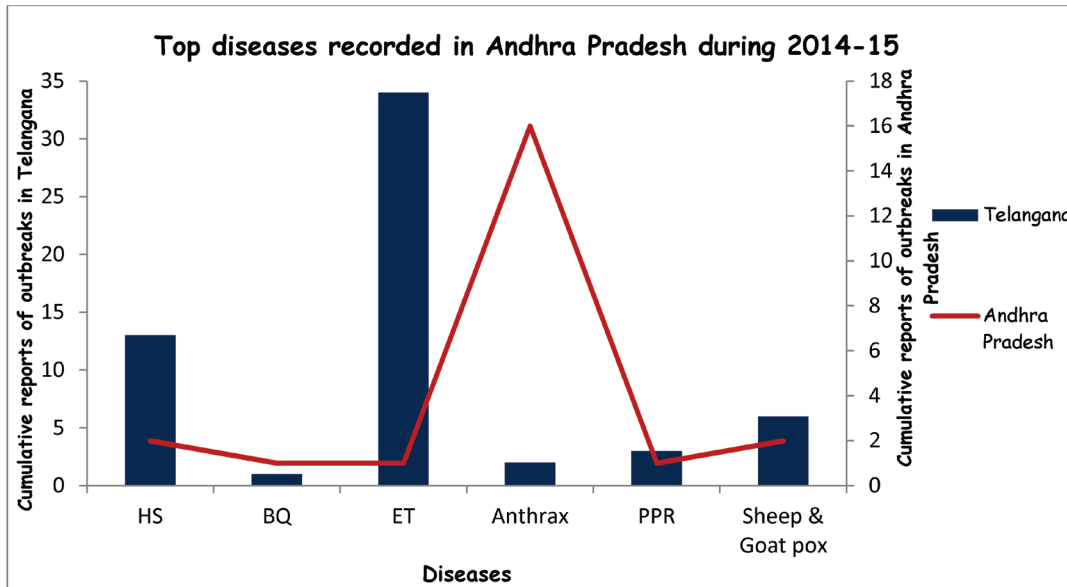


Fig 20: Top Diseases reported in Andhra Pradesh

03. ASSAM

- ◆ Classical Swine Fever, Black Quarter, Ranikhet disease, Peste-des petits ruminants, Haemorrhagic Septicaemia and Enterotoxaemia were the top diseases recorded in the state (Fig. 21).

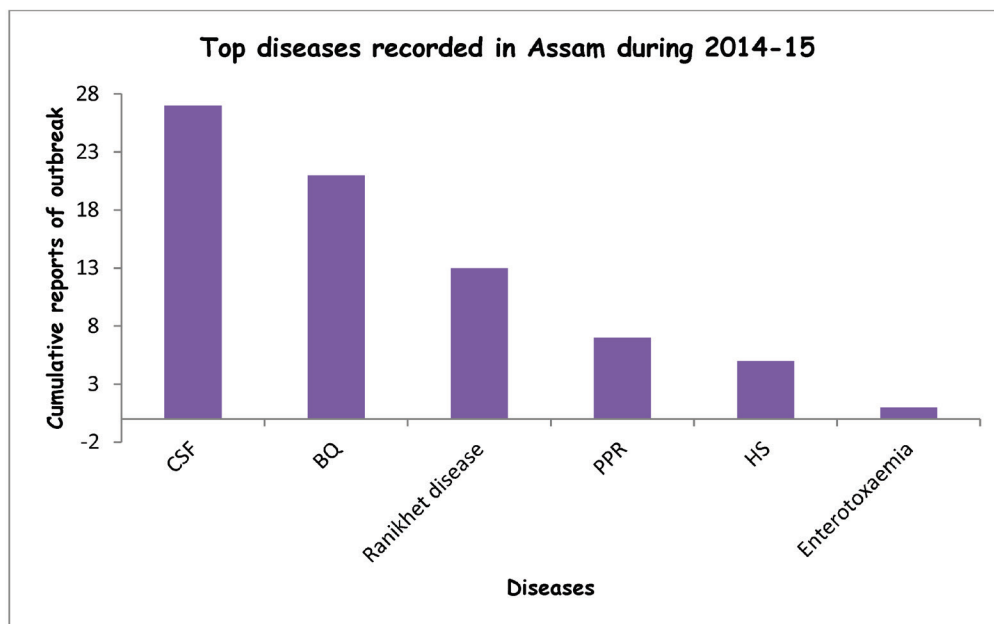


Fig 21: Top Diseases reported in Assam

- ◆ The incidence of Black Quarter was recorded from 12 districts during the year 2014-15 with 21 outbreaks affecting 138 animals and 36 deaths. The highest outbreak was recorded in Dhemaji district. The highest number of outbreaks occurred in spring followed by summer and winter seasons.
- ◆ A total of five outbreaks of HS were recorded from five districts of in the state affecting 28 cattle and death in 6 cattle. There was a substantial decrease in number of outbreaks than previous years which could be attributed to the mass vaccination programme under ASCAD. The highest outbreak of HS was recorded during autumn and summer (2 each) and one in winter.
- ◆ A single outbreak of Enterotoxaemia in goats was recorded from Sonitpur district in the month of February with 76.71% mortality.
- ◆ An outbreak of Swine Erysipelas was reported from Kamrup district affecting 3 piglets of which 2 died.
- ◆ A total of 27 outbreaks of Classical Swine Fever from 11 districts of Assam were reported affecting 829 pigs of which 573 died. The highest numbers of mortality was recorded from Golaghat district (Fig. 22).

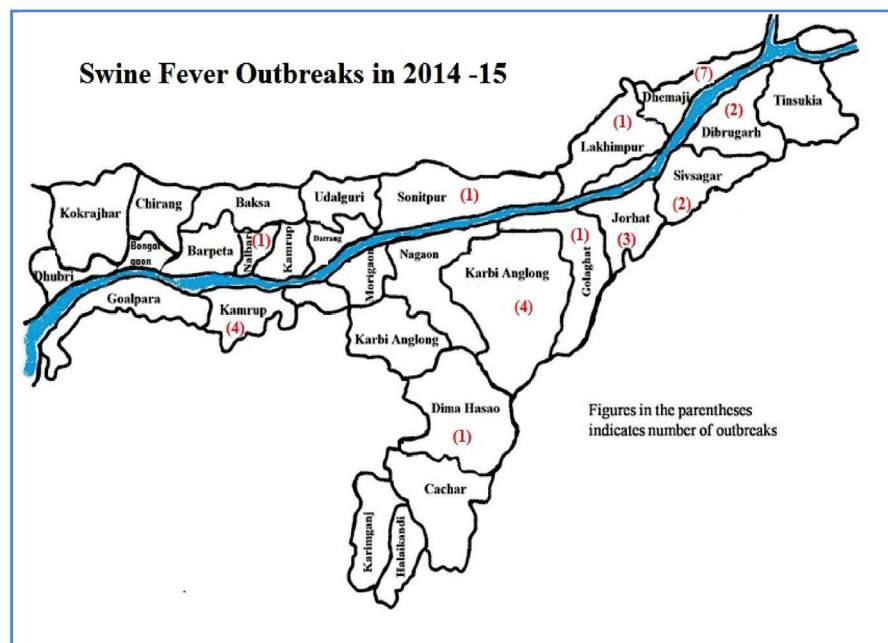


Fig 22: Spatial depiction of CSF

- ◆ Seven outbreaks of Peste-des petits ruminants (PPR) was recorded from four district of Assam affecting 129 numbers of animals and 88 deaths.
- ◆ The prevalence of Fascioliasis in cattle was recorded highest in Lakhimpur (0.31%).

04. GUJARAT

- ◆ The top diseases reported from Gujarat were HS, Trypanosomiasis, Sheep pox, Rabies and PPR (Fig. 23).

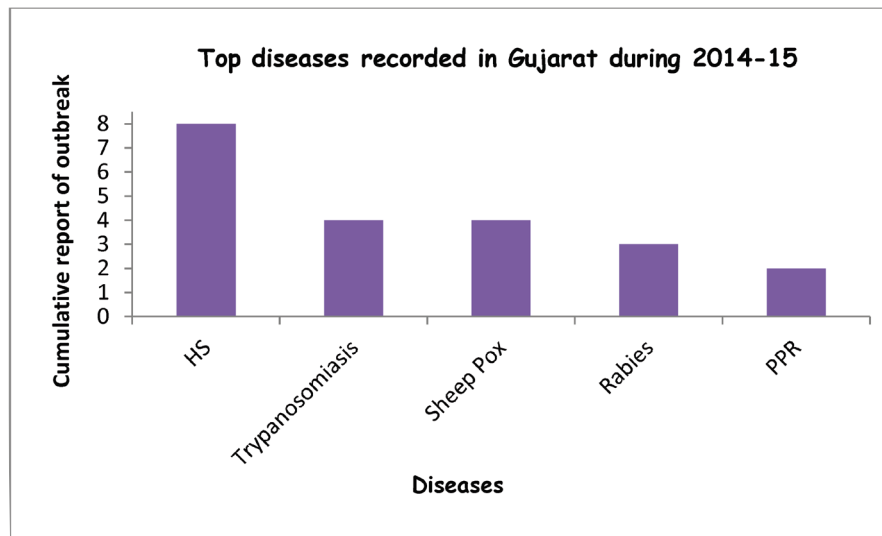


Fig 23: Top livestock diseases recorded in Gujarat.

- ◆ Gujarat state reported 4 outbreaks in Haemorrhagic septicaemia with 72 attacks and 19 deaths. Reduction in number of outbreaks than previous year might be due to mass vaccination campaign, but disease mainly reported the monsoon season may be due to high humidity (Fig. 24).

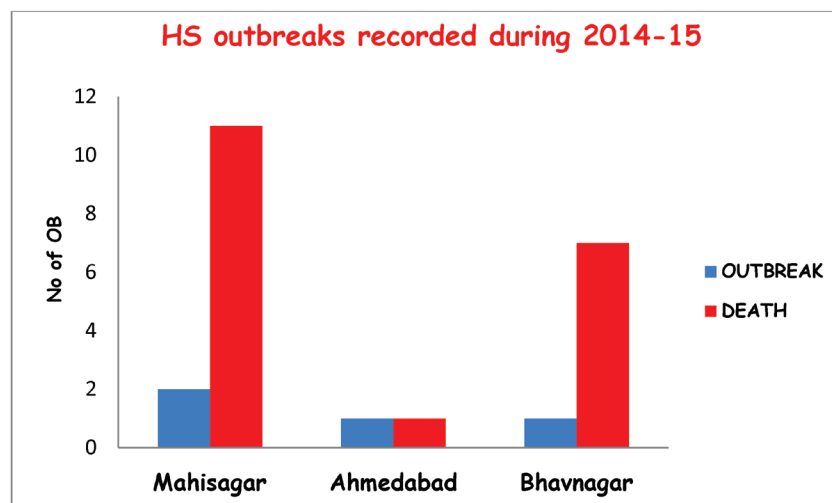


Fig 24: District-wise outbreak and Death due to HS.

- ◆ There were 4 outbreaks of PPR reported with 2636 attacks and 394 deaths, mostly during winter season. Reduction in outbreak might be due to awareness regarding Vaccination carried out by State Animal Husbandry Department.

- ◆ Trypanosomiasis was observed with 3 incidences, 25 attacks and 4 deaths.
- ◆ Rabies was reported as eight incidences with 48 attacks and 44 deaths.
- ◆ This year 2 outbreaks of sheep pox were observed with 53 attacks and 23 deaths.

05. JAMMU AND KASHMIR

- ◆ The major diseases reported in the state of Jammu and Kashmir were Foot Rot, FMD, BQ, Sheep & Goat Pox, PPR and Ranikhet disease (Fig. 25).

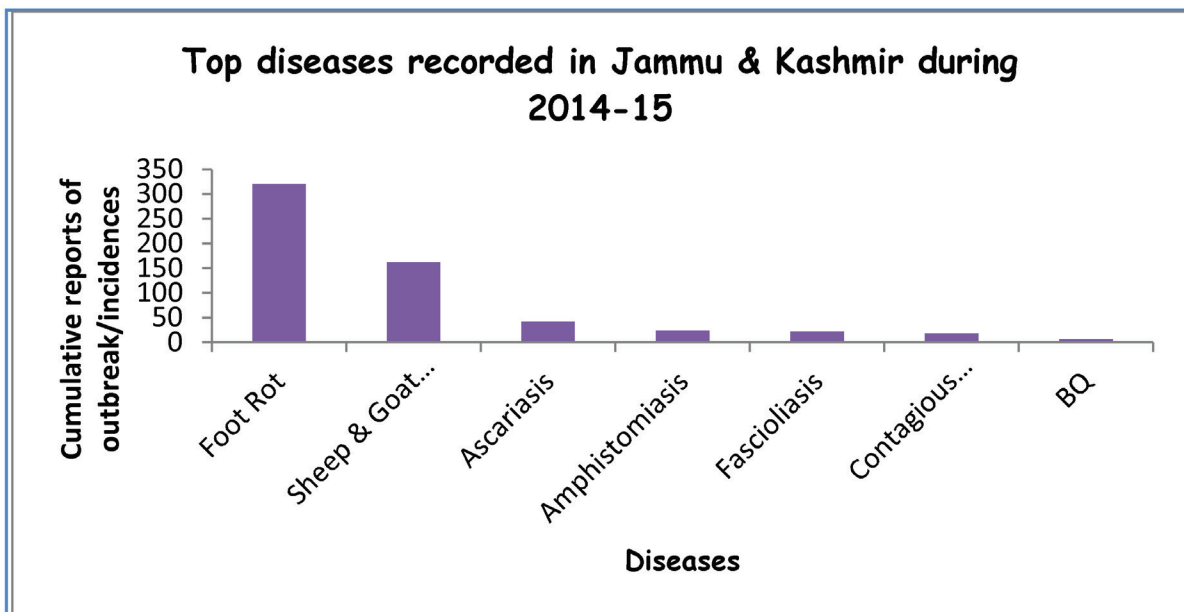


Fig 25: Top diseases recorded in Jammu and Kashmir

- ◆ During the year under report four outbreaks of FMD were recorded affecting cattle in Pulwama and Jammu districts. They were mostly encountered in Spring and Autumn season.
- ◆ Six outbreaks of BQ disease were recorded in Pulwama, Rajouri and Reasi districts during the months of August, September and October 2014 and March 2015 affecting 68 cattle and causing death of 10 cattle. The disease occurred during month of May, followed by months of August and, July (Early monsoon) then by late monsoon and summer.
- ◆ 162 outbreaks of sheep and goat pox were recorded in different districts of the valley throughout the year causing 304 deaths. The maximum outbreaks have been recorded during the months of October, November, December, January and February.

- ◆ The disease Foot Rot affected the sheep and goat population in all the districts of the state. During the year under report (320) outbreaks of the disease were recorded affecting about 40,252 Sheep and Goat population with death of 40 sheep. The disease has been mostly observed in the hilly areas experiencing heavy rain fall.
- ◆ Contagious ecthymia affecting the sheep and goat population with 18 outbreaks of the disease were recorded during all most all the months of calendar year affecting 518 Sheep and Goat population of the state
- ◆ PPR was reported during the month of October with only one outbreak and 2 attacks in Pulwama district.
- ◆ During the year under report a single outbreak of RKD has been reported during the month of February 2015 affecting 2900 birds and causing death in 1435.
- ◆ Out of (1345) dung samples collected from cattle, (22) samples were positive for Fascioliasis and (42) samples were positive for Ascariasis and (24) samples were positive for Amphistomes.

06. JHARKHAND

- ◆ During the year under report viral diseases dominated the livestock health scenario in the state. FMD, PPR, CSF, AI were the major diseases. Amongst the bacterial diseases, HS and Anthrax topped the list (Fig. 26).

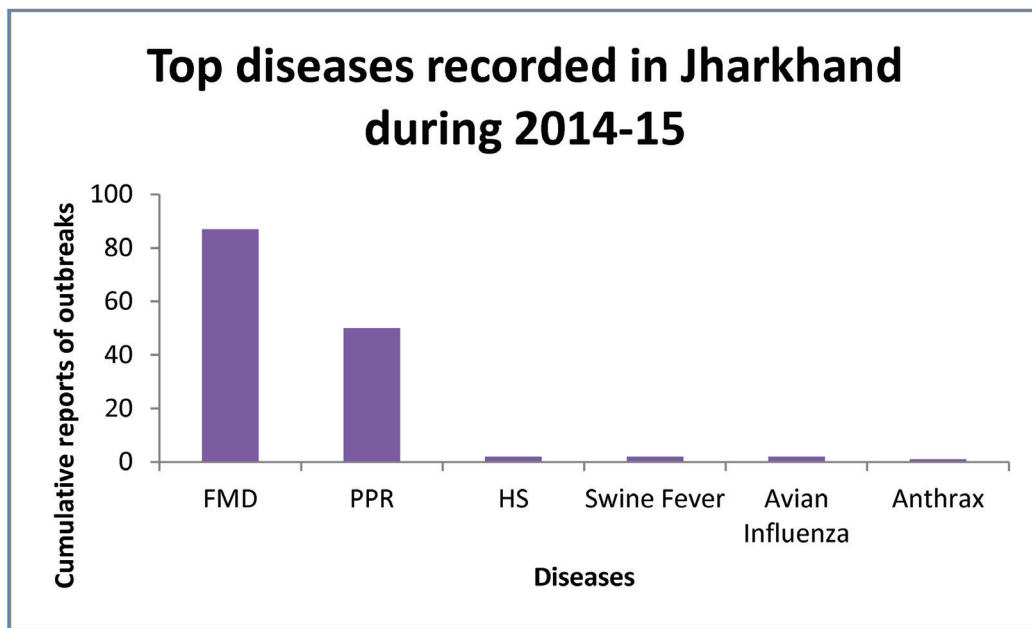


Fig 26: Top diseases recorded in Jharkhand

- ◆ In this year only 2 outbreaks of HS were reported with 2 animals affected and caused death of one animal.
- ◆ Only one outbreak of Anthrax was reported from Simdega district. After the consumption of dead animals by the villagers, seven people were reported to have died with the symptoms of anthrax until 17-10-2014.
- ◆ 87 outbreaks of FMD were reported in the state which was in rising trend than the previous year (13). Maximum outbreaks were reported from Ranchi range and observed throughout the year, with maximum incidences around the month of December.
- ◆ Only two outbreaks of Avian Influenza were reported one from Hazaribagh in the month of April and another from Ranchi in the month of October 2014.
- ◆ In this year only 2 outbreaks of Swine Fever were reported with 3 animals affected and caused death of one animal.
- ◆ The PPR outbreaks during the month of April to December have been recorded.
- ◆ The highest incidence of Babesiosis in cattle, buffalo and goat occurred in month of April. With the increase of ambient temperature (over 35 °C) the incidence rate decreased and again it is increased in October to December.
- ◆ Theileriosis in cattle and buffalo were mostly reported in the month of July and August and again it is increases in October to December.
- ◆ Decreased incidence of Trypanosomiasis was recorded during the rainy season than the other seasons.

07. KARNATAKA

- ◆ The top diseases recorded in the state were BQ, HS, Sheep and Goat Pox, ET, Anthrax, PPR, BT and FMD (Fig. 27). The fact that FMD has been pushed to eighth position proves that the FMD control programme in the state is highly effective especially in the light of the severe outbreak of the disease during the latter half of 2013. Further, BQ is being reported very frequently calls for a thorough investigation as to its origin and mode of spread. A strict measure is required for its control since a potent vaccine is available.

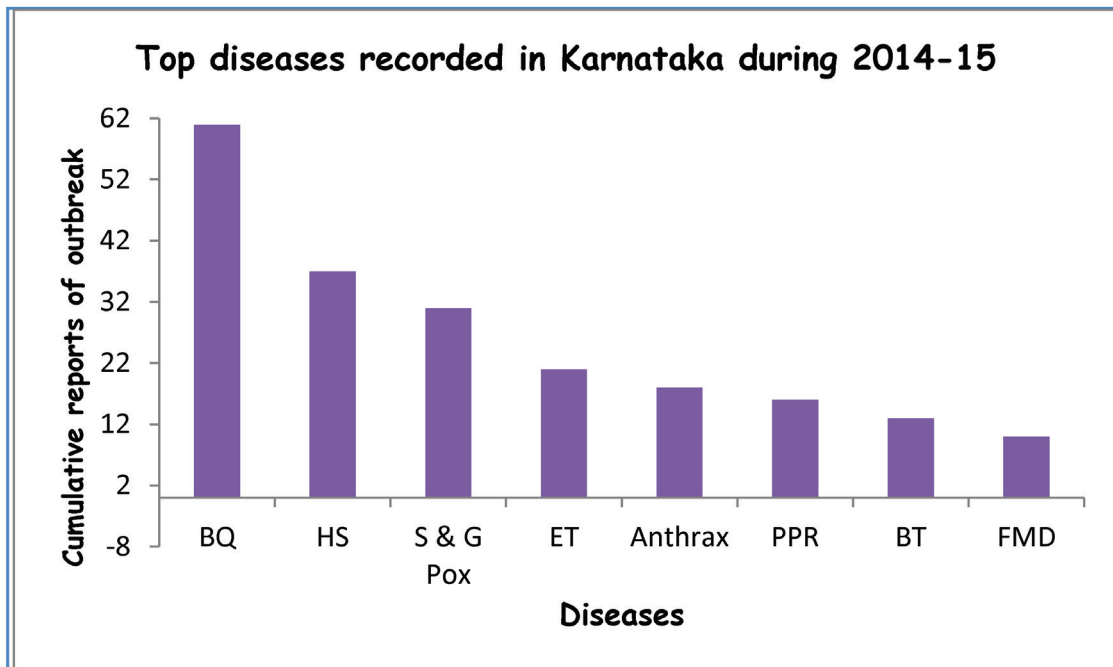


Fig 27: Top diseases recorded in Karnataka

- ◆ Anthrax has been reported sporadically in the state of Karnataka affecting cattle, sheep & goat. 18 outbreaks of Anthrax reported in 7 districts with 75 attacks and caused 75 deaths. The disease was reported in the state throughout the year except in the month of May, June and July. The incidence of Anthrax was highest during late Monsoon (7) followed by Summer (6) Winter (3) and early monsoon (2).
- ◆ Black Quarter was reported in 10 districts in the state during 2014-15 with 61 outbreaks, 222 attacks and 112 deaths. Hassan (35) and Koppal (9) had reported the highest numbers of outbreaks (Fig. 28). The incidence of BQ was highest in early monsoon (24) followed by winter (15), late monsoon (14) and Summer (5).
- ◆ 21 outbreaks of ET were reported with 449 attacks and 92 deaths in 6 districts of Karnataka. Late monsoon and winter seasons recorded more number of outbreaks compared to summer and early monsoon.
- ◆ During the year 2014-15, 35 outbreaks of HS were reported in the state affecting cattle, buffalo, sheep and goat with 413 attacks and 110 deaths. Davangere district reported 13 outbreaks followed by Hassan (12) Koppal (8), and Uttara Kannada (2). The disease was recorded with maximum number outbreaks in early monsoon (16) and during winter (10).

- ◆ There were 16 outbreaks of PPR with 402 attacks and 39 deaths from Belagavi, Chikkaballapur, Hassan and Kolar districts.. The disease was recorded with maximum number outbreaks in winter (11), late monsoon (4) and summer (1).
- ◆ A total of 31 outbreaks of Sheep & Goat pox were reported in the state. 16 Sheep and goat pox outbreaks were reported from the Davangere district with 530 attacks and 132 deaths.
- ◆ Thirteen Bluetongue outbreaks were reported from 6 districts affecting 990 sheep and causing 160 deaths.

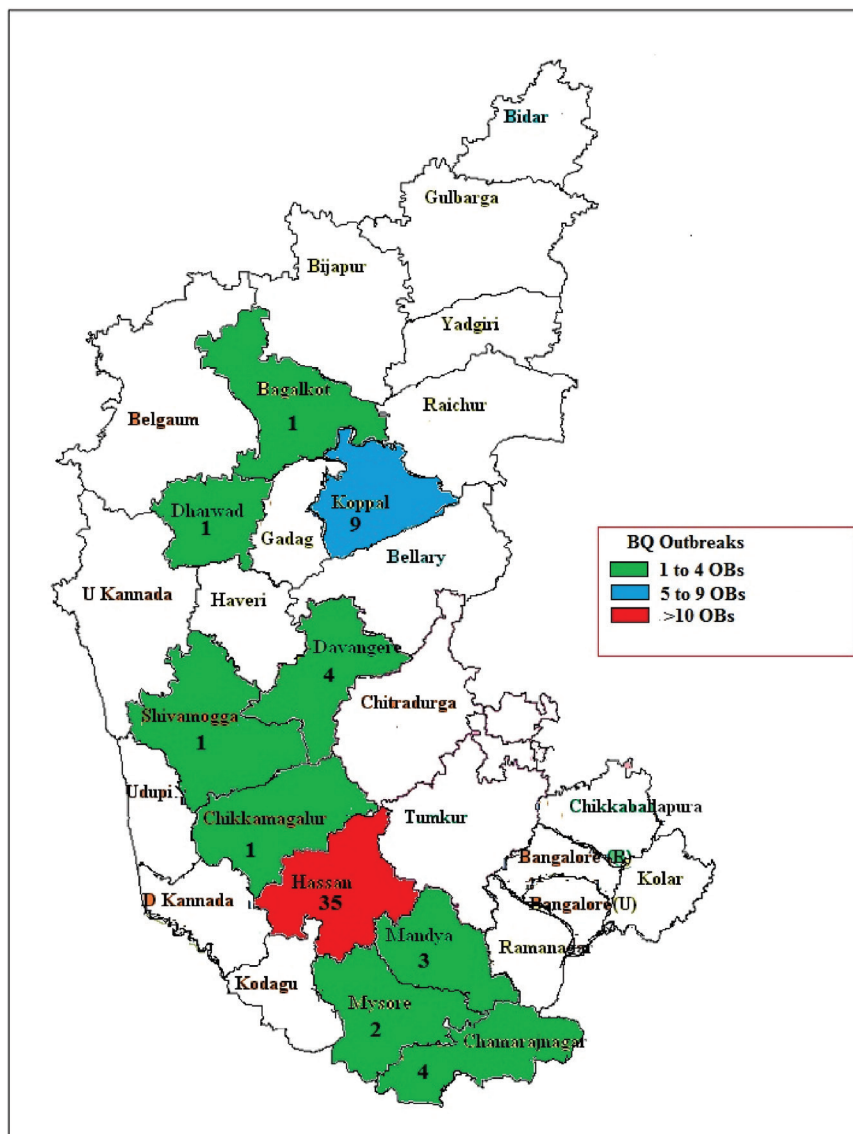


Fig 28: Spatial pattern of Black Quarter in Karnataka during 2014-15

08. KERALA

- ◆ In this year HS, Anthrax and Enterotoxaemia were the important bacterial diseases and CSF, PPR, Swine pox, rabies and Orf were the important viral diseases of livestock that were recorded (Fig. 29).

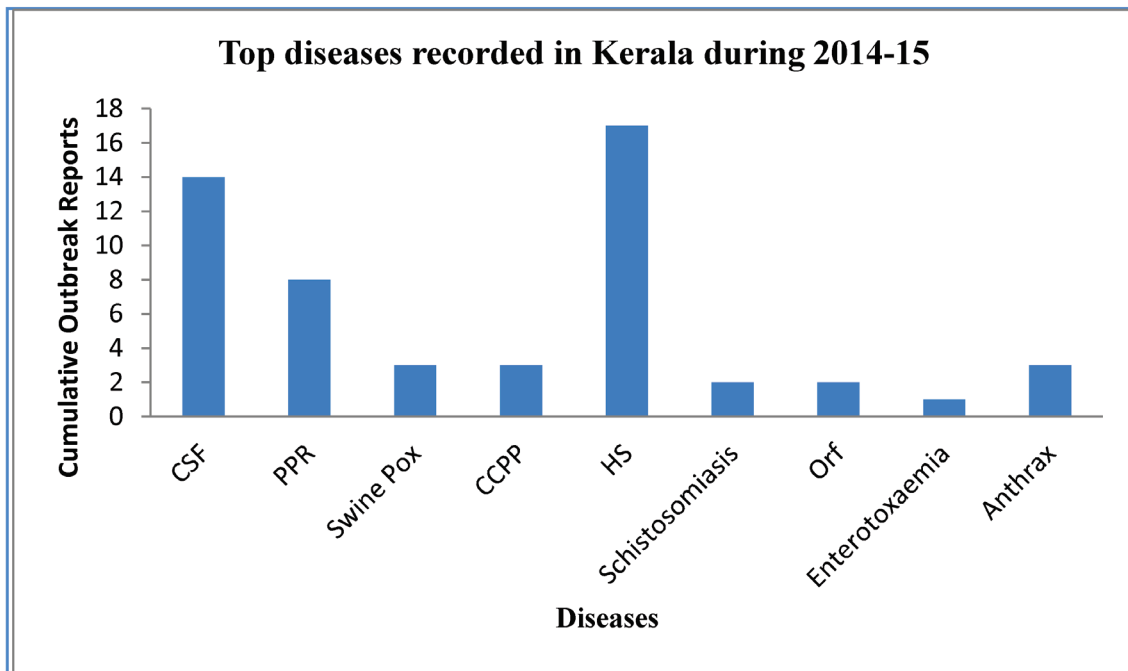


Fig 29: Top diseases recorded in Kerala

- ◆ HS was the top reported bacterial disease in Kerala with 17 outbreaks, 52 attacks and 39 deaths. The attack rate and Case Fatality Rate were found lower than previous year due to regular vaccination.
- ◆ Only three outbreaks of anthrax were recorded in cattle and pig. The disease was in reducing trend because of improved vaccination and better facilities for diagnosis.
- ◆ There is an increasing trend of CCPP with 78 attacks and 16 deaths in 2 districts.
- ◆ This year CSF was the top reported disease in the state with rising trend of outbreaks in comparison to the previous year with 14 outbreaks, 578 attacks and 263 deaths. New districts reporting CSF were Kottayam, Ernakulum & Wayanad.
- ◆ PPR was 2nd in ranking of top diseases of state with 8 outbreaks, 179 attacks and 53 deaths. Newly introduced goats from other areas were the source of infection in all outbreaks.

- ◆ Rabies is highly endemic in Kerala with drastic increase in incidence among large ruminants (66%) was recorded in the current year. Rabies incidence and death cattle was higher than Anthrax, HS or BQ in the state. New districts recording Rabies in Kerala were Ernakulum, Trissur, Palakkad, Kozhikode and Kasargode.
- ◆ An occurrence of three sporadic outbreaks of Swine pox was 1st time detected in Idukki, Trissur and Kottayam districts.
- ◆ Two outbreaks of Kyasanur Forest Disease (KFD)/Monkey Fever were recorded in two new districts i.e Wayanad & Malappuram proving its existence in the state with 127 attacks and 17 deaths in humans.
- ◆ Mass mortality was observed due to Avian Influenza(HPAI) in ducks in districts of Alappuzha and Kottayam
- ◆ After Avian Influenza(HPAI) outbreaks among turkeys, 1781 died in the farm of strength 8103 in the month of January'15.

09. MADHYA PRADESH

- ◆ In this year HS, BQ and Anthrax were the important bacterial diseases and FMD, PPR and Rabies were the important viral diseases reported (Fig. 30).

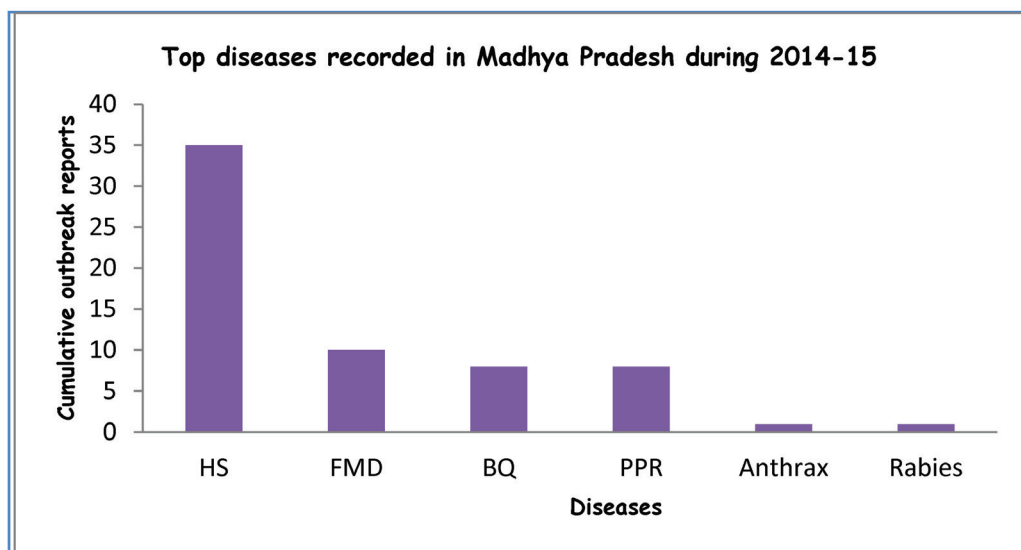


Fig 30: Top diseases recorded in Madhya Pradesh

- ◆ A total 35 outbreaks of HS were reported from 15 districts of the State with 221 attacks and 83 deaths (Fig. 31). Chhindwara district had maximum no of outbreaks followed by Jabalpur district. Maximum outbreaks were observed during late monsoon and winter season.

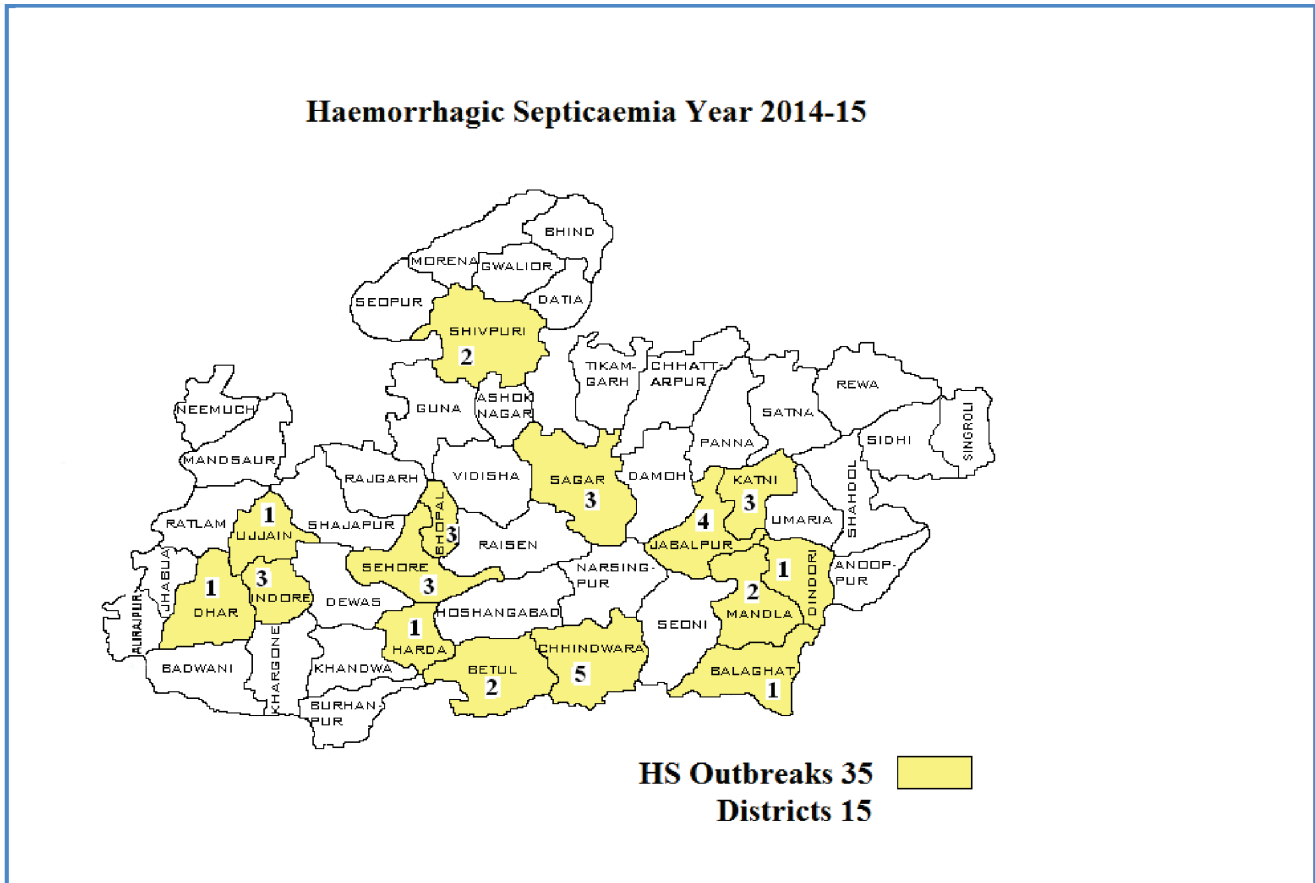


Fig 31: Spatial Distribution of HS in Madhya Pradesh

- ◆ In this year 8 outbreaks of BQ were reported from 4 districts out of which maximum 3 outbreaks were reported in Sagar district with 52 attacks and 19 deaths. Maximum outbreaks were reported during summer season.
- ◆ The incidence of Anthrax in the State was rare and sporadic in nature with one outbreak; one attack and one death were reported.
- ◆ A total of 10 outbreaks of FMD were reported from seven districts of the State with 1596 attacks. Two outbreaks each were reported by Balaghat, Ujjain and Umaria districts.

- ◆ In this year 08 outbreaks of PPR were reported from 07 districts with 392 attacks and 138 deaths. The distribution of outbreaks showed maximum outbreaks from Jabalpur district. The maximum outbreaks were reported during monsoon season.
- ◆ In this year one incidences of Silvatic Rabies was reported from Sehore district of Madhya Pradesh in bovines with 6 attacks and 2 deaths.

10. MAHARASHTRA

- ◆ Only one outbreak of HS was experienced during the month of October in Thane district of Maharashtra with 7 animals affected and caused death of 4 animals (Fig. 33). Stress experienced by animals after rainy season may be the precipitating factor in the occurrence of the disease.
- ◆ 21 outbreaks of PPR were occurred during winter season (13) followed by monsoon (7) and summer season (1) with 1281 animals affected and 477 animals died (Fig. 32).
- ◆ There were 2 outbreaks of Sheep pox recorded during winter season.
- ◆ Only one outbreak of Fowl typhoid was reported during summer season.
- ◆ No correlation is observed in H.S & PPR outbreaks with minimum & maximum temperature.
- ◆ 3989 numbers of sera samples were tested for Brucellosis and found 117 (2.94%) numbers positive.

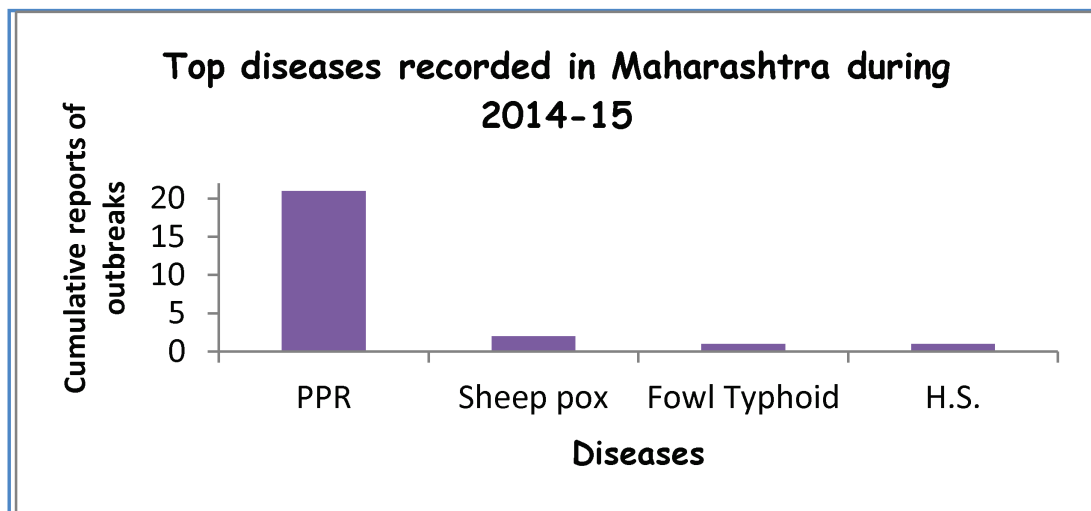


Fig 32: Top diseases recorded in Madhya Pradesh

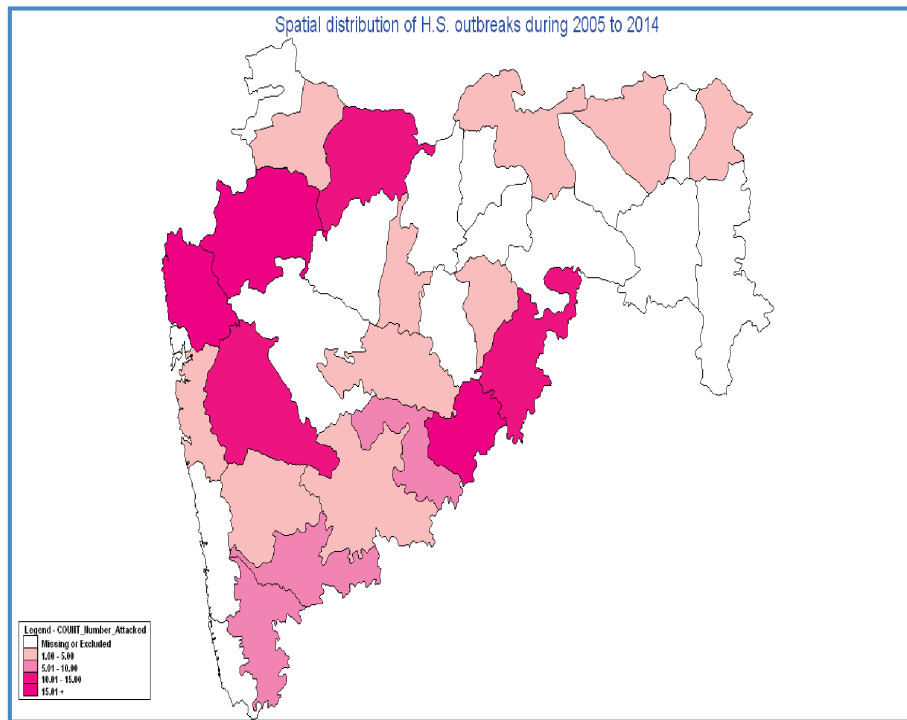


Fig 33: Spatial distribution of HS Outbreaks during 2005-14 in Maharashtra

II. MANIPUR

- ◆ In this year BQ, HS and Brucellosis were important bacterial diseases and FMD, Bluetongue, Goat Pox, Rabies and CSF were important viral diseases of livestock recorded (Fig. 34).

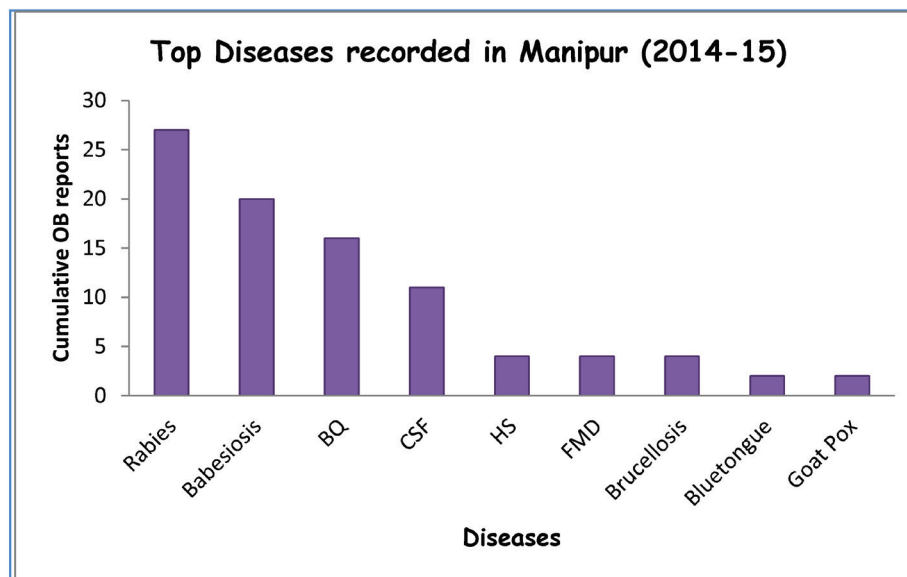


Fig 34: Top diseases recorded in Manipur

- ◆ Black Quarter was the top listed disease with 16 outbreaks, 260 attacks and 173 deaths in bovines. The incidence of the disease in Chandel and Tamenglong district were recorded after a span of 5-6 years (Fig. 35).
- ◆ Only 4 outbreaks of HS was recorded with 73 attacks and 15 deaths (average mortality 20.5%) in districts of Thoubal, Senapati and Bishnupur. There was no incidence of the disease in the remaining 5 districts of the state because of wide vaccination coverage.
- ◆ The prevalence rate of Bovine Brucellosis in the state was 5.7%.
- ◆ An occurrence of only 2 outbreaks of Blue tongue was reported with 13 attacks and 3 deaths in Senapati district.
- ◆ There were 11 outbreaks of Classical Swine Fever in pigs has been recorded with 292 attacks and 177 deaths of pigs with an average mortality of 60.6%. Districts like Imphal-West, Thoubal and Tamenglong witnessed the disease for the first time.
- ◆ There were 2 outbreaks of Goat pox was reported with 14 attacks and 3 deaths in district of Senapati.
- ◆ Canine Rabies diagnosis were made for 27 positive cases in the state. There was a report of 15 human death due to Rabies in Churachandpur, Imphal-East district of the state.
- ◆ The important parasitic disease reported were Fascioliasis, Amphistomiasis and Babesiosis with Amphistomiasis was the top listed one.
- ◆ The important poultry diseases reported were RD, IBD, Fowl Pox, CRD, BWD, Colibacillosis, Salmonellosis and Coccidiosis. Altogether, 1882 livestock faecal samples were examined as routine examination to detect parasitic load in these animals.

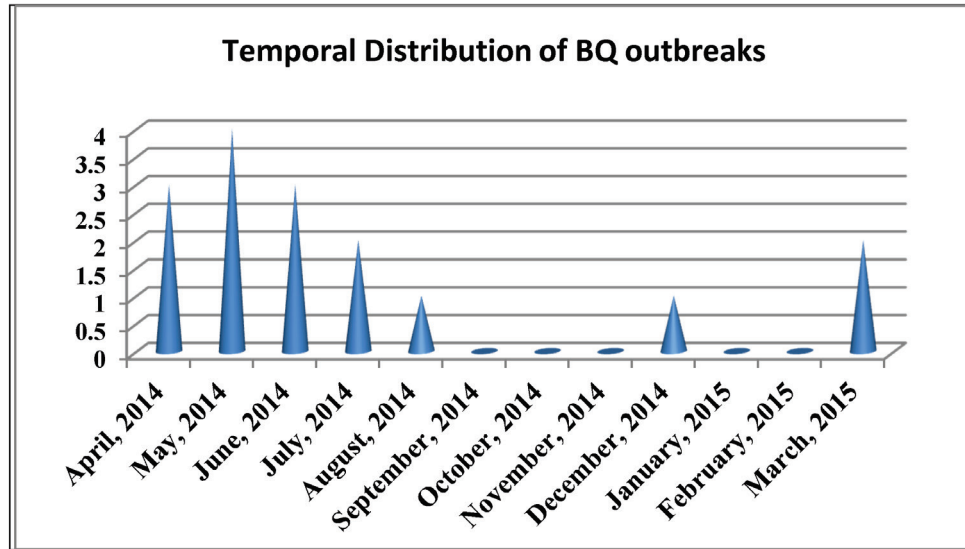


Fig 35: Temporal distribution of black quarter in Manipur during 2014-15:

12. MEGHALAYA

- ◆ The major livestock diseases recorded in the state of Meghalaya were BQ, HS, Foot and Mouth Disease (FMD) and Classical Swine Fever (CSF) (Fig. 36).

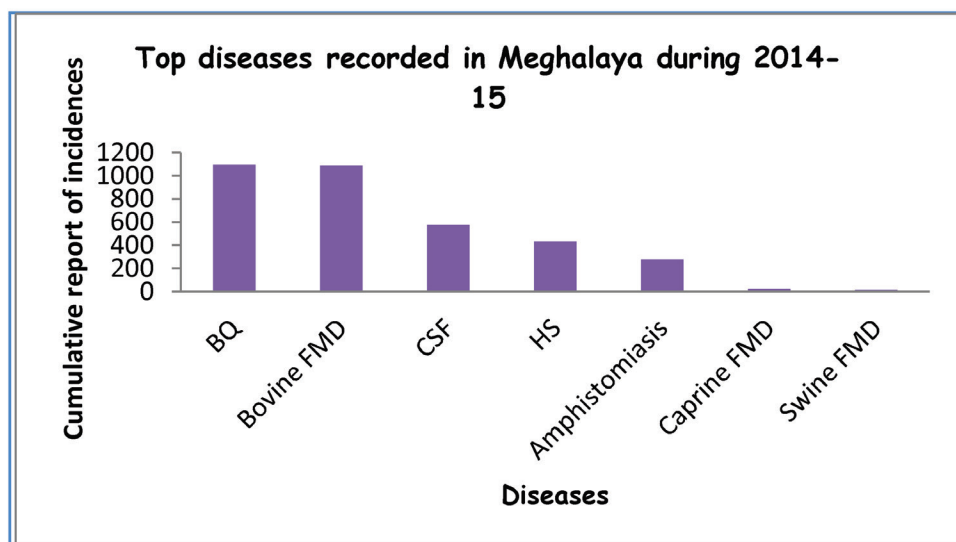


Fig 36: Top diseases recorded in Meghalaya

- ◆ During the period under report, 1090 cases of Cattle FMD were reported with 2 outbreaks and 56 attacks during autumn followed by winter season.
- ◆ BQ was recorded with 1097 cases, 2 outbreaks and 75 attacks during winter and autumn season.

- ◆ A total of 435 cases were reported for HS with a single outbreak and 46 attacks during winter season.
- ◆ Similarly 578 cases of CSF were reported. Two outbreaks of CSF were investigated in Sonidan and Rongman village in Ri-Bhoi District in the month of July and November respectively.
- ◆ The sero-positivity of bovine brucellosis was highest in Ri- Bhoi District (18.18%) followed by East Khasi (7.03%) and West Khasi Hills (5.88%). Similarly, the sero-positivity of swine brucellosis was highest in West Khasi Hills (5.45%) followed by East Khasi Hills (2.20%).
- ◆ A case of contagious caprine ecthymia(Orf)was reported in a buck in Smit village, East Khasi Hills.
- ◆ Cases of Amphistomiasis were recorded.

13. ORISSA

- ◆ During this year 23 outbreaks of Anthrax occurred, 97 animals affected out of which all 97 animals died in Koraput (20), Sundergarh(2) and Mayurbhanj (1) during months of March, May, June, July, October and December (Fig. 37 & 38).
- ◆ During the year 2014-15 24 outbreaks of BQ have been reported in bovines in which 122 animals were affected and 89 animals died. The disease occurred throughout the year except in the month of August.
- ◆ Eleven outbreaks of Enterotoxaemia in sheep and goats occurred in Jagatsinghpur, Mayurbhanja and Puri districts during the month of August, October and November affecting 238 animals out of which 114 animals died.
- ◆ During the year under report 11 outbreaks of HS occurred in cattle, sheep and goat affecting 203 animals out of which 138 animals died during month of July, September, October, November, December and February.
- ◆ Twelve outbreaks of PPR reported with 281 animals affected and 97 animals died in 5 districts of Odisha. Investigation of various field outbreaks indicated sources of infection was mainly due to introduction of newly purchased goats.
- ◆ During the year under report eight goat pox outbreaks were reported in one district of the state affected 172 goats causing 83 deaths.

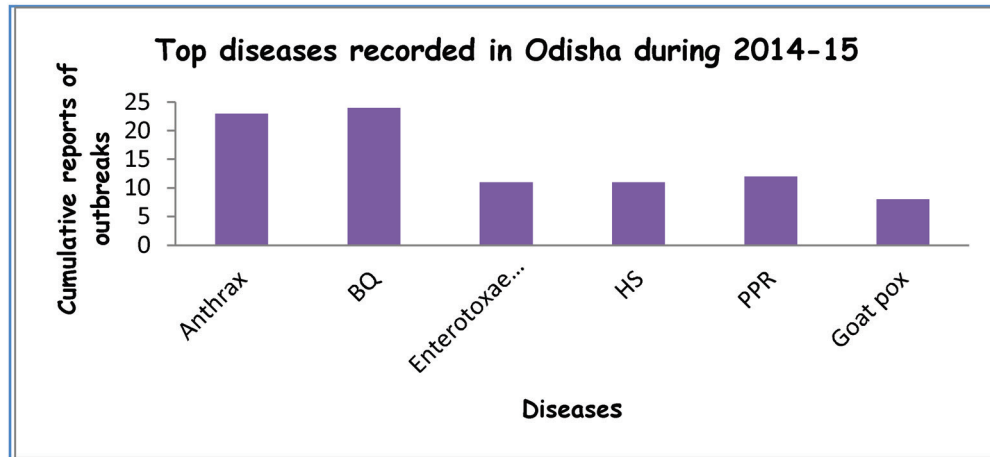


Fig 37: Top diseases recorded in Odisha

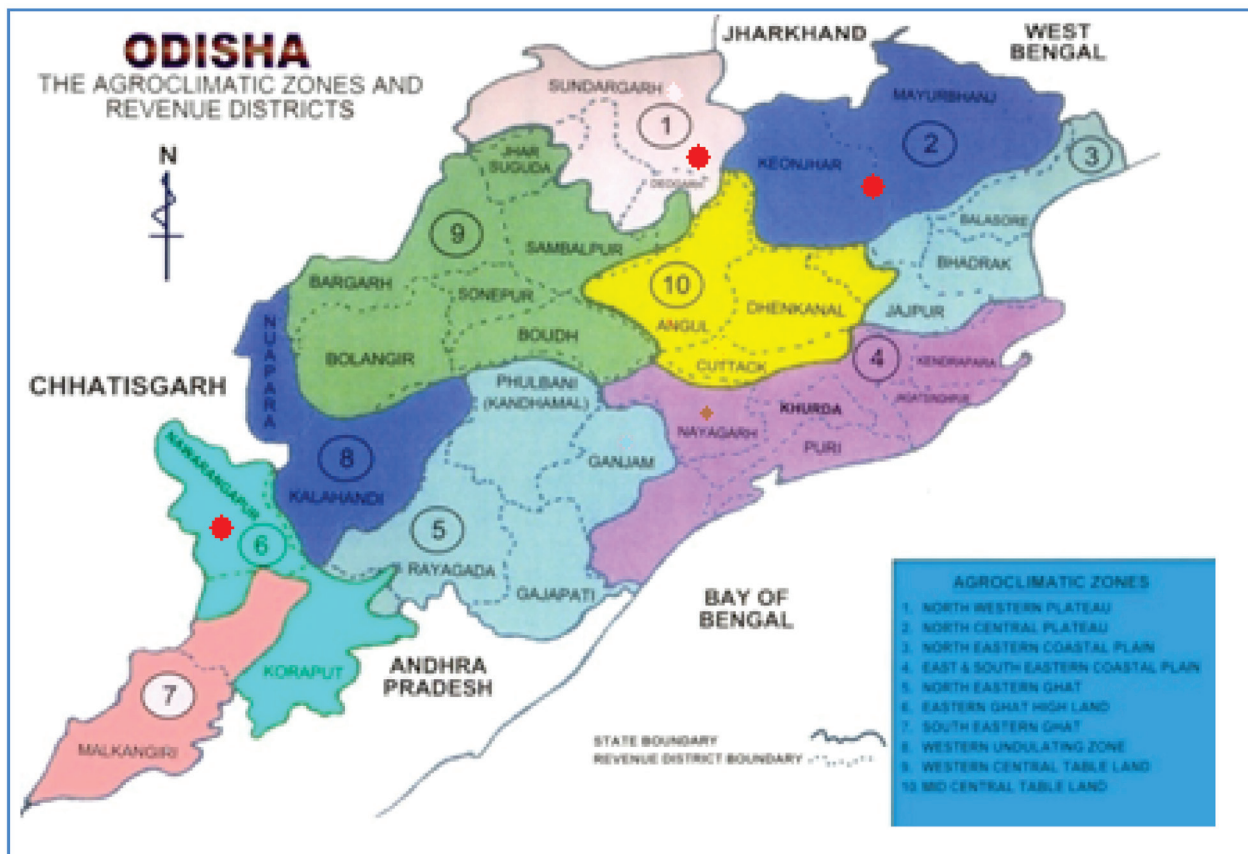


Fig 38: Spatial distribution of Anthrax in Odisha.

14. PUNJAB

- ◆ During the year under report, five outbreaks of HS were reported in Ludhiana and Roper districts with 31 death of 16 cattle and buffalo (Fig. 39).
- ◆ Two outbreaks of Listeriosis were recorded with 25 attacks and 11 deaths in sheep in the Barnala and Mohali districts.
- ◆ There were 6 outbreaks of Classical Swine Fever were recorded which affected 134 number of pigs and caused death of 60 pigs in the districts of Patiala, Bathinda and Ferozpur.
- ◆ One outbreak of PPR was reported with 35 attacks and 25 deaths in goats in Jalandhar district.
- ◆ Two outbreaks of Anaplasmosis occurred in the month of July at Patiala and Ludhiana. A total of 22 cattle were affected and 16 animals died of the disease. One outbreak was reported in the month of September at Ludhiana, 8 cattle were affected and two died of the disease.
- ◆ One outbreak of Babesiosis was reported at village Kajauli in district Fatehgarh Sahib. Two cattle were affected and one died.
- ◆ An outbreak of Coccidiosis was reported at Faridkot in goats. Out of 12 affected animals four died.
- ◆ Rabies was observed during this year with 16 incidences in dog and a total of 10 incidences in cattle, buffalo, equine and mongoose.

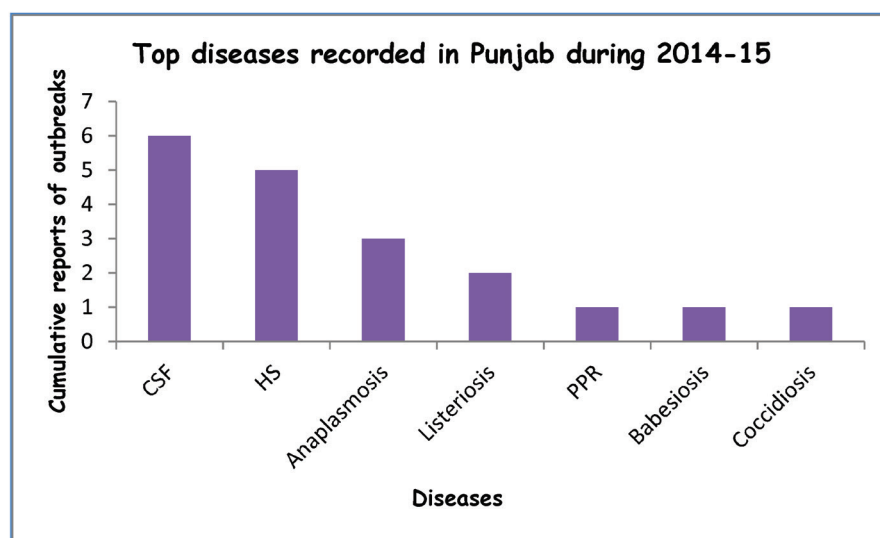


Fig 39: Top diseases recorded in Punjab

15. RAJASTHAN

- ◆ In the year 2014-15, major livestock diseases recorded in the state of Rajasthan were HS, Enterotoxaemia, Rabies, PPR and Coccidiosis (Fig. 40).
- ◆ 67 outbreaks of HS were reported from various districts of Rajasthan with 4999 attacks and caused death of 561 animals (Fig. 41). The disease occurred almost throughout the year indicating the adversities of climate might not have played a role in its precipitation.
- ◆ Four outbreaks of Enterotoxaemia were reported in 4 districts of Rajasthan with 551 attacks and 5 deaths during the month of May.
- ◆ PPR was recorded in 3 districts of Rajasthan with 5 outbreaks in animals which affected 922 animals and caused death of 234 animals during the month of May followed by January.
- ◆ Only one incidence of Rabies was reported with 70 attacks and 10 deaths.

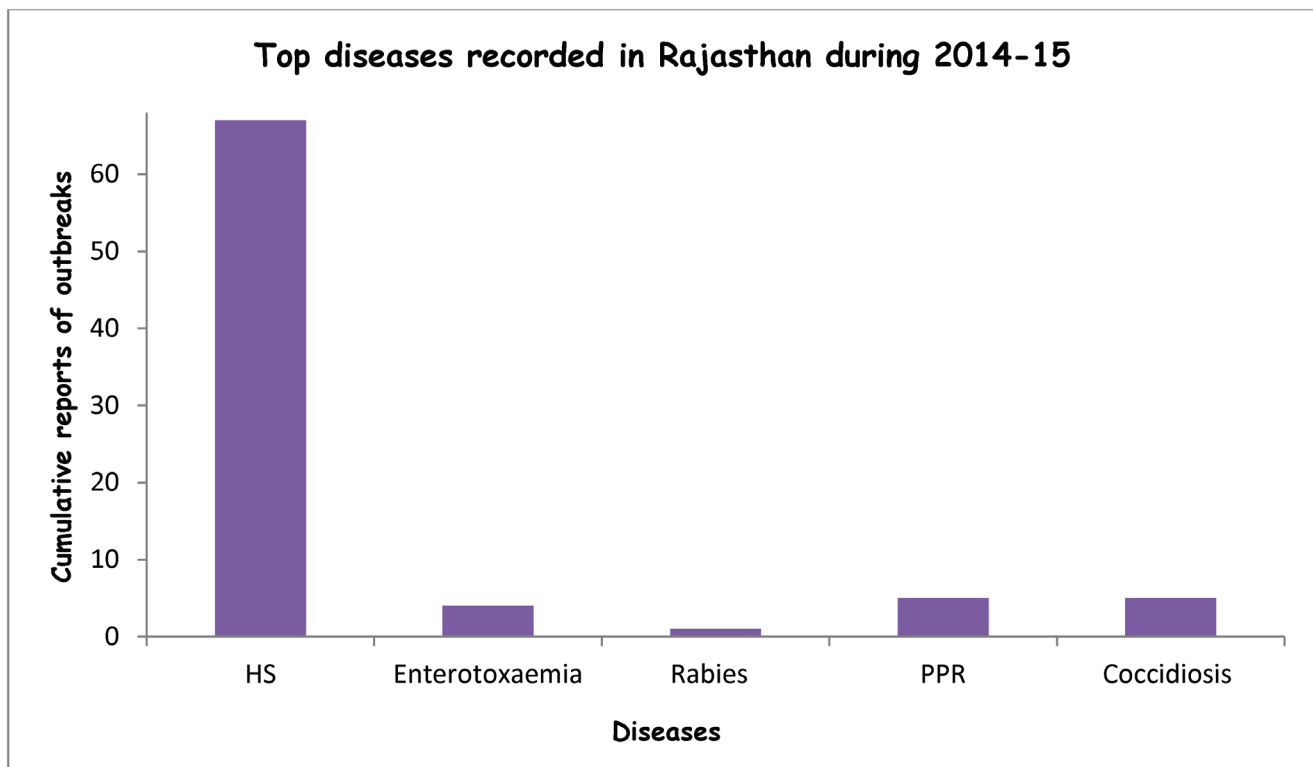


Fig 40: Top diseases recorded in Rajasthan

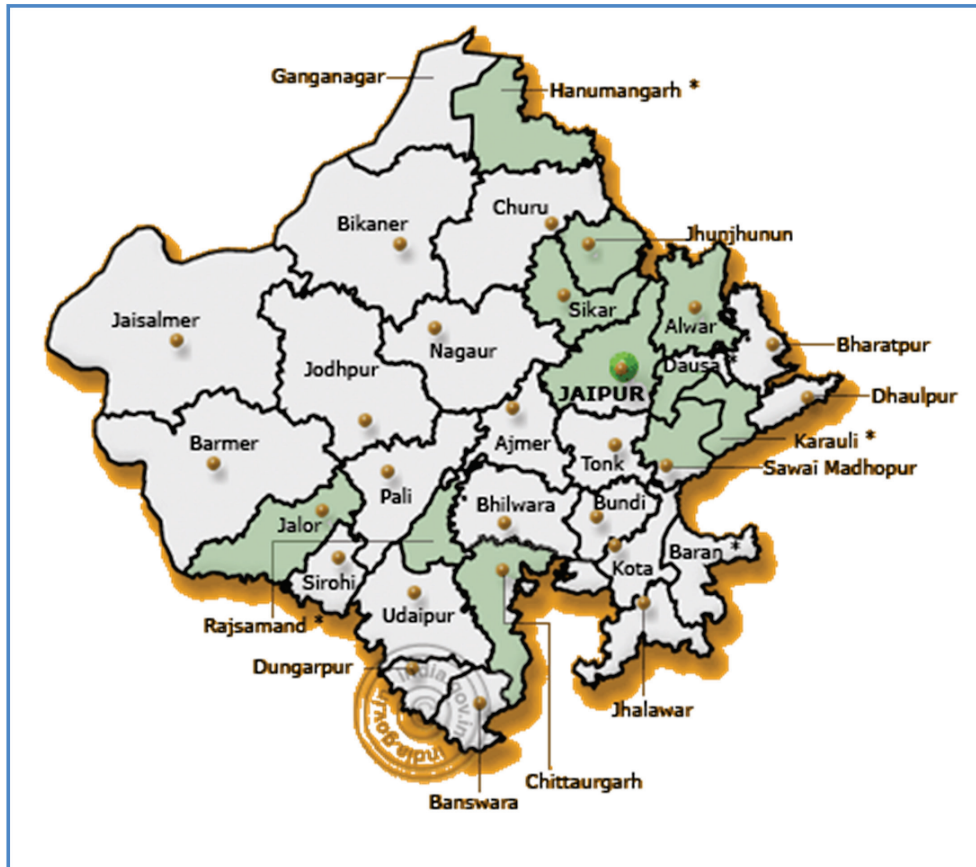


Fig 41: District wise HS outbreaks in 2014-15

16. WEST BENGAL

- ◆ The major livestock diseases recorded during 2014-15 were Anthrax, BQ, HS, CSF, PPR, FMD and Sheep & Goat pox (Fig. 42).
- ◆ HS was the top listed disease among bacterial diseases with 29 outbreaks.
- ◆ There were reports of BQ and Anthrax with 17 and 24 outbreaks, respectively.
- ◆ PPR was the top listed disease among viral diseases with 48 outbreaks.
- ◆ There were reports of goat pox, FMD and swine fever with 7, 3 and 1 outbreaks respectively.
- ◆ The parasitic diseases recorded were Babesiosis, Theileriasis, Amphistomiasis with 2, 9 and 2 number of incidences respectively.

- ◆ The major poultry diseases recorded were Ranikhet disease and Duck plague with 57 and 10 outbreaks respectively.
- ◆ An outbreak of anthrax in West Medinipur District was investigated during June-July, 2014 where 12 animals died with 10 tribals were also affected with cutaneous anthrax.

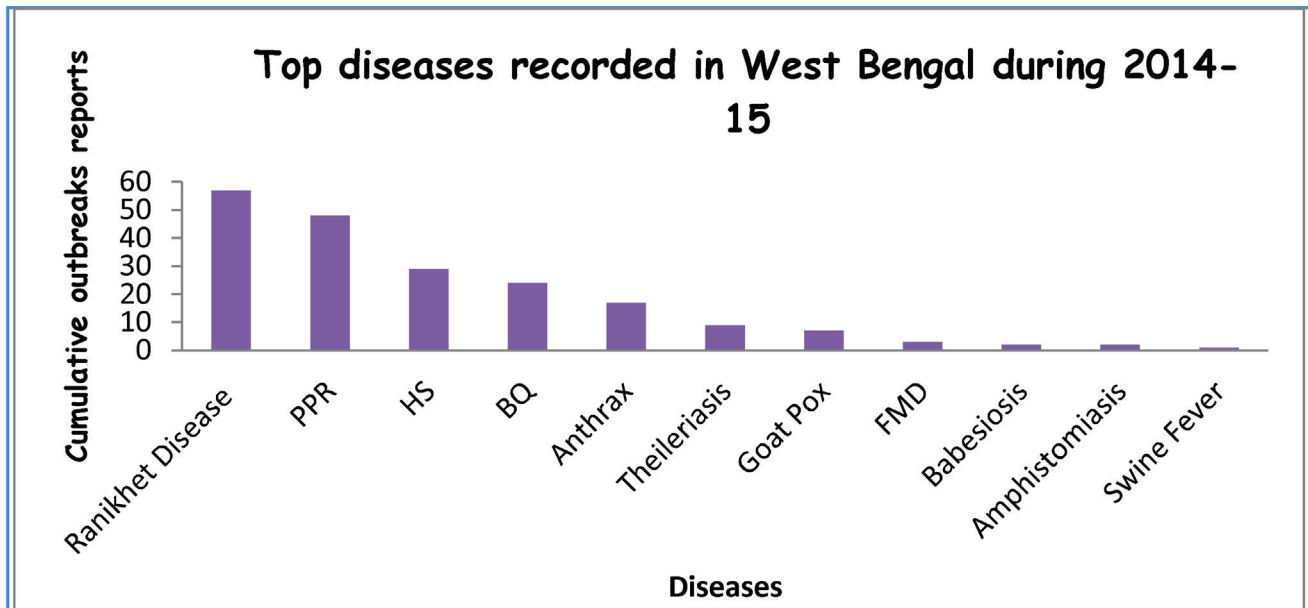


Fig. 42: Top diseases recorded in West Bengal

Financial Statement

Name of the unit	Allotment 2014 -15		Releases I		Releases II		Releases III		Total Release		Total funds available for 2014 -15		Expenditure 2014 -15		Balance as on 31.03.2015	
	TA	Contg.	TA	Contg.	TA	Contg.	TA	Contg.	TA	Contg.	TA	Contingency	TA	Contingency	TA	Contingency
Andhra pradesh	100000	500000	47552	249395	50000	250000			97552	499395	100000	500000	98046	499600	1954	400
Assam	100000	900000	87968	799117			100000		87968	899117	100000	906044	89724	906452	10276	- 408
Gujarat	100000	500000	50000	250000	50000	250000			100000	500000	100000	515301	77912	500000	22088	15301
Jammu & Kashmir	100000	500000	75000	250000	25000	250000			100000	500000	100000	511121	41451	415759	58549	95362
Jharkhand	100000	500000	50000	233804	50000	250000			100000	483804	114657	781216		356366	114657	424850
Karnataka	100000	500000	49954	208948	50000	250000			99954	477012	100000	573749	33350	619082	66650	- 45333
Kerala	100000	600000	50000	241837	50000	250000	100000		100000	591837	100000	600000	100000	600000	0	0
Madhya pradesh	100000	800000	50000	250000	50000	250000	300000		100000	800000	100000	800000	100000	800000	0	0
Maharashtra	100000	500000	0			241000			0	241000	0	500000		449000	0	51000
Manipur	100000	700000	50000	350000	50000	350000			100000	700000	100000	700000	142600	657364	- 42600	42636
Meghalaya	100000	700000	50000	293733	50000	350000			100000	643733	96325	700000	96325	697500	0	2500
Orissa	100000	500000	1990	236233	50000	250000			51990	486233	100000	500000	84247	500000	15753	0
Punjab	100000	500000	40045	249950	50000	250000			90045	499950	100000	500000	61366	499801	38634	199
Rajasthan	100000	500000	22175	149920	50000	250000			72175	399920	100000	500000	99503	500000	497	0
West Bengal									0	0						
West Bengal - IVRI	100000	500000	50000	250000					50000	250000	121969	520693	112833	481568	9136	39125
Total	1500000	8700000	674684	4012937	575000	3441000	0	500000	1249684	7972001	1432951	9108124	1137357	8482492	295594	625632

**ALL INDIA COORDINATED PROJECT ON
ANIMAL DISEASE MONITORING AND
SURVEILLANCE**

**NATIONAL INSTITUTE OF VETERINARY
EPIDEMIOLOGY AND DISEASE INFORMATICS
(Formerly PD_ADMAS)**

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2	Bengaluru Karnataka	Institute of Animal Health & Veterinary Biolog- icals, Hebbal, BANGALORE-560 024 Ph No : 080-23414791, 9448186432 Fax No : 080-23412367 E-mail : jrdri@yahoo.com	Dr. P. Giridhar Joint Director (RDI) IAH & VB, Hebbal, Bengaluru-560 024 Ph No: 080-23411502/23414791 Fax No : 080-23411502/23414791 Residence No: 080-23626830 Cell No: 09448186432 Email Id: jrdri@yahoo.com	Dr. H.K. Muniyellappa IAH & VB, Hebbal, Bengaluru-560 024 Ph No: 080-23414791/23414792 Fax No : 080-23414791/23414792 Residence No: 09448324121 Cell No: 09448324121 Email Id: hkmuni@gmail.com
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