



#### Contents

- ⇒ Top ten diseases reported and their spatial distribution in the month of **June**
- ⇒ Top ten diseases reported and their spatial distribution in the month of **July**
- ⇒ Top ten diseases reported and their spatial distribution in the month of **August**
- ⇒ Top ten diseases reported and their spatial distribution in the month of **September**
- ⇒ Top ten diseases reported and their spatial distribution in the month of **October**
- ⇒ Top ten diseases reported and their spatial distribution in the month of **November**
- ⇒ News
- ⇒ Epidemiological concepts

**Published by :**  
Director  
ICAR-NIVEDI

#### Contact:

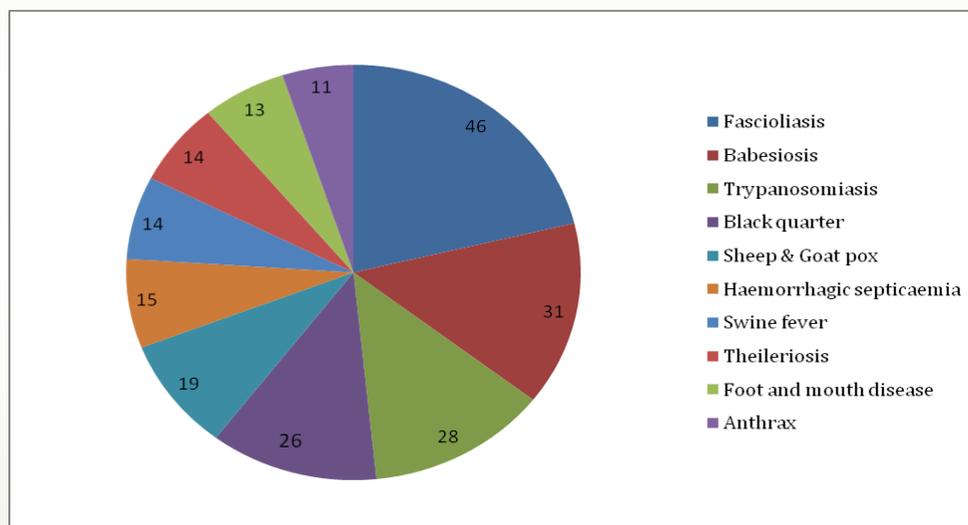
National Institute of Veterinary  
Epidemiology & Disease  
Informatics (NIVEDI),  
Post Box No. 6450  
Ramagondanahalli, Yelahanka,  
Bengaluru-560064

Phone: 0091-80-23093110/23093111

Email: epinetnivedi@gmail.com

## June 2015

The top ten diseases reported during June, 2015 are Fascioliasis, Babesiosis, Trypanosomiasis, Black quarter, Sheep & Goat pox, Hemorrhagic septicaemia, Swine fever, Theileriosis, Foot and mouth disease and Anthrax. The following Pie chart shows the top ten diseases reported during the month of June, 2015 (Fig. 1).



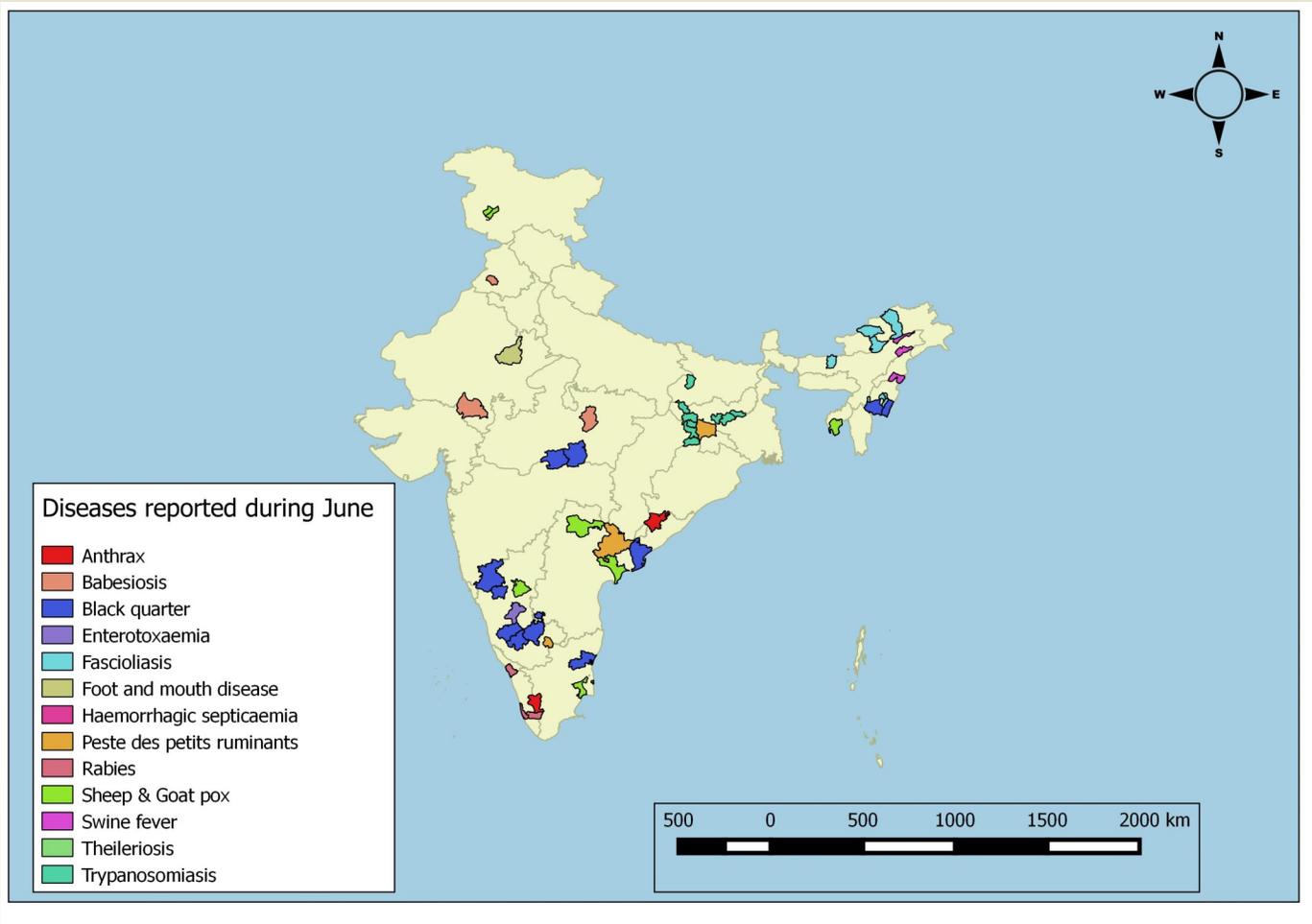
**Fig. 1 Top ten diseases reported during June 2015**  
(Numbers in chart indicate outbreaks)

**Fascioliasis** has been recorded from six states involving 24 districts with total of 46 outbreaks. Maximum number of outbreaks were reported from Jharkhand (13 districts) followed by, Andaman Nicobar (two districts), Puducherry (one district), Manipur (two districts), Arunachal Pradesh (3 districts) and Assam (3 districts) (Fig. 2).

**Babesiosis** has been recorded from five states involving 18 districts with total of 31 outbreaks. Maximum number of outbreaks has been recorded in Jharkhand (13 districts) followed by Puducherry (two districts) and one district each from Madhya Pradesh, Rajasthan and Punjab (Fig. 2).

**Trypanosomiasis:** has been recorded from two states involving 13 districts with total of 28 outbreaks. Maximum number of outbreaks has been recorded in Jharkhand (12 districts) followed by Bihar (one districts) (Fig. 2).

**Black quarter** has been recorded from seven states involving 13 districts with total of 22 outbreaks. Maximum number of outbreaks has been recorded in Karnataka state (five districts, 11 outbreaks). The other states that reported BQ are Madhya Pradesh, Manipur, Tamil Nadu, Meghalaya and Andhra Pradesh (Fig. 2).



**Fig.2 Spatial distribution of diseases reported during June 2015**

**Sheep and Goat pox** has been recorded from five states involving ten districts with total of 18 outbreaks. Maximum number of outbreaks has been recorded in Jammu and Kashmir State (three districts) followed by Karnataka, Tripura, Andhra Pradesh and Tamil Nadu (Fig. 2).

**Haemorrhagic septicaemia** has been recorded from three states involving seven districts with total of 15 outbreaks. Maximum number of outbreaks has been recorded in Kerala (four districts), followed by Meghalaya (two districts) and Karnataka (one districts) (Fig. 2).

**Swine fever** has been recorded from four states involving eight districts. Maximum number of outbreaks has been recorded in Meghalaya followed by Assam, Nagaland and Manipur (Fig. 2).

**Theileriosis** has been recorded from three states involving 13 districts total of 13 outbreaks. Maximum number of out-breaks has been recorded in Jharkhand followed by Punjab and Karnataka (Fig. 2).

**Foot and mouth disease** has been recorded from three states involving five districts. Maximum number of outbreaks has been recorded in Meghalaya state. Rajasthan and Orissa also reported the disease (Fig. 2).

**Anthrax** has been recorded from five states involving six districts. Maximum number of outbreaks has been recorded in Orissa state. Karnataka, Kerala, Tamil Nadu, and Andhra Pradesh also reported the disease (Fig. 2).

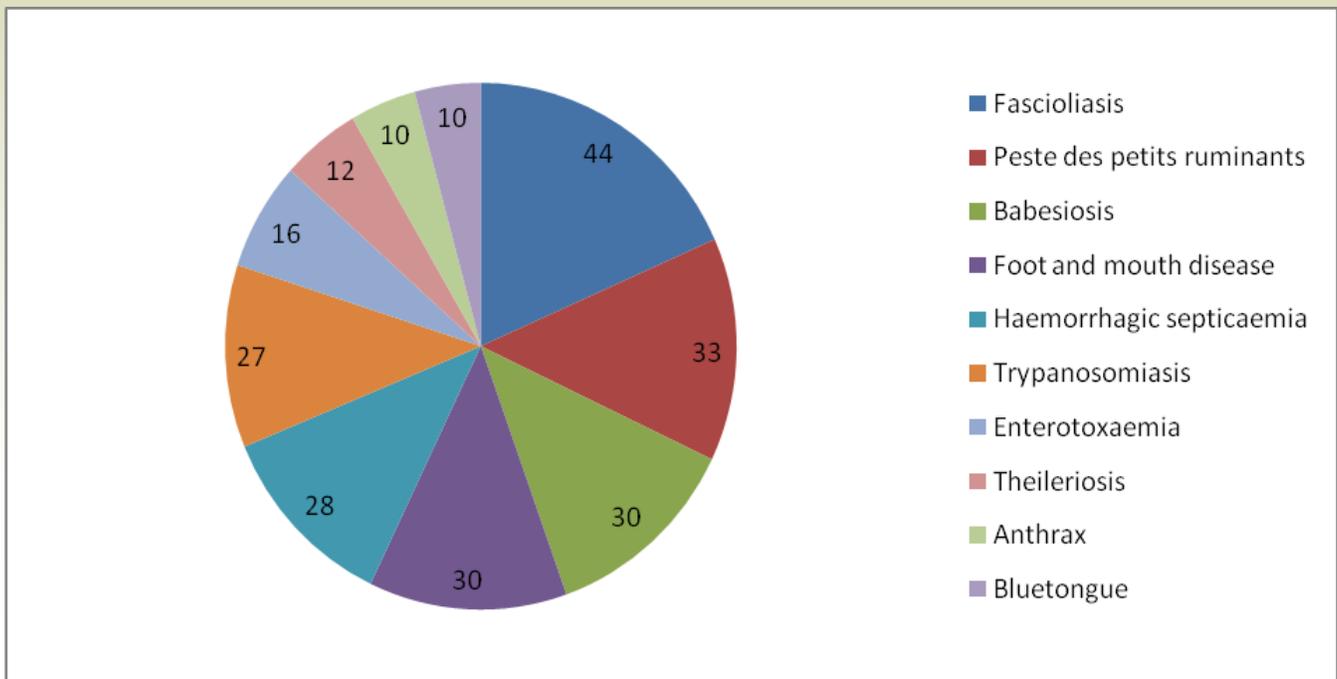
**Table.1 State wise disease reports for June, 2015**

State	Diseases reported*
Andaman and Nicobar	Fascioliasis (Cattle, Buffalo, Goat)
Andhra Pradesh	Anthrax (Sheep), Black quarter (Cattle), <i>Peste des petits ruminants</i> (Sheep), Sheep & Goat pox (Sheep and goat)
Arunachal Pradesh	Bunostomiasis (Cattle), Fascioliasis (Cattle)
Assam	Fascioliasis (Cattle), Swine fever (Pig)
Bihar	Trypanosomiasis (Buffalo)
Jammu and Kashmir	Sheep & Goat pox (Sheep and Goat)
Jharkhand	Babesiosis (Cattle, Buffalo), Black quarter (Cattle), Fascioliasis (Cattle, Buffalo, Goat, Pig), <i>Peste des petits ruminants</i> (Cattle), Theileriosis (Cattle, Buffalo, Goat), Trypanosomiasis (Cattle, Buffalo, Goat)
Karnataka	Anthrax (Sheep, Cattle), Black quarter (Cattle, Buffalo), Enterotoxaemia (Goat, Sheep), Haemorrhagic septicaemia (Goat, Buffalo), <i>Peste des petits ruminants</i> (Sheep, Goat), Sheep & Goat pox (Sheep), Theileriosis (Goat)
Kerala	Anthrax (Cattle), Haemorrhagic septicaemia (Cattle, Goat), <i>Peste des petits ruminants</i> (Goat), Rabies (Cattle, Canine, Goat)
Madhya Pradesh	Babesiosis (Cattle, Buffalo), Black quarter (Cattle)
Manipur	Black quarter (Cattle), Fascioliasis (Cattle), Swine fever (Pig)
Meghalaya	Black quarter (Cattle), Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle), Swine fever (Pig)
Nagaland	Swine fever (Pig)
Orissa	Anthrax (Cattle, Pig), Foot and mouth disease (Cattle)
Puducherry	Babesiosis (Cattle, Canine), Fascioliasis (Cattle)
Punjab	Babesiosis (Cattle), Theileriosis (Cattle)
Rajasthan	Babesiosis (Cattle), Foot and mouth disease (Cattle, Buffalo, Goat)
Tamil Nadu	Anthrax (Cattle), Black quarter (Cattle), Sheep & Goat pox (Goat)
Tripura	Sheep & Goat pox (Goat)

**Note:** \* The livestock species in the bracket indicates the occurrence of the disease in those species of livestock during the reporting month in respective states

## July 2015

The top ten diseases reported during July, 2015 are Fascioliasis, *Peste des petits ruminants*, Babesiosis, Foot and mouth disease, Hemorrhagic septicemia, Trypanosomiasis, Enterotoxaemia, Theileriosis, Anthrax and Bluetongue. The following Pie chart shows the top ten diseases reported during the month of July, 2015 (Fig. 3).



**Fig. 3 Top ten diseases reported during July 2015**

(Numbers in chart indicate outbreaks)

**Fascioliasis** has been recorded from five states involving twenty one districts. Maximum number of outbreaks has been recorded in Jharkhand state. Andaman & Nicobar, Assam, Arunachal Pradesh, and Puducherry are other states that reported the disease (Fig. 4).

***Peste des petits ruminants*** has been recorded from 5 states involving fourteen districts. Maximum number of outbreaks has been recorded in West Bengal state. Gujarat, Jharkhand, Karnataka and Madhya Pradesh are other states that reported the disease (Fig. 4).

**Babesiosis** has been recorded from six states involving sixteen districts. Maximum number of outbreaks has been recorded in Jharkhand state. Assam, Madhya Pradesh, Mizoram, Puducherry and Punjab are other states that reported the disease (Fig. 4).

**Foot and mouth disease** has been recorded from seven states and one union territory involving eighteen districts. Maximum number of outbreaks has been recorded in Kerala state. Daman & Diu, Jharkhand, Karnataka, Madhya Pradesh, Meghalaya, Orissa and West Bengal are other states that reported the disease (Fig. 4).

**Hemorrhagic septicemia** has been recorded from five states involving eight districts. Maximum number of outbreaks has been recorded in Karnataka state. Kerala, Bihar, Meghalaya and Orissa are other states that reported the disease (Fig. 4).

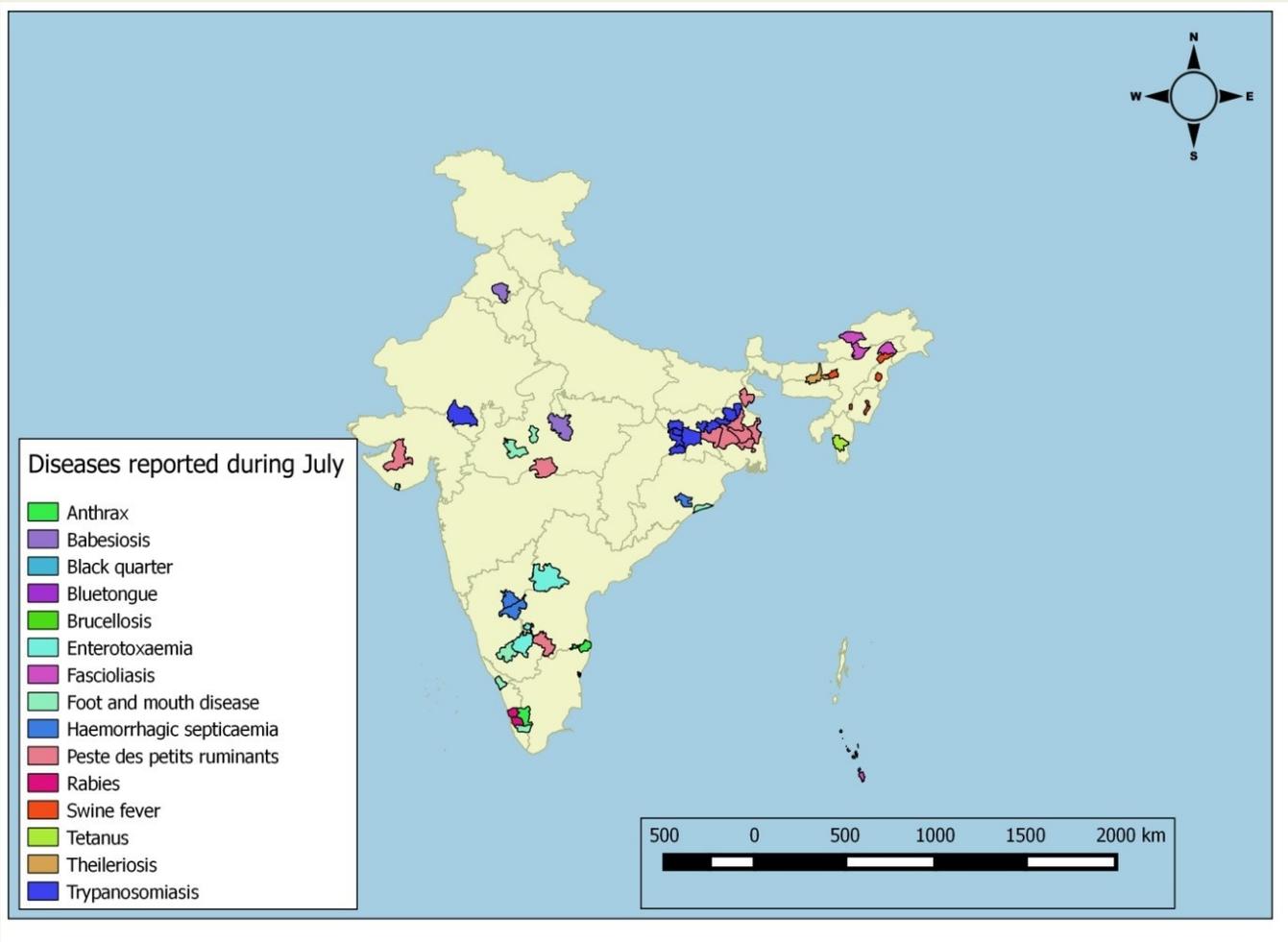
**Trypanosomiasis** has been recorded from two states involving thirteen districts. Maximum number of outbreaks has been recorded in Jharkhand state. Rajasthan is other states that reported the disease (Fig. 4).

**Enterotoxaemia** has been recorded from two states involving four districts. Maximum number of outbreaks has been recorded in Karnataka state. Andhra Pradesh is other states that reported the disease (Fig. 4).

**Theileriosis** has been recorded from two states involving nine districts. Maximum number of outbreaks has been recorded in Jharkhand state. Assam is other states that reported the disease (Fig. 4).

**Anthrax** has been recorded from three states involving five districts. Maximum number of outbreaks has been recorded in Karnataka followed by Kerala and Tamil Nadu (Fig. 4).

**Bluetongue** has been recorded from Karnataka involving one district (Fig. 4).



**Fig.4 Spatial distribution of diseases reported during July 2015**

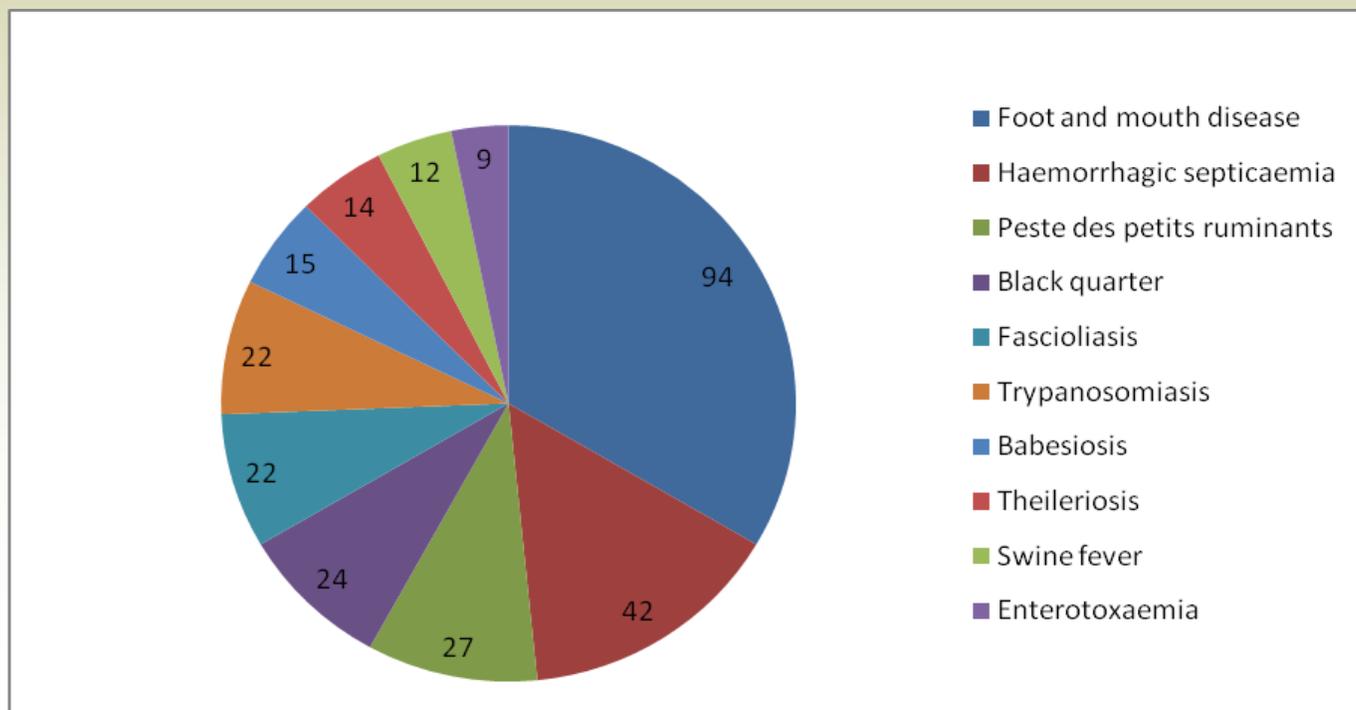
**Table.2 State wise disease reports for July, 2015**

State	Diseases reported*
Andaman and Nicobar	Fascioliasis (Cattle, Buffalo, Goat)
Andhra Pradesh	Enterotoxaemia (Sheep)
Arunachal Pradesh	Fascioliasis (Cattle)
Assam	Babesiosis (Cattle), Fascioliasis (Cattle), Swine fever (Pig), Theileriosis (Cattle)
Bihar	Haemorrhagic septicaemia (Cattle)
Daman and Diu	Foot and mouth disease (Cattle)
Gujarat	<i>Peste des petits ruminants</i> (Sheep, Goat)
Jharkhand	Babesiosis (Cattle, Buffalo, Canine, Goat), Black quarter (Cattle), Fascioliasis (Cattle, Buffalo, Goat, Pig), Foot and mouth disease (Cattle), <i>Peste des petits ruminants</i> (Goat), Theileriosis (Cattle, Buffalo, Goat), Trypanosomiasis (Cattle, Buffalo, Goat)
Karnataka	Anthrax (Cattle, Sheep), Bluetongue (Sheep, Goat), Brucellosis (Pig), Enterotoxaemia (Sheep, Goat), Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle, Sheep, Goat), <i>Peste des petits ruminants</i> (Sheep, Goat), Rabies (Cattle)
Kerala	Anthrax (Cattle, Pig), Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle), <i>Peste des petits ruminants</i> (Goat), Rabies (Cattle, Canine)
Madhya Pradesh	Babesiosis (Cattle), Black quarter (Cattle), Foot and mouth disease (Cattle, Buffalo), <i>Peste des petits ruminants</i> (Goat)
Manipur	Swine fever (Pig)
Meghalaya	Foot and mouth disease (Cattle, Pig), Haemorrhagic septicaemia (Cattle)
Mizoram	Babesiosis (Cattle), Tetanus (Pig)
Nagaland	Swine fever (Pig)
Orissa	Black quarter (Cattle), Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle)
Puducherry	Babesiosis (Cattle), Fascioliasis (Cattle)
Punjab	Babesiosis (Cattle)
Rajasthan	Trypanosomiasis (Camel)
Tamil Nadu	Anthrax (Cattle)
West Bengal	Black quarter (Cattle), Foot and mouth disease (Cattle, Goat), <i>Peste des petits ruminants</i> (Goat)

**Note:** \* The livestock species in the bracket indicates the occurrence of the disease in those species of livestock during the reporting month in respective states

## August 2015

The top ten diseases reported during August, 2015 are Foot and mouth disease, Haemorrhagic septicaemia, *Peste des petits ruminants*, Black quarter, Fascioliasis, Trypanosomiasis, Babesiosis, Theileriosis, Swine fever, Enterotoxaemia. The following Pie chart shows the top ten diseases reported during the month of August, 2015 (Fig. 5).



**Fig. 5 Top ten diseases reported during August 2015**

(Numbers in chart indicate outbreaks)

**Foot and mouth disease** has been recorded from six states and one union territory involving twenty two districts. Maximum number of outbreaks has been recorded in Kerala state. Bihar, Daman & Diu, Jammu & Kashmir, Karnataka, Meghalaya and West Bengal are other states that reported the disease (Fig. 6).

**Haemorrhagic septicaemia** has been recorded from eight states involving twenty one districts. Maximum number of outbreaks has been recorded in Madhya Pradesh state. Karnataka, Kerala, Meghalaya, Orissa, Rajasthan, Tamil Nadu and West Bengal are other states that reported the disease (Fig. 6).

***Peste des petits ruminants*** has been recorded from nine states involving sixteen districts. Maximum number of outbreaks has been recorded in West Bengal state. Gujarat, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Orissa, Rajasthan and Uttar Pradesh are other states that reported the disease (Fig. 6).

**Black quarter** has been recorded from five states involving fourteen districts. Maximum number of outbreaks has been recorded in Karnataka state. Madhya Pradesh, Meghalaya, Orissa, and West Bengal are other states that reported the disease (Fig. 6).

**Fascioliasis** has been recorded from four states involving twenty districts. Maximum number of outbreaks has been recorded in Jharkhand state. Assam, Arunachal Pradesh, and Puducherry are other states that reported the disease (Fig. 6).

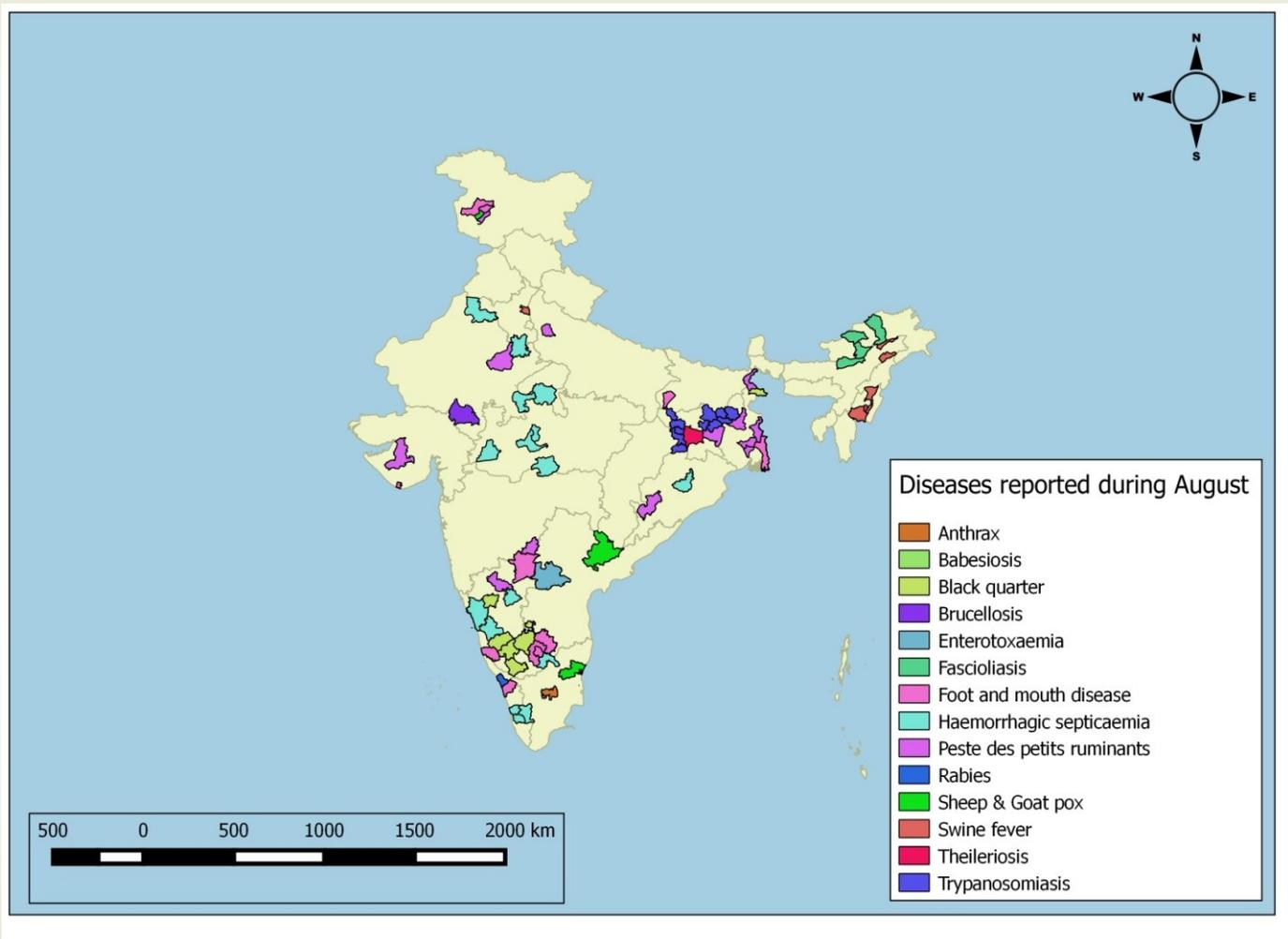
**Trypanosomiasis** has been recorded from Jharkhand involving twenty two districts (Fig. 6).

**Babesiosis** has been recorded from two states involving eleven districts. Maximum number of outbreaks has been recorded in Jharkhand state. Puducherry is other states that reported the disease (Fig. 6).

**Theileriosis** has been recorded from Jharkhand involving thirteen districts (Fig. 6).

**Swine fever** has been recorded from four states involving nine districts. Maximum number of outbreaks has been recorded in Manipur state. Assam, Haryana and Meghalaya are other states that reported the disease (Fig. 6).

**Enterotoxaemia** has been recorded from three states involving four districts. Maximum number of outbreaks has been recorded in Karnataka state. Madhya Pradesh and Andhra Pradesh are other states that reported the disease (Fig. 6).



**Fig.6 Spatial distribution of diseases reported during August 2015**

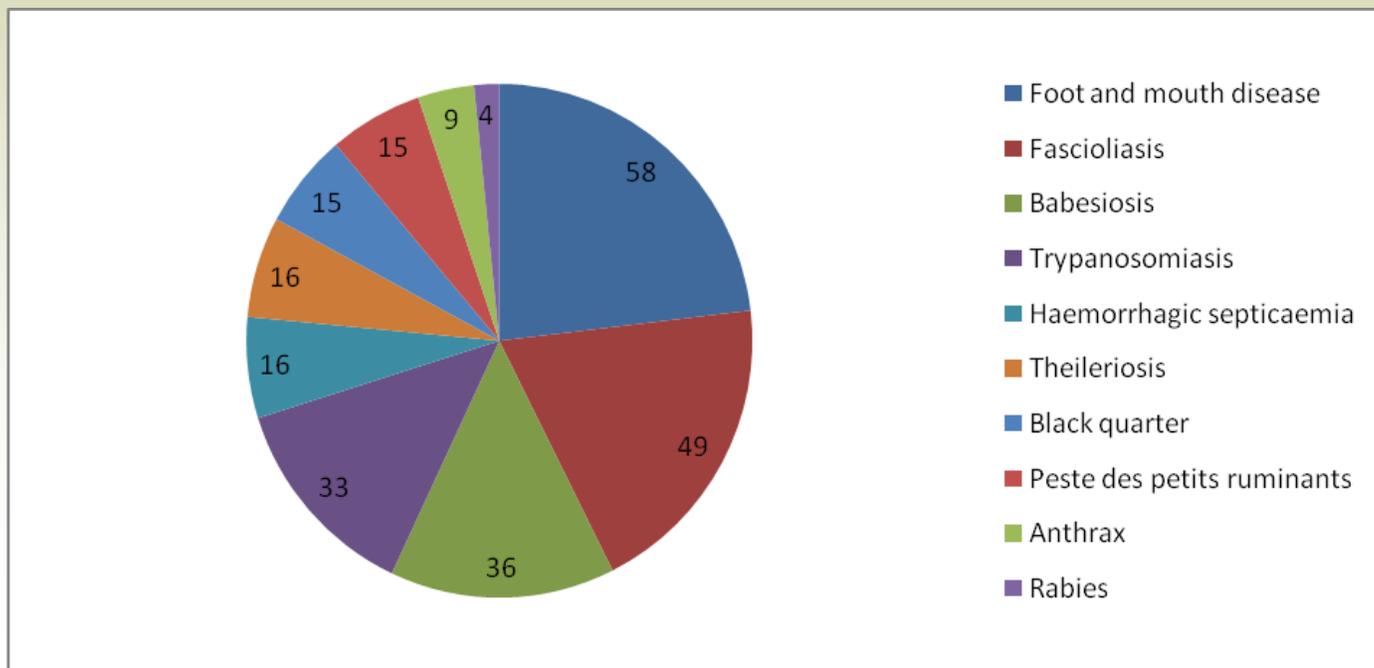
**Table.3 State wise disease reports for August, 2015**

State	Diseases reported*
Andhra Pradesh	Enterotoxaemia (Sheep), Sheep & Goat pox (Sheep)
Arunachal Pradesh	Fascioliasis (Cattle)
Assam	Fascioliasis (Cattle), Swine fever (Pig)
Bihar	Foot and mouth disease (Cattle, Buffalo)
Daman and Diu	Foot and mouth disease (Cattle)
Gujarat	<i>Peste des petits ruminants</i> (Sheep, Goat)
Haryana	Swine fever (Pig)
Jammu and Kashmir	Foot and mouth disease (Cattle), <i>Peste des petits ruminants</i> (Sheep, Goat), Sheep & Goat pox (Sheep, Goat)
Jharkhand	Babesiosis (Buffalo, Pig), Fascioliasis (Cattle, Buffalo, Pig), <i>Peste des petits ruminants</i> (Goat), Theileriosis (Cattle, Goat), Trypanosomiasis (Cattle, Goat)
Karnataka	Black quarter (Cattle), Brucellosis (Sheep), Enterotoxaemia (Sheep, Goat), Foot and mouth disease (Cattle, Buffalo), Haemorrhagic septicaemia (Cattle, Buffalo, Sheep, Goat), <i>Peste des petits ruminants</i> (Goat), Sheep & Goat pox (Goat)
Kerala	Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle), <i>Peste des petits ruminants</i> (Goat), Rabies (Cattle)
Madhya Pradesh	Black quarter (Cattle), Enterotoxaemia (Sheep), Haemorrhagic septicaemia (Cattle, Buffalo, Pig)
Manipur	Swine fever (Pig)
Meghalaya	Black quarter (Cattle), Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle), Rabies (Cattle), Swine fever (Pig)
Orissa	Black quarter (Cattle, Buffalo), Haemorrhagic septicaemia (Cattle), <i>Peste des petits ruminants</i> (Goat)
Puducherry	Babesiosis (Cattle), Fascioliasis (Cattle)
Rajasthan	Brucellosis (Sheep), Haemorrhagic septicaemia (Cattle, Buffalo), <i>Peste des petits ruminants</i> (Goat)
Tamil Nadu	Anthrax (Sheep), Haemorrhagic septicaemia (Cattle), Sheep & Goat pox (Sheep)
Uttar Pradesh	<i>Peste des petits ruminants</i> (Goat)
West Bengal	Black quarter (Cattle), Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle), <i>Peste des petits ruminants</i> (Goat)

**Note:** \* The livestock species in the bracket indicates the occurrence of the disease in those species of livestock during the reporting month in respective states

## September 2015

The top ten diseases reported during September, 2015 are Foot and mouth disease, Fascioliasis, Babesiosis, Trypanosomiasis, Haemorrhagic septicaemia, Theileriosis, Black quarter, *Peste des petits ruminants*, Anthrax and Rabies. The following Pie chart shows the top ten diseases reported during the month of September, 2015 (Fig. 7).



**Fig. 7 Top ten diseases reported during September 2015**  
(Numbers in chart indicate outbreaks)

**Foot and mouth disease** has been recorded from six states involving twenty two districts. Maximum number of outbreaks has been recorded in Kerala state. Karnataka, Madhya Pradesh, Meghalaya, Orissa and West Bengal are other states that reported the disease (Fig. 8).

**Fascioliasis** has been recorded from six states involving twenty five districts. Maximum number of outbreaks has been recorded in Jharkhand state. Assam, Arunachal Pradesh, Karnataka, Manipur and Puducherry are other states that reported the disease (Fig. 8).

**Babesiosis** has been recorded from two states involving fourteen districts. Maximum number of outbreaks has been recorded in Jharkhand state. Puducherry is other states that reported the disease (Fig. 8).

**Trypanosomiasis** has been recorded from three state involving fifteen districts. Maximum number of outbreaks has been recorded in Jharkhand state. Madhya Pradesh and Puducherry are other states that reported the disease (Fig. 8).

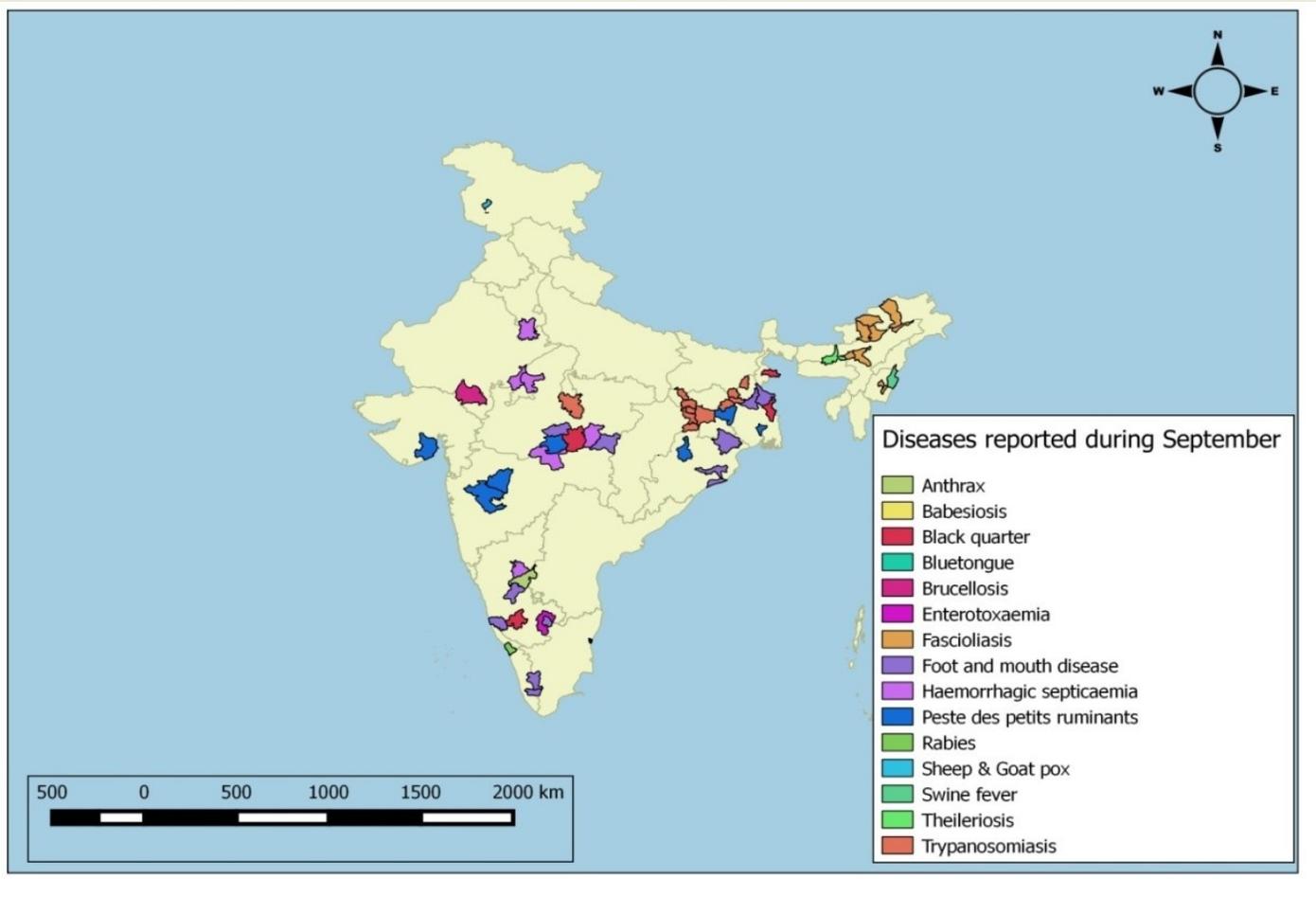
**Haemorrhagic septicaemia** has been recorded from six states involving ten districts. Number of outbreaks has been recorded in Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya and Rajasthan states (Fig. 8).

**Theileriosis** has been recorded from two states involving eleven districts. Maximum number of outbreaks has been recorded in Jharkhand state. Assam is other states that reported the disease (Fig. 8).

**Black quarter** has been recorded from five states involving eleven districts. Number of outbreaks has been recorded in Karnataka, Madhya Pradesh, Meghalaya, Orissa, and West Bengal states (Fig. 8).

**Peste des petits ruminants** has been recorded from eight states involving ten districts. Number of outbreaks has been recorded in Assam, Gujarat, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Orissa, and West Bengal states (Fig. 8).

**Anthrax** has been recorded from two states involving three districts. Number of outbreaks has been recorded in Karnataka and West Bengal states (Fig. 8).



**Fig. 8 Spatial distribution of diseases reported during September 2015**

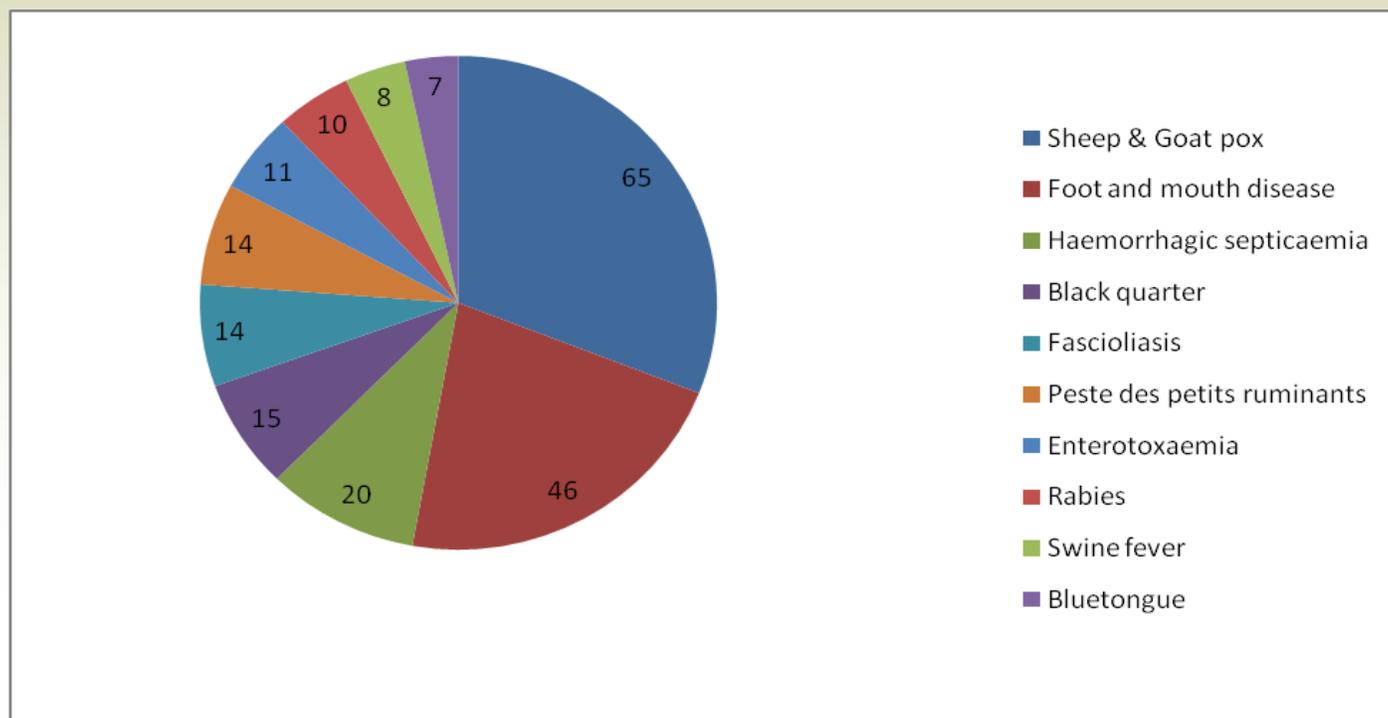
**Table.4 State wise disease reports for September, 2015**

State	Diseases reported*
Arunachal Pradesh	Fascioliasis (Cattle, Goat)
Assam	Fascioliasis (Cattle, Goat), <i>Peste des petits ruminants</i> (Goat), Theileriosis (Cattle)
Gujarat	<i>Peste des petits ruminants</i> (Sheep, Goat)
Jammu and Kashmir	<i>Peste des petits ruminants</i> (Sheep, Goat), Sheep & Goat pox (Sheep, Goat)
Jharkhand	Babesiosis (Cattle, Buffalo, Goat, Pig), Fascioliasis (Cattle, Buffalo, Goat, Pig), Theileriosis (Cattle, Buffalo, Goat), Trypanosomiasis (Cattle, Buffalo, Goat)
Karnataka	Anthrax (Goat, Sheep), Black quarter (Cattle), Bluetongue (Sheep), Enterotoxaemia (Sheep), Foot and mouth disease (Cattle, Buffalo), Haemorrhagic septicaemia (Cattle), <i>Peste des petits ruminants</i> (Sheep)
Kerala	Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle), Rabies (Cattle)
Madhya Pradesh	Black quarter (Cattle), Foot and mouth disease (Cattle, Buffalo), Haemorrhagic septicaemia (Cattle, Buffalo), <i>Peste des petits ruminants</i> (Goat), Trypanosomiasis (Cattle, Buffalo)
Maharashtra	Haemorrhagic septicaemia (Buffalo), <i>Peste des petits ruminants</i> (Sheep, Goat)
Manipur	Fascioliasis (Cattle), Swine fever (Pig)
Meghalaya	Black quarter (Cattle), Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle)
Mizoram	Sheep & Goat pox (Goat)
Orissa	Black quarter (Cattle), Foot and mouth disease (Cattle), <i>Peste des petits ruminants</i> (Sheep, Goat)
Puducherry	Babesiosis (Cattle), Fascioliasis (Cattle), Trypanosomiasis (Cattle)
Rajasthan	Brucellosis (Sheep), Haemorrhagic septicaemia (Cattle, Buffalo)
West Bengal	Anthrax (Cattle), Black quarter (Cattle), Foot and mouth disease (Cattle), <i>Peste des petits ruminants</i> (Goat)

**Note:** \* The livestock species in the bracket indicates the occurrence of the disease in those species of livestock during the reporting month in respective states

## October 2015

The top ten diseases reported during October, 2015 are Sheep & Goat pox, Foot and mouth disease, Hemorrhagic septicemia, Black quarter, Fascioliasis, *Peste des petits ruminants*, Enterotoxaemia, Rabies, Swine fever and Bluetongue. The following Pie chart shows the top ten diseases reported during the month of October, 2015 (Fig. 9).



**Fig. 9 Top ten diseases reported during October 2015**  
(Numbers in chart indicate outbreaks)

**Sheep and Goat pox** has been recorded from two states involving four districts. Maximum number of outbreaks has been recorded in Jammu & Kashmir state. Karnataka is the other state that reported the disease (Fig. 10).

**Foot and mouth disease** has been recorded from seven states involving twenty two districts. Maximum number of outbreaks has been recorded in Kerala state. Bihar, Daman & Diu, Jammu & Kashmir, Karnataka, Manipur and Meghalaya are other states that reported the disease (Fig. 10).

**Hemorrhagic septicemia** has been recorded from six states involving nine districts. Maximum number of outbreaks has been recorded in state of Madhya Pradesh. Assam, Karnataka, Kerala, Maharashtra and Meghalaya are other states that reported the disease (Fig. 10).

**Black quarter** has been recorded from three states involving seven districts. The maximum number of outbreaks has been recorded in Meghalaya followed by Karnataka and Manipur (Fig. 10).

**Fascioliasis** has been recorded from three states involving eleven districts. The maximum number of outbreaks has been recorded in Assam followed by Arunachal Pradesh and Puducherry (Fig. 10).

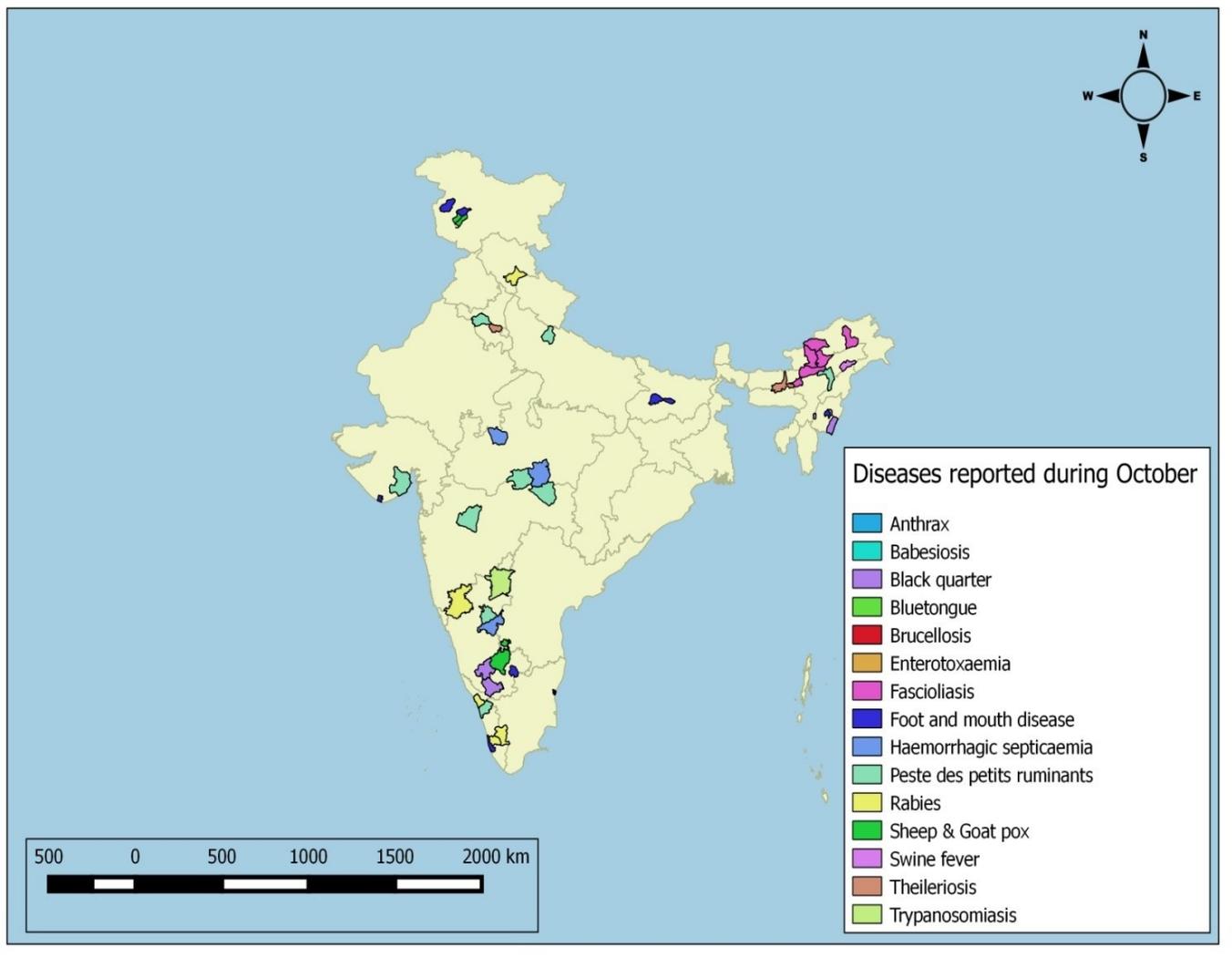
***Peste des petits ruminants*** has been recorded from eight states involving ten districts. Maximum number of outbreaks has been recorded in Maharashtra followed by Assam, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, and Uttar Pradesh states (Fig. 10).

**Enterotoxaemia** has been recorded from Karnataka involving two districts (Fig. 10).

**Rabies** has been recorded from three states involving seven districts. Maximum number of outbreaks has been recorded in Kerala followed by Karnataka and Himachal Pradesh (Fig. 10).

**Swine fever** has been recorded from two states involving two districts. Maximum number of outbreaks reported has been recorded in Meghalaya followed by Assam (Fig. 10).

**Bluetongue** has been recorded from Karnataka involving only one district (Fig. 10).



**Fig.10 Spatial distribution of diseases reported during October 2015**

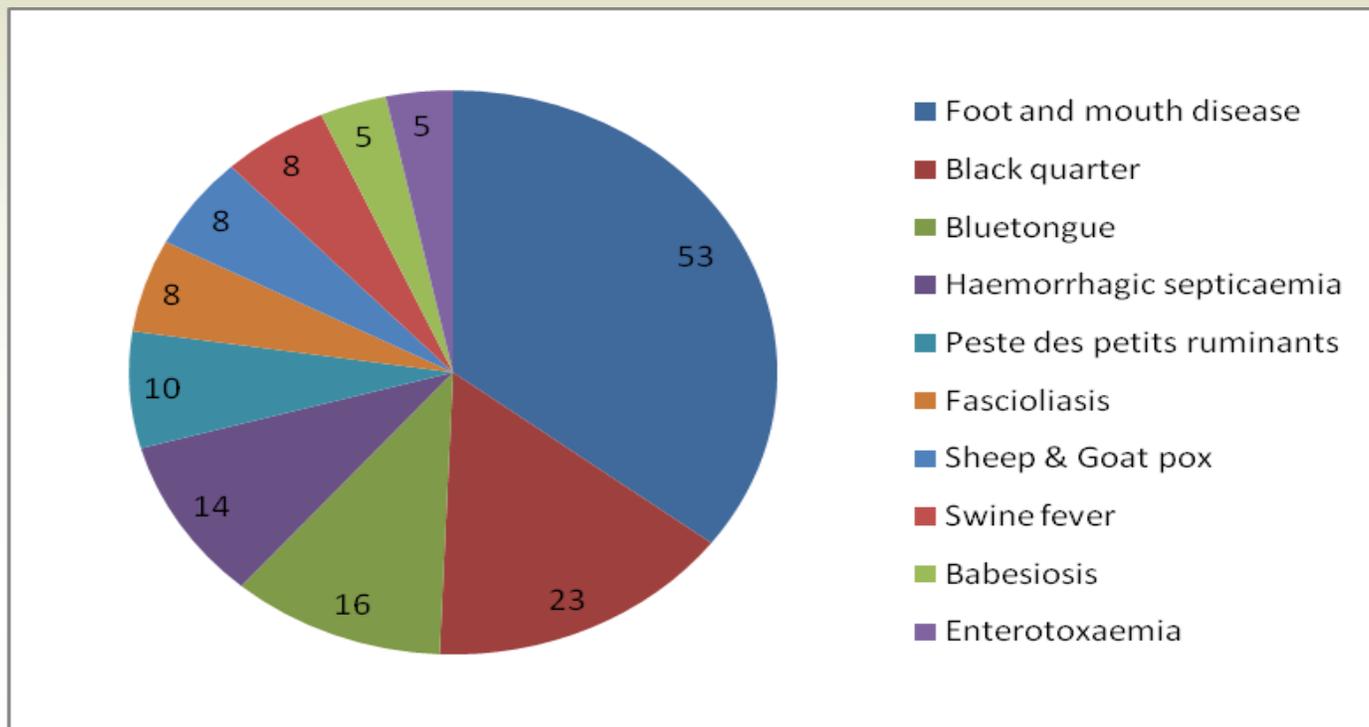
**Table.5 State wise disease reports for October, 2015**

State	Diseases reported*
Arunachal Pradesh	Fascioliasis (Cattle)
Assam	Fascioliasis (Cattle, Goat), Haemorrhagic septicaemia (Cattle), <i>Peste des petits ruminants</i> (Goat), Swine fever (Pig), Theileriosis (Cattle)
Bihar	Foot and mouth disease (Cattle)
Daman and Diu	Foot and mouth disease (Cattle, Buffalo)
Gujarat	<i>Peste des petits ruminants</i> (Sheep, Goat)
Haryana	Brucellosis (Sheep), <i>Peste des petits ruminants</i> (Sheep, Goat), Theileriosis (Cattle)
Himachal Pradesh	Rabies (Cattle)
Jammu and Kashmir	Foot and mouth disease (Cattle, Sheep, Goat), Sheep & Goat pox (Sheep, Goat)
Karnataka	Anthrax (Sheep), Black quarter (Cattle), Bluetongue (Sheep), Brucellosis (Sheep), Enterotoxaemia (Sheep, Goat), Foot and mouth disease (Cattle, Pig, Sheep), Haemorrhagic septicaemia (Sheep, Goat), <i>Peste des petits ruminants</i> (Sheep), Rabies (Cattle, Buffalo), Sheep & Goat pox (Sheep), Theileriosis (Sheep, Goat), Trypanosomiasis (Buffalo)
Kerala	Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle), <i>Peste des petits ruminants</i> (Goat), Rabies (Cattle, Goat)
Madhya Pradesh	Haemorrhagic septicaemia (Cattle, Buffalo), <i>Peste des petits ruminants</i> (Goat)
Maharashtra	Haemorrhagic septicaemia (Cattle), <i>Peste des petits ruminants</i> (Sheep, Goat)
Manipur	Black quarter (Cattle), Foot and mouth disease (Cattle)
Meghalaya	Black quarter (Cattle), Foot and mouth disease (Cattle, Pig), Haemorrhagic septicaemia (Cattle), Swine fever (Pig)
Puducherry	Babesiosis (Cattle), Fascioliasis (Cattle)
Uttar Pradesh	<i>Peste des petits ruminants</i> (Goat)

**Note:** \* The livestock species in the bracket indicates the occurrence of the disease in those species of livestock during the reporting month in respective states

## November 2015

The top ten diseases reported during November, 2015 are Foot and mouth disease, Black quarter, Bluetongue, Hemorrhagic septicemia, *Peste des petits ruminants*, Fascioliasis, Sheep & Goat pox, Swine fever, Babesiosis and Enterotoxaemia. The following Pie chart shows the top ten diseases reported during the month of November, 2015 (Fig. 11).



**Fig. 11** Top ten diseases reported during November 2015  
(Numbers in chart indicate outbreaks)

**Foot and mouth disease** has been recorded from seven states involving nineteen districts. Maximum number of outbreaks has been recorded in Kerala state. Daman & Diu, Himachal Pradesh, Jammu & Kashmir, Karnataka, Madhya Pradesh and Orissa are other states that reported the disease (Fig. 12).

**Black quarter** has been recorded from four states involving five districts. Maximum number of outbreaks has been recorded in Karnataka followed by Orissa, Manipur and Andhra Pradesh (Fig. 12).

**Bluetongue** has been recorded from Karnataka involving three districts (Fig. 12).

**Hemorrhagic septicemia** has been recorded from six states involving ten districts. Maximum number of outbreaks has been recorded in Kerala followed by Maharashtra Andhra Pradesh, Himachal Pradesh, Karnataka and Madhya Pradesh (Fig. 12).

***Peste des petits ruminants*** has been recorded from five states involving seven districts. Maximum number of outbreaks has been recorded in Maharashtra followed by Karnataka, Kerala, Assam, and Madhya Pradesh (Fig. 12).

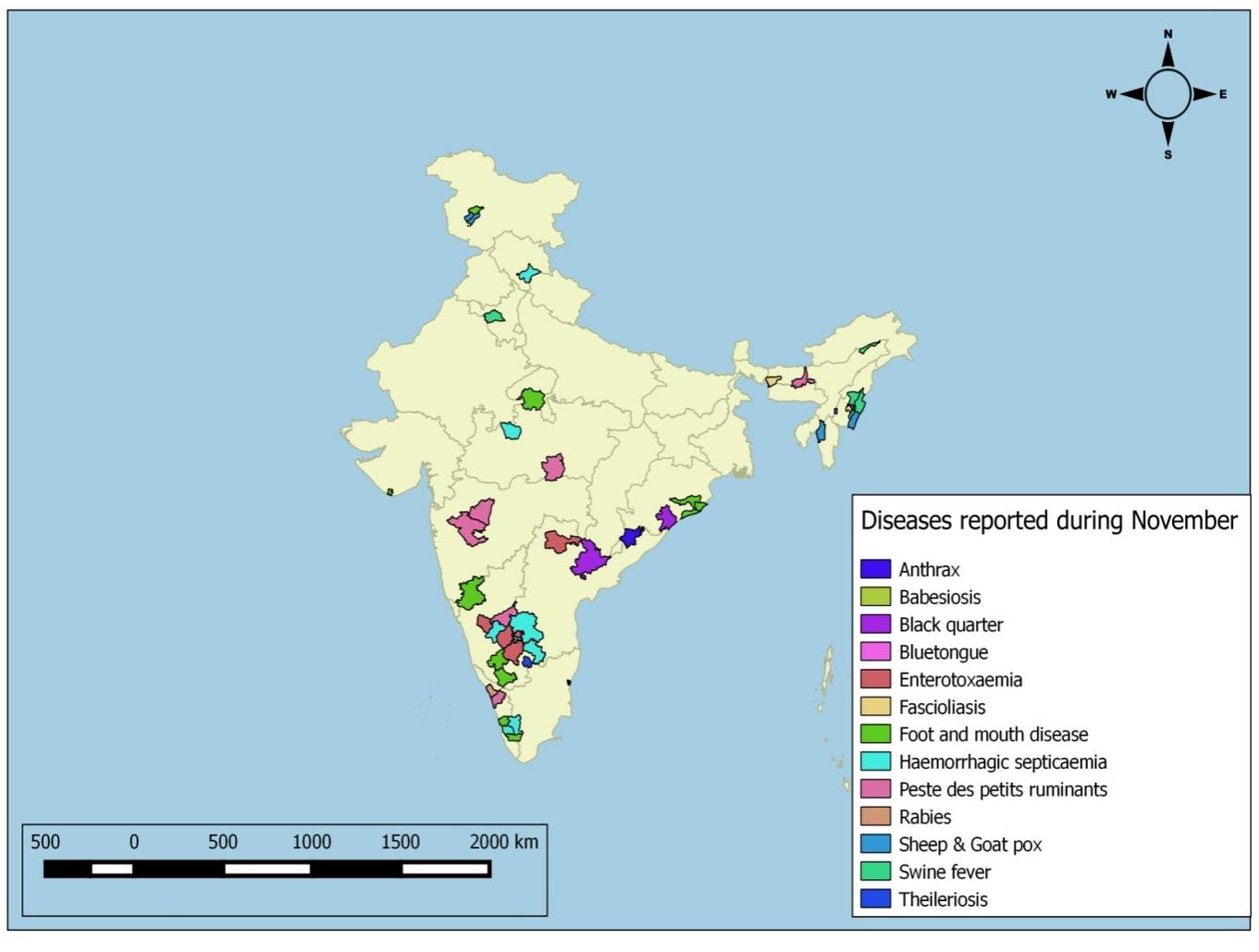
**Fascioliasis** has been recorded from three states involving six districts. Maximum number of outbreaks has been recorded in Puducherry followed by Assam and Manipur (Fig. 12).

**Sheep and Goat pox** has been recorded from three states involving five districts. Maximum number of outbreaks has been recorded in Jammu & Kashmir followed by Manipur and Mizoram (Fig. 12).

**Swine fever** has been recorded from four states involving seven districts. Maximum number of outbreaks has been recorded in Manipur followed by Assam Haryana and Karnataka (Fig. 12).

**Babesiosis** has been recorded from three states involving three districts. Maximum number of outbreaks has been recorded in Puducherry followed by Haryana and Karnataka (Fig. 12).

**Enterotoxaemia** has been recorded from two states involving four districts. Number of outbreaks has been maximum in Karnataka followed by Andhra Pradesh (Fig. 12).



**Fig.12 Spatial distribution of diseases reported during November 2015**

**Table.6 State wise disease reports for November, 2015**

State	Diseases reported*
Andhra Pradesh	Black quarter (Cattle), Enterotoxaemia (Sheep), Haemorrhagic septicaemia (Cattle)
Assam	Fascioliasis (Cattle), <i>Peste des petits ruminants</i> (Goat), Swine fever (Pig)
Daman and Diu	Foot and mouth disease (Cattle, Buffalo)
Haryana	Babesiosis (Cattle), Swine fever (Pig)
Himachal Pradesh	Foot and mouth disease (Cattle), Haemorrhagic septicaemia (Cattle)
Jammu and Kashmir	Foot and mouth disease (Cattle), Sheep & Goat pox (Sheep, Goat)
Karnataka	Anthrax (Sheep), Babesiosis (Cattle), Black quarter (Cattle), Bluetongue (Sheep), Enterotoxaemia (Sheep, Goat), Foot and mouth disease (Cattle, Buffalo), Haemorrhagic septicaemia (Buffalo, Sheep), <i>Peste des petits ruminants</i> (Sheep, Goat), Swine fever (Pig), Theileriosis (Cattle, Sheep)
Kerala	Haemorrhagic septicaemia (Cattle), Foot and mouth disease (Cattle), <i>Peste des petits ruminants</i> (Goat), Rabies (Cattle)
Madhya Pradesh	Foot and mouth disease (Cattle, Buffalo), Haemorrhagic septicaemia (Cattle, Buffalo), <i>Peste des petits ruminants</i> (Goat)
Maharashtra	Haemorrhagic septicaemia (Sheep), <i>Peste des petits ruminants</i> (Goat)
Manipur	Black quarter (Cattle), Fascioliasis (Cattle), Sheep & Goat pox (Goat), Swine fever (Pig)
Mizoram	Sheep & Goat pox (Goat)
Orissa	Anthrax (Cattle, Goat), Black quarter (Cattle), Foot and mouth disease (Cattle)
Puducherry	Babesiosis (Cattle), Fascioliasis (Cattle)

**Note:** \* The livestock species in the bracket indicates the occurrence of the disease in those species of livestock during the reporting month in respective states

# News

## June 2015

### **Man dies due to Anthrax**

Man dies and three other got ill by eating partially cooked beef which was confirmed to have anthrax spores in Koraput, Odhisa (ECTAD\*, Vol. 60, No. 89, 60 June 2015).

### **Kerala to Produce Goat Plague Vaccine**

Kerala state will commence production of its own *Peste des petits ruminants* (PPR) vaccine with assistance from the Indian Veterinary Research Institute (IVRI), Mukteshwar. This will affect the health of state's two million sheep and goats population. The vaccine will be developed by the Institute for Animal Health and Veterinary Biologicals (IAHVB) at Palode. (ECTAD\*, Vol. 60, No. 81, 75 June 2015).

## July 2015

### **Control room for livestock vaccination**

The Chhattisgarh Government has established a host of control rooms for vaccination drive launched for livestock in various districts of State. Every year, a month-long restrictive vaccination drive is organized in Chhattisgarh in the month of June-July to save livestock from contagious seasonal diseases, officials stated. This year, this vaccination drive has commenced from June 25, officials stated. Under this drive, vaccination teams hold camps in villages to vaccinate livestock and go door-to-door to ensure that each and every farm animal is vaccinated. (ECTAD\*, Vol. 60, No. 83, 68 July 2015).

## August 2015

### **Cattle to be immunized against anthrax**

Cattle in the surroundings of Manalmedu in Bhavani Sagar range, Tamil Nadu where an adult elephant was found dead with anthrax symptoms will be immunized shortly. The carcass of the female elephant, aged about 15 years was found with anthrax spores, was burnt and disposed of by a Forest Department team. Blood samples were taken for confirmation through laboratory tests. The post-mortem examination was not conducted completely after spores were found on the body. If the laboratory tests prove to be positive, it will be the 3rd elephant death due to anthrax in the last year in Sathyamangalam Tiger Reserve in Tamil Nadu. (ECTAD\*, Vol. 60, No. 90, 86 August 2015).

### **Mysterious disease**

At least 100 goats have perished displaying symptoms of cold and fever at Ragapur village in Sirpur (U) mandal, Telangana in the last four days spreading panic among the Gonds. "We are unable to understand what ails the goats," wondered Pendur Geeta one of whose goats fell ill two days back. Kanaka Sonabai, the local Asha workers and some other villagers informed the animal husbandry department of the disease which seems to be endemic as of now. The veterinarian did respond but failed in saving the goats the loss being valued at over Rs. 4 lakh in terms of money. (ECTAD\*, Vol. 60, No. 91, 84 August 2015).

## September 2015

### **FMD outbreak in Wayanad**

Outbreak of foot-and-mouth disease (FMD) in cattle has been reported in Nenmeni and Noolpuzha grama panchayats in Wayanad district of Kerala. According to the data of the District Animal Husbandry Department, as many as 11 heads of cattle, including four cows and eight calves, died of the disease in those grama panchayats in a fortnight. Moreover, 104 heads of cattle, including 34 in Noolpuzha and 70 in Nenmeni grama panchayats, have been affected so far. Transportation of cattle from the neighboring States was the major reason for the outbreak of the disease. (ECTAD\*, Vol. 60, No. 93, 76 September 2015).

### **Government comes out with new biosecurity norms for poultry farms**

The government has come out with new biosecurity norms for poultry farms to prevent outbreak of diseases and maintain basic sanitary conditions essential for healthy birds and hygienic products. The biosecurity guidelines were last issued in 2013. The norms have been revised in light of latest developments and to incorporate some practices in vogue to make them more effective, the Agriculture Ministry said in a statement. Releasing the guidelines today, the Ministry said, "The General Guidelines for Biosecurity at Central Poultry Development Organizations (CPDOs) were revised so that the basic tenets can be applied not only to CPDOs but also state and private poultry farms." (ECTAD\*, Vol. 60, No. 95, 80 September 8671)

### **October 2015**

#### **Goat Pox behind mass deaths of Serows in Mizoram**

Goat Pox is behind the mass deaths of Serows, a wild goat-antelope animal that is Mizoram's state animal and a Schedule-1 protected species under India's Wildlife Protection Act, according to veterinary experts who warn "Serows in Mizoram are under threat of extinction" and that the disease is zoonotic, meaning it can also spread to humans. Wildlife health experts said there are at least 50 known Serow deaths so far, and more are likely to have died undetected in the wild. Investigations into the cause of Serow deaths have shown that Goat Pox is the cause, and further studies are underway. Goats and Serows are closely related species, and there is a high probability that the current outbreak originated and spread from goats. (ECTAD\*, Vol. 60, No. 08, 71 October 8671)

### **November 2015**

#### **21 cases of rabid mongoose attacking people reported in Edakkad, Kerala**

Unscientific management of domestic waste could lead to the spread of rabies to wild animals, as was seen in a village in Kerala. The issue attains significance as the debate over the management of domestic refuses and stray dog population has reached the apex court of the country and pro and anti-dog culling activists are vehemently driving home their arguments. Recently, two researchers from the Kerala Forest Research Institute codified and published reports on 21 cases of rabid mongoose attacking people in Edakkad, Kan-nur district, Kerala. The reported incident took place in 2010 and was considered as the first report from India on a massive attack of rabid mongooses on humans in a village. (ECTAD\*, Vol. 60, No. 02, 78 November 2015)

**Ref:** \* The news was taken from ECTAD South Asia Weekly Animal Disease E-Information at <http://www.saarc-rsu-hped.org/weekly-e-info>

# Epidemiological concepts

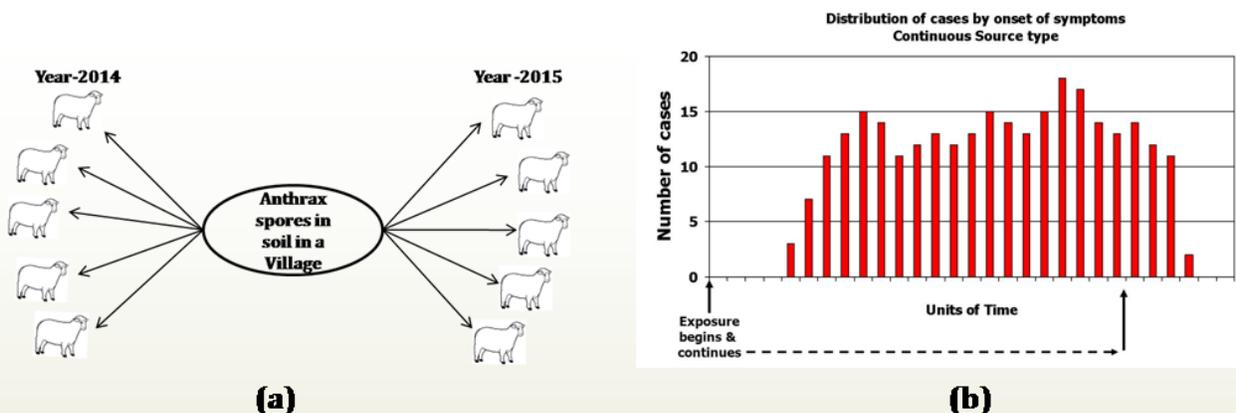
**Attack rate:** Incidence that measures the proportion of animals in a population that come down with an acute disease during a limited period (e.g., during an outbreak). The attack rate is usually expressed as a percentage or per 1,000 or 100,000 population.

$$\text{Attack Rate (\%)} = \frac{\text{Number of animals showing the disease from beginning till the end of outbreak}}{\text{Total number of animals at the beginning of the outbreak}} \times 100$$

Eg. A village with 10,000 cattle population reports HS outbreak which lasted for two weeks. A total of 50 animals showed acute respiratory signs typical of HS. The HS attack rate in this outbreak is 0.5% or 5 per 1000 or 500 per 100,000

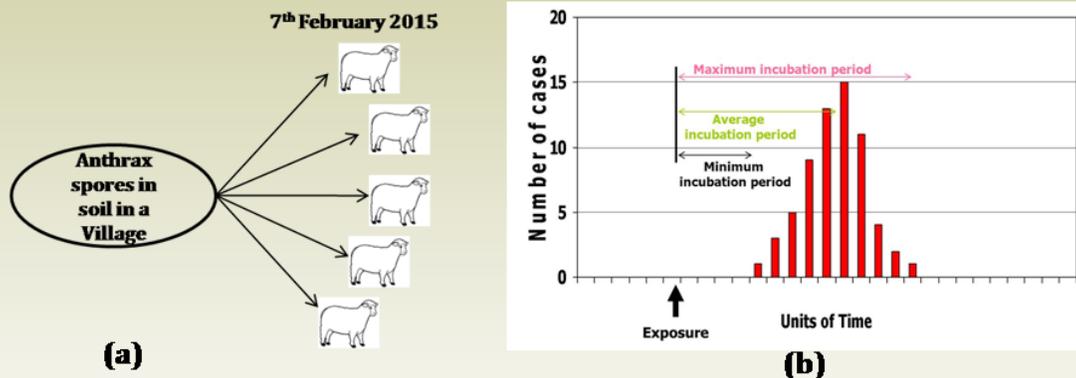
**Outbreak:** The occurrence of more cases of disease, injury, or other health condition than expected in a given area or among a specific population of animals during a specific period. Usually, the cases are presumed to have a common cause or to be related to one another in some way.

**Common-source outbreak:** An outbreak that results from an animal being exposed to the same harmful influence (e.g., an infectious agent or toxin). The exposure period can be brief or can extend over days, weeks, or longer, with the exposure being either intermittent or continuous (Fig.13).



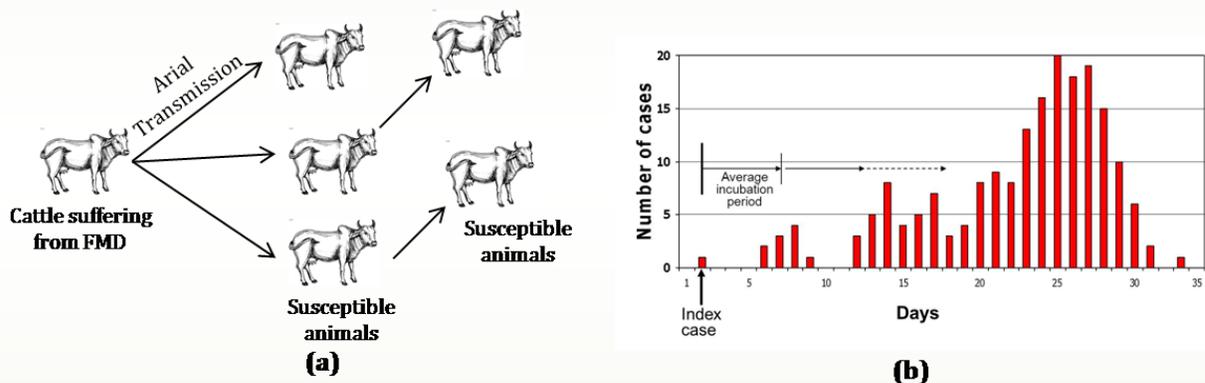
**Fig.13 Common source outbreak:** (a) Anthrax as an example of common source disease outbreak (b) Epidemic curve showing distribution of cases in point source outbreak (Fig. 13 (b) Source: <http://phprimer.afmc.ca>)

**Point-source outbreak:** A common source outbreak in which the exposure period is relatively brief so that all cases occur within one incubation period (Fig.14).



**Fig.14 Point source outbreak:** (a) Example of point source disease outbreak (b) Epidemic curve showing distribution of cases in point source outbreak (Fig. 14 (b) Source: <http://phprimer.afmc.ca>)

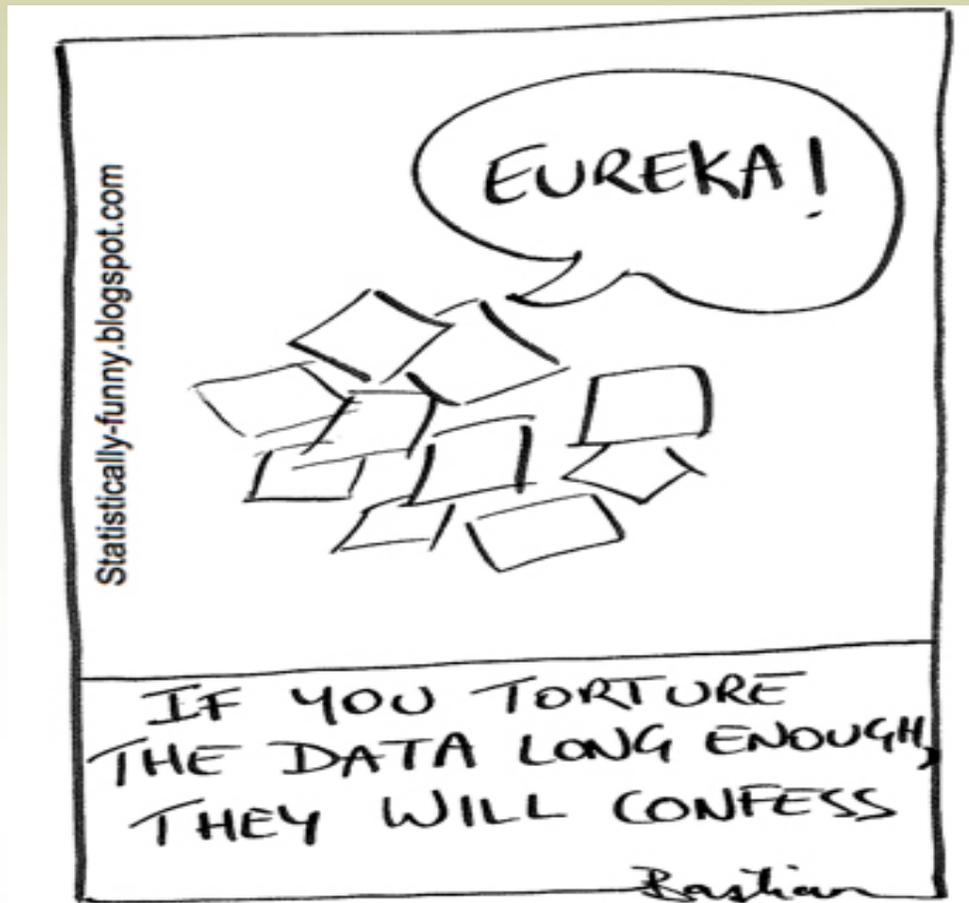
**Propagated outbreak:** An outbreak that spreads from animal to animal rather than from a common source to animals (Fig.15).



**Fig.15 Propagated outbreak:** (a) Example of propagated disease outbreak (b) Epidemic curve showing distribution of cases in Propagated out break (Fig 15 (b) Source: <http://phprimer.afmc.ca>)

**Ref:** The definitions are taken and modified from CDC website where as diagrammatic illustrations were developed by the editorial team. The CDC website address is - <http://www.cdc.gov/OPHSS/CSELS/DSEPD/SS1978/Glossary.html#outbreak>)

## Epidemiology Cartoon



Source: <http://blogs.scientificamerican.com/absolutely-maybe/statistical-significance-and-its-part-in-science-downfalls/>

**Source of the data:** The data for the **EpiNET.India** was obtained from the database of National Animal Disease Referral Expert System (NADRES), ICAR-NIVEDI. Any reproduction or representation of the data from this e-bulletin should be done only with prior permission from Director, ICAR-NIVEDI.

### Editorial team:

**Dr. Jagadish Hiremath**, Scientist, ICAR-NIVEDI  
**Dr. Md. Mudassar Chanda**, Scientist, ICAR-NIVEDI  
**Dr. K. P. Suresh**, Senior Scientist, ICAR-NIVEDI  
**Dr. G. S. Desai**, Senior Scientist, ICAR-NIVEDI  
**Dr. S. S. Patil**, Senior Scientist, ICAR-NIVEDI  
**Dr. D. Hemadri**, Principal Scientist, ICAR-NIVEDI  
**Dr. B. R. Shome**, Principal Scientist, ICAR-NIVEDI