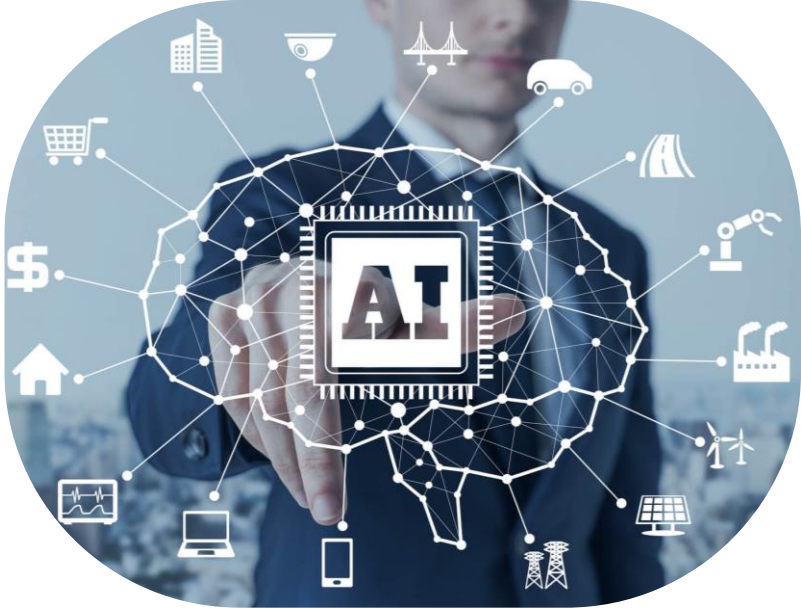
Modern Epidemiological Tools in Disease Investigation and their Application

PRESENTED BY,

DR. K P SURESH

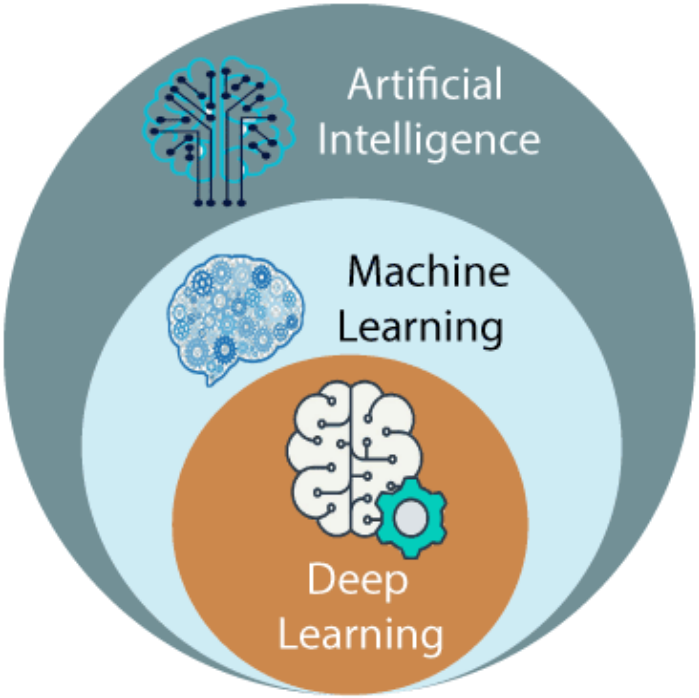
ICAR-NIVEDI, BENAGLURU

Artificial intelligence



AI is a broad and complex concept that has been around for decades.
AI is used to describe a concept or a system that mimics the cognitive functions of the human brain.
AI is often used to describe a system that can learn from experience, can use knowledge to perform tasks, to reason, and to make decisions.

Machine learning

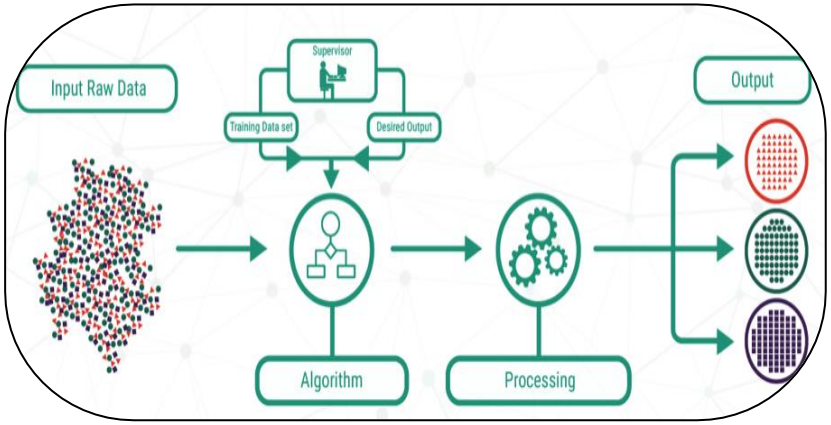


Machine learning is a subset of AI and is a method for algorithms to learn from data.
It can be used to build models that can predict future behaviour based on past experience.
Machine learning is used to analyse large datasets and to find patterns in the data.

There are three different types of machine learning

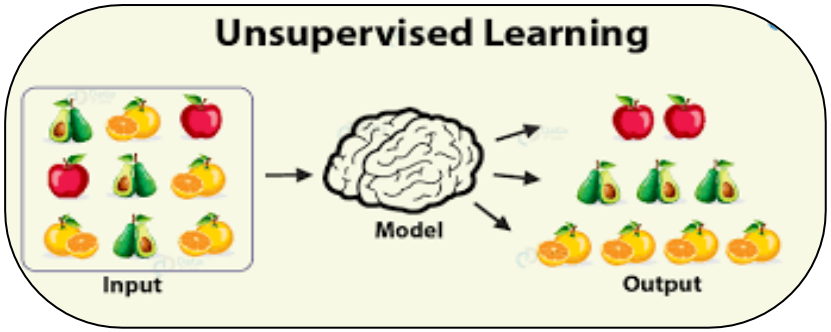
Supervised learning

- Supervised learning is the most common type of machine learning.
- It is used to find patterns in data and is used to predict future behaviour based on past experience.
- The goal of supervised learning is to find a relationship between independent variables and dependent variables.



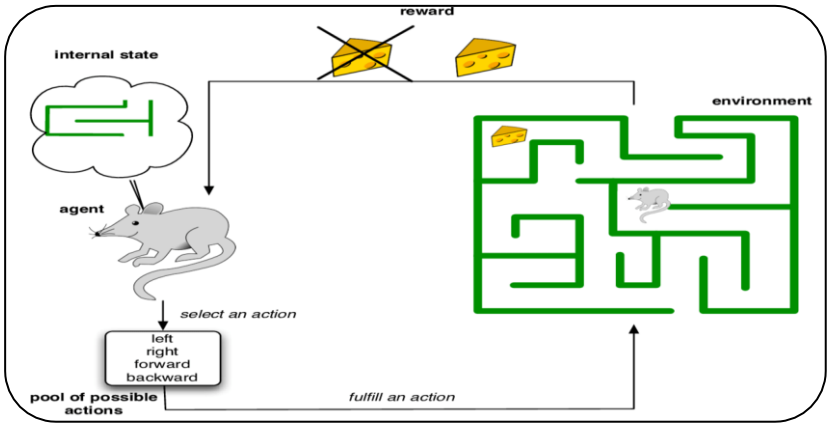
Unsupervised learning

- Unsupervised learning is used to find structure in the data.
- Also be used to find groups or clusters in the data or to identify anomalies in the data.



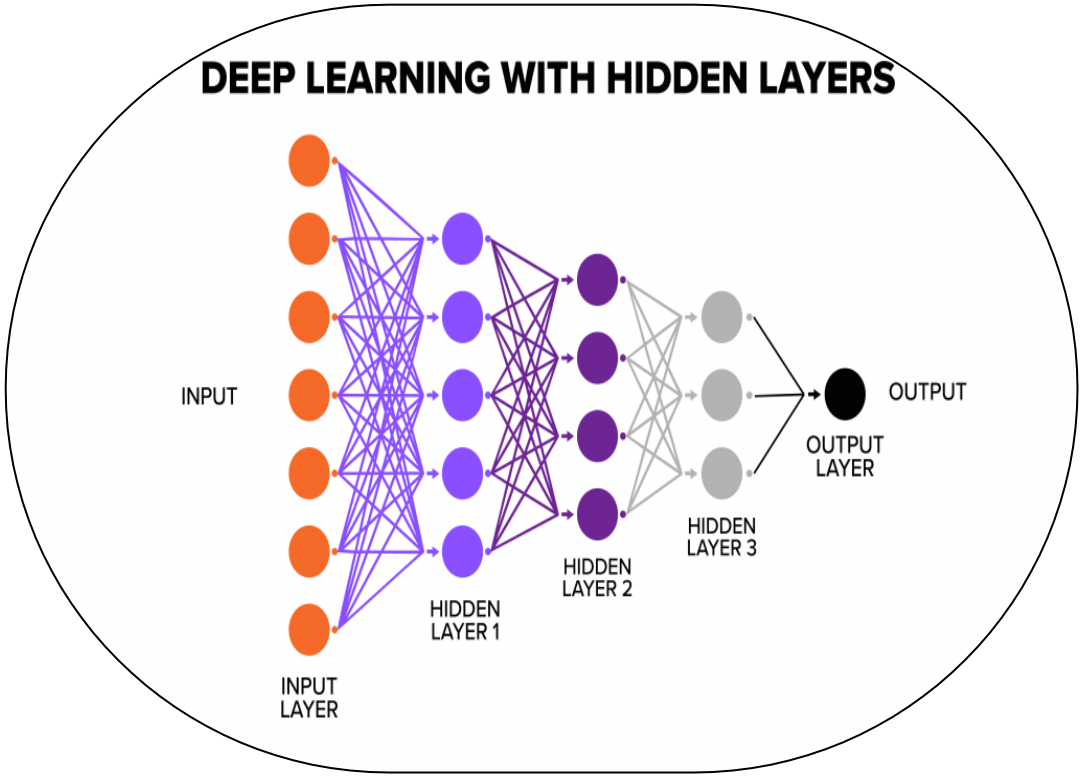
Reinforcement learning

- Reinforcement learning is a type of machine learning that is used to find good actions or decisions based on the data.
- Reinforcement learning is used to find an optimal action or decision that will maximize the reward.
- The optimal solution depends on the reward function.



Deep learning

- Deep learning is a subset of machine learning that uses artificial neural networks.
- Artificial neural networks are computational models that are inspired by the architecture of the human brain. They are used to develop algorithms that can learn from data.
- Deep learning is used to build models that can classify data or find patterns in the data.
- Deep learning is used to perform complex tasks such as object recognition, speech recognition, and translation.
- Deep learning is the most popular type of machine learning.



Disease Diagnosis using Deep Learning

DISEASE DETECTION

- Direct Antigen
  EM, Isolation & Identification
- Protein
  ELISA & STRIP TEST
- Nucleic Acid
  PCR, Q-PCR.LAMP
- Protein & Genome
  PCR-ELISA
- Rise in Antibody
  ELISA

METHODS article
Front. Plant Sci., 22 September 2016 | https://doi.org/10.3389/fpls.2016.01419

Using Deep Learning for Image-Based Plant Disease Detection

Sharada P. Mohanty[1,2,3], David P. Hughes[4,5,6] and Marcel Salathé[1,2,7]*

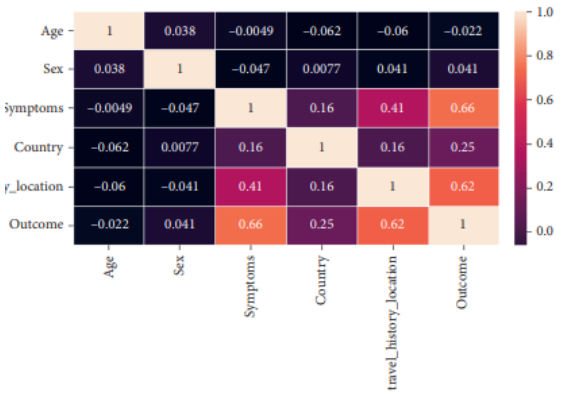


FIGURE 2: Heatmap of COVID-19 dataset.

Improved perception accuracy and disease diagnosis are some of the points put up by the recent machine learning researchers. Compared to the traditional computation algorithms, deep learning algorithms are way more effective in disease detection and diagnosis.

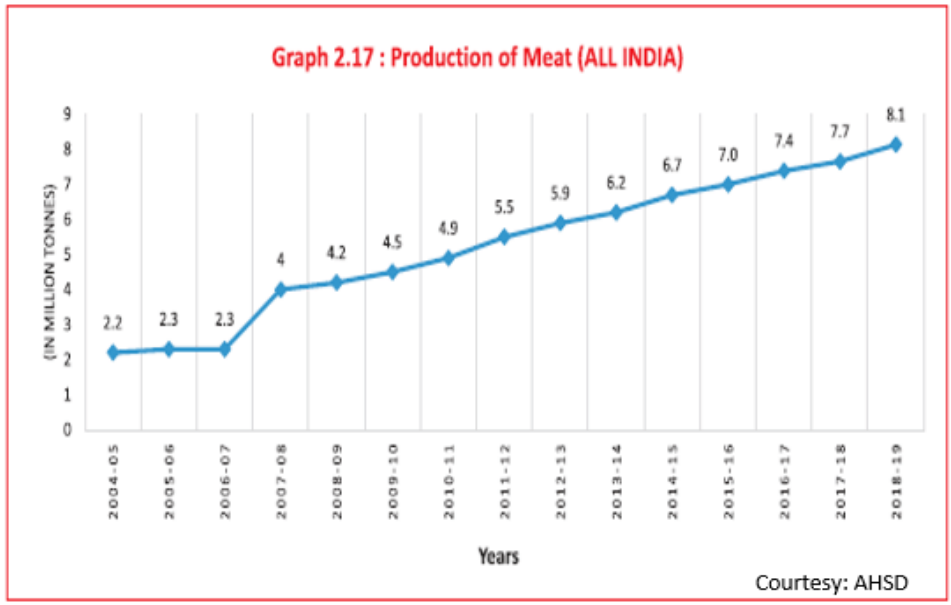
Contents lists available at ScienceDirect
Journal of Pharmaceutical Analysis
journal homepage: www.elsevier.com/locate/jpa
ELSEVIER

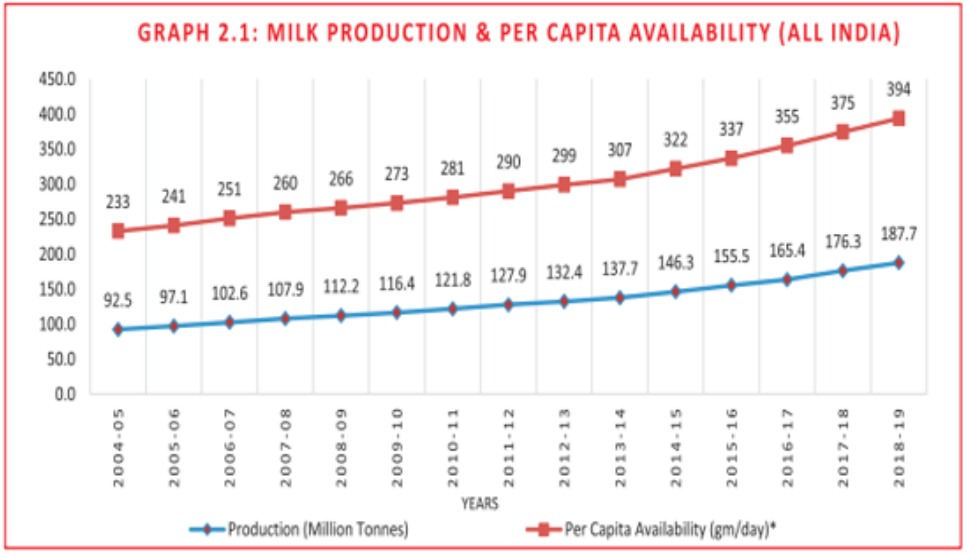
Quantitative computed tomography analysis for stratifying the severity of Coronavirus Disease 2019

Cong Shen [a], Nan Yu [b], Shubo Cai [c], Jie Zhou [c], Jiexin Sheng [d], Kang Liu [e], Heping Zhou [f], Youmin Guo [a, **], Gang Niu [a, *]

Livestock Population and Production data

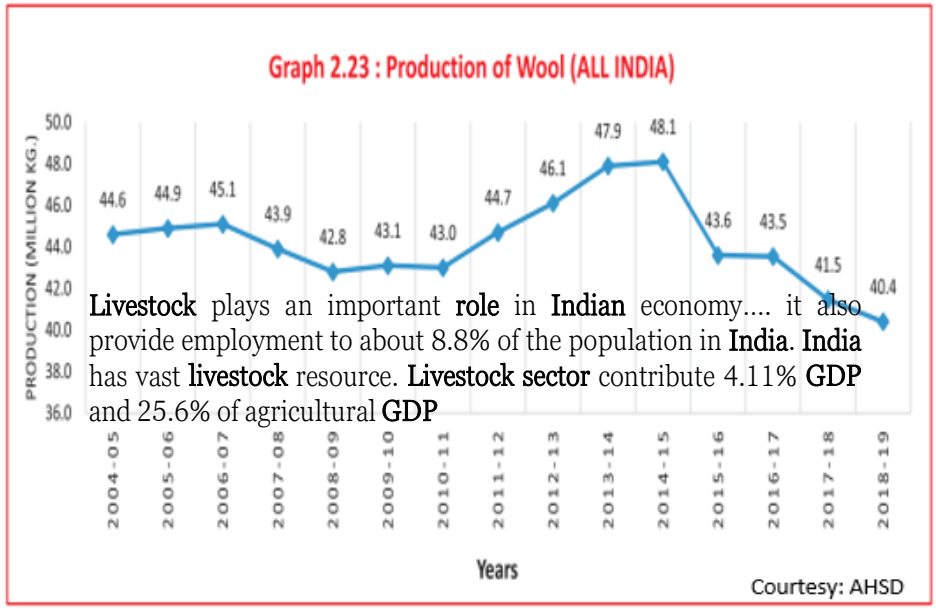
Species-wise & Category-wise Livestock Population (in thousands)					
Sl. No	Species	Category	Population in 2012	Population in 2019	% Change
1	Cattle	Exotic	39732	51356	29.3
		Indigenous	151172	142106	-6.0
		Total	**190904**	**193462**	**1.3**
2	Buffalo		**108702**	**109852**	**1.1**
3	Sheep	Exotic	3781	4088	8.1
		Indigenous	61288	70172	14.5
		Total	**65069**	**74260**	**14.1**
4	Goat		**135173**	**148885**	**10.1**
5	Pig	Exotic	2456	1897	-22.8
		Indigenous	7837	7159	-8.7
		Total	**10293**	**9056**	**-12.0**
Total Livestock			**510141**	**535515**	**5.0**





* Based on Projected Population of March,2018 based on Human Census-2001

Courtesy: AHSD



Livestock plays an important **role** in **Indian** economy.... it also provide employment to about 8.8% of the population in **India**. **India** has vast **livestock** resource. **Livestock sector** contribute 4.11% **GDP** and 25.6% of agricultural **GDP**

ABOUT NADRES V2

https://www.nivedi.res.in/Nadres_v2/

NADRES V2 Web application implemented with Artificial intelligence for entry, analysis, prediction and monitoring data disease and climate related RISK MAPS

NADRES V_2 technology provides the both online and offline data entry facility, disease analytics, forewarning, sampling plan, Risk maps etc.

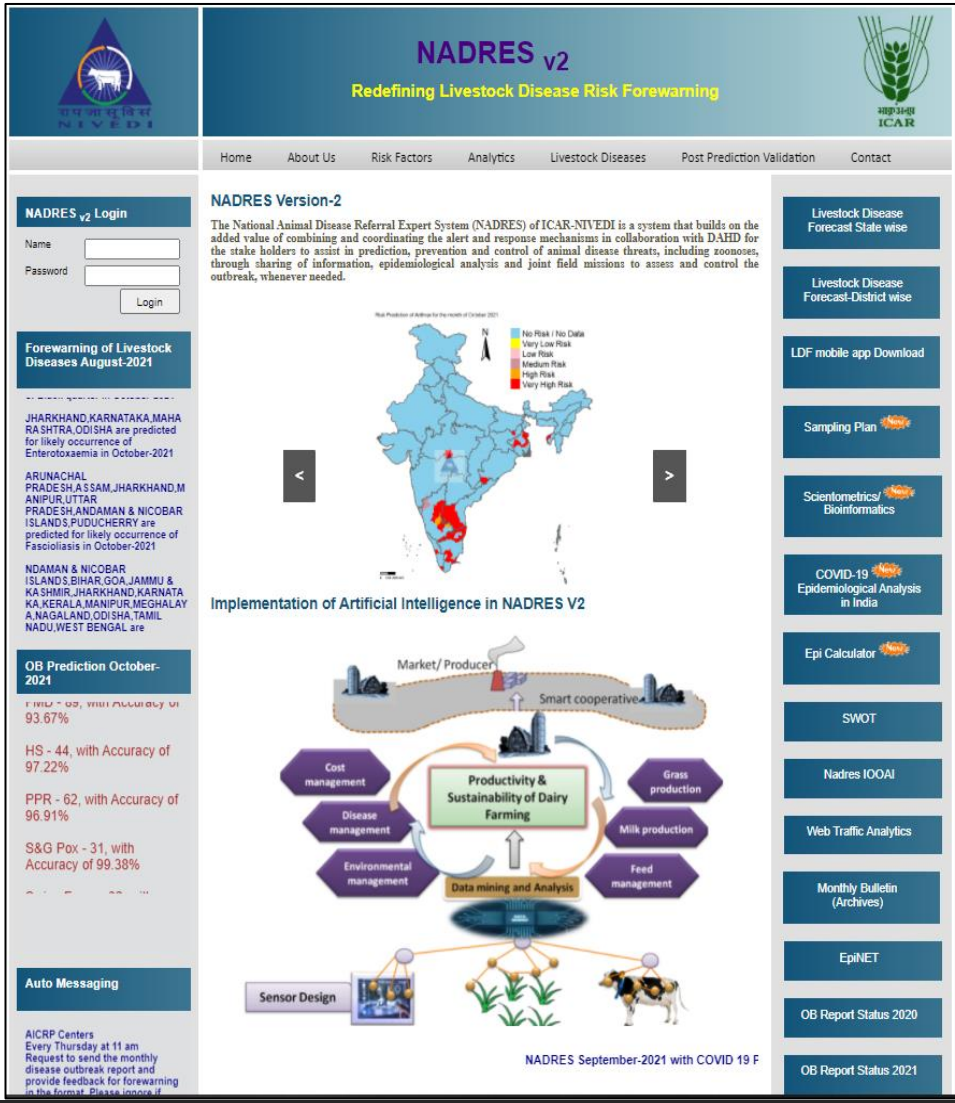
This helps to evaluate the effectiveness of control measures, reduce economic losses due to the incidence of disease, understand disease dynamics and timely decision about the control strategy.

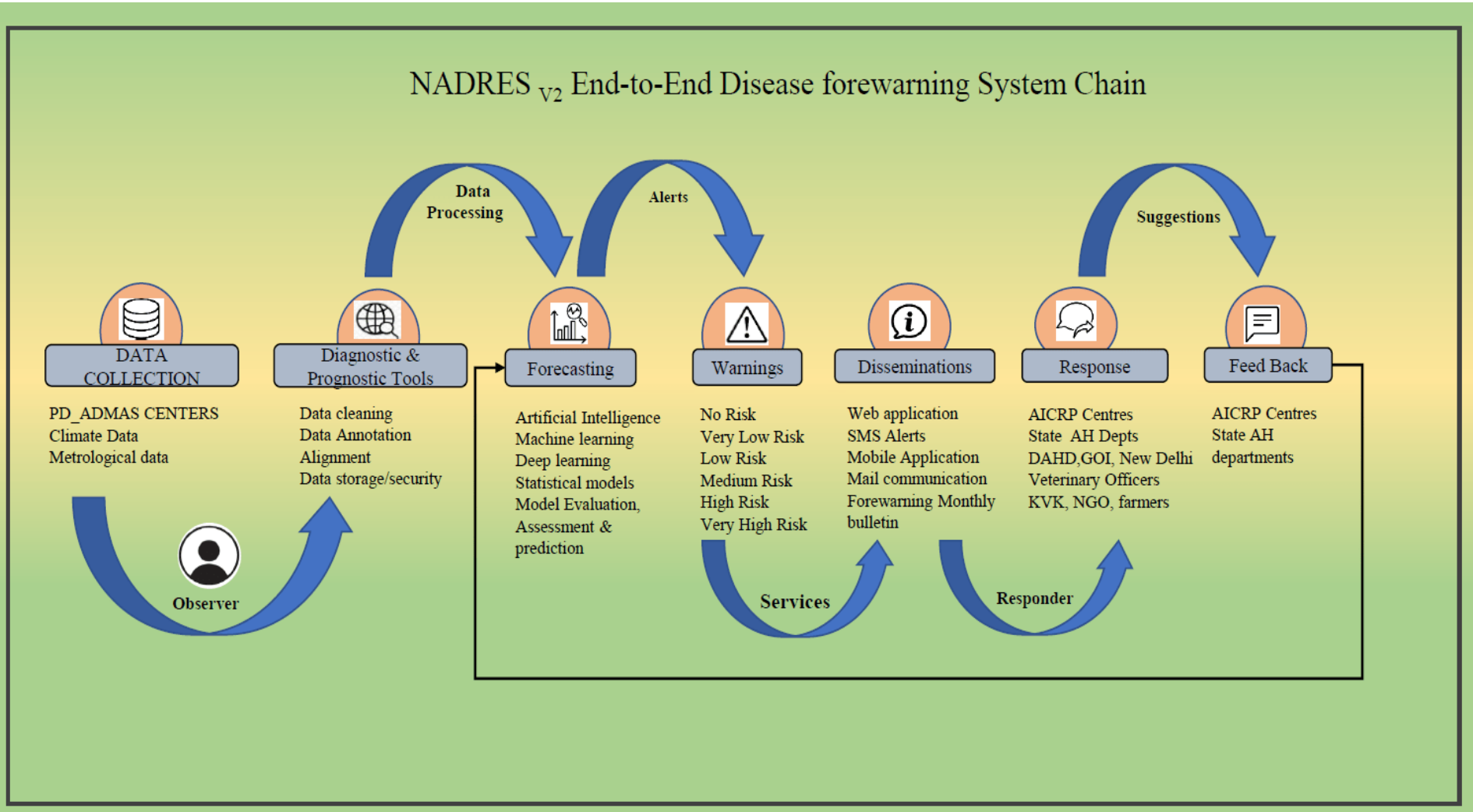
Risk map developed is beneficial for policy makers, planners and veterinarians to improve the risk governance through prioritizing the risk management efforts.

Automated alert messages are sent to AICRP centers on every Thursday to send the monthly disease outbreak report and provide feedback on forewarning in the prescribed format.

Automated LCD display app was developed to display the results of forewarning in display units using Interconnect XML, JAVA and Blue Stack technology

Link-https://nivedi.res.in/Nadres_v2/




NADRES V2 End-to-End Disease forewarning System Chain
Data Processing
Alerts
Suggestions
DATA COLLECTION
Diagnostic & Prognostic Tools
Forecasting
Warnings
Disseminations
Response
Feed Back
PD_ADMAS CENTERS
Climate Data
Metrological data
Data cleaning
Data Annotation
Alignment
Data storage/security
Artificial Intelligence
Machine learning
Deep learning
Statistical models
Model Evaluation,
Assessment &
prediction
No Risk
Very Low Risk
Low Risk
Medium Risk
High Risk
Very High Risk
Web application
SMS Alerts
Mobile Application
Mail communication
Forewarning Monthly
bulletin
AICRP Centres
State AH Depts
DAHD,GOI, New Delhi
Veterinary Officers
KVK, NGO, farmers
AICRP Centres
State AH
departments
Observer
Services
Responder

AI & ML Powered Data Capturing and Forewarning System

Remote sensing data (Modis data, ISRO, Landsat Data)

Meteorological Data

Livestock Population

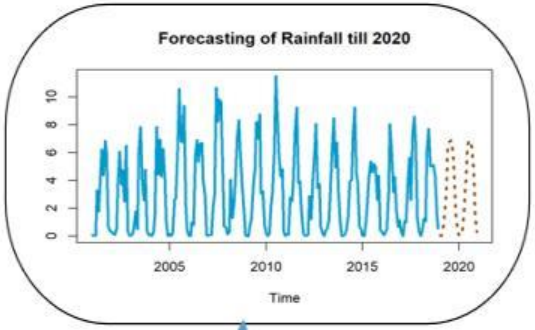
Disease Data

Soil Parameters

Input

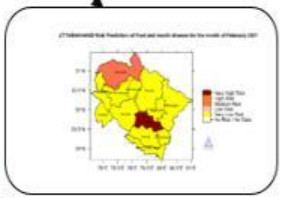
Syndromic Data

Other Risk Factors



Districts of Uttarakhand	Livestock Disease											
	Anthrax	Babesiosis	BQ	BT	ET	Fasciolasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomiasis
Almora	NR	NR	NR	NR	NR	NR	VHR	NR	NR	NR	NR	NR	NR
Bageshwar	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Chamoli	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Champawat	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Dehradun	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR	NR
Garhwal	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Haridwar	NR	NR	NR	NR	NR	NR	MR	VLR	NR	NR	NR	NR	NR
Nainital	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Pithoragarh	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Rudraprayag	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Tehri Garhwal	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Udham Singh Nagar	NR	NR	NR	NR	NR	NR	HR	VLR	NR	NR	NR	NR	NR
Uttarkashi	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR	NR

If vaccination has already been done, please ignore the disease forecast for that disease.



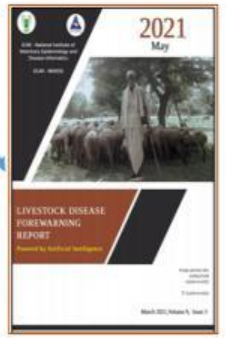
Cleaning → Annotation → Forecasting Risk Variables → Disease Modelling ML Algorithms → Model Assessment → Prediction → Results

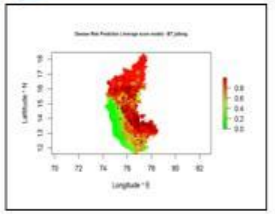
Hot Spot Maps

Forewarning (1M,2M,6M LT)

Risk Maps

Disease Communication





LT –Lead Time

Farmers

State Animal Husbandry Dept.'s

Veterinary Officers

DAHD, Govt of India

Feedback

Bulletin

Web portal

Mobile App

Alert Messages

NADRES v2

Redefining Livestock Disease Risk Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases August-2021

ASSAM JAMMU & KASHMIR JHARKHAND KARNATAKA RAJASTHAN TAMIL NADU TRIPURA WEST BENGAL are predicted for likely occurrence of S & G Pox in October-2021

ASSAM JHARKHAND KERALA MADHYA PRADESH MANIPUR MEGHALAYA NAGALAND TRIPURA are predicted for likely occurrence of Swine fever in October-2021

HARYANA JHARKHAND KARNATAKA KERALA MAHARASHTRA UTTAR PRADESH WEST BENGAL are predicted for likely occurrence of Theileriosis in

OB Prediction October-2021

Anthrax - 32, with Accuracy of 99.69%

Babesiosis - 60, with Accuracy of 97.38%

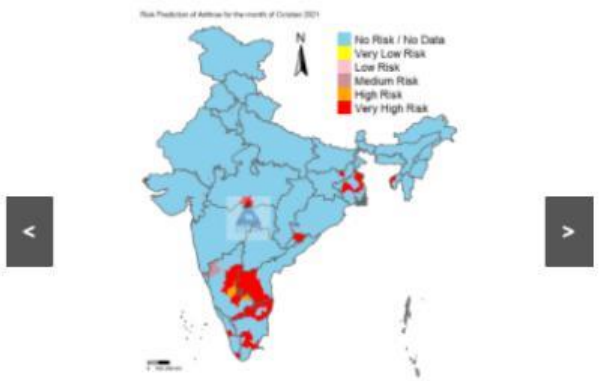
Black quarter - 39, with Accuracy of 99.85%

Enterotoxaemia- 19, with Accuracy of 99.85%

Auto Messaging

NADRES Version-2

The National Animal Disease Referral Expert System (NADRES) of ICAR-NIVEDI is a system that builds on the added value of combining and coordinating the alert and response mechanisms in collaboration with DAHD for the stake holders to assist in prediction, prevention and control of animal disease threats, including zoonoses, through sharing of information, epidemiological analysis and joint field missions to assess and control the outbreak, whenever needed.



Implementation of Artificial Intelligence in NADRES V2

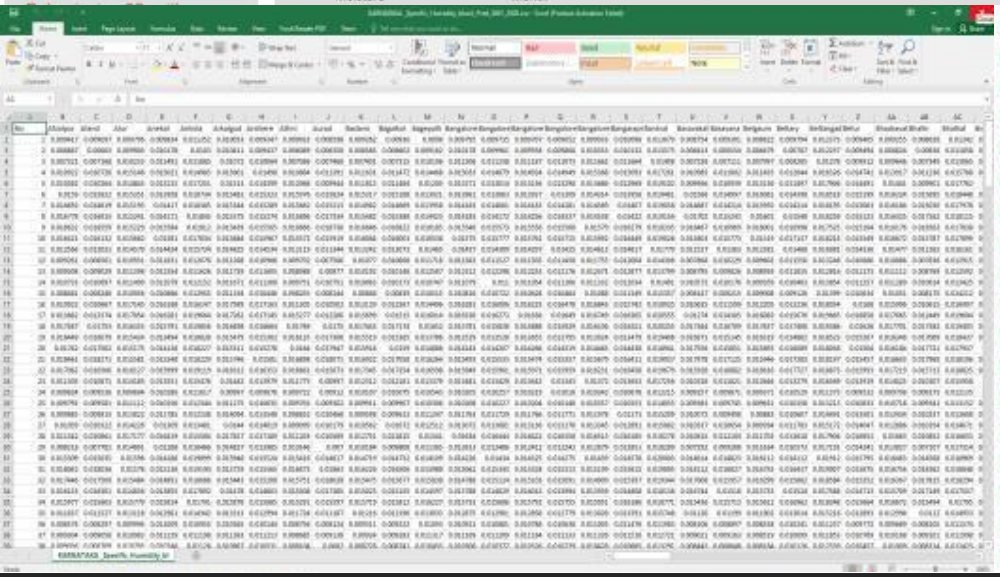
- Livestock Disease Forecast State wise
- Livestock Disease Forecast-District wise
- LDF mobile app Download
- Sampling Plan (New)
- Scientometrics/ Bioinformatics (New)
- COVID-19 Epidemiological Analysis in India (New)
- Epi Calculator (New)
- SWOT
- Nadres IOOAI
- Web Traffic Analytics
- Monthly Bulletin (Archives)
- EpiNET

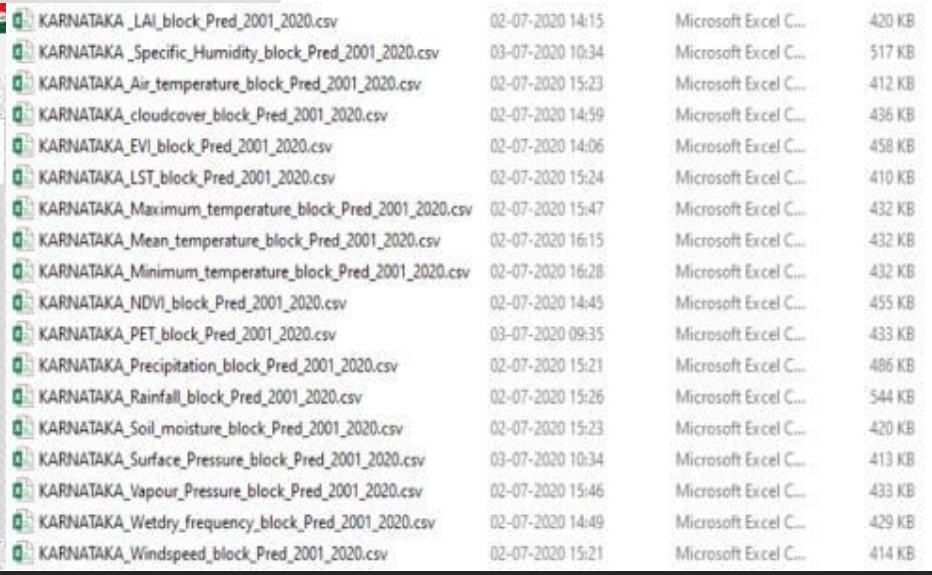
Updated sampling plan for Sero-monitoring and sero-surveillance for FMD

Meta Analysis and Bioinformatics

Covid-19 epidemiological distribution data in India

Secured Login created for Epi Calculator use





2.85cr Meteorological and Remote Sensing data of 18 parameters for Block level available for 30 states from 2001 to 2020 .

Similarly data extracted up to 2021 is 13.89 lakh (..in progress) cumulatively 2.98cr data have been generated

Query Report

1. OUTBREAK DATA YEAR WISE
2. OUTBREAK DATA State Wise
3. OUTBREAK DATA STATEWISE with YEAR
4. OUTBREAK DATA Disease WISE

Export To Excel

Disease_name	Outbreaks	Deaths	Attacks
Bluetongue	16	127	611
Anthrax	1	15	15
Anthrax	1	4	4
Anthrax	1	13	18
Peste des petits ruminants	1	3	8
Haemorrhagic septicaemia	1	5	5
Anthrax	2	2	2
Haemorrhagic septicaemia	3	33	212
Anthrax	1	7	7
Haemorrhagic septicaemia	3	2	52
Peste des petits ruminants	1	2	7
Sheep & Goat pox	1	1	6
Anthrax	1	7	7
Haemorrhagic septicaemia	3	2	52
Haemorrhagic septicaemia	1	2	7
Sheep & Goat pox	1	1	6
Bluetongue	1	3	15
Sheep & Goat pox	1	2	10
Sheep & Goat pox	1	2	10
Anthrax	1	3	3

Export To Excel

Disease_name	Outbreaks	Deaths	Attacks
Foot and mouth disease	1	0	10
Black quarter	1	3	3
Black quarter	2	5	21
Haemorrhagic septicaemia	1	4	6
Black quarter	4	2	4
Foot and mouth disease	4	0	47
Foot and mouth disease	12	1	216
Foot and mouth disease	5	0	41
Foot and mouth disease	3	0	12
Haemorrhagic septicaemia	5	29	96
Haemorrhagic septicaemia	4	14	25
Black quarter	1	2	2
Black quarter	2	9	13
Foot and mouth disease	3	0	17
Foot and mouth disease	2	0	23
Black quarter	2	2	2
Black quarter	1	3	6
Black quarter	1	1	3
Black quarter	1	2	2
Black quarter	2	5	8
Black quarter	1	4	4

Outbreak data Received Status - 2019

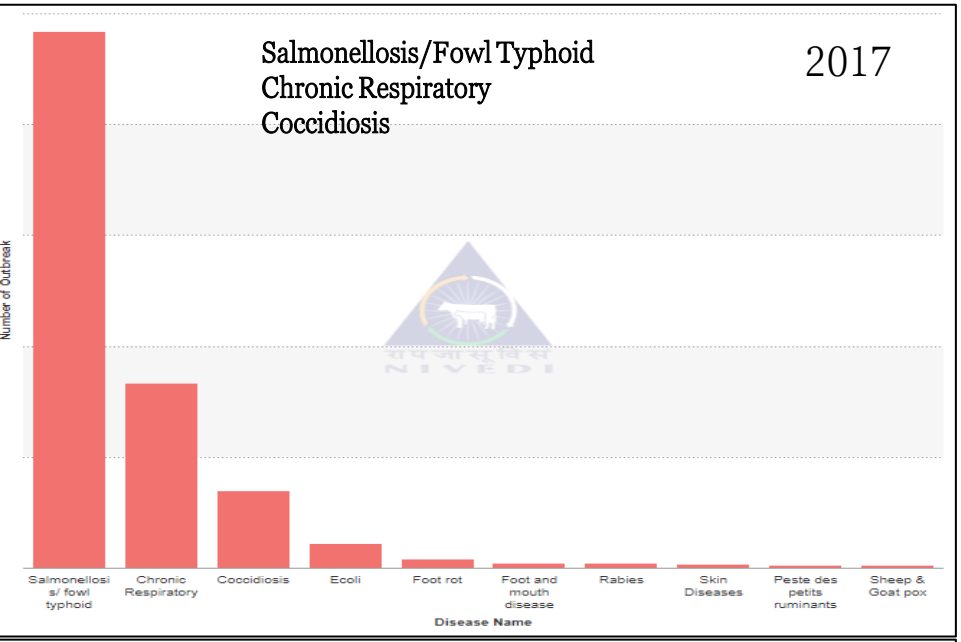
Sl.no	State Name	January	February	March	April	May	June	July	August	September	October	November	December
1	ANDHRA PRADESH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
2	ARUNACHAL PRADESH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
3	ASSAM	Received	Received	Received	Received	Received	Not Received	Not Received	Not Received	Received	Received	Received	Received
4	BIHAR	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
5	CHHATTISGARH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
6	GOA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
7	GUJARAT	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
8	HARYANA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
9	HIMACHAL PRADESH	Received	Received	Not Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
10	JAMMU & KASHMIR	Received	Received	Received	Received	Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received
11	JHARKHAND	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
12	KARNATAKA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
13	KERALA	Received	Received	Not Received	Received	Received	Received	Received	Not Received	Received	Received	Received	Received
14	MADHYA PRADESH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
15	MAHARASHTRA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
16	MANIPUR	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received	Not Received	Received
17	MEGHALAYA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
18	MIZORAM	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
19	NAGALAND	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
20	ODISHA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
21	PUNJAB	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
22	RAJASTHAN	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
23	SIKKIM	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
24	TAMIL NADU	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
25	TRIPURA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
26	UTTAR PRADESH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
27	UTTARAKHAND	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
28	WEST BENGAL	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
29	ANDAMAN & NICOBAR ISLANDS	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
30	CHANDIGARH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
31	DADRA & NAGAR HAVELI	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received
32	DAMAN & DIU	Received	Not Received	Received	Received	Received	Received	Received	Not Received	Not Received	Not Received	Not Received	Received
33	PUDUCHERRY	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
34	TELANGANA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received

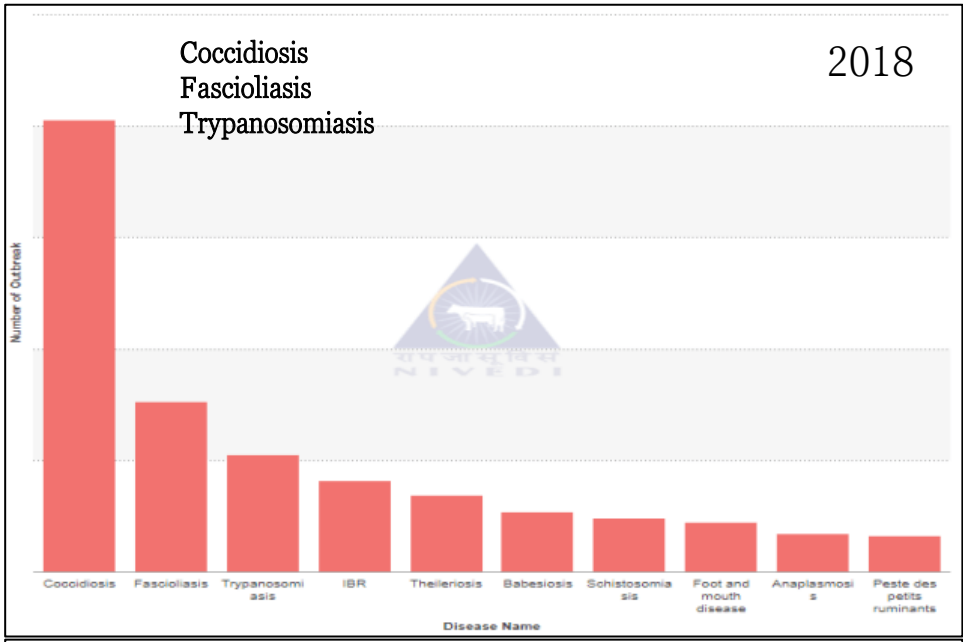
Outbreak data Received Status - 2020

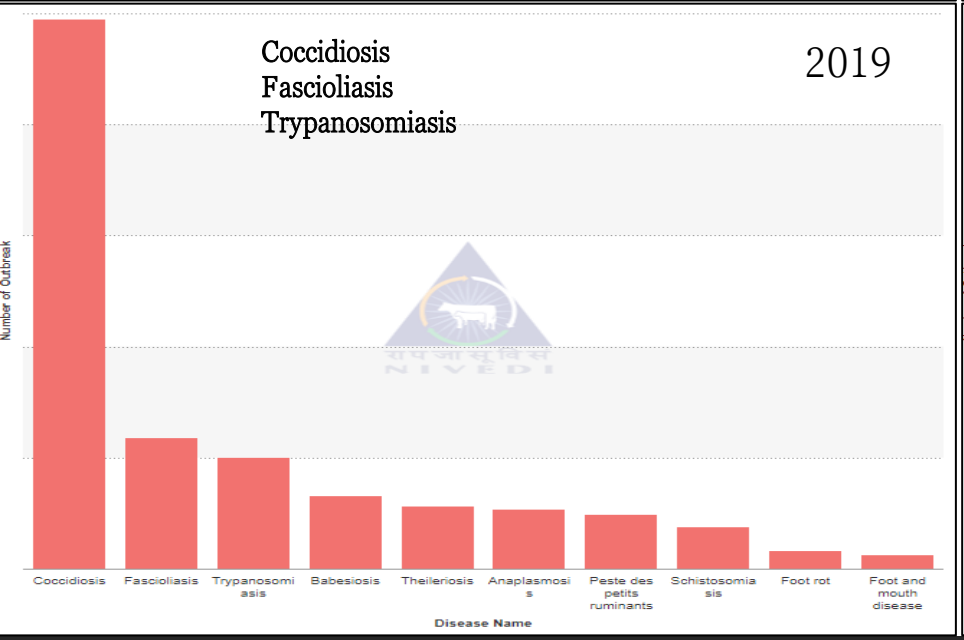
Sl.no	State Name	January	February	March	April	May	June	July	August	September	October	November	December
1	ANDHRA PRADESH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
2	ARUNACHAL PRADESH	Received	Received	Received	Received	Received	Not Received	Received	Received	Not Received	Not Received	Not Received	Received
3	ASSAM	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
4	BIHAR	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
5	CHHATTISGARH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received	Not Received	Received
6	GOA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
7	GUJARAT	Received	Received	Received	Received	Received	Received	Received	Not Received	Received	Received	Received	Received
8	HARYANA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
9	HIMACHAL PRADESH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
10	JAMMU & KASHMIR	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received
11	JHARKHAND	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
12	KARNATAKA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received
13	KERALA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received
14	MADHYA PRADESH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received	Received
15	MAHARASHTRA	Received	Received	Received	Received	Received	Received	Received	Received	Not Received	Received	Received	Received
16	MANIPUR	Received	Not Received	Not Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
17	MEGHALAYA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
18	MIZORAM	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
19	NAGALAND	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received	Not Received
20	ODISHA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
21	PUNJAB	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received	Not Received
22	RAJASTHAN	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received
23	SIKKIM	Received	Received	Received	Received	Received	Received	Received	Received	Not Received	Received	Received	Not Received
24	TAMIL NADU	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
25	TRIPURA	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
26	UTTAR PRADESH	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
27	UTTARAKHAND	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Not Received
28	WEST BENGAL	Not Received	Received	Received	Received	Received	Received	Not Received	Received	Not Received	Not Received	Not Received	Not Received
29	ANDAMAN & NICOBAR ISLANDS	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
30	CHANDIGARH	Received	Not Received	Not Received	Not Received	Not Received	Received	Received	Received	Not Received	Received	Not Received	Received
31	DADRA & NAGAR HAVELI	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received
32	DAMAN & DIU	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received
33	NCT OF DELHI	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received
34	LAKSHADWEEP	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received	Not Received
35	PUDUCHERRY	Received	Received	Received	Received	Received	Received	Received	Not Received	Received	Received	Received	Received

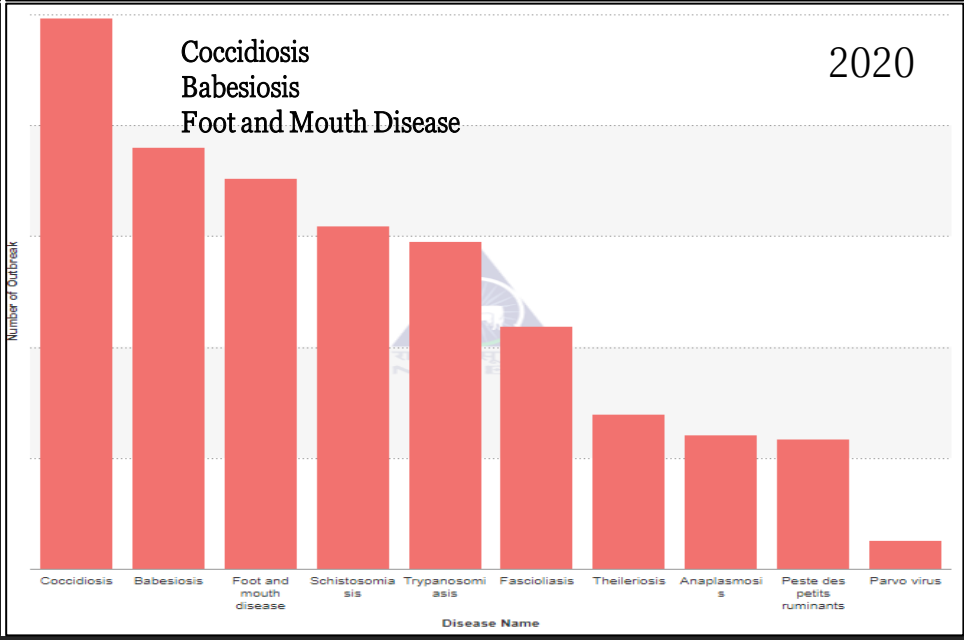
Descriptive Disease data Analysis

Top 10 Disease Burden(Prevalence) in India

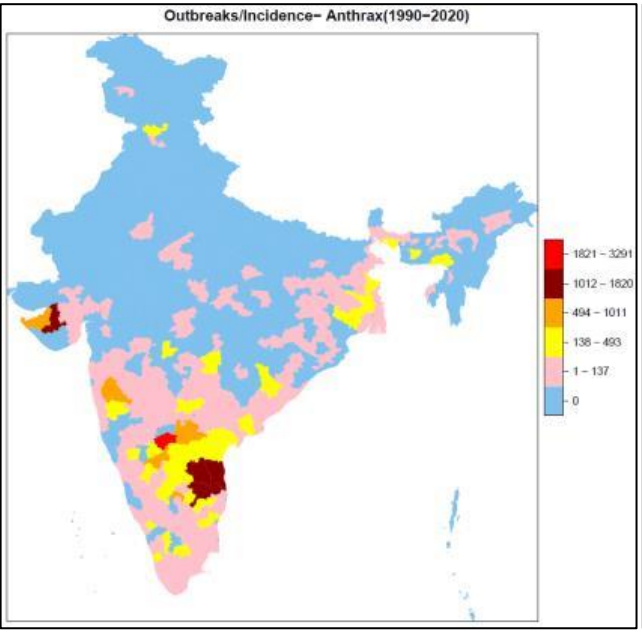


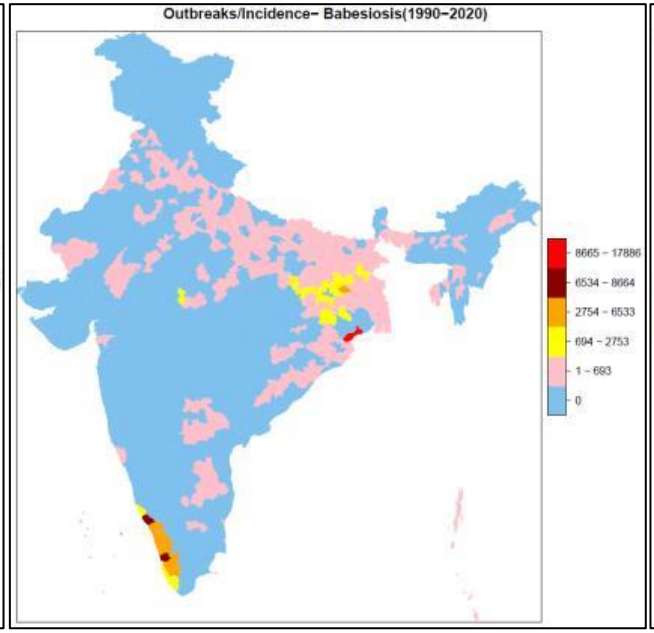


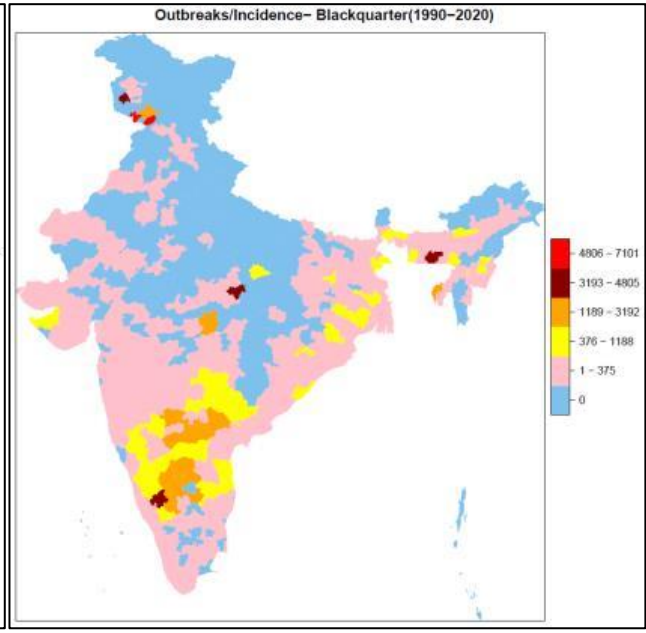


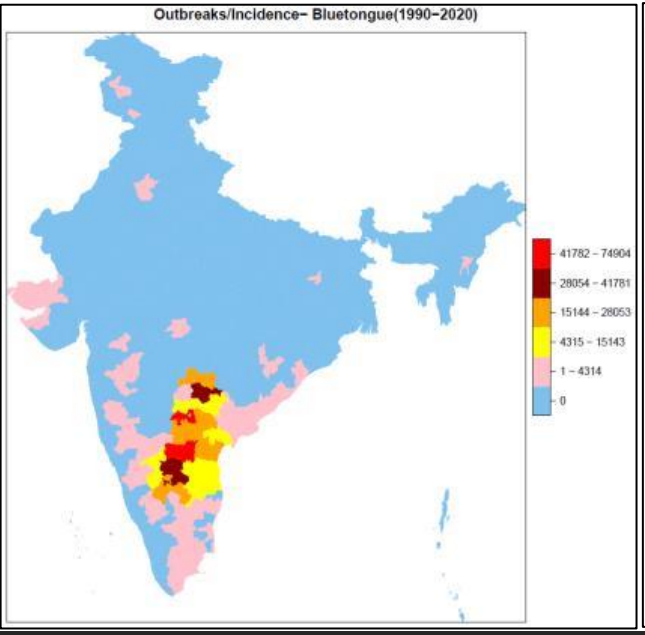


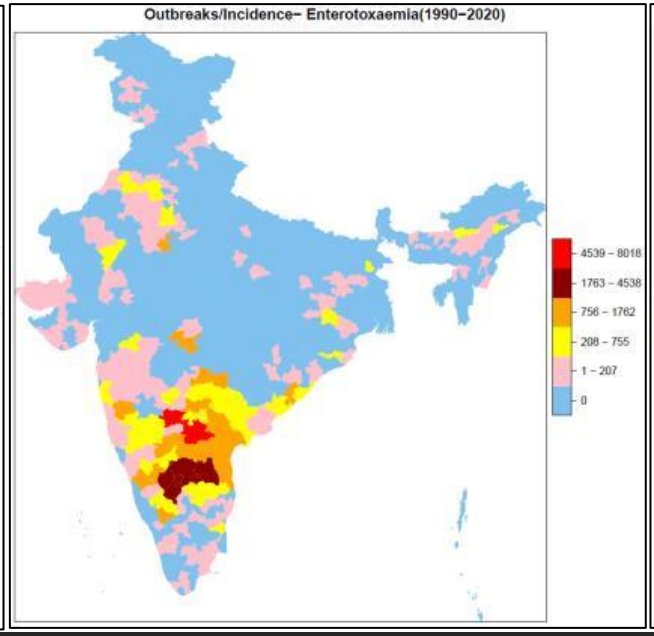
Disease Incidence maps (1990-2020)

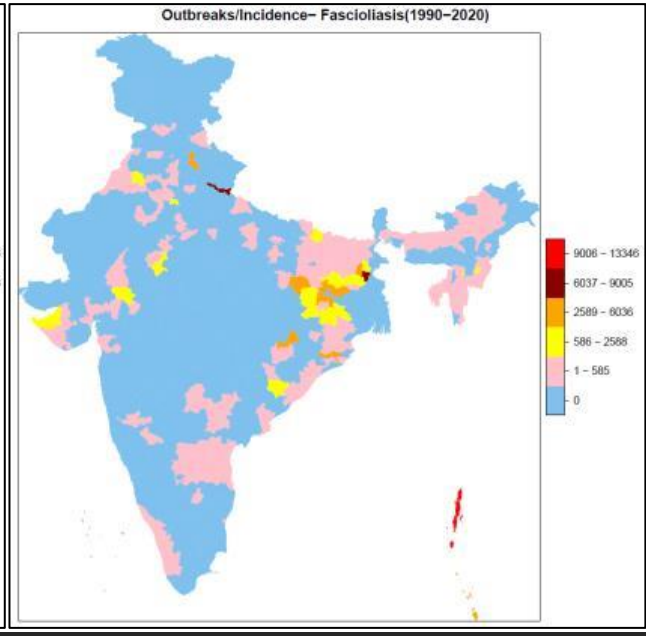


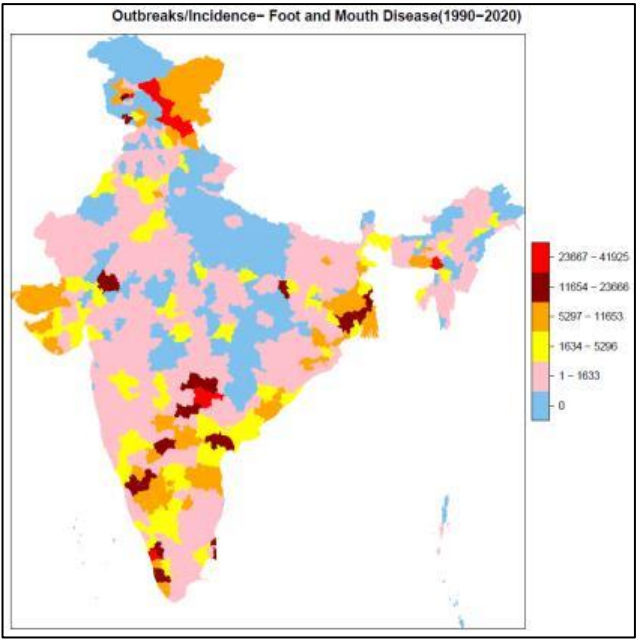


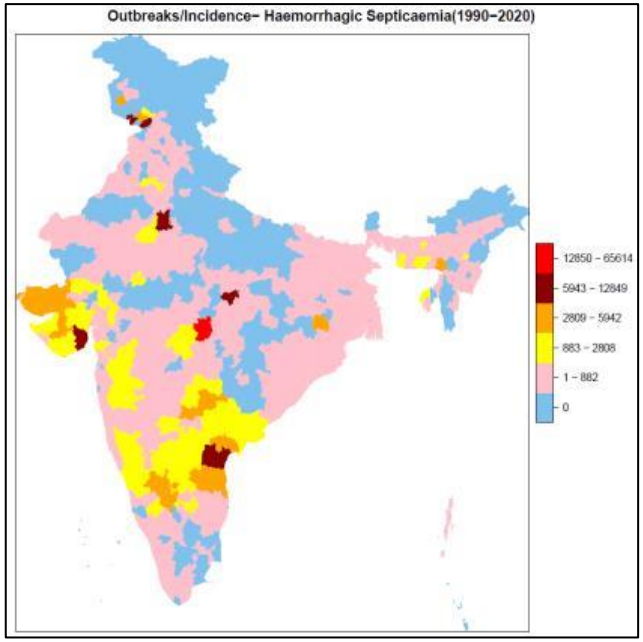


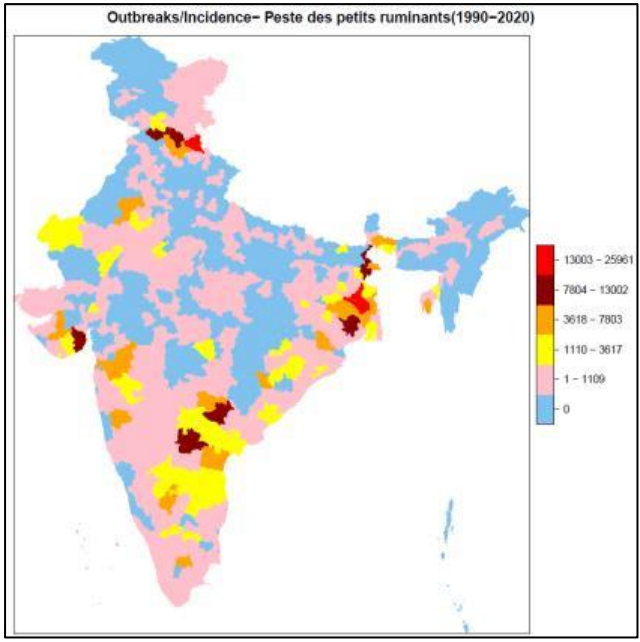


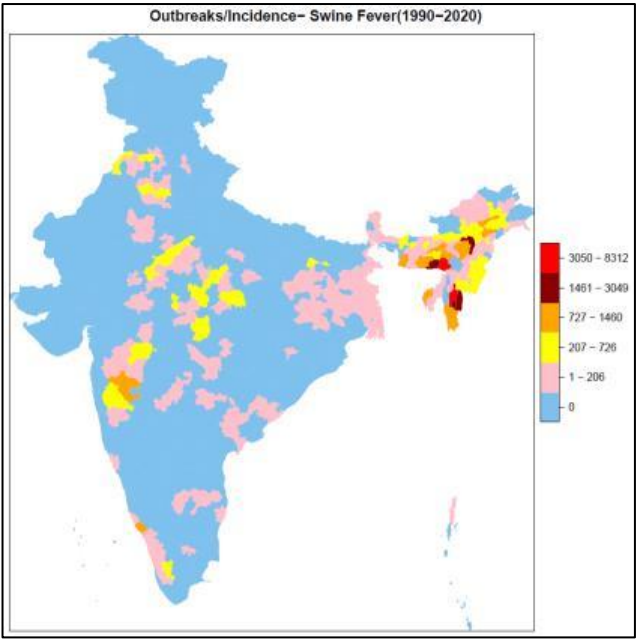


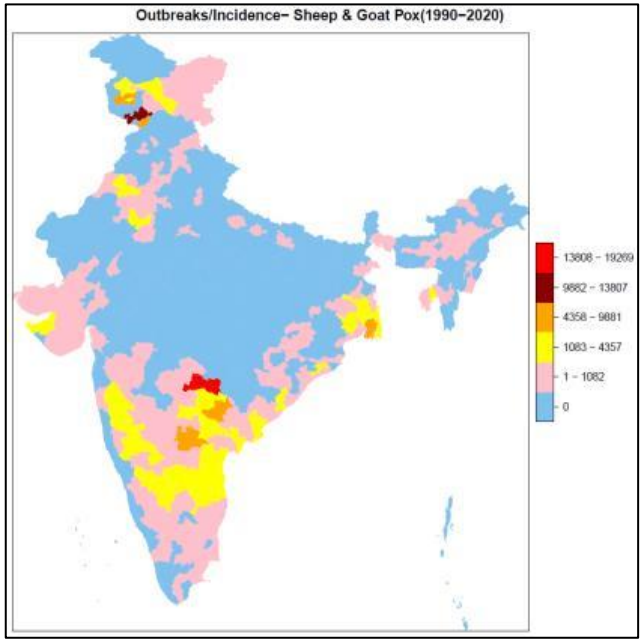


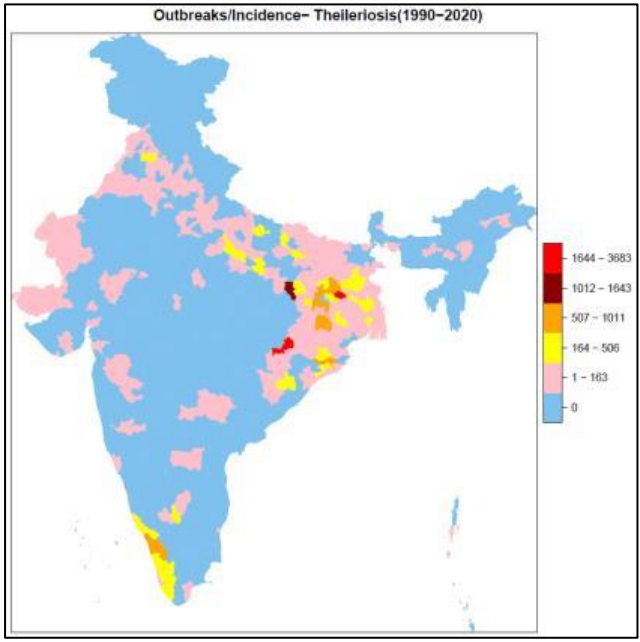

Outbreaks/Incidence- Foot and Mouth Disease(1990-2020)
23667 - 41925
11654 - 23666
5297 - 11653
1634 - 5296
1 - 1633
0


Outbreaks/Incidence- Haemorrhagic Septicaemia(1990-2020)
12850 - 65614
5943 - 12849
2809 - 5942
883 - 2808
1 - 882
0

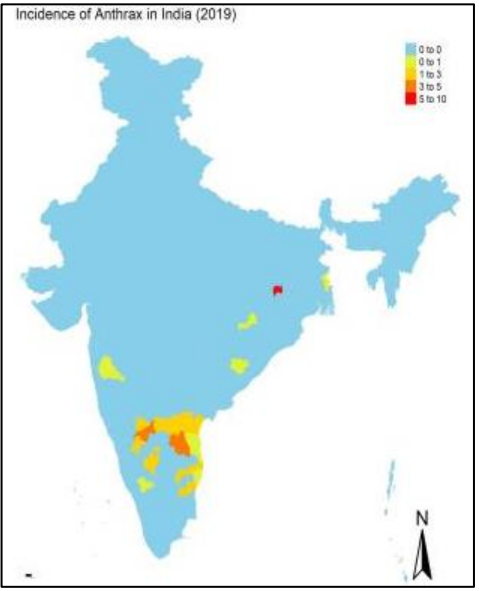

Outbreaks/Incidence- Peste des petits ruminants(1990-2020)
13003 - 25961
7804 - 13002
3618 - 7803
1110 - 3617
1 - 1109
0

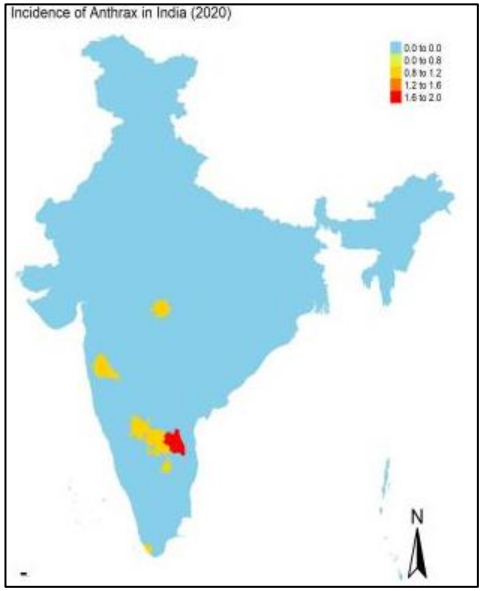

Outbreaks/Incidence- Swine Fever(1990-2020)
3050 - 8312
1461 - 3049
727 - 1460
207 - 726
1 - 206
0

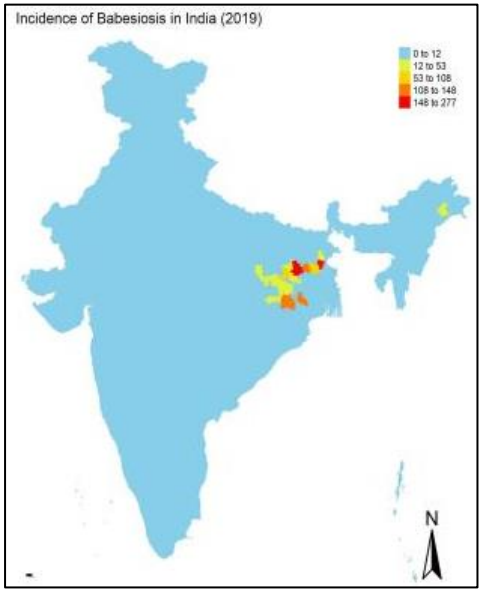

Outbreaks/Incidence- Sheep & Goat Pox(1990-2020)
13808 - 19269
9882 - 13807
4358 - 9881
1083 - 4357
1 - 1082
0

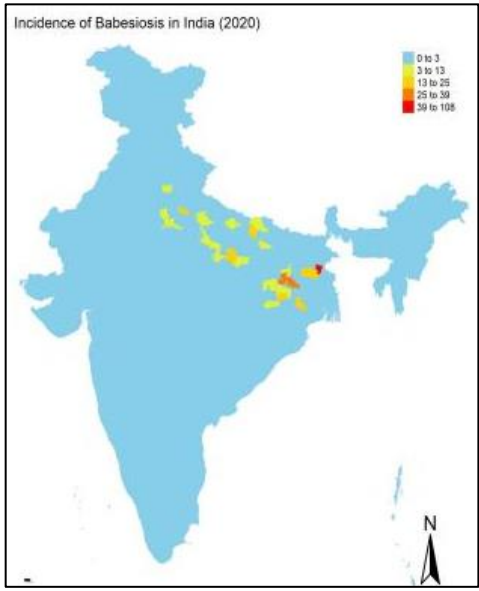

Outbreaks/Incidence- Theileriosis(1990-2020)
1644 - 3683
1012 - 1643
507 - 1011
164 - 506
1 - 163
0

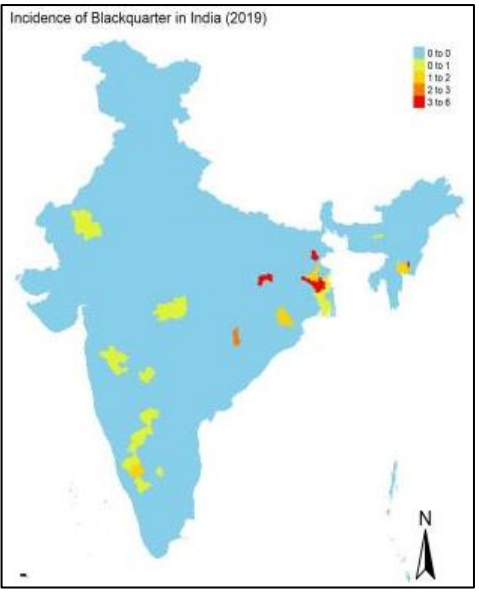
Comparison of Disease Incidence maps of 2019 and 2020

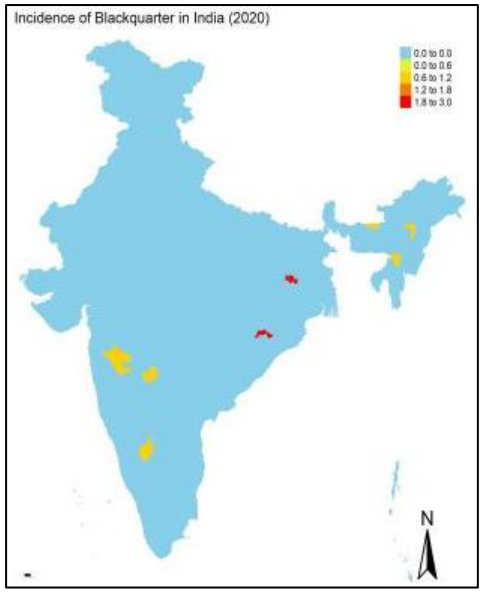


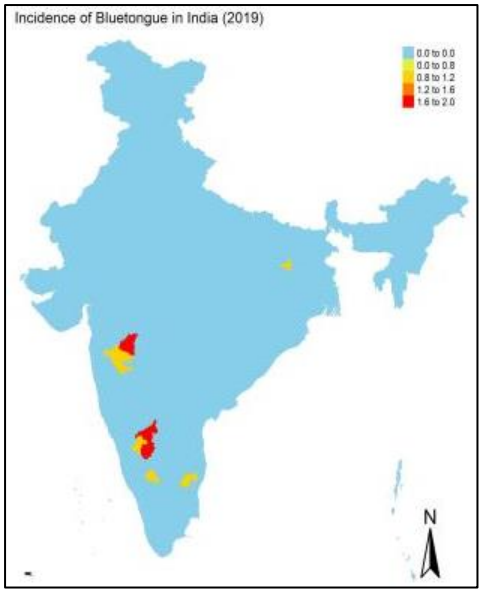


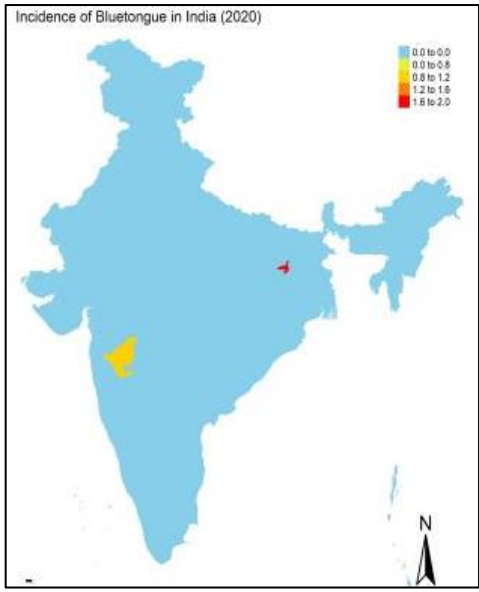


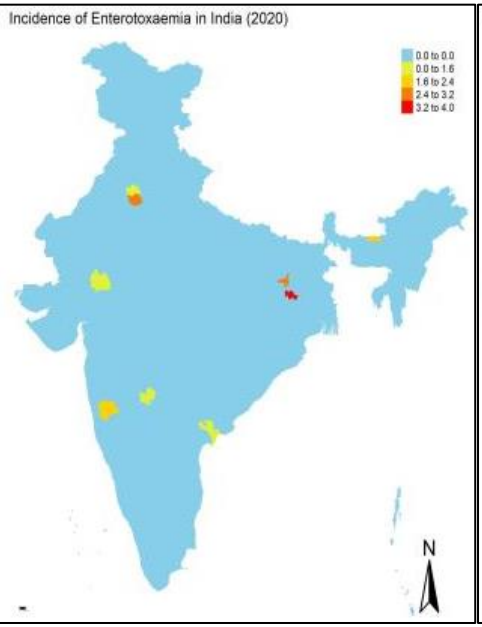


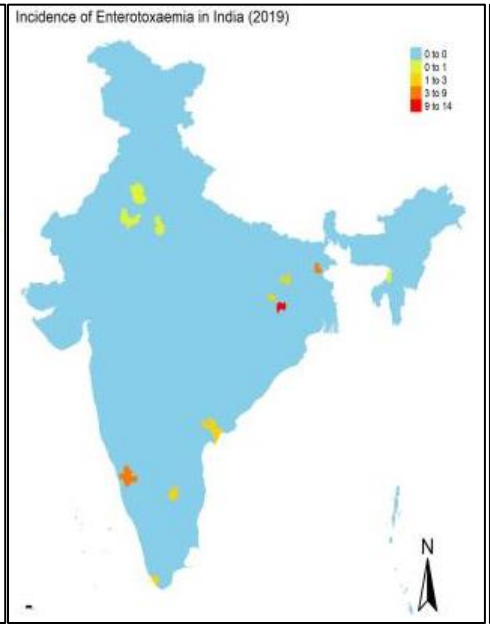


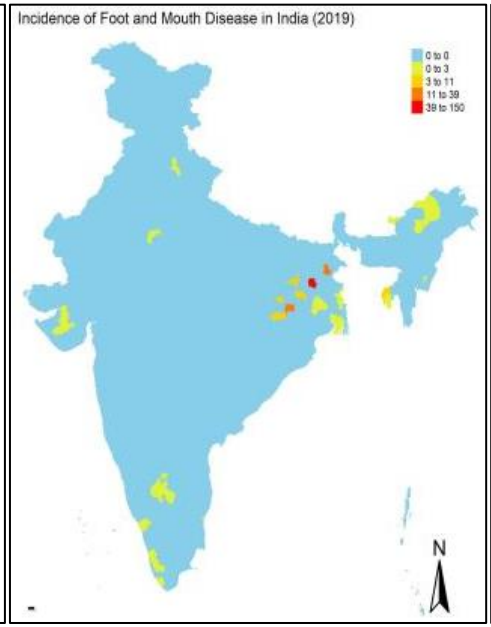


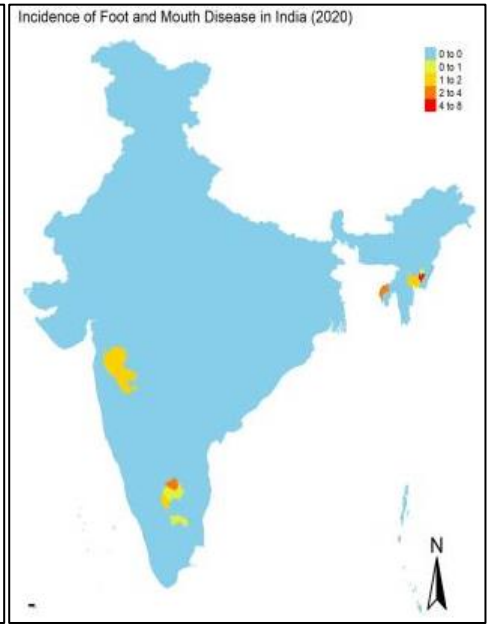


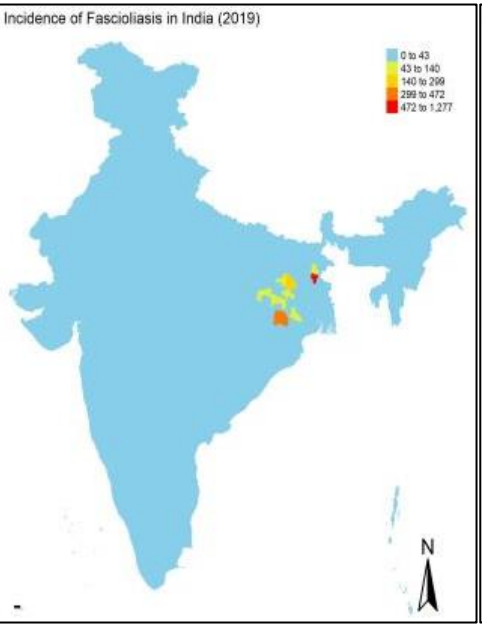


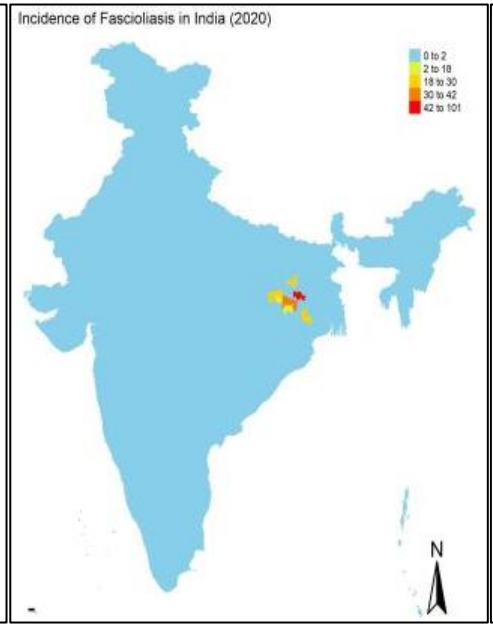

Incidence of Enterotoxaemia in India (2020)
0.0 to 0.0
0.0 to 1.6
1.6 to 2.4
2.4 to 3.2
3.2 to 4.0
N

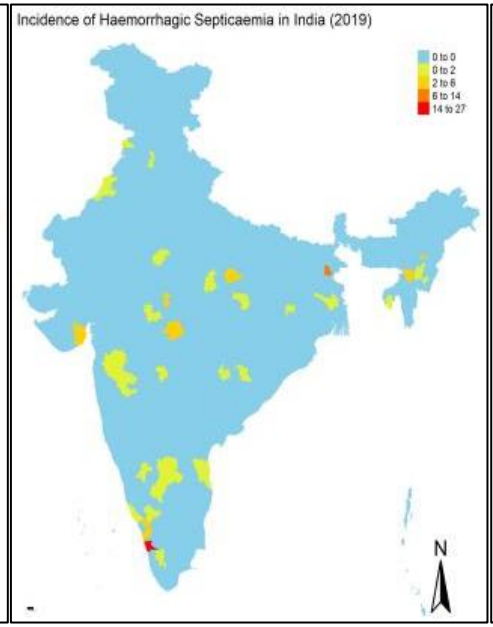

Incidence of Enterotoxaemia in India (2019)
0 to 0
0 to 1
1 to 3
3 to 9
9 to 14
N

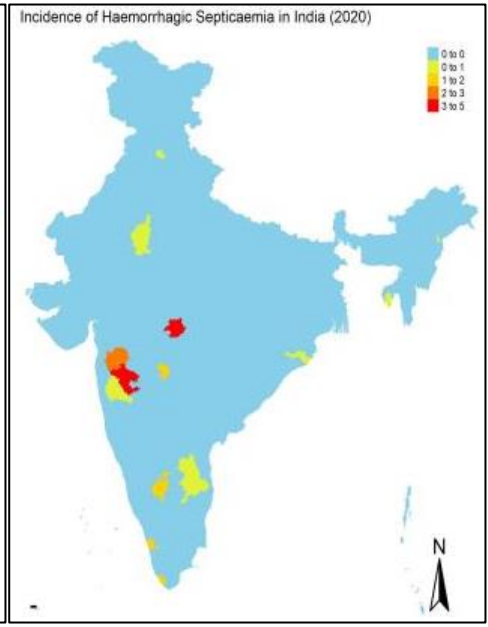

Incidence of Foot and Mouth Disease in India (2019)
0 to 0
0 to 3
3 to 11
11 to 39
39 to 150
N


Incidence of Foot and Mouth Disease in India (2020)
0 to 0
0 to 1
1 to 2
2 to 4
4 to 8
N

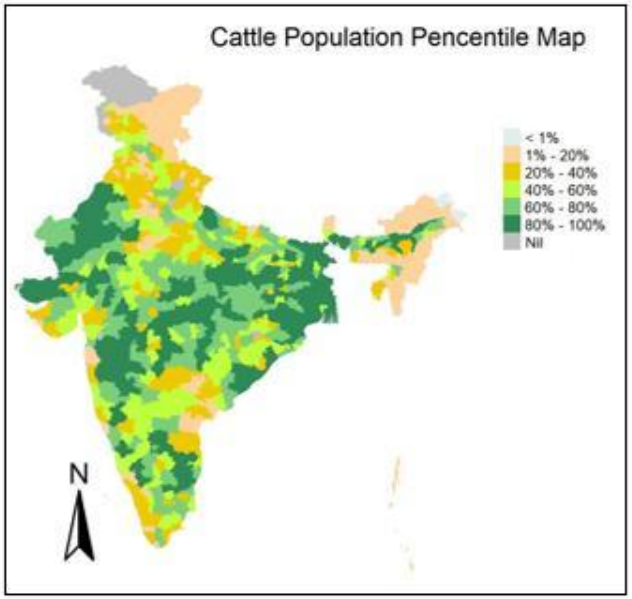

Incidence of Fascioliasis in India (2019)
0 to 43
43 to 140
140 to 299
299 to 472
472 to 1,277
N

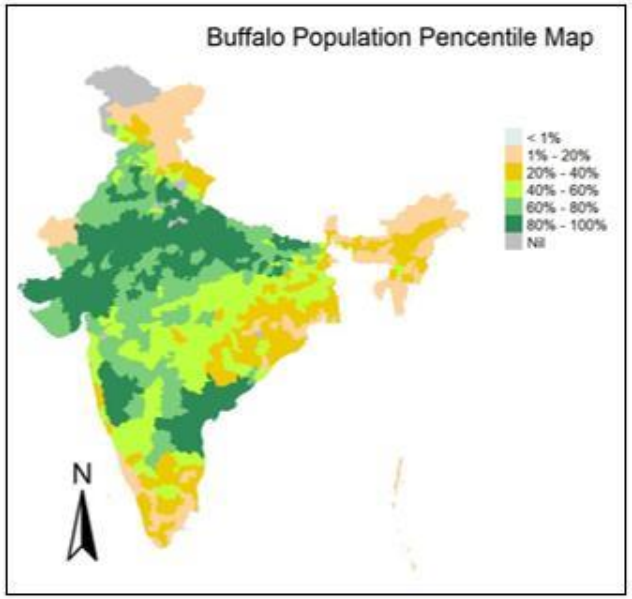

Incidence of Fascioliasis in India (2020)
0 to 2
2 to 18
18 to 30
30 to 42
42 to 101
N

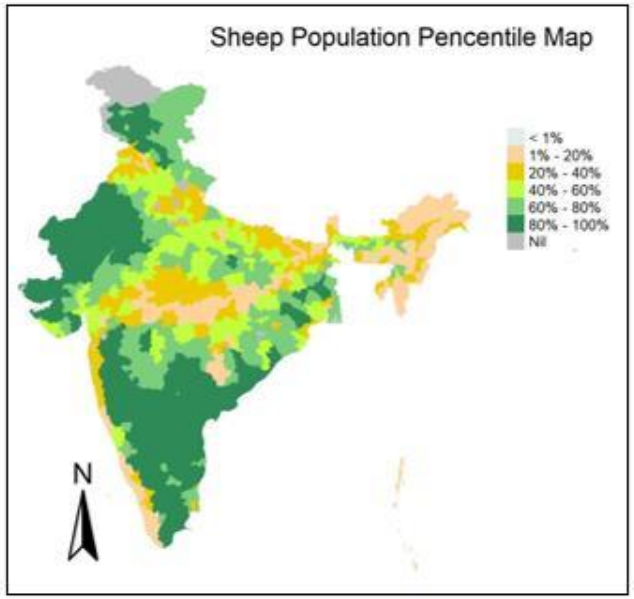

Incidence of Haemorrhagic Septicaemia in India (2019)
0 to 0
0 to 2
2 to 6
6 to 14
14 to 27
N

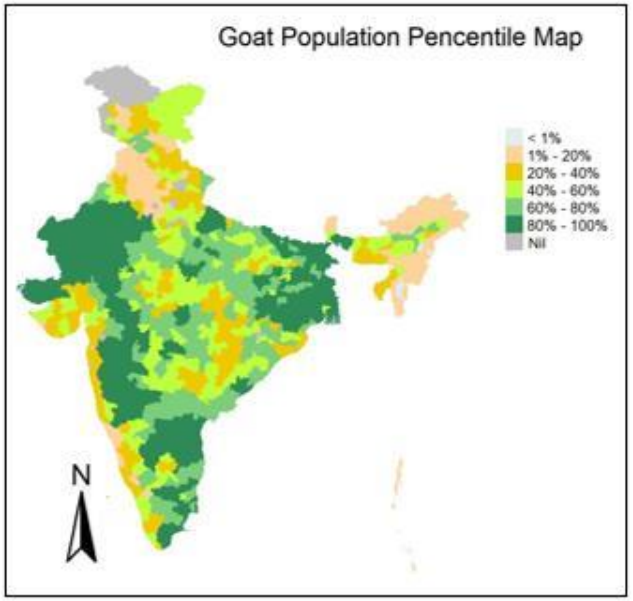

Incidence of Haemorrhagic Septicaemia in India (2020)
0 to 0
0 to 1
1 to 2
2 to 3
3 to 5
N

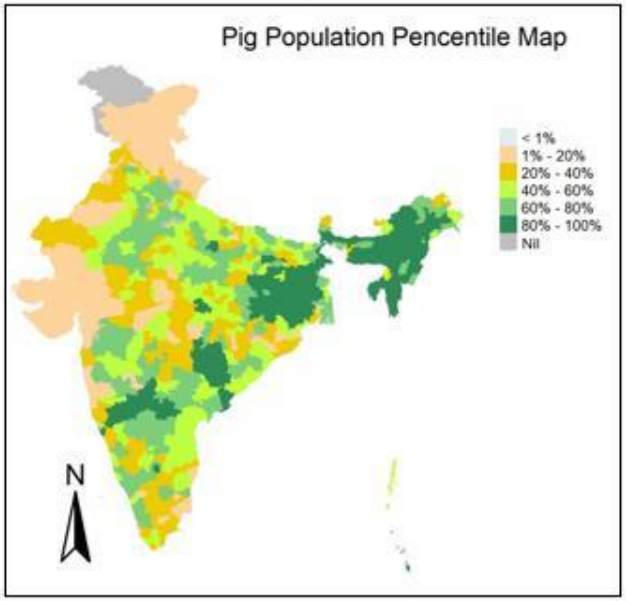
Livestock Population





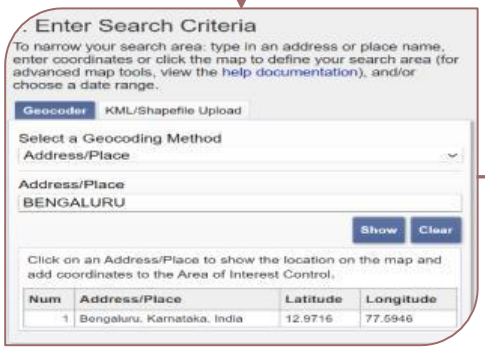


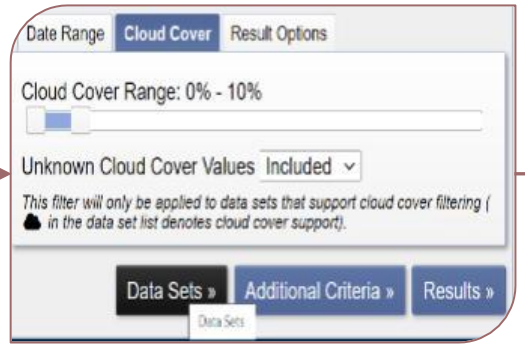


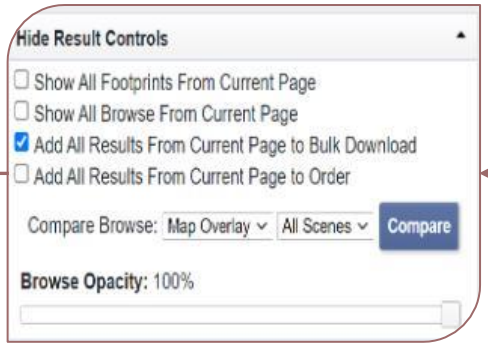


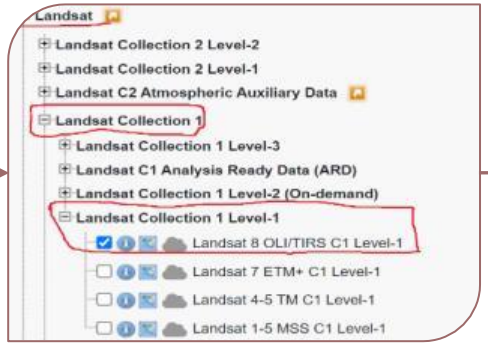
Extraction of features/parameters from Landsat8 real image datasets

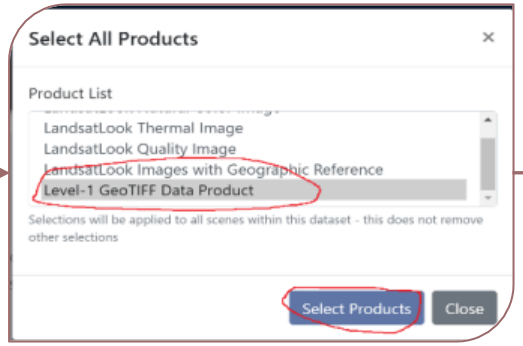
https://earthexplorer.usgs.gov/

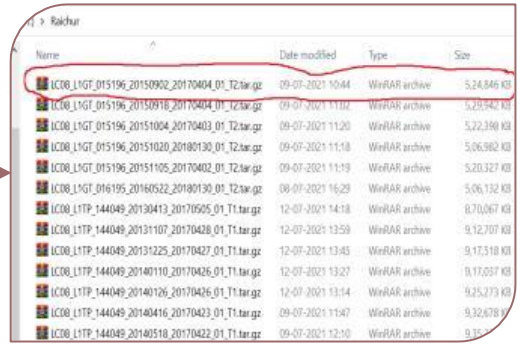




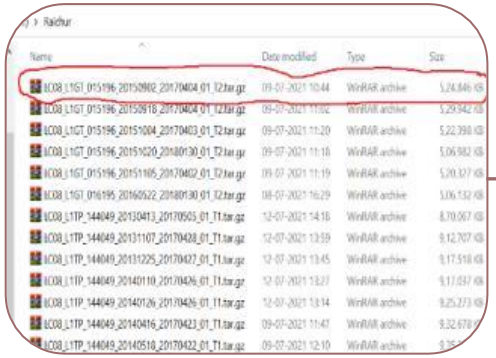




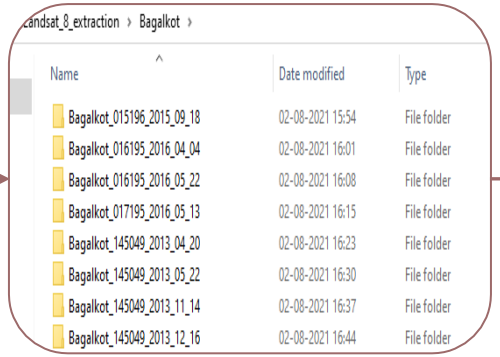




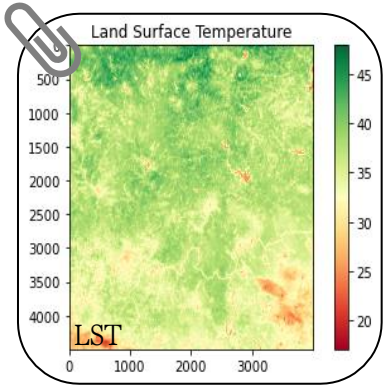
Decompress and Features/parameters extraction from of Landsat8 image datasets



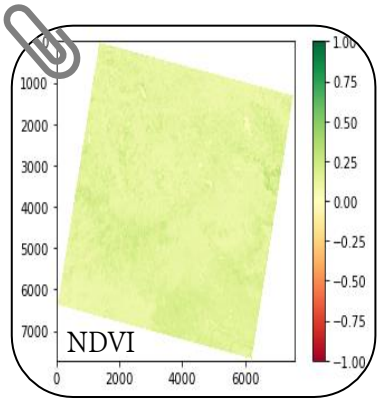
Decompression Algorithm

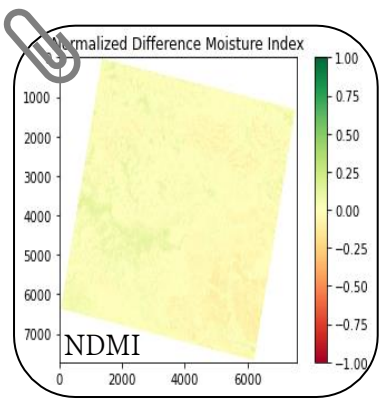


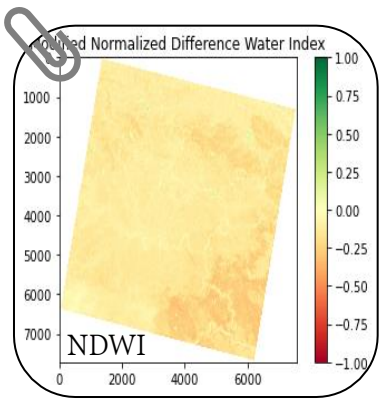
```
# -*- coding: utf-8 -*-
"""
Created on Tue Jul 13 10:26:49 2021

@author: Venkatesh
"""
import os
import cv2
import math
import numpy as ppool
import pandas as pd
import numpy as np
import tarfile
from os import walk
from glob import glob
import rasterio as rio
import earthpy.spatial as es

np.seterr(divide='ignore', invalid='ignore')

def NDVI(ndvi_est,T1,T2):
    ndvi_1=ndvi_est[1500:6000, 1500:6000]
    r,c=np.shape(ndvi_1); sum=0; count=0;
    try:
        ndvi_value=np.zeros((r,c), np.float32)
        for i in range(r):
            for j in range(c):
                if(ndvi_1[i][j]>=T1 and ndvi_1[i][j]<=T2):
                    ndvi_value[i][j]=ndvi_1[i][j]
                    sum+=ndvi_value[i][j]
                    count+=1
                else:
                    ndvi_value[i][j]=0
        return sum/count
    except ZeroDivisionError:
        return 0
```

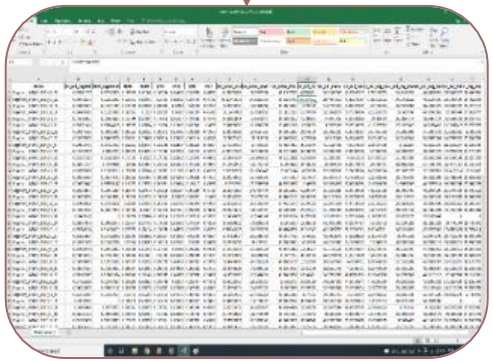


Features/parameters Extraction Algorithm









List of parameters/features extracted:

1. NDVI (Normalized Difference Vegetation Index for soil +vegetation)
2. NDVI (Normalized Difference Vegetation Index for vegetation)
3. NDMI (Normalized Difference Moisture Index)
4. NDWI(Normalized Difference Water Index)
5. VARI(Visible Atmospherically Resistant Index)
6. SAVI(Soil Adjusted Vegetation Index)
7. CMR(Clay Minerals Ratio)
8. FMR (Ferrous Minerals Ratio)
9. LSE (Land Surface Emissivity)
10. LST (Land Surface Temperature for Water, Soil, Vegetation, Soil+Vegetation)

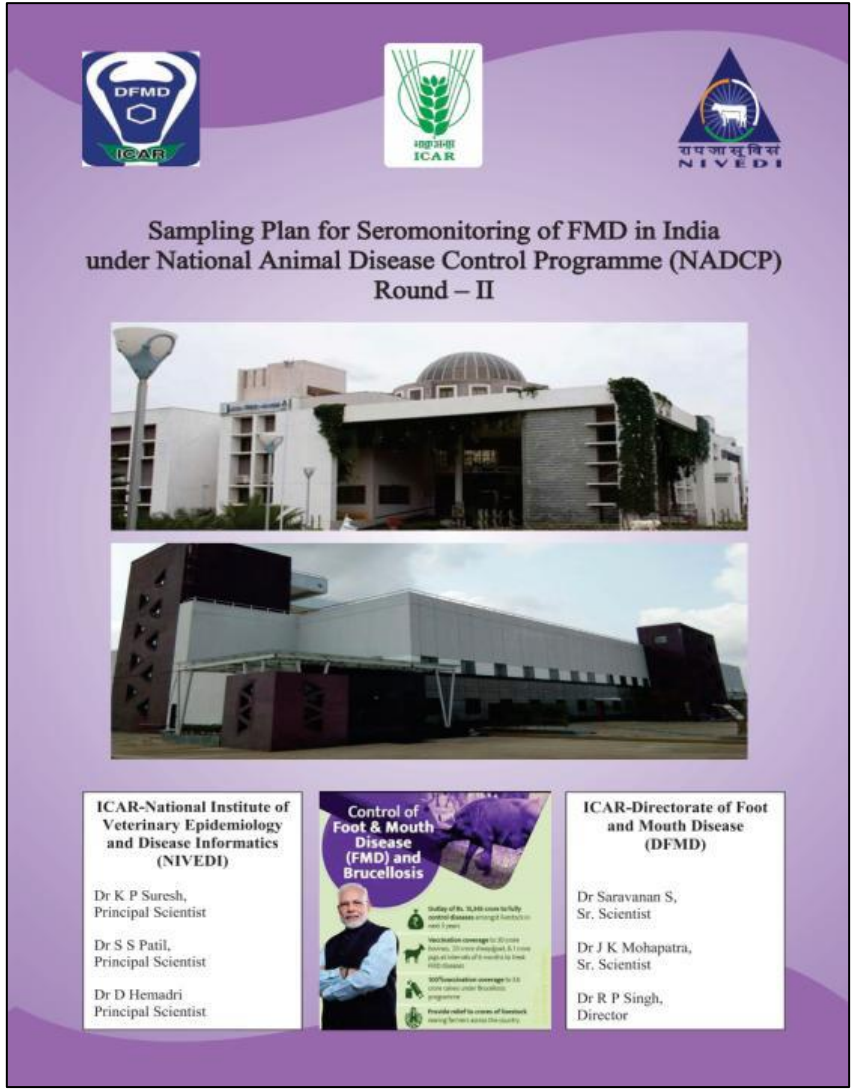
Sampling Plan for strengthening disease surveillance system

Introduction: Epidemiological surveillance

- Epidemiological surveillance systems that are ongoing and systematic, that use standardized routines for quality assurance, and that provide for analysis and timely dissemination of information are critical for early warning system.
- Disease surveillance requires the robust sampling plan for generating quality data and provide the true representation of population under consideration.
- Disease surveillance in livestock population comprises the detecting of presence of disease, estimating the prevalence and spatial distribution and monitoring its progression.
- Sample surveys often rely on probability sampling to choose the sample unit (animal) for observation from a population of Interest.
- Probability sampling is most often used when the objective is to estimate the population prevalence and number of diseased animals
- Since the selection probabilities are known, valid statistical properties of estimators can be derived, which provide the basis for evaluating the scientific credibility of the estimators such as prevalence rates.
- Two-Stage random sampling will be employed in the present study.

Animal level design	Test Sensitivity = 90%, Target Cluster Sensitivity = 90%, Confidence Interval = 95%					
	Cluster level Prevalence					
	10%		15%		20%	
Prevalence (in %)	Total Number of Villages Required	Total Number of Samples Required	Total Number of Villages Required	Total Number of Samples Required	Total Number of Villages Required	Total Number of Samples Required
1	3328	841984	2218	561154	1663	420739
2	1663	212864	1109	141952	831	106368
3	1109	94265	739	62815	554	47090
4	831	53184	554	35456	415	26560
5	665	34580	443	23036	332	17264
6	554	23822	369	15867	276	11868
7	475	17575	316	11692	237	8769
8	415	13280	276	8832	207	6624
9	369	10701	246	7134	184	5336
10	332	8632	221	5746	165	4290
11	302	7248	201	4824	150	3600
12	276	6072	184	4048	138	3036
13	255	5100	170	3400	127	2540
14	237	4503	158	3002	118	2242
15	221	3978	147	2646	110	1980
16	207	3312	138	2208	103	1648
17	195	3120	130	2080	97	1552
18	184	2760	122	1830	91	1365
19	174	2436	116	1624	87	1218
20	165	2145	110	1430	82	1066
21	158	2054	105	1365	78	1014
22	150	1800	100	1200	75	900
23	144	1728	95	1140	71	852
24	138	1518	91	1001	68	748
25	132	1452	88	968	66	726
26	127	1270	84	840	63	630
27	122	1220	81	810	61	610
28	118	1180	78	780	58	580
29	114	1026	76	684	56	504
30	110	990	73	657	54	486
31	106	954	71	639	53	477
32	103	824	68	408	51	663
33	100	800	66	528	49	392
34	97	776	64	512	48	384
35	94	752	62	496	47	376
36	91	728	61	488	45	360
37	89	623	59	413	44	308
38	87	609	57	399	43	301
39	84	588	56	392	42	294
40	82	574	54	378	41	287
41	80	560	53	371	40	280
42	78	546	52	364	39	273
43	76	456	51	306	38	228
44	75	450	49	294	37	222
45	73	438	48	288	36	216
46	71	426	47	282	35	210
47	70	420	46	276	34	204
48	68	408	45	270	34	204
49	67	402	44	264	33	198
50	66	396	43	258	32	192

Updated and Revised Sero-surveillance and Sero-monitoring Sampling Plan for FMD and Brucellosis with 20th Livestock Census data.



FMD Sero-Surveillance	
Number of samples estimated	124493
Number of Blocks covered	2922
Number of districts covered	710

FMD Sero-Monitoring	
Number of samples estimated	73457
Number of Blocks covered	3103
Number of districts covered	708

Sampling Plan for Serosurveillance of Bovine Brucellosis in India under National Animal Disease Control Programme

K P Suresh, Principal Scientist

S S Patil, Principal Scientist

M Nagalingam, Scientist

Divakar Hemadri, Principal Scientist

Parimal Roy, Director

ICAR-National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI), P.B.No 6450, Yelahanka, Bengaluru-560064

Brucellosis Sero-Surveillance	
Number of samples estimated	79326
Number of Blocks covered	2227
Number of districts covered	688

Sampling Plan for Seromonitoring of Brucellosis in India under National Brucellosis Control Programme

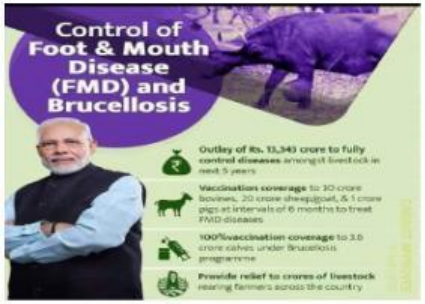
ICAR-National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI)

Dr K P Suresh, Principal Scientist

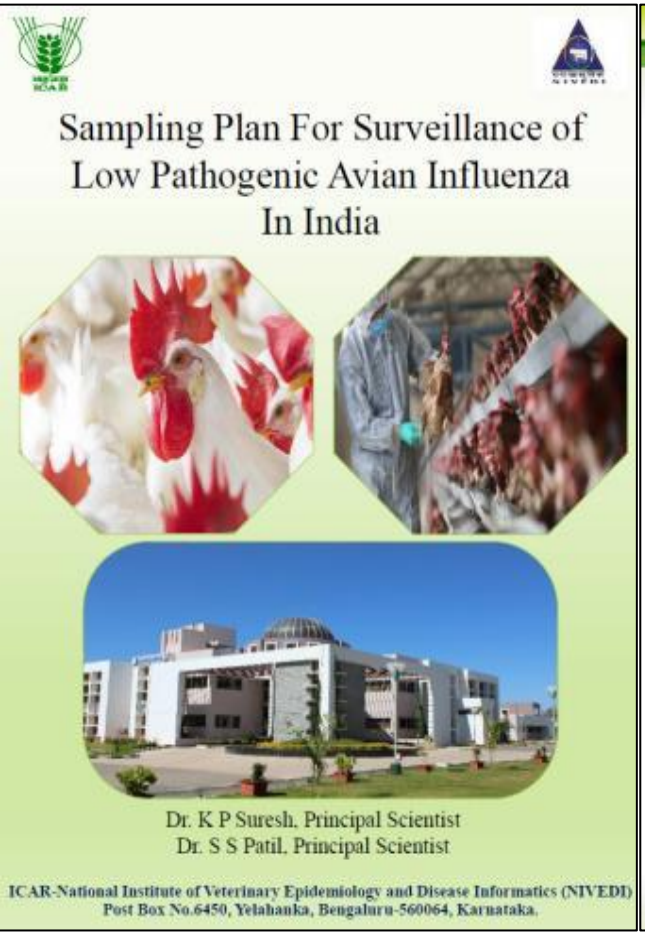
Dr S S Patil, Principal Scientist

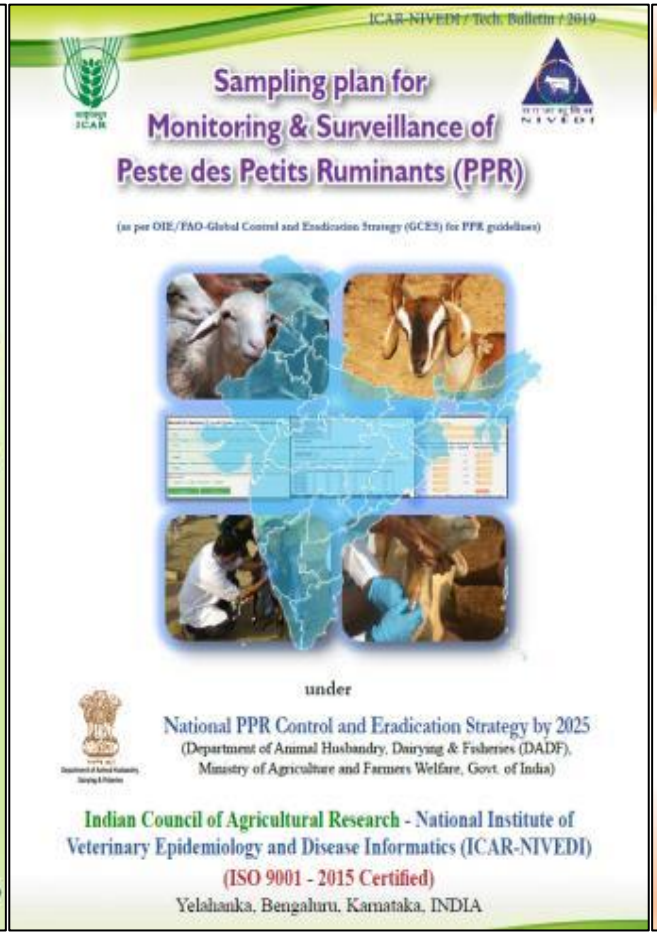
Dr Divakar Hemadri, Principal Scientist

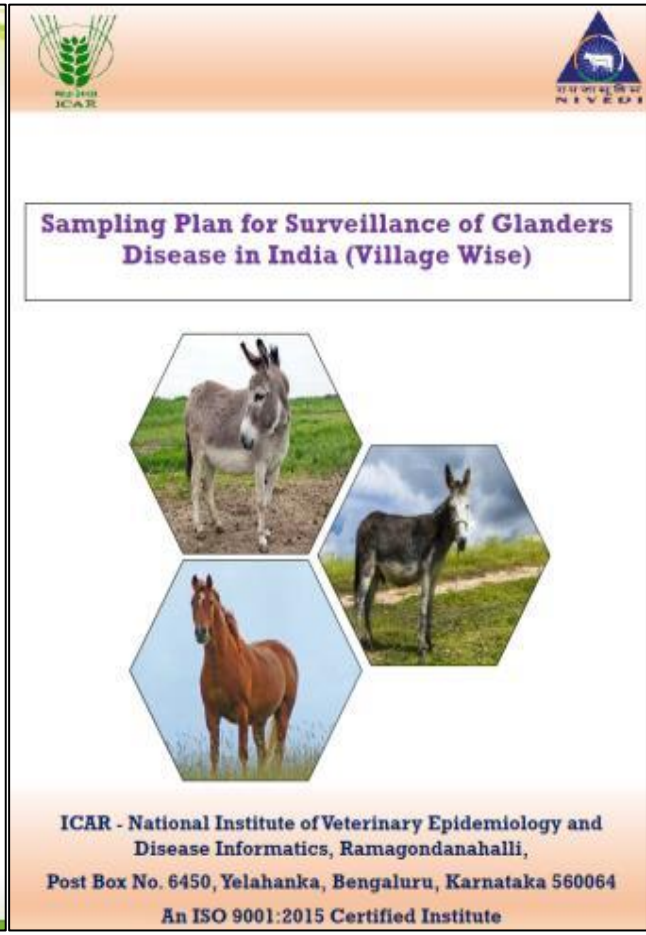
Dr Parimal Roy, Director



Brucellosis Sero-Monitoring	
Number of samples estimated	51708
Number of Blocks covered	2548
Number of districts covered	704







Avian Influenza	
Number of samples estimated	119455
Number of Blocks covered	3371
Number of Districts covered	691
Number of Villages covered	3371

Glanders	
Number of samples estimated	27131
Number of Blocks covered	364
Number of Districts covered	217
Number of Villages covered	748

Meta Analysis to Measure Disease Burden

INTRODUCTION

- Meta-analysis is a statistical method that combines and synthesizes multiple studies and integrates their results, It also considers the sample size of various studies and provides precise estimate of prevalence.
- Data synthesized from meta-analysis are usually more beneficial than the results of narrative reviews, decisions are transparent and statistical analysis yields an objective measure of the integrated quantitative evidence.
- The systematic review uses systematic methods to identify, select and analyse the primary studies both qualitatively and quantitatively, while meta-analysis is part of systematic review and employs statistical methods to integrate the results from multiple primary research studies.

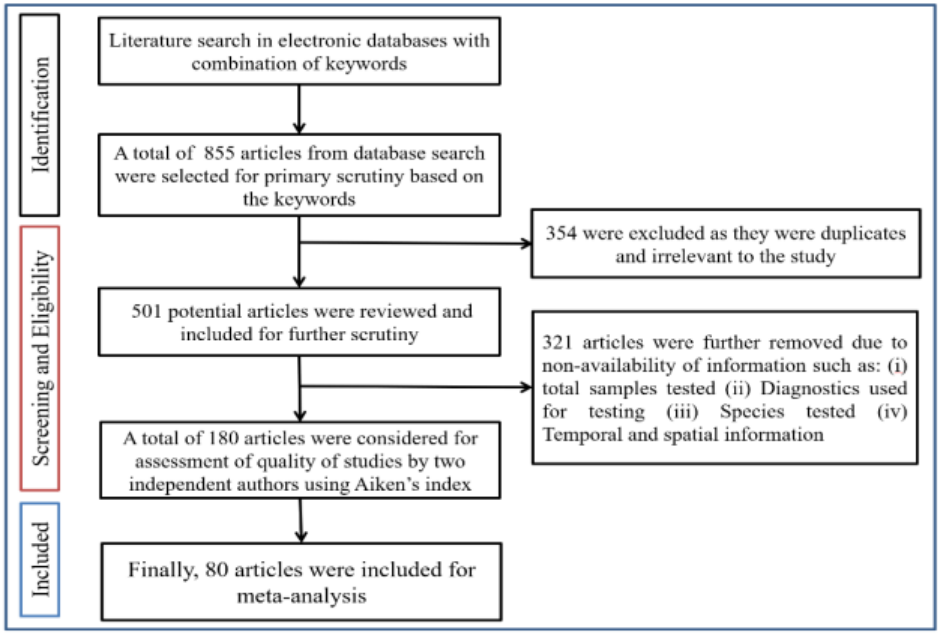
  The main objectives of Meta-analysis:

  (1) Estimate the more valid, generalizable summary estimates of the prevalence of Brucellosis.

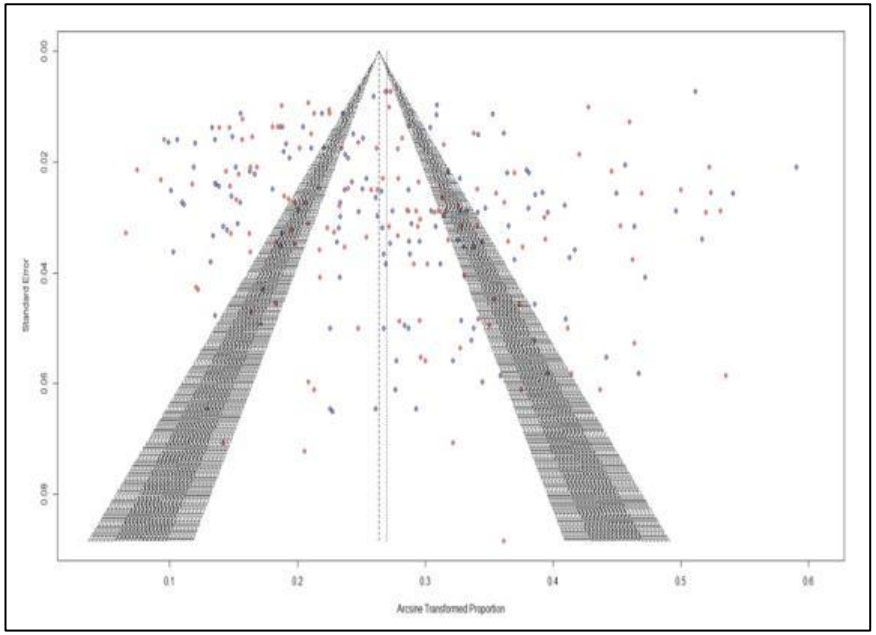
  (2) Identify and provide the information on factors or co-variates that affect the prevalence.

  (3) Identify the areas of further research.

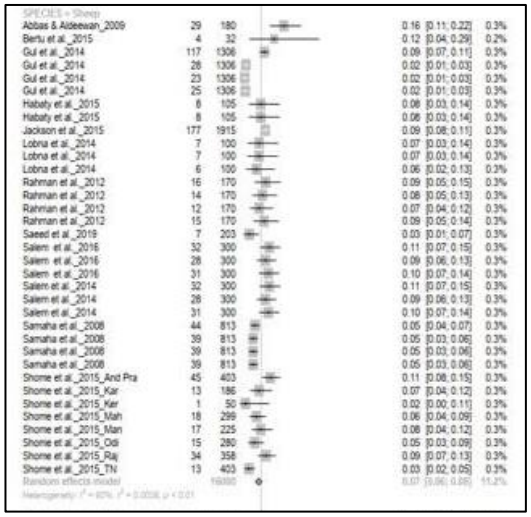
Flowchart of Inclusion and Exclusion of Studies



Funnel Plot for Publication Bias



Forest Plot

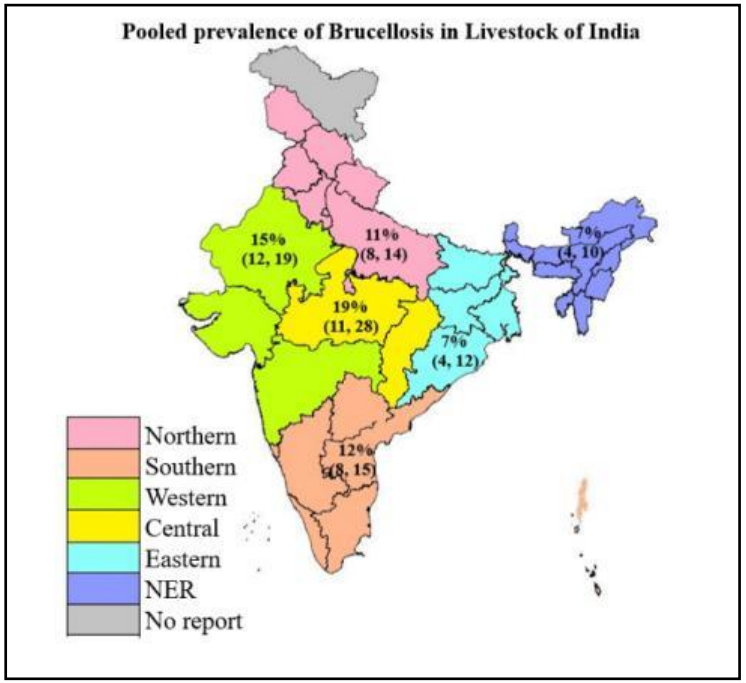


Meta- Regression Analysis

Predictors	Estimate	SE	z value	$\tau 2$	I^2 (%)	H^2 (%)	R^2 (%)	Qm	p Value
Region(Ref)	0.295	0.013	22.878	0.019	97.66	42.72	17.76	79.83	<0.0001
Test	0.328	0.150	2.190	0.021	97.81	45.61	8.78	59.91	<0.0001
Species	0.300	0.017	17.766	0.023	98.02	50.49	2.26	11.65	0.01
Quality	0.422	0.072	17.766	0.023	98.06	51.46	0.36	2.25	0.07
Sample Size	0.324	0.017	33.899	0.153	98.04	51.01	0.49	3.22	0.07
Year	2.918	3.170	0.920	0.024	98.07	51.70	0.00	0.67	0.41

Sub group Analysis

(a)Continent-wise Stratification				
Names of Continent	*Prevalence % (95% CI)*	*I2(%)*	*τ2*	*Model*
Africa	8.0(7.0–9.0)	96	0.0104	REM
Asia	8.0(7.0–9.0)	96	0.0149	REM
(b) Diagnostic test-wise Stratification				
Names of the test	*Prevalence % (95% CI)*	*I2(%)*	*τ2*	*Model*
ELISA	7.0(6.0–8.0)	97	0.0122	REM
PCR	11.0(2.0–26.0)	79	0.0317	REM
RBPT	8.0(7.0–9.0)	93	0.0085	REM
MRT	7.0(4.0 –11.0)	94	0.0107	REM
Agglutination Tests	7.0(6.0–8.0)	94	0.0115	REM
CFT	10.0(8.0–11.0)	75	0.0009	REM
LFA & FPA	4.0(3.0–6.0)	50	0.0019	FEM
Riv. Test	4.0(3.0–5.0)	56	0.0005	FEM
(c) Species-wise Stratification				
Names of Species'	*Prevalence % (95% CI)*	*I2(%)*	*τ2*	*Model*
Buffalo	6.0 (5.0–8.0)	90	0.0085	REM
Cattle	8.0(7.0–9.0)	97	0.0124	REM
Goat	6.0(5.0–7.0)	82	0.0054	REM
Sheep	7.0(6.0–8.0)	90	0.0038	REM



NADRES v2

Redefining Livestock Disease Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases August-2021

for likely occurrence of Enterotoxaemia in October-2021

ARUNACHAL PRADESH,ASSAM,JHARKHAND,MANIPUR,UTTAR PRADESH,ANDAMAN & NICOBAR ISLANDS,PUDUCHERRY are predicted for likely occurrence of Fasciliasis in October-2021

NDAMAN & NICOBAR ISLANDS,BIHAR,GOA,JAMMU & KASHMIR,JHARKHAND,KARNATAKA,KERALA,MANIPUR,MEGHALAYA,NAGALAND,ODISHA,TAMIL NADU,WEST BENGAL are predicted for likely occurrence of Foot and mouth disease in October-2021

OB Prediction October-2021

HS - 44, with Accuracy of 97.22%

PPR - 62, with Accuracy of 96.91%

S&G Pox - 31, with Accuracy of 99.38%

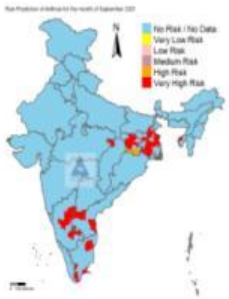
Swine Fever - 32, with Accuracy of 99.69%

Auto Messaging

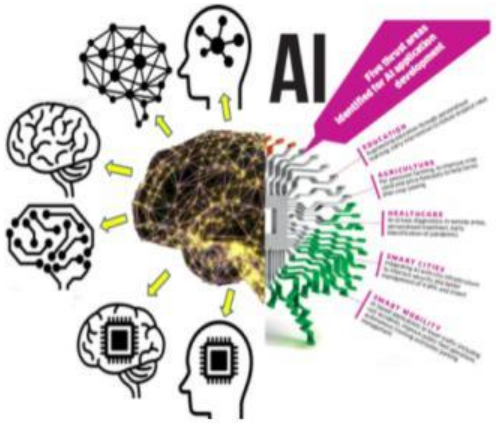
Request to send the monthly disease outbreak report and

NADRES Version-2

The National Animal Disease Referral Expert System (NADRES) of ICAR-NIVEDI is a system that builds on the added value of combining and coordinating the alert and response mechanisms in collaboration with DAHD for the stake holders to assist in prediction, prevention and control of animal disease threats, including zoonoses, through sharing of information, epidemiological analysis and joint field missions to assess and control the outbreak, whenever needed.



Implementation of Artificial Intelligence in NADRES V2



- Livestock Disease Forecast State wise
- Livestock Disease Forecast-District wise
- LDF mobile app Download
- Sampling Plan
- Scientometrics/ Bioinformatics
- COVID-19 Epidemiogical Analysis in India
- Epi Calculator
- SWOT
- Nadres IOOAI
- Web Traffic Analytics
- Monthly Bulletin (Archives)
- EpiNET
- OB Report Status 2020

NADRES v2

Redefining Livestock Disease Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases August-2021

ANDHRA PRADESH,KARNATAKA,ODISHA,TAMIL NADU,WEST BENGAL are predicted for likely occurrence of Babesiosis in Octoberr-2021

OB Prediction October-2021

Anthrax - 32, with Accuracy of 99.69%

Babesiosis - 60, with Accuracy of 97.38%

Auto Messaging

Scientometrics (Systematic Review & Meta-analysis)

To set priorities for livestock health policy, such as funding for veterinary health interventions and planning for curbing the burden of livestock diseases, it is necessary to have accurate data on the prevalence of livestock diseases in India. With an increase in submission of research articles, the value of systematic review and meta-analysis for summarizing the results is greatly acknowledged. Meta-analysis is a statistical method that combines and synthesizes multiple studies and integrates their results.

Meta Analysis to measure disease burden

1. A systematic review and meta-analysis on the prevalence of infectious diseases of Duck.
2. Meta-analysis of the prevalence of livestock diseases in North Eastern Region of India .
3. Global and countrywide prevalence of subclinical and clinical mastitis in dairy cattle and buffaloes by systematic review and meta-analysis .
4. Bovine babesiosis: An insight into the global perspective on the disease distribution by systematic review and meta-analysis .
5. Meta-analysis of classical swine fever prevalence in pigs in India: A 5-year study.
6. Prevalence of extended-spectrum betalactamase producing bacteria from animal origin: A systematic review and meta-analysis report from India.
7. Basic reproduction number (R0), an epidemiological tool for prioritizing livestock diseases.
8. An Understanding of the Global Status of Major Bacterial Pathogens of Milk Concerning Bovine Mastitis: A Systematic Review and Meta-Analysis (Scientometrics).

Bio-Informatics

Bioinformatics is the application of computational technology to handle the rapidly growing repository of information related to molecular biology. It is particularly useful for managing and analyzing large sets of data, such as those generated by the fields of genomics and proteomics.

1. Comparative Genome Analysis of Short Sequence Repeats in Pathogenic and Non Pathogenic Leptospira- A Statistical Approach.
2. Relative Analysis of Codon Usage and Nucleotide Bias between Anthrax Toxin Genes Subsist Inpxo1 Plasmid of Bacillus Anthracis.
3. Analysis of codon usage bias of classical swine fever virus.
4. Evolutionary analysis and detection of positive selection of Hemagglutinin and neuraminidase genes of h5n1 avian influenza from chicken, duck and goose across Asia.
5. Insight of Codon usage bias and Evolutionary rate among the genes C, E,prM and NS5 of the Kyasanur Forest Disease virus.

- Livestock Disease Forecast State wise
- Livestock Disease Forecast-District wise
- LDF mobile app Download
- Sampling Plan
- Scientometrics/ Bioinformatics
- COVID-19 Epidemiogical Analysis in India
- Epi Calculator
- SWOT
- Nadres IOOAI
- Web Traffic Analytics
- Monthly Bulletin (Archives)
- EpiNET
- OB Report Status 2020

Bioinformatics: Molecular Epidemiological Data Analysis

Explor Anim Med Res,
Vol.10, Issue - 2, 2020, p. 169-178

ISSN 2277- 470X (Print), ISSN 2319-247X (Online)
Website: www.animalmedicalresearch.org

Research Article

EVOLUTIONARY ANALYSIS AND DETECTION OF POSITIVE SELECTION OF HEMAGGLUTININ AND NEURAMINIDASE GENES OF H5N1 AVIAN INFLUENZA FROM CHICKEN, DUCK AND GOOSE ACROSS ASIA

Kuralayanapalya Puttahonnappa Suresh*, Sharanagouda Patil, Uma Bharathi Indrabalan, Rajangam Sridevi, Paramanadham Krishnamoorthy, Shinduja Rajamani, Parimal Roy

Substitution Rate and tMRCA

Gene	Host	Substitution Rate (10^{-3}) (subs/site/year)				tMRCA			
				95% HPD				95% HPD	
		Mean	Median	Lower	Upper	Mean	Median	Lower	Upper
HA	Chicken	2.36	2.31	1.82	3.00	69.53	67.63	59.39	83.1
	Duck	5.15	5.15	4.75	5.54	25.22	25.19	23.35	27.16
	Goose	5.19	5.19	4.52	5.89	23.87	23.74	22.62	25.4
NA	Chicken	2.88	3.00	1.82	3.42	36.23	35.14	30	46.61
	Duck	2.28	2.16	1.80	2.98	41.27	40.67	35.71	48.6
	Goose	6.25	6.24	5.39	7.13	22.15	22.1	22	22.47

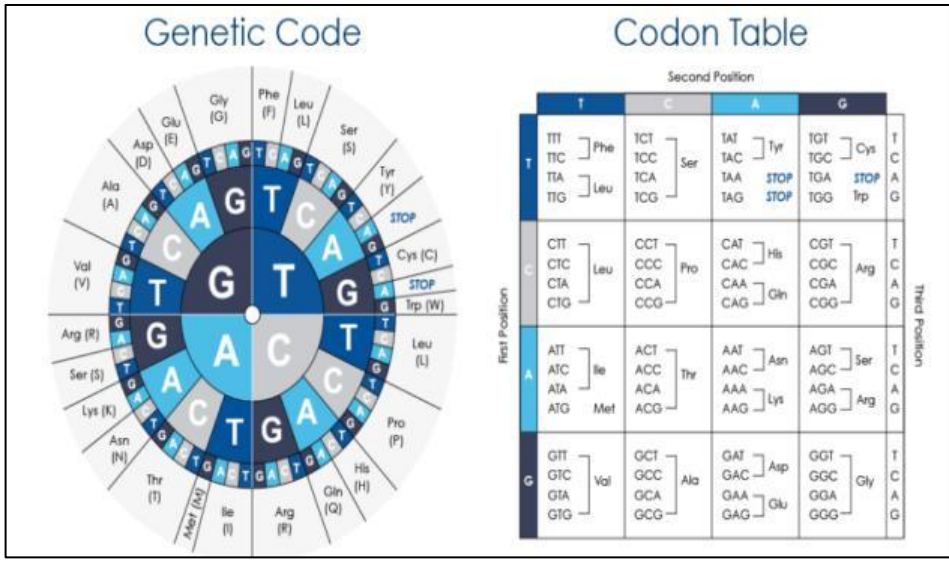
*tMRCA: time of the most common ancestor in years, HPD: highest posterior density.

Codon Usage Bias Analysis

- A similar genetic code is used by most organisms on Earth, but different organisms have different preferences for the codons they use to encode specific amino acids. This is possible because there are 4 bases (A, T, C, and G) and 3 positions in each codon.
- Evolutionary constraints have molded which codons are used preferentially in which organisms - organisms have codon usage bias.
- Codon usage bias refers to differences in the frequency of occurrence of synonymous codons in coding DNA.

The mechanism of codon bias selection for the bias fall into two general categories.

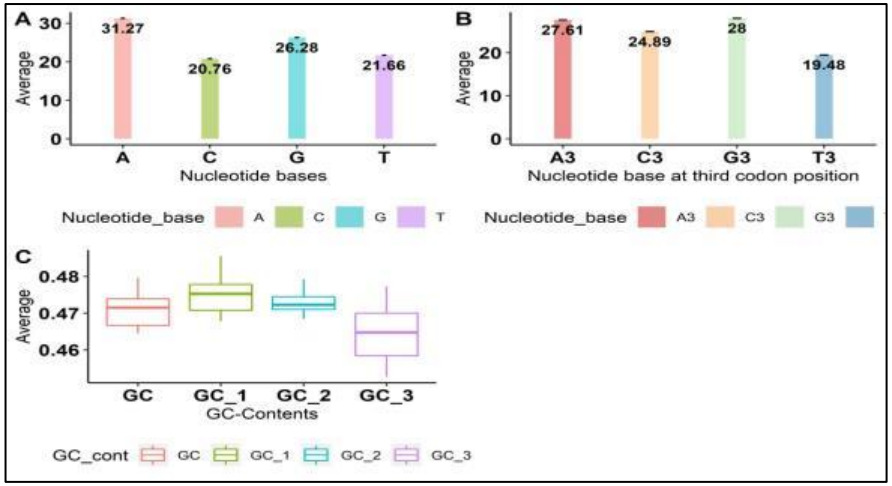
- *Selection theory*, in which codon bias contributes to the efficiency and/or accuracy of protein expression and therefore undergoes positive selection.
- *mutational bias*, a theory which determines that codon bias exists because of non randomness in the mutational patterns.



Methods of analysis

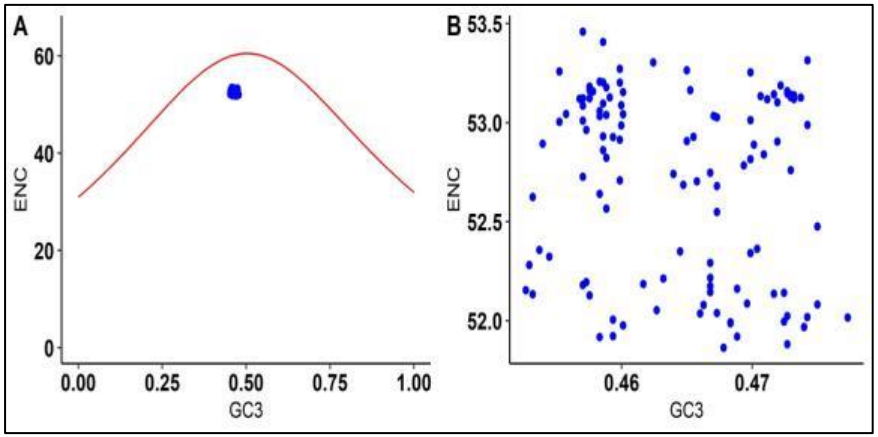
Nucleotide Compositional analysis

- Frequency of Nucleotides
- Frequency of Nucleotides at third codon position
- Frequency of GC contents



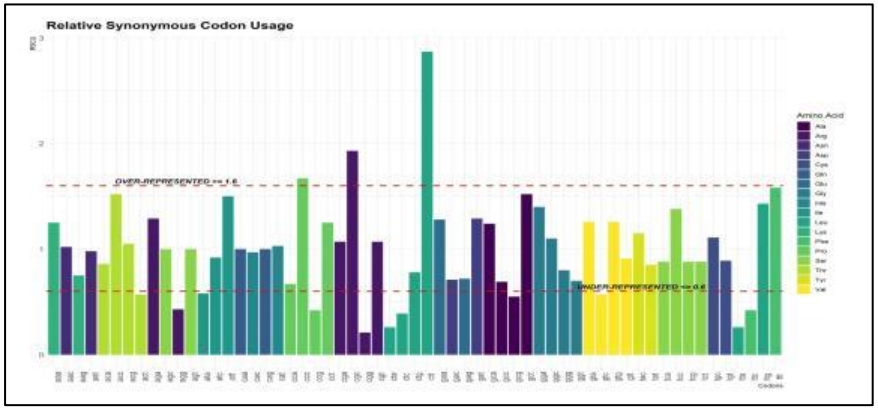
Effective number of codons (ENC)

An effective number of codon (ENC) analysis reflects the deviation of codon from random selection.
The ENC value ranges from 20 to 61.



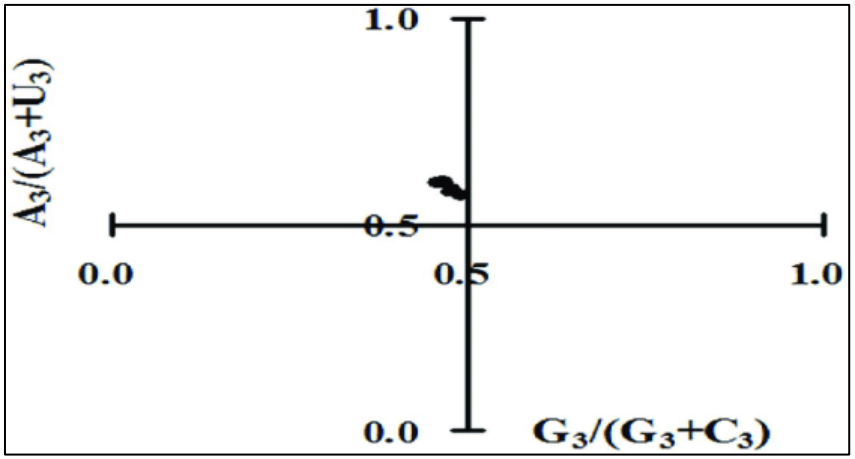
Relative synonymous codon usage

It is one of the most widely used parameters for querying the pattern of synonymous codon usage across genes and genomes.



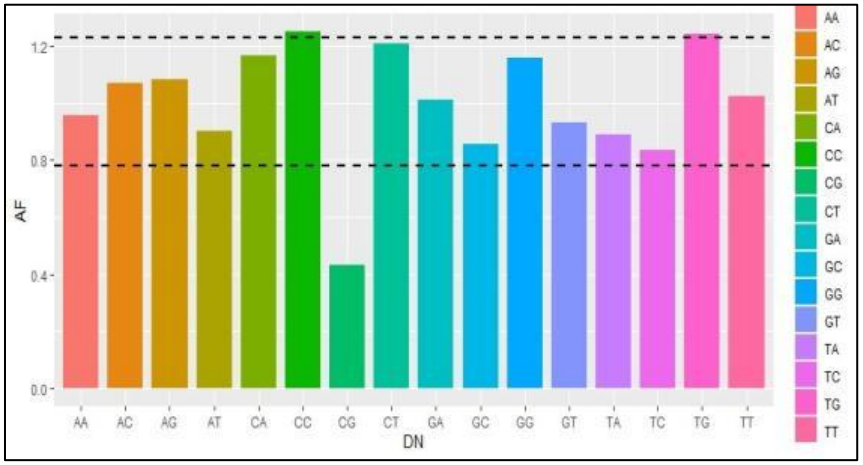
Parity rule 2 analysis

The relationship between purine(A and G) and primidines (T and C) of each gene can be analyzed by PR2-plot.



Dinucleotide abundance frequency

Considering the relative abundance of dinucleotides affecting the pattern of codon usage, the relative abundance of 16 dinucleotides are calculated.

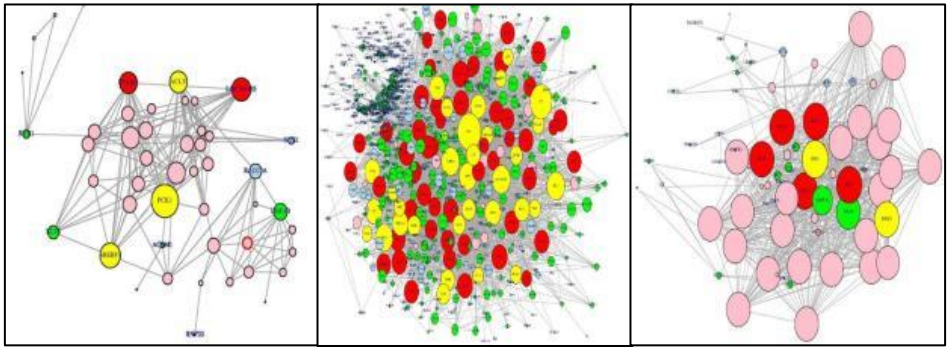


Integrated Analysis of protein interaction network and identification of candidate genes in *E. coli* Mastitis using systems biology approach

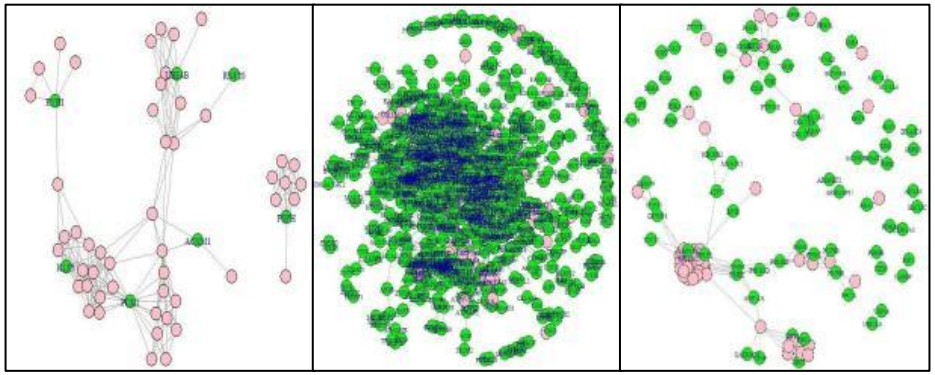
Coliform mastitis is the source of a large proportion of acute cases of clinical mastitis in dairy cows rather than by other pathogens.
Analyzing the Microarray gene expression evaluation of *E. coli* inoculated bovine mammary gland tissue with quarter post infection.

Sl.No	Accession No	Time course	Control	Disease	Total No. of Samples
1.	GSE15019	6 h	5	5	10
2.	GSE15020	24h	5	5	10
3.	GSE15022	n24h	5	5	10

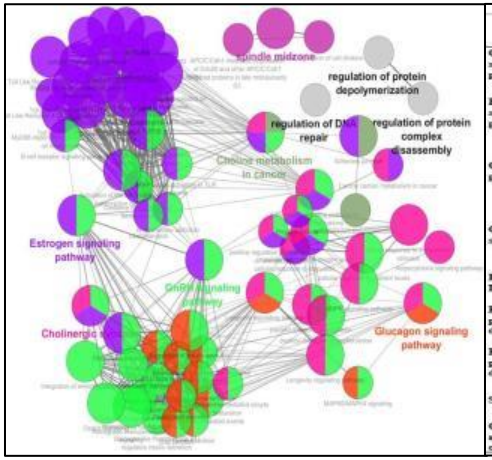
The topology network was analyzed for biological proteins were analysis using Cytoscape plugin ClueGo for 6h, 24h and 24h neighbor quarter post infection.



The Differentially Expressed Genes were constructed for protein interaction network separately using R-Igraph for inoculated with E. coli at 6h, 24h and 24h neighbor quarter post infection was performed.



Gene Ontology and Pathway Enrichment for the hub and bottleneck nodes



PATHWAY	6 h infected	24 h infected	24 h neighbor
Glucagon signalling pathway	PCK1, SREBF1	ADCY6,BCL2,EGFR,FOXO1,GNG2,MTOR,PKM, PLCB1,POMC,PRKACA,PSMA6	-
Estrogen signalling pathway	PCK1, SREBF1	ACTN2,ADCY6,APP,BCL2,CDH1, EGFR,FOS,FOXO1,GNG, JUN,MAPK14,MTOR,PKM,PLCB1, PPARG,PRKAC,RAC2	-
GnRH signalling pathway	ACLY, PCK1, SREBF1	ADCY6, BCL2, EGFR, FOXO1, GNG2, MTOR, PKM, PLCB1, POMC, FOS, JUN, MAPK14, PLK1, PPARG, PRKACA, PSMA6,RAC2	-
Cholinergic synapse	PCK1, SREBF1	ADCY6, BCL2, EGFR, FOXO1, GNG2, MTOR, PKM, PLCB1, POMC, FOS, JUN, MAPK14, PLK1, PPARG, PRKACA, RAC2	-
Regulation of DNA repair	-	EGFR,PCNA,RPS3	RPS3
Regulation of protein complex disassembly	SREBF1	ACTN2,AURKB	-
Regulation of protein depolymerization	SREBF1	ACTN2,AURKB	-
Spindle midzone	-	AURKB,CDC6,PLCB1,PLK1,PSMA6	-
Cholino metabolism in cancer	-	ACTN2,BCL2,CDH1,EGFR,FOS,JUN,MTOR,RAC2	-

- These pathways, interestingly, very important to obtain appropriate approaches for the breast and ovarian development.
- The results suggest that, the potential role of the hub genes in mastitis resistance is significant

NADRES v2

Redefining Livestock Disease Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases August-2021

for likely occurrence of Enterotoxaemia in October-2021

ARUNACHAL PRADESH,ASSAM,JHARKHAND,MANIPUR,UTTAR PRADESH,ANDAMAN & NICOBAR ISLANDS,PUDUCHERRY are predicted for likely occurrence of Fasciliasis in October-2021

NDAMAN & NICOBAR ISLANDS,BIHAR,GOA,JAMMU & KASHMIR,JHARKHAND,KARNATAKA,KERALA,MANIPUR,MEGHALAYA,NAGALAND,ODISHA,TAMIL NADU,WEST BENGAL are predicted for likely occurrence of Foot and mouth disease in October-2021

OB Prediction October-2021

HS - 44, with Accuracy of 97.22%

PPR - 62, with Accuracy of 96.91%

S&G Pox - 31, with Accuracy of 99.38%

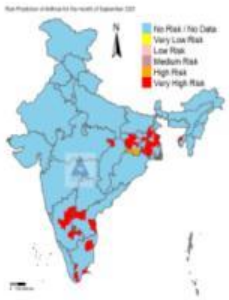
Swine Fever - 32, with Accuracy of 99.69%

Auto Messaging

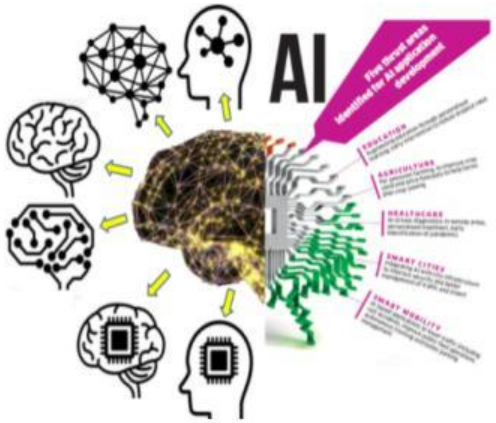
Request to send the monthly disease outbreak report and

NADRES Version-2

The National Animal Disease Referral Expert System (NADRES) of ICAR-NIVEDI is a system that builds on the added value of combining and coordinating the alert and response mechanisms in collaboration with DAHD for the stake holders to assist in prediction, prevention and control of animal disease threats, including zoonoses, through sharing of information, epidemiological analysis and joint field missions to assess and control the outbreak, whenever needed.



Implementation of Artificial Intelligence in NADRES V2



- Livestock Disease Forecast State wise
- Livestock Disease Forecast-District wise
- LDF mobile app Download
- Sampling Plan (New)
- Scientometrics/ Bioinformatics (New)
- COVID-19 (New) Epidemiogical Analysis in India
- Epi Calculator (New)
- SWOT
- Nadres IOOAI
- Web Traffic Analytics
- Monthly Bulletin (Archives)
- EpiNET
- OB Report Status 2020

NADRES v2

Redefining Livestock Disease Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases August-2021

ANDHRA PRADESH,KARNATAKA,ODISHA,TAMIL NADU,WEST BENGAL are predicted for likely occurrence of Babesiosis in October-2021

OB Prediction October-2021

Anthrax - 32, with Accuracy of 99.69%

Babesiosis - 60, with Accuracy of 97.38%

Auto Messaging

Scientometrics (Systematic Review & Meta-analysis)

To set priorities for livestock health policy, such as funding for veterinary health interventions and planning for curbing the burden of livestock diseases, it is necessary to have accurate data on the prevalence of livestock diseases in India. With an increase in submission of research articles, the value of systematic review and meta-analysis for summarizing the results is greatly acknowledged. Meta-analysis is a statistical method that combines and synthesizes multiple studies and integrates their results.

Meta Analysis to measure disease burden

1. A systematic review and meta-analysis on the prevalence of infectious diseases of Duck.
2. Meta-analysis of the prevalence of livestock diseases in North Eastern Region of India .
3. Global and countrywide prevalence of subclinical and clinical mastitis in dairy cattle and buffaloes by systematic review and meta-analysis .
4. Bovine babesiosis: An insight into the global perspective on the disease distribution by systematic review and meta-analysis .
5. Meta-analysis of classical swine fever prevalence in pigs in India: A 5-year study.
6. Prevalence of extended-spectrum betalactamase producing bacteria from animal origin: A systematic review and meta-analysis report from India.
7. Basic reproduction number (R0), an epidemiological tool for prioritizing livestock diseases.
8. An Understanding of the Global Status of Major Bacterial Pathogens of Milk Concerning Bovine Mastitis: A Systematic Review and Meta-Analysis (Scientometrics).

Bio-Informatics

Bioinformatics is the application of computational technology to handle the rapidly growing repository of information related to molecular biology. It is particularly useful for managing and analyzing large sets of data, such as those generated by the fields of genomics and proteomics.

1. Comparative Genome Analysis of Short Sequence Repeats in Pathogenic and Non Pathogenic Leptospira- A Statistical Approach.
2. Relative Analysis of Codon Usage and Nucleotide Bias between Anthrax Toxin Genes Subsist Inpxo1 Plasmid of Bacillus Anthracis.
3. Analysis of codon usage bias of classical swine fever virus.
4. Evolutionary analysis and detection of positive selection of Hemagglutinin and neuraminidase genes of h5n1 avian influenza from chicken, duck and goose across Asia.
5. Insight of Codon usage bias and Evolutionary rate among the genes C, E,prM and NS5 of the Kyasanur Forest Disease virus.

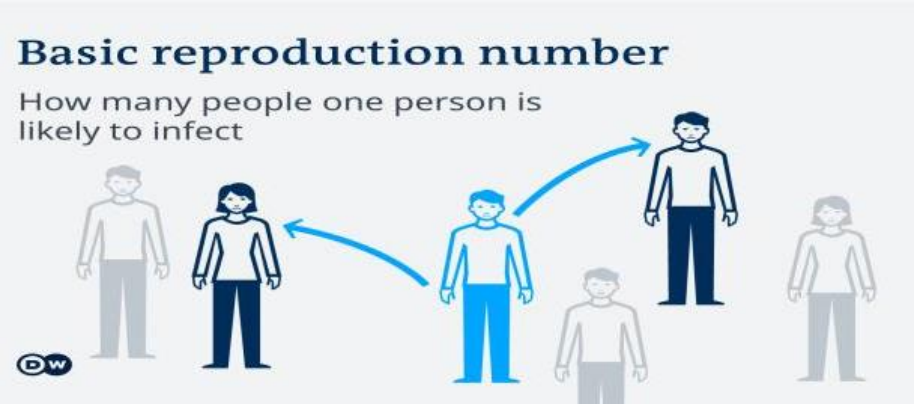
- Livestock Disease Forecast State wise
- Livestock Disease Forecast-District wise
- LDF mobile app Download
- Sampling Plan (New)
- Scientometrics/ Bioinformatics (New)
- COVID-19 (New) Epidemiogical Analysis in India
- Epi Calculator (New)
- SWOT
- Nadres IOOAI
- Web Traffic Analytics
- Monthly Bulletin (Archives)
- EpiNET
- OB Report Status 2020

R_0 [Reproductive Number]

The Basic Reproduction Number is the number of cases directly generated by one case in a population where all individuals are susceptible to infection.

R0 is used to determine the ability of a disease to spread within a given population.

R0 represent the transmissibility of a disease.



Calculation of R_0

There are three main factors used to calculate R_0.

- *Infectious Period:*

This is the duration that a person infected is able to transmit that infection to another human, how long a person with the disease is contagious. Longer infectious periods mean higher R_0 values.

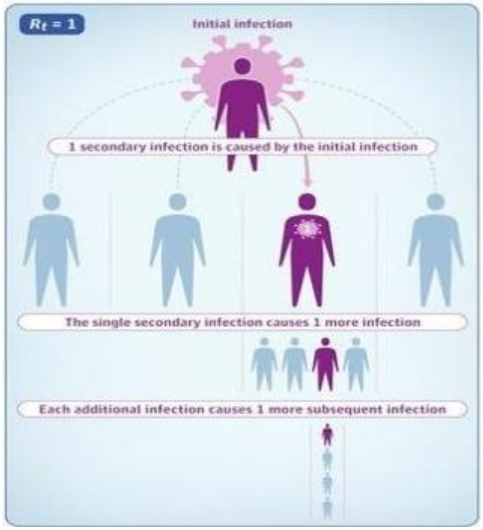
- *Mode of Transmission:*

This is how the disease is spread. Airborne infections, like the flu, will spread more quickly than those requiring physical contact to be transmitted.

- *Contact Rate:*

This refers to how many people a person with the disease can be expected to come into contact with.

- If R0<1 each existing infection causes less than one new infection(cases decrease).
- If R0=0 cases are stable
- If R0>1 each existing infection causes more than one new infection(cases increases).



Indian Journal of Animal Sciences **90** (4): 510–514, April 2020/Article

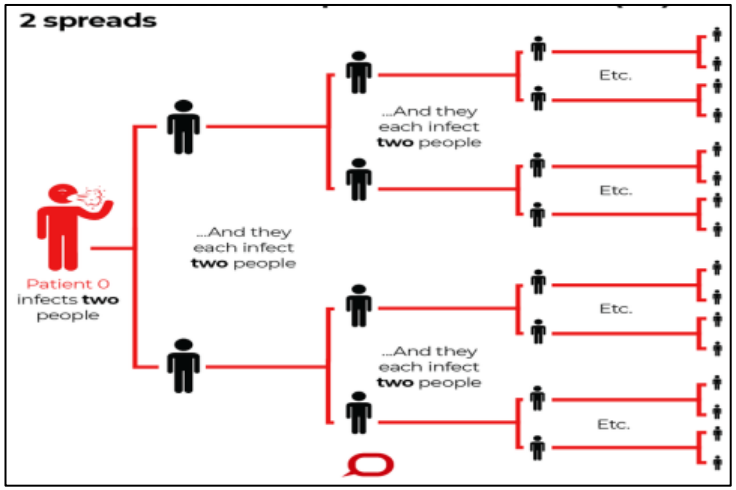
Basic reproduction number (R_0), an epidemiological tool for prioritizing livestock diseases—An example of Karnataka

P KRISHNAMOORTHY*, K P SURESH, R DHEERAJ and PARIMAL ROY

ICAR-National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru, Karnataka 560 064 India

Year	Livestock diseases											
	AX	BA	BQ	BT	ET	FA	FMD	HS	PPR	RA	SGP	TE
2000	1.08	0.76	1.44	0.99	1.20	0.76	2.55	1.09	1.07	1.36	0.92	–
2001	1.23	–	2.93	1.75	4.84	1.97	2.63	1.17	–	1.15	1.29	–
2002	2.19	–	1.08	1.16	1.27	0.76	1.25	1.16	1.91	1.38	1.53	–
2003	1.37	–	2.98	1.43	2.01	–	2.98	1.13	10.55	2.13	1.51	–
2004	2.38	–	1.74	0.92	0.81	–	1.50	1.43	3.83	1.59	1.62	–
2005	1.72	–	1.67	1.14	1.91	–	2.98	1.63	2.22	–	1.00	–
2006	1.46	–	1.51	1.14	2.08	–	3.21	1.28	1.18	–	1.86	–
2007	1.31	–	1.35	1.62	1.22	–	1.38	1.64	1.27	0.76	1.05	–
2008	1.75	–	3.21	0.97	2.19	–	1.10	1.78	1.91	1.49	1.05	–
2009	1.50	–	1.4	1.29	1.27	–	0.81	1.80	1.10	1.09	1.23	–
2010	1.13	–	1.01	1.64	1.57	–	–	2.00	1.26	1.23	1.38	–
2011	1.94	–	3.33	0.78	0.97	–	–	1.51	1.85	1.33	3.72	–
2012	1.09	–	1.57	–	1.60	–	1.60	2.04	1.60	1.36	2.08	–
2013	1.62	–	2.90	2.08	1.26	–	1.68	1.32	1.54	–	1.67	–
2014	1.20	–	1.29	1.23	1.11	1.60	0.84	1.45	1.65	1.62	1.22	1.67
2015	1.23	1.78	2.63	2.24	1.26	–	1.33	21.49	3.74	1.39	0.79	1.64
2016	1.37	–	1.58	0.81	1.04	–	0.91	1.37	1.06	1.62	1.20	1.78
2017	1.27	–	0.90	1.67	0.76	–	0.99	0.89	1.15	–	1.10	–
2018	1.20	1.59	1.47	0.76	0.80	–	1.37	1.57	1.10	–	1.19	–
Mean ± SE	1.48± 0.09	1.38± 0.31	1.89± 0.19	1.31± 0.10	1.54± 0.21	1.27± 0.31	1.71± 0.20	2.51± 1.06	2.22± 0.53	1.39± 0.08	1.44± 0.15	1.70± 0.04
Confidence interval at 95% level	1.31– 1.64	0.76– 1.99	1.53– 2.25	1.11– 1.52	1.13– 1.94	0.67– 1.87	1.32– 2.10	0.44– 4.58	1.19– 3.25	1.23– 1.56	1.15– 1.73	1.61– 1.78

AX, Anthrax; BQ, Black quarter; BT, Bluetongue; ET, Enterotoxaemia; FMD, Foot and mouth disease; HS, Haemorrhagic septicaemia; PPR, *Peste des petits ruminants*; RA, Rabies; SGP, Sheep and goat pox; BA, Babesiosis; FA, Fasciolosis; TE, Theileriosis. For Trypanosomosis only one R_0 value 1.67 was available for the year 2015.



Covid-19: Epidemiological Analysis

Covid-19 Epidemiological Analysis in India

- Coronavirus disease (COVID-19,) a novel coronavirus originated from Wuhan, a city in the Hubei Province of China at the end of 2019, has further progressed rapidly to become a global epidemic. In February 2020, the World Health Organization (WHO) designated the disease as COVID-19 and declared it as a global pandemic, as the disease has spread to nearly all the continents and the cases are rising at an exponential rate.
- A confirmed case of COVID-19 infection is defined as those with a positive result for viral infection and history of acute respiratory illness for the collected specimens. A suspected case is defined as a patient with symptoms of COVID-19 infection, but not confirmed by viral nucleic acid testing.
- An actual estimate of the serial interval was considered by estimating the time from onset of illness in a primary case (infector) to illness onset in a secondary case (infected) in a transmission chain.
- Serial interval can only be estimated by linking dates of onset for infector-infected data pairs, and these links are difficult to be established.
- R0 is defined as the actual expected number of secondary cases that one primary case will generate in a susceptible population.

Epidemiology of COVID-19 ALL INDIA

Number of Infections (5 laks Increment)	No of days taken to reach since 22 Jan-2020	date reached since 22 Jan-2020	Cumulative Number of deaths	CFR	avg. daily deaths	R_0 for confirmed cases	Required herd Immunity (Threshold) R_0	Total Vaccine Administered (cum)	% of Immunity by Infection	% of immunity by vaccination	total % of Immunity gained
1st 5 Lakh Cases	156 days	06-26-2020	15685	3.06	116.0	1.872	46.58		0.04		0.04
Cum 10 Lakh Cases	20 days	07-16-2020	25602	2.49	481.1	1.802	44.51		0.07		0.07
Cum 15 Lakh Cases	12 days	07-28-2020	34193	2.23	711.5	1.762	43.25		0.11		0.11
cum 20 Lakh Cases	9 days	08-06-2020	41585	2.04	809.4	1.732	42.26		0.14		0.14
cum 25 Lakh Cases	8 days	08-14-2020	49036	1.97	932.2	1.732	42.26		0.18		0.18
cum 30 Lakh Cases	8 days	08-22-2020	56706	1.90	964.3	1.722	41.93		0.22		0.22
cum 35 Lakh Cases	7 days	08-29-2020	63498	1.82	973.0	1.702	41.25		0.25		0.25
cum 40 Lakh Cases	6 days	09-04-2020	69561	1.74	996.3	1.692	40.9		0.29		0.29
cum 45 Lakh Cases	6 days	09-10-2020	76271	1.70	1111.0	1.692	40.9		0.32		0.32
cum 50 Lakh Cases	5 days	09-15-2020	82066	1.64	1157.6	1.692	40.9		0.36		0.36
cum 55 Lakh Cases	6 days	09-21-2020	88935	1.62	1146.0	1.692	40.9		0.39		0.39
cum 60 Lakh Cases	6 days	09-27-2020	95542	1.59	1101.5	1.692	40.9		0.43		0.43
cum 65 Lakh Cases	6 days	10-03-2020	101782	1.57	1039.3	1.692	40.9		0.47		0.47
cum 70 Lakh Cases	7 days	10-10-2020	108334	1.55	937.0	1.702	41.25		0.50		0.50
cum 75 Lakh Cases	8 days	10-18-2020	114610	1.53	784.5	1.722	41.93		0.54		0.54
cum 80 Lakh Cases	10 days	10-28-2020	120527	1.51	591.7	1.752	42.92		0.57		0.57
cum 85 Lakh Cases	10 days	11-07-2020	126121	1.48	559.3	1.772	43.57		0.61		0.61
cum 90 Lakh Cases	12 days	11-19-2020	132162	1.47	503.2	1.972	49.29		0.65		0.65
cum 95 Lakh Cases	13 days	12-02-2020	138648	1.46	498.9	2.332	57.12		0.68		0.68
cum 100 Lakh Cases	16 days	12-18-2020	145136	1.45	405.3	3.083	67.56		0.72		0.72
cum 105 Lakh Cases	26 days	01-13-2021	151727	1.45	253.6	2.673	62.59		0.75		0.75
cum 110 Lakh Cases	39 days	02-21-2021	156385	1.42	119.4	2.052	51.27	10651012	0.79	0.76	1.55
cum 115 Lakh Cases	25 days	03-18-2021	159370	1.39	119.4	2.092	52.2	35923500	0.83	2.58	3.40
cum 120 Lakh Cases	10 days	03-28-2021	161843	1.35	247.5	2.202	54.59	55180875	0.86	3.96	4.82
cum 125 Lakh Cases	7 days	04-04-2021	165101	1.32	464.4	2.202	54.59	76405697	0.90	5.48	6.38
cum 130 Lakh Cases	4 days	04-08-2021	167642	1.29	640.5	2.112	52.65	91881530	0.93	6.59	7.53
cum 135 Lakh Cases	3 days	04-11-2021	170179	1.26	838.0	2.012	50.3	102000401	0.97	7.32	8.29
cum 140 Lakh Cases	3 days	04-14-2021	173123	1.24	981.0	1.902	47.42	111913288	1.00	8.03	9.04
cum 145 Lakh Cases	2 days	04-16-2021	175649	1.21	1260.0	1.822	45.12	117305344	1.04	8.42	9.46
cum 150 Lakh Cases	2 days	04-18-2021	178769	1.19	1560.0	1.742	42.59	121207098	1.08	8.70	9.78
cum 155 Lakh Cases	2 days	04-20-2021	182533	1.18	1882.0	1.701	41.21	127428887	1.11	9.15	10.26
cum 160 Lakh Cases	2 days	04-22-2021	186920	1.17	2193.0	1.641	39.06	132754608	1.15	9.53	10.68
cum 165 Lakh Cases	1 days	04-23-2021	189544	1.18	2624.0	1.611	37.93	135658324	1.18	9.74	10.92
cum 170 Lakh Cases	2 days	04-25-2021	195123	1.15	2789.0	1.581	36.75	139185173	1.22	9.99	11.21
cum 175 Lakh Cases	1 days	04-26-2021	197894	1.13	2771.0	1.561	35.94	142524947	1.26	10.23	11.48
cum 180 Lakh Cases	2 days	04-28-2021	204832	1.14	3469.0	1.531	34.68	147053392	1.29	10.55	11.85
cum 185 Lakh Cases	1 day	04-29-2021	208330	1.13	3498.0	1.521	34.25	149268772	1.33	10.71	12.04
cum 190 Lakh Cases	1 day	04-30-2021	211853	1.12	3523.0	1.511	33.82	151998107	1.36	10.91	12.27
cum 195 Lakh Cases	1 day	05-01-2021	215542	1.11	3689.0	1.510	33.77	153626325	1.40	11.03	12.43
cum 200 Lakh Cases	2 days	05-03-2021	222408	1.11	3433.0	1.501	33.38	156082136	1.44	11.20	12.64
cum 205 Lakh Cases	1 days	05-04-2021	226188	1.10	3780.0	1.491	32.93	157750752	1.47	11.32	12.79
cum 210 Lakh Cases	1 days	05-05-2021	230168	1.10	3980.0	1.491	32.93	159931238	1.51	11.48	12.98
cum 215 Lakh Cases	2 days	05-07-2021	238270	1.10	4051.0	1.481	32.48	165190000	1.54	11.86	13.40
cum 220 Lakh Cases	1 day	05-08-2021	242347	1.10	4077.0	1.481	32.48	167493857	1.58	12.02	13.60
cum 225 Lakh Cases	1 day	05-09-2021	246116	1.09	3769.0	1.471	32.02	168304868	1.61	12.08	13.69
cum 230 Lakh Cases	2 days	05-11-2021	254197	1.11	4040.0	1.471	32.04	173862643	1.65	12.48	14.13
cum 235 Lakh Cases	1 day	05-12-2021	258317	1.10	4120.0	1.461	31.58	176045577	1.69	12.63	14.32
cum 240 Lakh Cases	1 day	05-13-2021	262317	1.09	4000.0	1.461	31.58	178361846	1.72	12.80	14.52
cum 245 Lakh Cases	2 days	05-15-2021	270284	1.10	3983.0	1.461	31.58	181544536	1.76	13.03	14.79
cum 250 Lakh Cases	2 days	05-17-2021	278719	1.11	4217.0	1.461	31.58	183817204	1.79	13.19	14.98
cum 255 Lakh Cases	2 days	05-19-2021	287122	1.13	4201.0	1.451	31.10	186410600	1.83	13.38	15.21
cum 260 Lakh Cases	2 days	05-21-2021	295525	1.14	4202.0	1.451	31.10	189344105	1.87	13.59	15.45
cum 265 Lakh Cases	2 days	05-23-2021	303720	1.15	4098.0	1.451	31.10	191877460	1.90	13.77	15.67
cum 270 Lakh Cases	2 days	05-25-2021	311388	1.15	3834.0	1.451	31.10	196463495	1.94	14.10	16.04
cum 275 Lakh Cases	2 days	05-27-2021	318895	1.16	3754.0	1.451	31.10	201438120	1.97	14.46	16.43
cum 280 Lakh Cases	3 days	05-30-2021	329100	1.18	3402.0	1.451	31.10	208907723	2.01	14.99	17.00
cum 285 Lakh Cases	4 days	06-03-2021	340702	1.20	2901.0	1.451	31.10	219831571	2.05	15.78	17.83
cum 290 Lakh Cases	5 days	06-08-2021	353528	1.22	2565.0	1.451	31.10	223642281	2.08	16.86	18.94
cum 295 Lakh Cases	5 days	06-13-2021	374305	1.27	4155.0	1.451	31.10	250656362	2.12	17.99	20.11
cum 300 Lakh Cases		06-14-2021	377031					254653040			

Epidemiology of COVID-19 Kerala State

Number of Infections (1 laks Increment)	No of days taken to reach since 14 March-2020	date reached since 14 March - 2020	Cumulative Number of deaths	CFR	avg. daily deaths	R_0 for confirmed cases	Required herd Immunity (Threshold) R_0	Total Vaccine Administered (cum)	% of Immunity by Infection	% of immunity by vaccination	total % of Immunity gained
1st 1 lakh Cases	182 days	11-09-2020	411	0.41	2.0	1.732	42.25		0.14		0.14
Cum 2 Lakh Cases	20 days	01-10-2020	772	0.39	18.0	1.692	40.89		0.28		0.28
Cum 3 Lakh Cases	12 days	13-10-2020	1047	0.35	23.0	1.672	40.18		0.43		0.43
Cum 4 Lakh Cases	14 days	27-10-2020	1377	0.34	24.0	1.642	39.09		0.57		0.57
Cum 5 Lakh Cases	15 days	11-11-2020	1772	0.35	26.0	1.652	39.45		0.71		0.71
Cum 6 Lakh Cases	19 days	30-11-2020	2245	0.37	25.0	1.702	41.24		0.85		0.85
Cum 7 Lakh Cases	19 days	19-12-2020	2787	0.40	28.0	1.802	44.5		0.99		0.99
Cum 8 Lakh Cases	20 days	08-01-2021	3258	0.41	24.0	1.862	46.29		1.13		1.13
Cum 9 Lakh Cases	19 days	27-01-2021	3664	0.41	21.0	2.052	51.27	58323	1.28	0.08	1.36
Cum 10 Lakh Cases	18 days	14-02-2021	3986	0.40	18.0	2.983	66.48	340452	1.42	0.48	1.90
Cum 11 Lakh Cases	33 days	19-03-2021	4468	0.41	15.0	3.363	70.27	2298455	1.56	3.26	4.82
Cum 12 Lakh Cases	31 days	16-04-2021	4878	0.41	13.0	3.433	70.87	5680114	1.70	8.06	9.76
Cum 13 Lakh Cases	5 days	21-04-2021	5001	0.38	25.0	2.492	59.88	6353600	1.84	9.01	10.86
Cum 14 Lakh Cases	4 days	25-04-2021	5111	0.37	27.0	2.122	52.88	6847075	1.99	9.71	11.70
Cum 15 Lakh Cases	4 days	29-04-2021	5260	0.35	37.0	1.842	45.71	7229177	2.13	10.25	12.38
Cum 16 Lakh Cases	2 days	01-05-2021	5357	0.33	48.0	1.762	43.24	7425416	2.27	10.53	12.80
Cum 17 Lakh Cases	3 days	04-05-2021	5508	0.32	50.0	1.702	41.24	7577304	2.41	10.75	13.16
Cum 18 Lakh Cases	3 days	07-05-2021	5683	0.32	58.0	1.642	39.09	7869269	2.55	11.16	13.71
Cum 19 Lakh Cases	2 days	09-05-2021	5815	0.31	66.0	1.612	37.95	7952556	2.69	11.28	13.97
Cum 20 Lakh Cases	3 days	12-05-2021	6054	0.30	80.0	1.592	37.17	8185506	2.84	11.61	14.45
Cum 21 Lakh Cases	3 days	15-05-2021	6340	0.30	95.0	1.572	36.37	8417840	2.98	11.94	14.92
Cum 22 Lakh Cases	3 days	18-05-2021	6613	0.30	91.0	1.562	35.96	8573567	3.12	12.16	15.28
Cum 23 Lakh Cases	4 days	22-05-2021	7171	0.31	139.0	1.552	35.55	8644281	3.26	12.26	15.52
Cum 24 Lakh Cases	4 days	26-05-2021	7883	0.33	178.0	1.542	35.13	8789981	3.40	12.47	15.87
Cum 25 Lakh Cases	4 days	30-05-2021	8642	0.35	190.0	1.542	35.13	9241456	3.55	13.11	16.65
Cum 26 Lakh Cases	5 days	04-06-2021	9511	0.37	174.0	1.542	35.13	10026627	3.69	14.22	17.91
Cum 27 Lakh Cases	7 days	11-06-2021	10805	0.40	185.0	1.551	35.53	11102819	3.83	15.75	19.58
Cum 28 Lakh Cases	9 days	20-06-2021	12061	0.43	140.0	1.561	35.94	12161549	3.97	17.25	21.22
Cum 29 Lakh Cases	9 days	29-06-2021	13094	0.45	115.0	1.571	36.35	13948645	4.12	19.78	23.90
Cum 30 Lakh Cases	8 days	07-07-2021	14108	0.47	127.0	1.581	36.75				
Cum 31 Lakh Cases	7 days	14-07-2021	14938	0.48	119.0	1.601	37.54				
Cum 32 Lakh Cases	7 days	21-07-2021	15618	0.49	97.0	1.621	38.31				
Cum 33 Lakh Cases	6 days	27-07-2021	16327	0.49	118.0	1.641	39.06				

Statewise vaccntion

Data Source

http://api.covid19india.org/csv/latest/state_wise_daily.csv

https://api.covid19india.org/

CFR: Case Fatality rate , number of deaths for every 100 cases

Prepared by Spatial Epidemiology Lab , ICAR-NIVEDI, Bengaluru

NADRES v2

Redefining Livestock Disease Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases August-2021

ANDHRA PRADESH,KARNATAKA,ODISHA,TAMIL NADU,WEST BENGAL are predicted for likely occurrence of Babesiosis in Octoberr-2021

GOA,JHARKHAND,KERALA,MANIPUR,TRIPURA,UTTAR PRADESH,PUDUCHERRY are predicted for likely occurrence of Babesiosis in October-2021

ASSAM,JHARKHAND,KARNATAKA,MAHARASHTRA,MANIPUR,MEGH

OB Prediction October-2021

Anthrax - 32, with Accuracy of 99.69%

Babesiosis - 60, with Accuracy of 97.38%

Black quarter - 39, with Accuracy of 99.85%

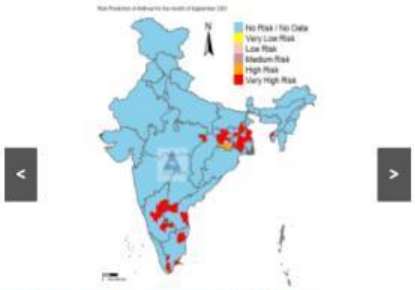
Enterotoxaemia- 19, with

Auto Messaging

AICRP Centers

NADRES Version-2

The National Animal Disease Referral Expert System (NADRES) of ICAR-NIVEDI is a system that builds on the added value of combining and coordinating the alert and response mechanisms in collaboration with DAHD for the stake holders to assist in prediction, prevention and control of animal disease threats, including zoonoses, through sharing of information, epidemiological analysis and joint field missions to assess and control the outbreak, whenever needed.



Implementation of Artificial Intelligence in NADRES V2

Livestock Disease Forecast State wise

Livestock Disease Forecast-District wise

LDF mobile app Download

Sampling Plan

Scientometrics/ Bioinformatics

COVID-19 Epidemiological Analysis in India

Epi Calculator

SWOT

Nadres IOOAI

Web Traffic Analytics

Monthly Bulletin (Archives)

EpiNET

OB Report Status 2020

NADRES v2

Redefining Livestock Disease Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases August-2021

ANDHRA PRADESH,KARNATAKA,ODISHA,TAMIL NADU,WEST BENGAL are predicted for likely occurrence of Babesiosis in Octoberr-2021

GOA,JHARKHAND,KERALA,MANIPUR,TRIPURA,UTTAR PRADESH,PUDUCHERRY are predicted for likely occurrence of

OB Prediction October-2021

Anthrax - 32, with Accuracy of 99.69%

Babesiosis - 60, with Accuracy of 97.38%

Black quarter - 39, with Accuracy of 99.85%

Enterotoxaemia- 19, with

Covid-19 Epidemiological Analysis in India

Coronavirus disease (COVID-19,) a novel coronavirus originated from Wuhan, a city in the Hubei Province of China at the end of 2019, has further progressed rapidly to become a global epidemic. In February 2020, the World Health Organization (WHO) designated the disease as COVID-19 and declared it as a global pandemic, as the disease has spread to nearly all the continents and the cases are rising at an exponential rate.A confirmed case of COVID-19 infection is defined as those with a positive result for viral infection and history of acute respiratory illness for the collected specimens. A suspected case is defined as a patient with symptoms of COVID-19 infection, but not confirmed by viral nucleic acid testing. An actual estimate of the serial interval was considered by estimating the time from onset of illness in a primary case (infector) to illness onset in a secondary case (infected) in a transmission chain. Serial interval can only be estimated by linking dates of onset for infector-infected data pairs, and these links are difficult to be established. R0 is defined as the actual expected number of secondary cases that one primary case will generate in a susceptible population

India

India R0 Calculation Table

STATE WISE R0 CALCULATION

State Wise R0 Calculation Table

Covid Related Articles

1. Time Series Analysis of Covid-19 Occurrence In Different States of India.
2. Coronavirus (COVID-19) forecasting in India: Application of ARIMA and periodic regression models.
3. Future trends of COVID-19 disease outbreak in different states in India: a periodic regression analysis.
4. A Study on the Global Scenario of COVID-19 Related Case Fatality Rate, Recovery Rate and Prevalence Rate and Its Implications for India—A Record Based Retrospective Cohort Study.
5. Prediction of daily and cumulative cases for COVID-19 infection based on reproductive number (R0) in Karnataka: a data-driven analytics.
6. A Systematic Review on The CoronaViruses of Animals and SARS-CoV-2.
7. SARS-CoV-2 antigenic diversity and role of passive surveillance in the control of COVID-19

Livestock Disease Forecast State wise

Livestock Disease Forecast-District wise

LDF mobile app Download

Sampling Plan

Scientometrics/ Bioinformatics

COVID-19 Epidemiological Analysis in India

Epi Calculator

SWOT

Nadres IOOAI

Web Traffic Analytics

Monthly Bulletin (Archives)

Disease Risk Prediction

Seven step approach used for risk Prediction

1.Showing the spatial endemicity by spatial maps

2.Showing the temporal endemicity by bar graph

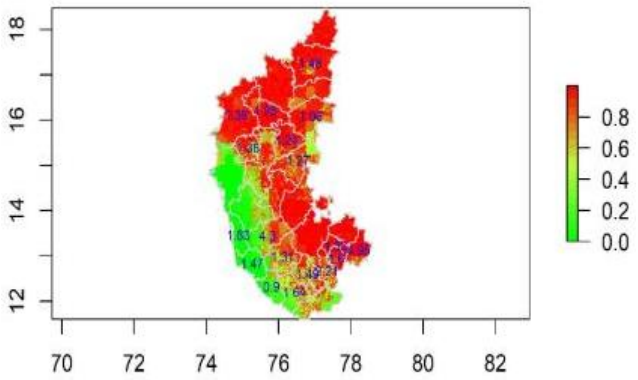
3.Auto correlation to measure the indication of presence of clusters by GI values.

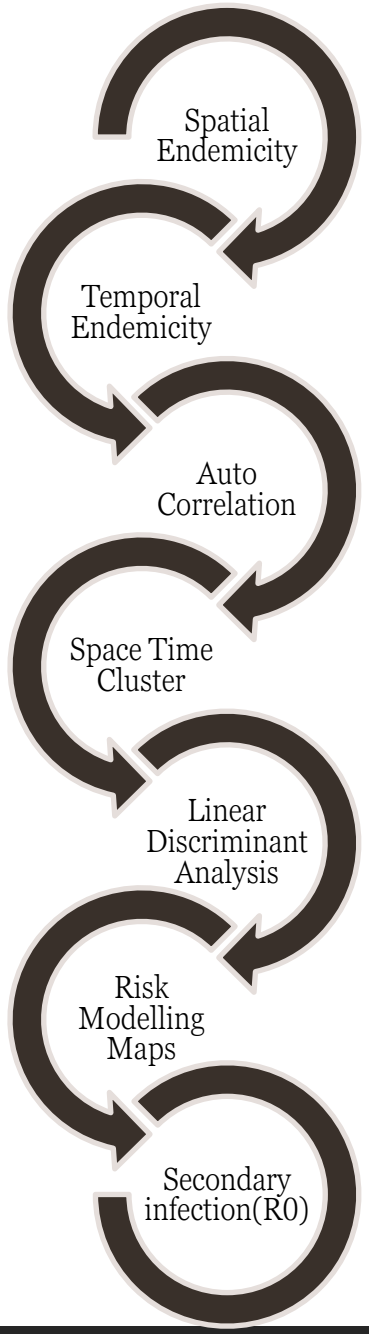
4.Space-time cluster analysis by Poison model

5.Identification of risk elements associated with clustering of disease using Discriminant function

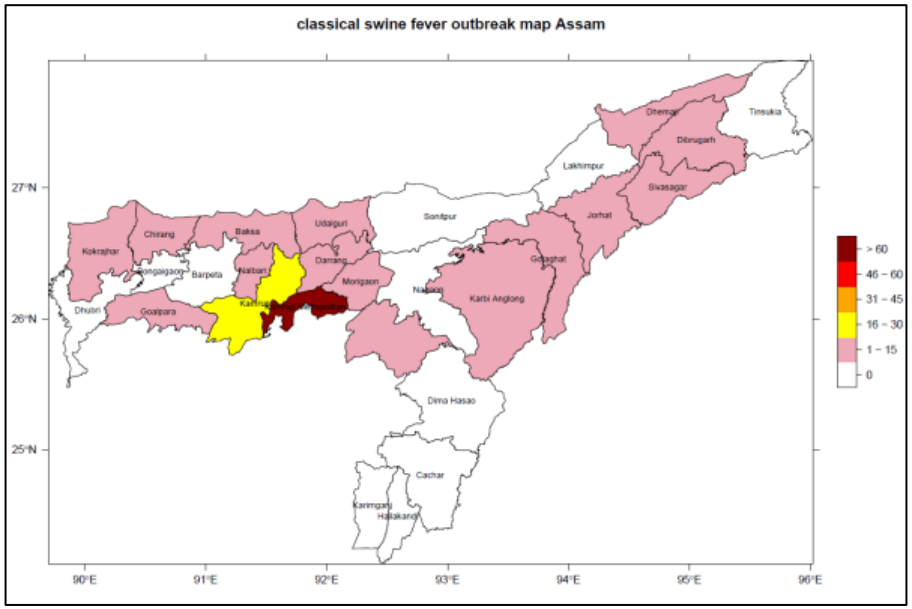
6.Risk Modelling and risk mapping using significant risk factors identified though discriminant function.

7.Further analysis of determining potential secondary infection in the estimated risk region using R0.

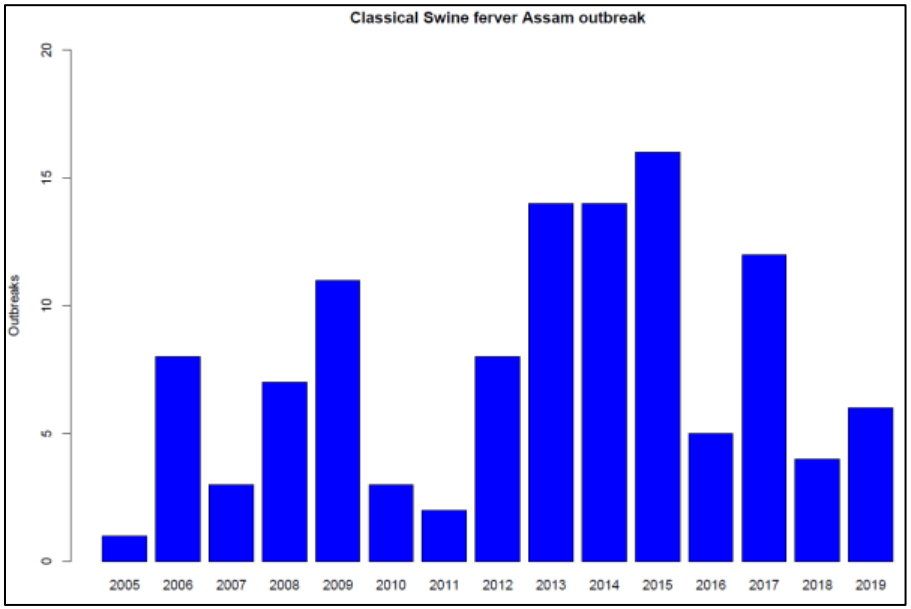




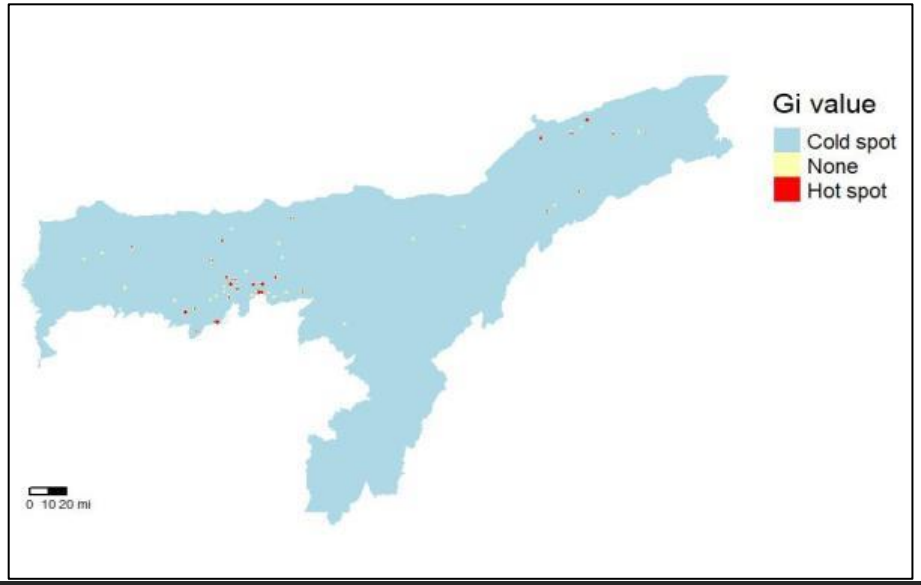
CSF Assam Spatial Map



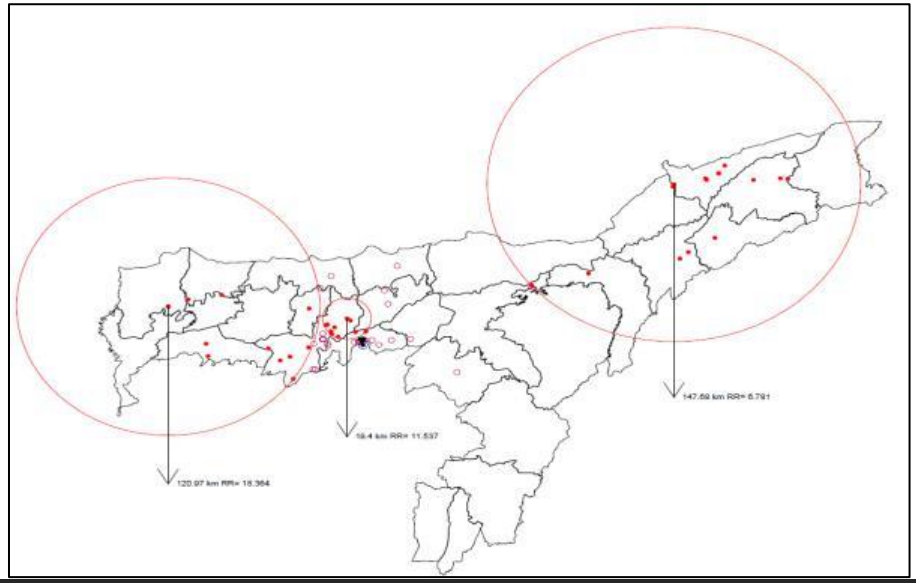
CSF Assam Temporal Graph



CSF Assam Spatial Auto Correlation



CSF Assam Spatial Time Cluster Analysis



Models used in analysing disease data

- Generalized Linear Model(GLM)
- Generalized Additive Model (GAM)
- Random Forest (RF)
- Gradient Boosting Machine (GBM)
- Neural Networks (NN)
- Multiple Adaptive Regression Splines (MARS)
- Flexible Discriminant Analysis (FDA)
- Classification Tree (CT)
- Support Vector Machine (SVM)
- Naïve Bayes (NB)
- Adaptive Boosting (ADA)
- MaxLike **(under testing)**
- GLMNET (**under testing**)

Principal Component Analysis(PCA)

Principal Component Analysis (PCA) is a technique for reducing the dimensionality of such datasets, increasing the interpretability but at the same time, minimizing the information loss. The PCA is employed in NADRES v2 by creating new uncorrelated variables that successively maximize the variance. This means that ` preserving as much variability as possible` translates into finding new variables that are linear functions of those in the original dataset, that successively maximize variance and that are uncorrelated with each other. Determining such new variables, the principal components (PCs) reduces to solve an eigenvalue/eigenvector problem. PCA can be based on either covariance matrix or the correlation matrix and the main use of PCA are descriptive.

In the present study, all the meteorological and remote sensing variables are considering for PCA, with correlation matrix, the final output of principal components which are independent of each were considered for further ML modelling and risk estimation.

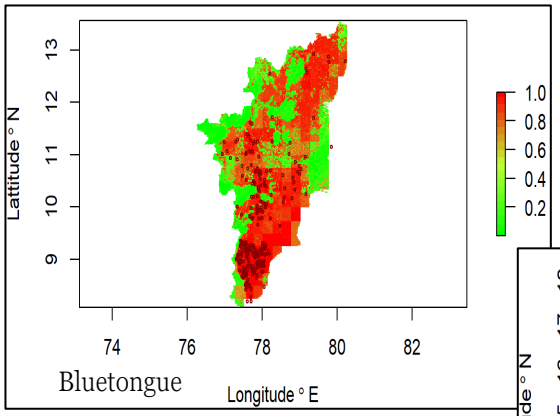
Indices For Model Evaluation[Testing]
KAPPA
ROC
TSS

UNDER TESTING

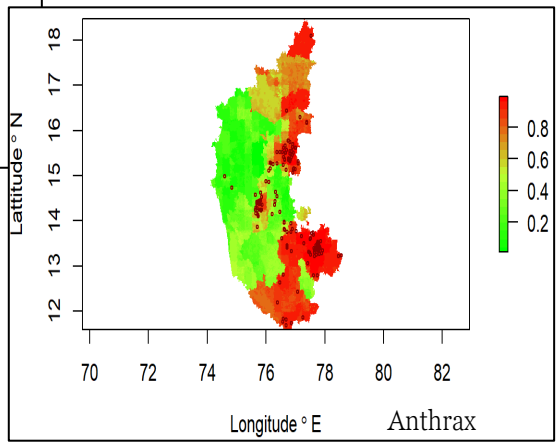
Accuracy	Error Rate
Precession	Sensitivity
Specificity	F1 Score
Log loss	Gini Coefficient

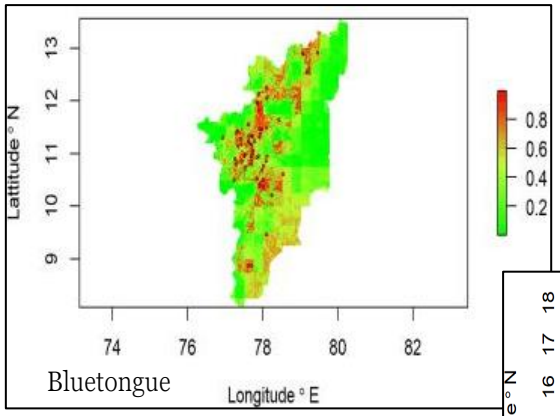
Risk Prediction based on [EL NINO and LA NINA]

- The Sea surface temperatures plays a major role in global weather which influences two extreme phases of a naturally occurring climate cycle, i.e. El Nino/Southern Oscillation and La Nina. Both terms refer to large-scale changes in sea-surface temperature across the eastern tropical Pacific and the most powerful phenomenon of the Earth.

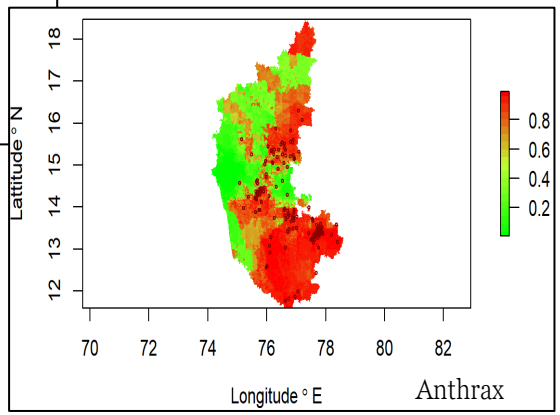


EL NINO

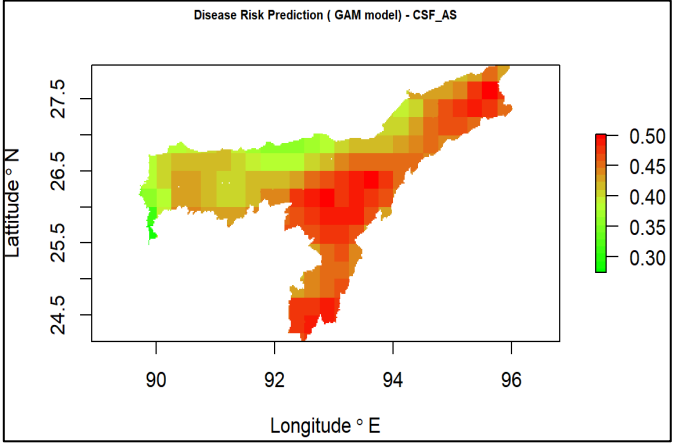


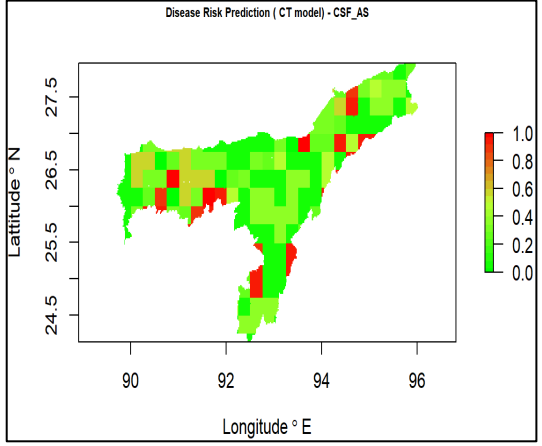


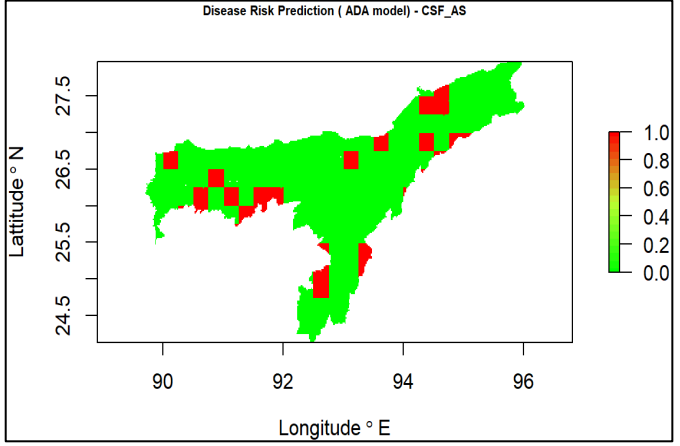
LA NINA

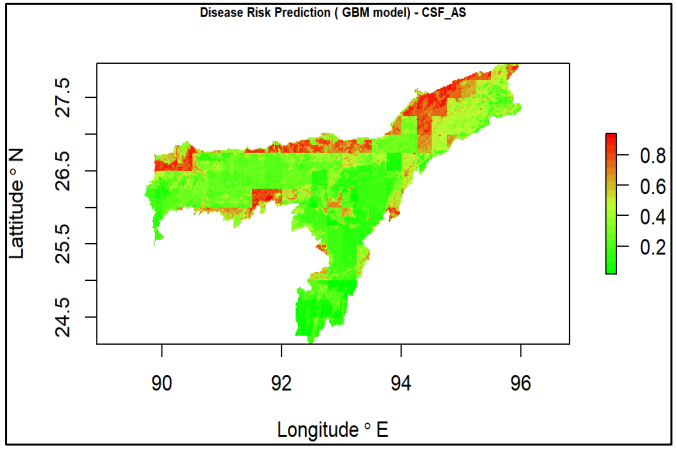


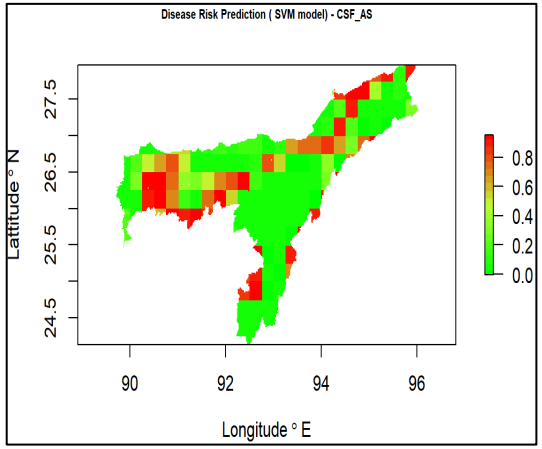
- El Nino during winter causes warm conditions over the Indian subcontinent and during summer, it leads to dry conditions and deficient monsoon. Whereas La Nina results in better than normal monsoon in India.

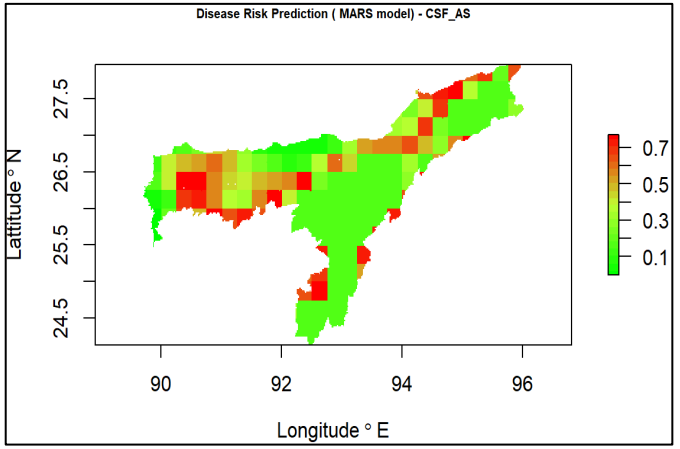

Disease Risk Prediction (GAM model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
0.50
0.45
0.40
0.35
0.30

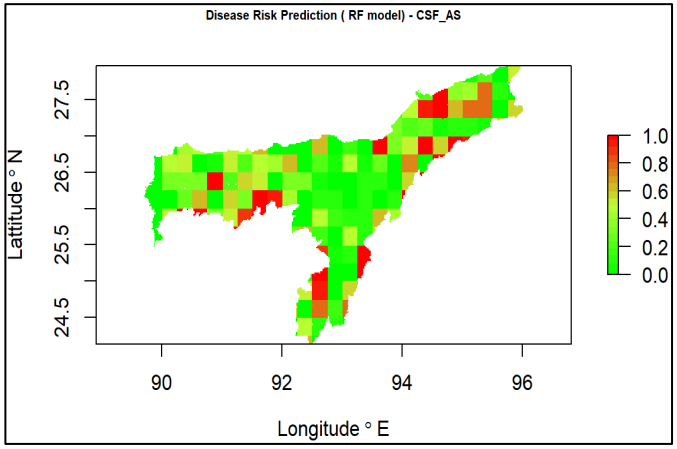

Disease Risk Prediction (CT model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
1.0
0.8
0.6
0.4
0.2
0.0

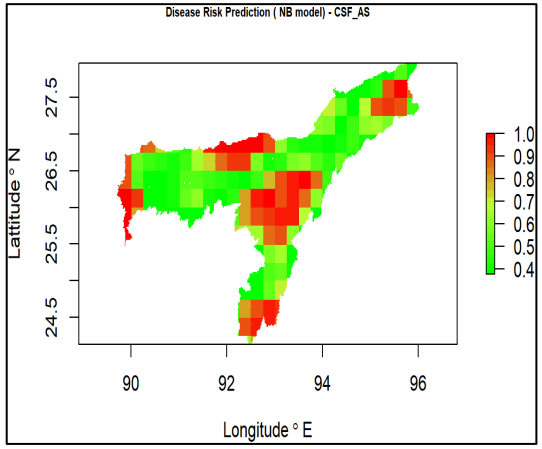

Disease Risk Prediction (ADA model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
1.0
0.8
0.6
0.4
0.2
0.0

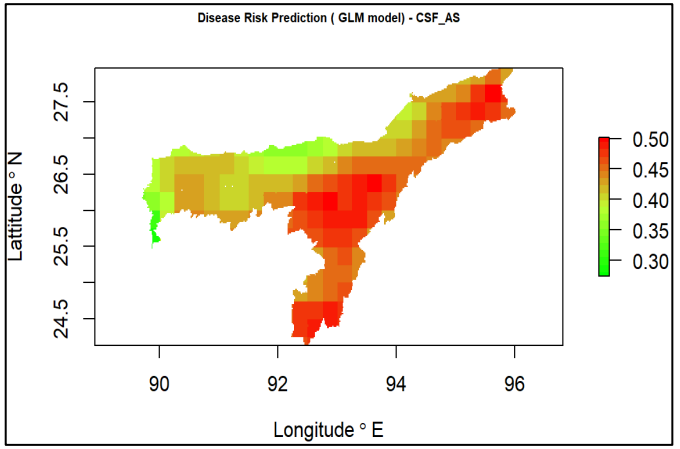

Disease Risk Prediction (GBM model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
0.8
0.6
0.4
0.2


Disease Risk Prediction (SVM model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
0.8
0.6
0.4
0.2
0.0


Disease Risk Prediction (MARS model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
0.7
0.5
0.3
0.1


Disease Risk Prediction (RF model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
1.0
0.8
0.6
0.4
0.2
0.0

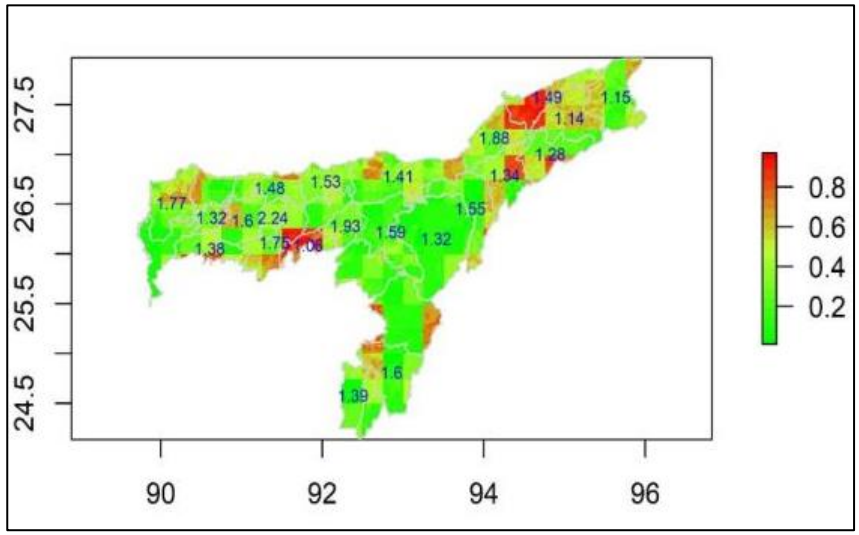

Disease Risk Prediction (NB model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
1.0
0.9
0.8
0.7
0.6
0.5
0.4

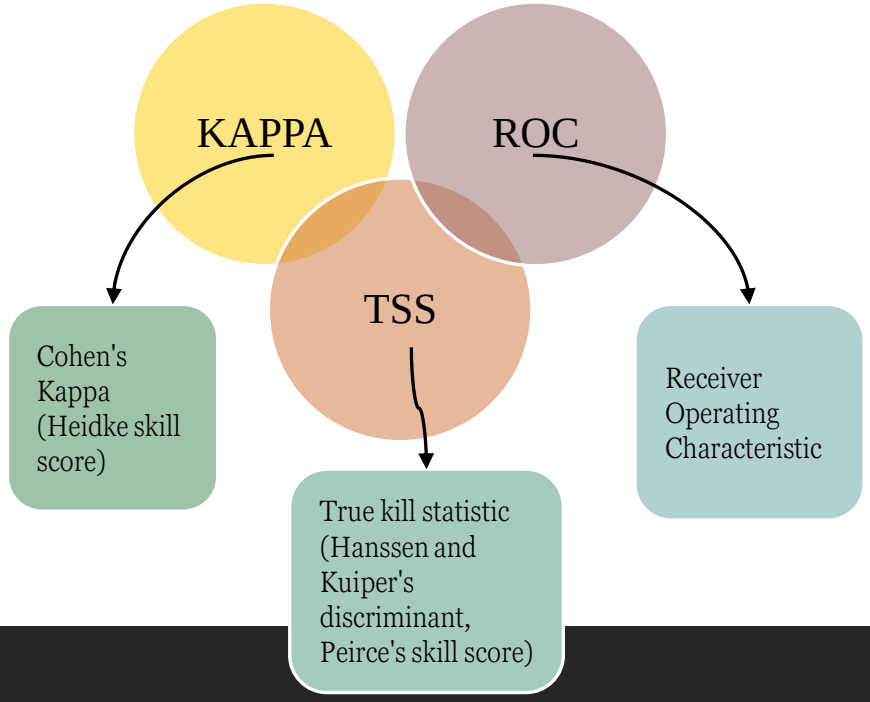

Disease Risk Prediction (GLM model) - CSF_AS
Lattitude ° N
Longitude ° E
24.5
25.5
26.5
27.5
90
92
94
96
0.50
0.45
0.40
0.35
0.30

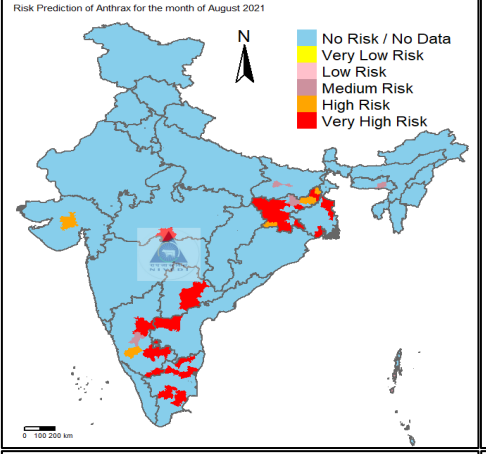
Models Evaluation and R_0 Map

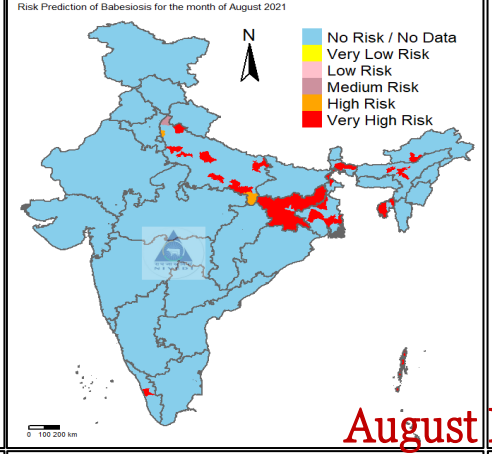
Models	KAPPA	ROC	TSS
GLM	0.046	0.531	0.257
GAM	0.046	0.531	0.257
RF	0.7	0.94	0.713
GBM	0.677	0.934	0.753
NNET	0	0.5	0
MARS	0.432	0.789	0.463
FDA	0	0.5	0
CT	0.617	0.888	0.59
SVM	0.427	0.775	0.477
NB	-0.394	0.758	-0.29
ADA	0.601	0.79	0.58

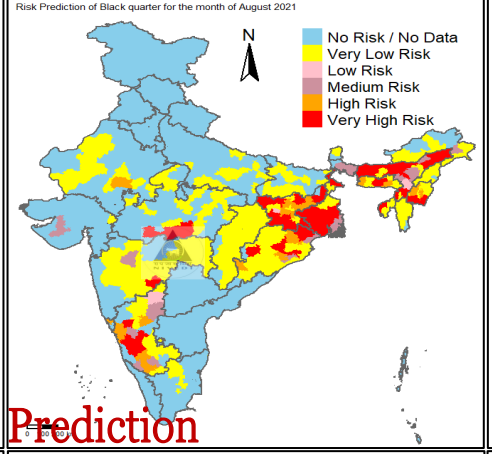
Classical swine Fever R_0 Map

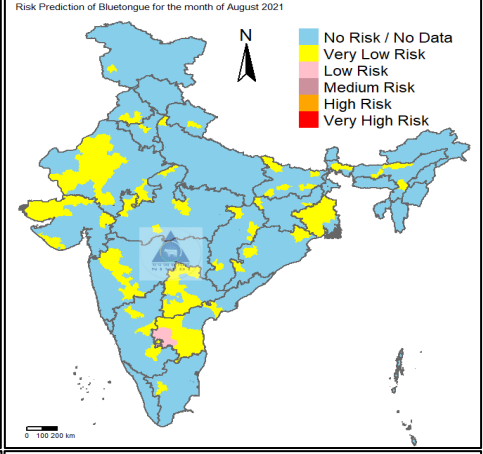




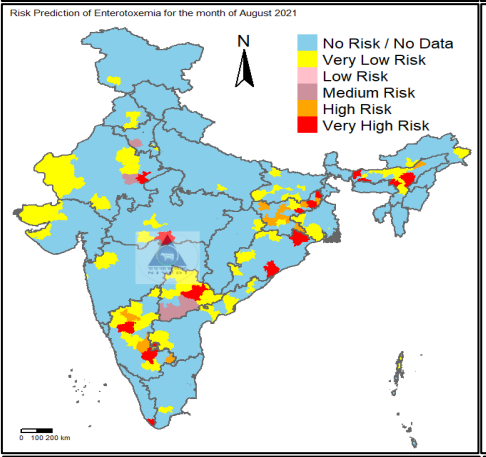


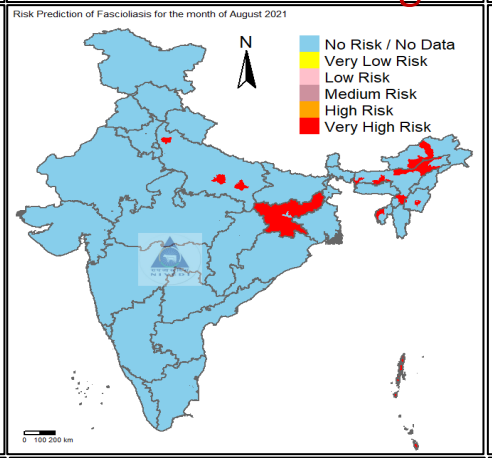


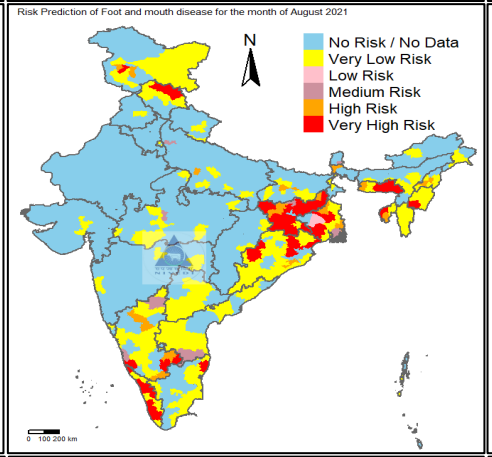


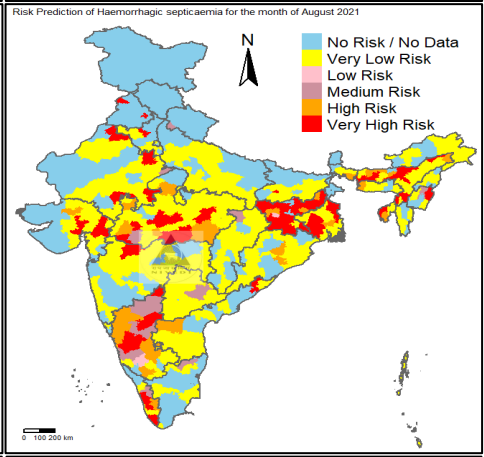


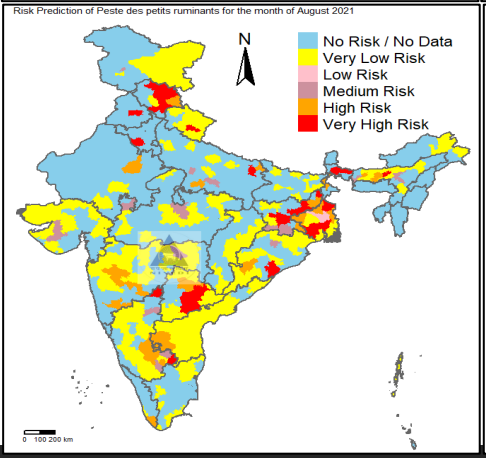
August Prediction

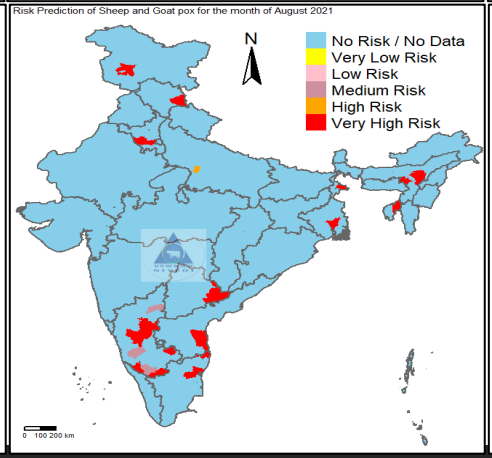


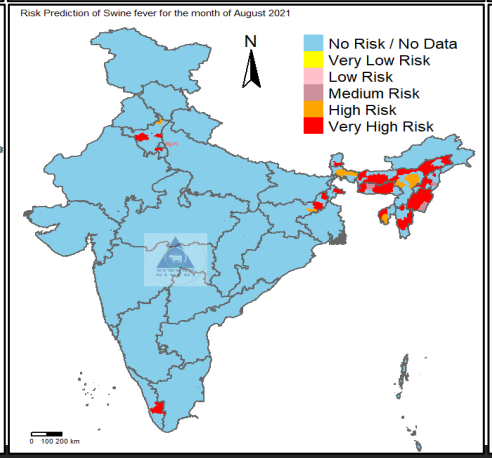


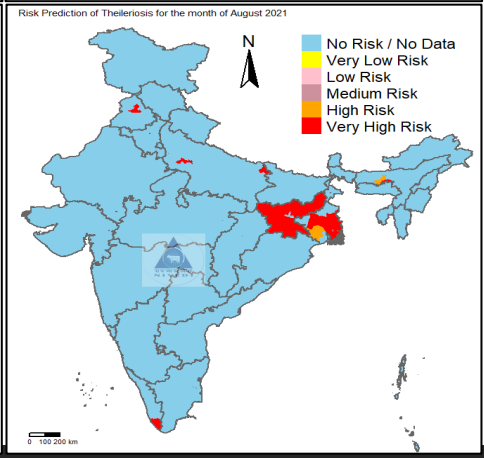












NADRES V2 RESULTS USED FOR SCHEDULING FMD VACCINATION

Madhusmita Dutta <Madhusmita.Dutta@in.ey.com> DR KP Suresh; Vatika Bhatnagar

Country wise FMD risk prediction data

You replied to this message on 19-03-2021 10:10.

Dear Sir,

As discussed, kindly provide the country wise FMD risk prediction data so that the vaccination schedule can be prepared.

Regards,

Madhusmita Dutta|
Technology Consulting

Ernst & Young LLP
Mobile: +91 8474808816 | Madhusmita.dutta@in.ey.com

Subject: Fw: FMD OCTOBER MONTH DISK RISK FOREWARNING TABLE-07.08.2021

From: Dr K P Suresh Biostatistician<sureshkp97@rediffmail.com> on Sat, 07 Aug 2021 19:43:18

To: "upamanyubasu"<upamanyubasu@gmail.com>

Cc: "madhusmitadutta"<madhusmita.dutta@in.ey.com>,"princyjohn"<princy.john@in.ey.com>,"directornivedi"<director.nivedi@icar.gov.in>,"SHARANAGOUDA PATIL"<sharanspin13@gmail.com>,"Divakar Hemadri"<divakar.hemadri@gmail.com>

1 attachment(s) - FMD_OCTOBER_MONTH_DISEASE_FOREWARNIING_RISK_TABLE-08.07.2021.xlsx (85.50KB)

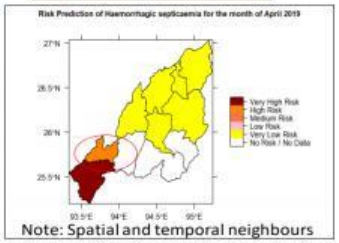
Respected sir

Please find the excel file on Forecasting of FMD for October 2021
this can be utilised for scheduling the vaccination
thanking you

Post Prediction Validation

DIMAPUR | Publish Date: 4/14/2019 AH&VS TEAM VISITS AFFECTED AREAS UNDER MEDZIPHEMA,
Source: http://www.nagalandpost.com

Following reports of a good number of buffaloes dying in a recent outbreak of suspected Haemorrhagic septicaemia (HS), a team from Animal Husbandry and Veterinary Services (AH&VS) department visited the affected areas under Medziphema on April 12. (Haemorrhagic septicaemia is a contagious bacterial disease that affects cattle and water buffaloes with a high mortality rate in infected animals).
AH&VS, deputy director & principal investigator, AICRP-ADMAS, Dr S. Amenla Walling, in a press release reported that the team consisted of the department's director, Dr Temsumeren, along with additional director, Dr. Budhi Lama, and other officials from the department. The press release added that the area is prone to such kind of disease outbreaks and the department officials reminded villagers to cooperate with the department and vaccinate their animals against such outbreaks. The team told the villagers that even an outbreak can be contained more effectively if villagers report the matter on time to the nearest Veterinary Health Centre.
The villagers admitted in the meeting that they had not reported the recent outbreak to the department initially. The director appreciated the CVO Dimapur and his Rapid Response Team for their quick action after receiving information and for remaining stationed in the outbreak area to date. Free medicine was also distributed among the villagers. The department, through the press release also appealed to everyone to report such matters to the nearest Veterinary Health Centre (so that qualified staff may intervene quickly), instead of publicizing it in other ways. It stated that the department is prepared to extend services to any outbreak of diseases in animals to control such things.
The press release also pointed out that to control the recent outbreak, the department had to direct its officials to make their own transport arrangements to go to the affected areas because the State Election department did not consider an appeal to exempt the department's emergency duty vehicle from election duty.
Meanwhile, when contacted, Dr S. Amenla Walling told Nagaland Post that it is difficult to say if the disease has been fully contained since its free grazing season for the animals, but the department is doing its best under the circumstances.



NIVEDI PREDICITONS

Districts of Nagaland	HS prediction for February 2019	HS prediction for March 2019	HS prediction for April 2019
Peren	VLR	VLR	VHR
Dimapur	VLR	NR	HR
Kohima	VLR	VLR	NR
Wokha	VLR	NR	VLR

Apr-2019

Note: Spatial and temporal neighbours

Tripura zoo closes down after threat of anthrax infection among animals |UNI | Agartala | Feb 24, 2019

Mar-2019

Following up with the reports of veterinary experts, wildlife authority in Tripura has suspended the entry of tourist in Sepahijala zoo in West Tripura for a week apprehending the presence of anthrax infection among the animals residing there.

According to report, a deer recently died in the zoo on Feb 19 last and the carcass was sent to the laboratory of veterinary College. The autopsy report of the dead animal has been suspected of being contaminated with anthrax virus in the zoo, which prompted the authority to close the zoo down for public entry.

"The necessary sanitization work has been going on to prevent any further spread of the infection," said a zoo official adding that there is no health hazard inside and in the surrounding localities of the zoo due to the spread of infection.

Anthrax is an infectious bacterial disease of animals, caused by the spore-forming bacteria Bacillus anthracis. It can affect humans and a wide range of animals. Likely to infect the cattle in the surrounding areas.

Source: **ProMED-SoAs: South Asia**

NIVEDI PREDICITONS

Districts of Tripura	FMD prediction for March 2019	FMD prediction for February 2019	FMD prediction for January 2019
Dhalai	NR	NR	NR
South Tripura	NR	NR	NR
West Tripura	LR	VLR	VLR

Note: Spatial and Temporal neighbours

Foot-and-mouth disease outbreak in TN, AP puts district on high alert

Mysuru: The highly contagious viral foot-and-mouth disease (FMD) has been noticed among cattle in the district especially in border regions like Nanjangud and Periyapatna taluks. As there is an outbreak of disease in the neighbouring states including Andra Pradesh and Tamil Nadu, the authorities of animal husbandry are examining the cattle which are being transported into the district at border checkposts.
As per the records of animal husbandry and veterinary sciences, there are more than five lakh cattle in the district. Usually there will be an outbreak of the disease during winter season in December and January every year. The animal husbandry takes up vaccination of cattle for FMD twice a year, in June and January.
The department authorities have taken strict measures to prevent diseased cattle entering into Mysuru district from neighbouring states.
Speaking to TOI, animal husbandry and veterinary sciences deputy director N Ajith Kumar said that the disease is found among cattle in Nanjangud and Periyapatna taluks. "As there is an outbreak of the disease in in Tamil Nadu and Andra Pradesh, we have taken measures to vaccinate cattle which enter into the district through six check posts. Two veterinarians along with staff are posted at the check posts to examine and vaccinate the cattle," he said.
The district authorities have already distributed vaccines to each taluk to prevent spread of the disease. The vaccination drive began on January 28 and will complete by February 15, covering five lakh cattle. "Vaccination is being provided to cattle free of cost. On the first day, 22,000 cattle and on the second day 23,000 cattle were vaccinated," he said.
Nanjangud taluk veterinarian Manjunath told TOI that there are around 75,000 cattle in the taluk and every day the staff are administrating vaccine to around 12,000 cattle.

Source: **ProMED-SoAs: South Asia**

Jan-2019

NIVEDI PREDICTIONS

Districts of Karnataka	FMD prediction for January 2019	FMD prediction for December 2018	FMD prediction for November 2018
Kodagu	VHR	LR	HR
Hassan	VHR	LR	HR
Mysore	HR	LR	HR
Mandya	HR	LR	HR
Chamrajanagar	VLR	VLR	VLR

Note: Spatial and Temporal neighbours

Foot and mouth disease among cattle on the rise in Kerala
Published: Dec 16, 2018, 08:02 AM IST

Palakkad: The outbreak of foot and mouth disease among cattle is causing concern in the state. Directions by the State Animal Welfare Board to close cattle markets and maintain caution on check posts to block transporting of affected cattle from neighbouring states have not been implemented.

As the foot and mouth disease was confirmed among cattle in Tamil Nadu, the cattle markets in the state were shut down. Though there has been a decline in the import of cattle from Tamil Nadu, cattle markets in Kerala operated as usual this week.

A preventive injection is being taken to all cattle in 15 panchayats of Palakkad district which has a large cattle population in the state. Due to the disease, milk production declined and would affect the reproductive capacity of cattle.

Farmers complained that three cows had died in Ayiloor panchayat the other day. However, Animal Welfare Board reports no deaths due to foot and mouth disease.

Symptoms

Severe fever in cows and buffalos and the flow of water like surf from mouth or thread-like liquid from nose and mouth are the primary symptoms of foot and mouth disease. The cattle hesitate to eat fodder, losing skin in mouth and tongue. In the initial stage, there will be a decline in milk production. This can affect the lives of calves that are less than five months old. A virus that moves through wind spreads the disease.

The Animal Welfare Board officials said that medicines are given to cattle in the area where the disease was confirmed.

Source: **ProMED-SoAs: South Asia**

Dec-2018

NIVEDI PREDICTIONS

Districts of Kerala	FMD prediction for December 2018	FMD prediction for November 2018	FMD prediction for October 2018
Malappuram	HR	VHR	VHR
Palakkad	HR	VHR	VHR
Thrissur	HR	VHR	VHR

Note: Spatial and Temporal neighbours

Foot-and-mouth disease has dairy farmers in Tirupur dist worried
Dec 3, 2018, 12.32 AM IST, The Times of India
Tirupur: While the animal husbandry department claims to have controlled the spread of foot-and-mouth disease (FMD), livestock farmers in the district are not convinced.
"More than 500 cattle are down with the virus at Dharapuram. Farmers are worried as a major part of their income comes from milk production," district president of Ulavar Ulaippalar Katchi R Eswaramoorthi said.
As many as 300 cattle are affected by the disease at Palladam taluk, said district president of Katchi Sarbatra Vivasaigal Sangam M Eswaran. "The FMD effect is high due to the heavy rainfall this year," he said.
Some veterinary doctors of the animal husbandry department are demanding as much as Rs 1,000 to treat the cattle, Eswaramoorthi said. "It is condemnable that the veterinarians are demanding money from the farmers, who are facing financial loss," he told TOI.
The veterinarians demand money claiming that they buy the medicines from private shops, said Eswaran. "They say that the farmers should pay for the medicines. Farmers, who are in a desperate situation, are forced to pay whatever the veterinarians demand. But despite providing medication, many cattle have not recovered."
Meanwhile, a senior animal husbandry department official denied the allegations. "As per Foot and Mouth Disease Control Programme (FMD-CP), the department had administered vaccine. But some calves could not survive. FMD was prevalent in the calves. As the disease is spread through air and water, animals on Noyyal and Amaravathi belts are infected easily."
The department has formed 36 special teams to curb the disease, the official said. "We have also ensured availability of medicines to control the disease, whose prevalence is only sporadic in the district. The district administration has taken sufficient steps, including temporary ban on cattle markets. The situation will soon become normal."

Source: **ProMED-SoAs: South Asia**

Dec-2018

NIVEDI PREDICITONS

Districts of Tamil Nadu	FMD prediction for December 2018	FMD prediction for November 2018	FMD prediction for October 2018
The Nilgiris	VLR	VLR	VLR
Coimbatore	VLR	VHR	HR
Erode	VLR	HR	HR
Dindigul	VLR	VHR	HR
Theni	VLR	VHR	HR

Note: Spatial and Temporal neighbours

Foot-and-mouth cases among cattle in district worry farmers

| Wednesday | 14th November, 2018

Nov-2018

Coimbatore: The sporadic spreading of foot-and-mouth disease among cattle in the district for the past one week has raised concerns among farmers. Pockets in Annur and Vellamadai have witnessed infection among cattle and there have been cases in Idikarai too. However, this time even after vaccination their cattle have contracted the disease. When contacted, animal husbandry department officials ruled out the shortage of medicine. But when he went to animal husbandry department's dispensary in the area, they said they don't have the medicine to treat pregnant cows. If we get to know of other ailing animals, we would confirm it and form team to treat them," the official said. They said they vaccinate their cattle twice a year (March and September) to prevent the disease.

Source: **ProMED-SoAs: South Asia**

NIVEDI PREDICITONS

Districts of Tamil Nadu	FMD prediction for November 2018	FMD prediction for October 2018	FMD prediction for September 2018
The Nilgiris	VLR	VLR	VLR
Coimbatore	VHR	HR	VLR
Theni	HR	HR	LR
Erode	MR	HR	VLR
Dindigul	VHR	HR	VLR

Note: Spatial and Temporal neighbours

FMD: cattle shandies to remain closed for two weeks

NC: THE HINDU, ERODE, NOVEMBER 26, 2018 00:00 IST

Nov-2018

The busy cattle shandy in Karungalpalayam wore a deserted look on Thursday after the district administration ordered closure of the shandies for two weeks to prevent spread of Foot-and-mouth-disease (FMD) that affects the cattle.

Farmers in many parts of the district have complained that their cattle were affected by the disease and urged the district administration to take steps to control the spread of disease.

Hence, District Collector C. Kathiravan ordered closure of shandies at Karungalpalayam, Anthiyur, Seenapuram, Modachur and Puliyampatti for two weeks.

Officials of the Animal Husbandry Department said that over 2.5 lakh cattle were vaccinated during a camp held in September and following the outbreak, vaccination camp was being held. Officials were hopeful that once the disease is under control, shandies will be reopened.

Source: ProMED-SoAs: South Asia

NIVEDI PREDICITONS

Districts of Tamil Nadu	FMD prediction for November 2018	FMD prediction for October 2018	FMD prediction for September 2018
The Nilgiris	VLR	VLR	VLR
Coimbatore	VHR	HR	VLR
Erode	HR	HR	VLR
Dindigul	VHR	HR	VLR
Salem	HR	MR	LR
Namakkal	HR	MR	LR
Karur	HR	MR	LR

Note: Spatial and Temporal neighbours

Anthrax scare: 6 anthrax cases reported after eating infected meat

THE HANS INDIA | Oct 27, 2018

Oct-2018

TIRUPATI: While the 'swine flu' epidemic has been giving sleepless nights to the district administration, the detection of anthrax cases in Chittoor district have shaken them up.

On Friday, the officials of the District Medical and Health Department received a jolt with six suspected cases reported at Kodandaramapuram village of Karvetinagaram mandal in the district.

They approached the Puttur PHC with symptoms of cutaneous anthrax like skin rashes and pimples to five of them and the other one was suspected to be suffering from meningitis whom local doctor has referred to Ruia Hospital in Tirupati.

According to the DM&HO Dr B Ramagiddaiah, the condition of all the patients was stable and their blood samples were sent to the microbiology lab at SV Medical College. Results may come by Monday, he said. There is no need to panic as it was a bacterial disease and with administration of antibiotics patients will become normal, he said. He told The Hans India that, some of the villagers consumed stored meat of a **goat infected with *Bacillus anthracis*** about 10 days back which might have caused the disease. After the cases were reported on Friday, they took all the steps to prevent the disease from spreading further. Sources said that those who consumed the meat of goat have even distributed it to their near and dear in the close vicinity of the village.

Meanwhile, the **Animal Husbandry Department** plunged into action and **vaccinating the livestock and domesticated animals**. DM&HO has advised the villagers not to consume meat for a few days and take precautions like frequent hand wash etc., to be safe from such type of bacterial diseases.

Meanwhile, District Collector PS Pradyumna, who was away in Amaravati to attend Collectors conference, has appealed to people not to become panic and said the condition of five patients was stable and they were sent back to home. Only one patient was under the observation of doctors at Ruia Hospital.

Source: **ProMED-SoAs: South Asia**

NIVEDI PREDICTIONS

Districts of Andhra Pradesh	Anthrax prediction for October 2018	Anthrax prediction for September 2018	Anthrax prediction for August 2018
Anantapur	VHR	HR	VHR
Chittoor	MR	VHR	HR
Y.S.R.	VLR	VLR	VLR
Nellore	VLR	NR	MR

Note: Spatial and Temporal Neighbours

TELANGANA

Sheep deaths caused by bacteria, virus and over-eating

NALGONDA, MARCH 31, 2018 00:00 IST
UPDATED: MARCH 31, 2018 04:59 IST

The identification of three possible reasons for the recent death of large number of sheep in Miryalguda by the State Veterinary Biological and Research Institute, Hyderabad, raises bigger questions of the vulnerability of the sheep population that are taken for grazing in the open fields across the State.

Random samples of serum, blood and viscera from **affected flocks tested positive for Peste des petits ruminants (Sheep plague or PRR), Enterotoxemia (ET or Overeating disease) and Leptospirosis**, District Animal Husbandry Officer (AHO) C.H. Ramesh said.

Not only are the nomadic shepherds lacking awareness of the diseases, but also the affected animals have not been vaccinated by the administration of the originating district, veterinarians pointed out. In ET or overeating disease, a change in animal's diet with high fibre and protein intake accelerates the already 'low bacteria' present in its intestines into bacteria toxins.

There is a higher risk of the animals suffering from ET in the coming days as the sheep are likely to overeat in harvested paddy fields starting April. Thankfully, ET is a vaccine-curable disease unlike PRR. "And all veterinary departments have enough supplies of ET vaccines," officials said.


File photo of shepherds tending their flocks in Nalgonda townSingam VenkataramanaSINGAM VENKATARAMANA

Shepherds lack awareness of disease, say veterinarians

Disease forewarning for March 2018: Telangana

Districts of Telangana	ET	PPR
Adilabad	MR	VLR
Hyderabad	NR	NR
Karimnagar	MR	VHR
Khammam	VHR	HR
Mahbubnagar	HR	VHR
Medak	MR	HR
Nalgonda	HR	MR
Nizamabad	MR	LR
Rangareddy	NR	NR
Warangal	MR	HR

31 March 2018

NIVEDI PREDICTIONS

Pigs' death due to classical swine fever, not PRRS : Sailo

Published 02-Aug-2017 14:09 IST


Representational Image

Aizawl: At least 35 pigs and piglets have died of classical swine fever in Mizoram-Myanmar border village of Biate in Champhai district since July. State Animal Husbandry and Veterinary department director Dr Saingura Sailo said, laboratory tests have confirmed that the pigs died of classical swine fever and not Porcine Reproductive and Respiratory Syndrome (PRRS). The laboratory tests were conducted at the College of Veterinary Science and Animal Husbandry at Selesih near Aizawl, he said.

EENADU INDIA
Fri, 1st September 2017, 18:46 IST

Disease forewarning for August 2017: Mizoram

Districts of Mizoram	Swine Fever
Aizawl	HR
Champhai	MR
Kolasib	VLR
Lawngtlai	VLR
Lunglei	MR
Mamit	NR
Saiha	LR
Serchhip	LR

2 August 2017

NIVEDI PREDICTIONS

ಅಂಧ್ರಾಕ್ಸ್‌ಗೆ 19 ಕುರಿ ಬಲಿ

ಹರಿಹರ: ಆಪಾಯಕಾರಿ ಅಂಧ್ರಾಕ್ಸ್ ಕಾಯಿಲೆಗೆ 19 ಕುರಿಗಳು ಬಲಿಯಾದ ಘಟನೆ ತಾಲೂಕಿನ ಭಾನುವಳ್ಳಿ ಗ್ರಾಮದಲ್ಲಿನಡೆದಿದೆ.

ನಾರಾಯಣಸ್ವಾಮಿ ಎಂಬವರಿಗೆ ಸೇರಿದ ಕುರಿಗಳು ಈ ಕಾಯಿಲೆಯಿಂದ ಮೃತಪಟ್ಟಿವೆ. 10 ದಿನಗಳ ಅವಧಿಯಲ್ಲಿ ದಿನಕ್ಕೆ 1-2 ಕುರಿಗಳು ಸಾಯುತ್ತ ಬಂದಿವೆ. ಭಾನುವಾರದವರೆಗೆ 14 ದೊಡ್ಡ 5 ಮರಿಗಳು ಸೇರಿದಂತೆ 19 ಕುರಿಗಳು ಸತ್ತಿವೆ. ತಾಲೂಕಿನ ಭಾನುವಳ್ಳಿಯಂತೆಯೆ ಕಳೆದ ಜುಲೈ ತಿಂಗಳಲ್ಲಿ ತಾಲೂಕಿನ ಹೊಳೆಸಿರಿಗೆರೆ, ಕೊಕ್ಕನೂರು ಗ್ರಾಮಗಳಲ್ಲೂ ಈ ಕಾಯಿಲೆಗೆ ಹಲವು ಕುರಿಗಳು ಬಲಿಯಾಗಿವೆ. ಭಾನುವಳ್ಳಿ ಗ್ರಾಮವೊಂದರಲ್ಲೆ 4 ಸಾವಿರ ಕುರಿ ಸಾಕಾಣಿಕೆ ಇದ್ದು ಕುರಿಗಾಹಿಗಳಲ್ಲಿ ಆತಂಕ ಸೃಷ್ಟಿಸಿದೆ.

02 | ಸೋಮವಾರ,21 ಆಗಸ್ಟ್ 2017, ಬೆಂಗಳೂರು

ವಿಜಯ ಕರ್ನಾಟಕ

21 August 2017

Disease forewarning for August 2017: Karnataka

Districts of Karnataka	Anthrax	Districts of Karnataka	Anthrax
Bagalkot	VLR	Gulbarga	VLR
Bangalore	NR	Hassan	LR
Bangalore Rural	HR	Haveri	LR
Belgaum	NR	Kodagu	NR
Bellary	VHR	Kolar	MR
Bidar	NR	Koppal	HR
Bijapur	NR	Mandya	VLR
Chamarajanagar	HR	Mysore	VLR
Chikkaballapura	MR	Raichur	MR
Chikmagalur	NR	Ramanagara	NR
Chitradurga	MR	Shimoga	VLR
Dakshina Kannada	NR	Tumkur	VHR
Davanagere	VHR	Udupi	NR
Dharwad	NR	Uttara Kannada	NR
Gadag	NR	Yadgir	NR

NIVEDI PREDICTIONS

Foot and mouth disease affects cattle in Balige village

Kalasa / DH News Service Nov 19 2017, 23:01 IST


A villager looks after his bull, which is affected by foot and mouth disease, in Balige village.

Cattle in Balige village are infected with foot and mouth disease which has spread from the stray cattle in Kyatanamakki.

The cattle affected with the disease bleed from their gums and hooves. The aged cattle have become weak, after not being able to consume fodder. The disease is also found in Dantaga and Thura areas.

The cattle of the local breed of Malenadu Gidda, have also developed foot and mouth disease. The farmers see a bleak future as the bulls used for agriculture and milch cows are suffering from the disease.

Animal husbandry department officials and staff have visited Balige village and have noted the severeness of the disease. Department Assistant Director Dr Venugopal said that as the domestic cattle have come in contact with stray cows in Kyatanamakki while grazing, the disease has spread faster. Hundreds of stray cattle from other regions which graze in the hills are not vaccinated against the disease.

The villagers said that the cattle from other places are transported in goods vehicles, and are left in the hills to graze.

Disease forewarning for November 2017: Karnataka

Districts of Karnataka	FMD
Bagalkot	MR
Bangalore	VHR
Bangalore Rural	HR
Belgaum	HR
Bellary	MR
Bidar	MR
Bijapur	HR
Chamarajanagar	MR
Chikkamangaluru	HR
Chikmagalur	VHR
Chitradurga	VHR
Dakshina Kannada	LR
Davanagere	VHR
Dharwad	HR
Gadag	MR
Gulbarga	VHR
Hassan	VHR
Haveri	VHR
Kodagu	VLR
Kolar	VHR
Koppal	VHR
Mandya	VHR
Mysore	HR
Raichur	VHR
Ramanagara	HR
Shimoga	HR
Tumkur	VHR
Udupi	MR
Uttara Kannada	HR
Yadgir	LR

Balige village
Mudigere Taluk
Chikmagalur District

18 November 2017

NIVEDI PREDICTIONS

NIVEDI Prediction

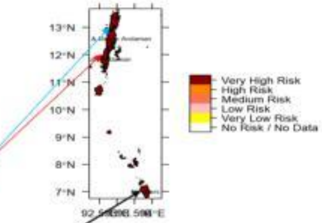
District wise Livestock Disease forewarning for June 2020: Andaman and Nicobar

Districts of Andaman and Nicobar	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fasciolosis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomiasis
Nicobars	NR	MR	NR	NR	NR	VHR	NR	NR	NR	NR	NR	NR	NR
North & Middle Andaman	NR	NR	NR	NR	NR	VHR	NR	NR	NR	NR	NR	NR	NR
South Andaman	NR	MR	MR	NR	NR	VHR	NR	NR	NR	MR	NR	NR	NR

If vaccination is already been done please ignore the disease forecast for that disease.

*No risk/No data available (NR), Very low risk (VLR), Low risk (LR), Moderate risk (MR), High risk (HR),Very high risk (VHR)

ANDAMAN & NICOBAR ISLANDS Risk Prediction of Fascioliasis for the month of June 2020



Andaman and Nicobar Report June-2020

monthly report June 2020

Number of cases of of parasitic cases and other diseases reported from A & N Islands during the month of June 2020

CASES	FASCIOLIASIS	ASCARIASIS	AMPHISTOME	STRONGYLOIDS	COCCIDIOSIS	MASTITIS	TOTAL
South Andaman	24	48	192	34	2	7	307
N&M Andaman	258	43	14	5	3	10	333
Nicobar	79	31	0	0	0	0	110
TOTAL	**361**	**122**	**206**	**39**	**5**	**17**	**750**

Dr. Jai Sunder
PI, AICRP-ADMAS
Port Blair

NIVEDI Prediction

District wise Livestock Disease forewarning for July 2020: Himachal Pradesh

Districts of Himachal pradesh	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fasciolosis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomiasis
Bilaspur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chamba	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Hamirpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kangra	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kinnaur	NR	NR	NR	VLR	NR	NR	NR	NR	NR	VHR	NR	NR	NR
Kullu	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lahul & Spiti	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mandi	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Shimla	NR	NR	NR	NR	NR	NR	NR	NR	NR	VHR	NR	NR	NR
Sirmaur	NR	NR	NR	NR	NR	NR	NR	MR	NR	NR	NR	NR	NR
Solan	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Una	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccination has already been done please ignore the disease forecast for that disease.

HIMACHAL PRADESH Risk Prediction of Sheep and Goat pox for the month of July 2020

HINACHAL PRADESH Report July-2020

FORMAT FOR SUBMITTING LIVESTOCK DISEASE OUTBREAK DATA TO NIVEDI. (REVISED REPORT-11/07/2018)

Table showing Number of Disease Predicted and Outbreaks reported for the year 2020

Livestock diseases	Jan-March 2020		Apr-June 2020		July-Sep 2020		Oct- Dec 2020	
	No of Districts predicted the disease	No of districts reported the disease*	No of Districts predicted the disease	No of districts reported the disease*	No of Districts predicted the disease	No of districts reported the disease*	No of Districts predicted the disease	No of districts reported the disease*
Anthrax	68	5	80	4	121	1	90	2
Babesiosis	139	87	142	62	137	66	131	7
Black quarter	152	4	195	8	208	2	148	2
Bluetongue	22	1	3	2	1	NA	19	2
Enterotoxaemia	57	9	70	6	66	8	64	NA
Fascioliasis	163	32	150	52	152	56	158	2
Foot and mouth disease	261	8	158	42	232	6	317	2
Haemorrhagic septicaemia	166	12	175	16	262	6	168	6
Peste des petits ruminants	201	47	178	24	162	13	168	13
Sheep & Goat pox	127	12	75	15	91	6	108	2
Swine fever	127	15	107	23	120	13	113	9
Theileriosis	113	67	149	67	106	37	125	52
Trypanosomiasis	111	42	133	107	104	138	150	NA

Number of Disease Predicted and Outbreaks reported for the year 2020

Sl.NO	Disease	No. Predicted	No. Reported
1	Anthrax	359	12
2	Babesiosis	549	222
3	Black quarter	703	16
4	Bluetongue	45	5
5	Enterotoxaemia	257	23
6	Fascioliasis	623	142
7	Foot and mouth disease	968	58
8	Haemorrhagic septicaemia	771	40
9	Peste des petits ruminants	709	97
10	Sheep & Goat pox	401	35
11	Swine fever	467	60
12	Theileriosis	493	223
13	Trypanosomiasis	498	287

Risk Communication

Accessing forewarning data in NADRES v2

NADRES v2

Redefining Livestock Disease Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases June-2021

ANDHRA PRADESH,JHARKHAND,KARNATAKA,KERALA,MAHARASHTRA,MEGHALAYA,ODISHA,TAMIL NADU Anthrax in August-2021

JHARKHAND,TRIPURA,ANDAMAN & NICOBAR ISLANDS are predicted for likely occurrence of Babesiosis in August-2021

ANDHRA PRADESH,ASSAM,JAMMU &

OB Prediction August-2021

Anthrax - 27, with Accuracy of 99.69%

Babesiosis - 32, with Accuracy of 98.61%

Black quarter - 67, with Accuracy of 97.60%

Enterotoxaemia- 19, with Accuracy of 96.91%

Fasciolosis - 54, with

Auto Messaging

AICRP Centers
Every Thursday at 11 am Request to send the monthly disease outbreak report and

Livestock Disease Forecast for the prospective second month to initiate the control measures

Disease name: Swine fever

State name: Mizoram

Month: April / May / June / July / August

Submit | Reset

COVID-19 An epidemiological distribution in India

Sampling Plan

Online GIS

Livestock Disease Forecast State wise

Livestock Disease Forecast-District wise

Epi Calculator

LDF mobile app Download

SWOT

Nadres IOOAI

Web Traffic Analytics

Forewarning Bulletin

NADRES August-2021 with COVID 19 Preventive measures report of June-2021

Monthly Bulletin (Archives)

NADRES v2

Redefining Livestock Disease Forewarning

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases June-2021

ANDHRA PRADESH,JHARKHAND,KARNATAKA,KERALA,MAHARASHTRA,MEGHALAYA,ODISHA,TAMIL NADU Anthrax in August-2021

JHARKHAND,TRIPURA,ANDAMAN & NICOBAR ISLANDS are predicted for likely occurrence of Babesiosis in August-2021

ANDHRA PRADESH,ASSAM,JAMMU &

OB Prediction August-2021

Anthrax - 27, with Accuracy of 99.69%

Babesiosis - 32, with Accuracy of 98.61%

Black quarter - 67, with Accuracy of 97.60%

Enterotoxaemia- 19, with Accuracy of 96.91%

Auto Messaging

every Thursday at 11 am Request to send the monthly disease outbreak report and provide feedback for forewarning

Swine fever Livestock Disease Forecast of August month in MIZORAM

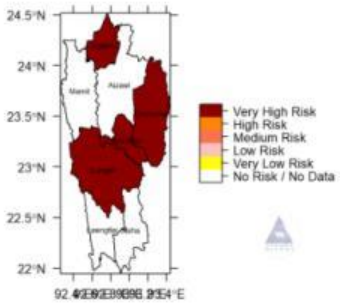
District Name	Pig	Month	Result
Champhai	24915	August	Very High Risk
Kolasib	12995	August	Very High Risk
Lunglei	11884	August	Very High Risk
Serchhip	5436	August	Very High Risk
Champhai	24915	August	Very High Risk
Kolasib	12995	August	Very High Risk
Lunglei	11884	August	Very High Risk
Serchhip	5436	August	Very High Risk

Preventive Measures:

Vaccinatio n of susceptible animals. Restriction on animal movement, strict biosecurity measures and proper disposal of carcass.

Back

MIZORAM Risk Prediction of Swine fever for the month of August 2021



COVID-19 An epidemiological distribution in India

Sampling Plan

Online GIS

Livestock Disease Forecast State wise

Livestock Disease Forecast-District wise

Epi Calculator

LDF mobile app Download

SWOT

Nadres IOOAI

Web Traffic Analytics

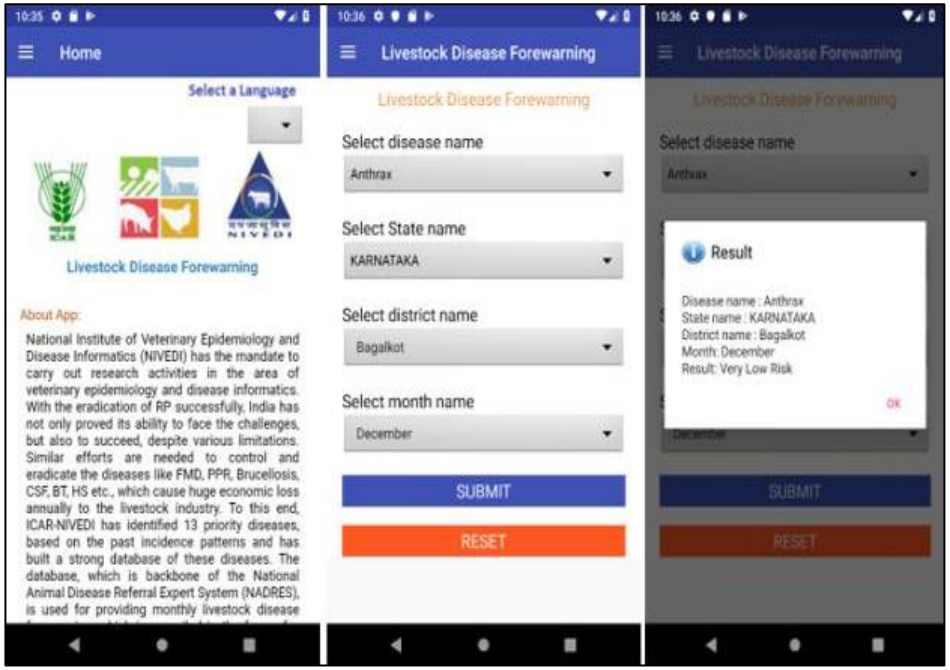
Forewarning Bulletin

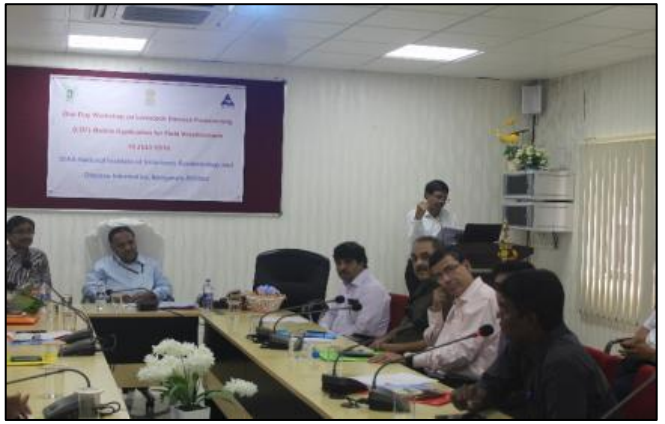
NADRES August-2021 with COVID 19 Preventive measures report of June-2021

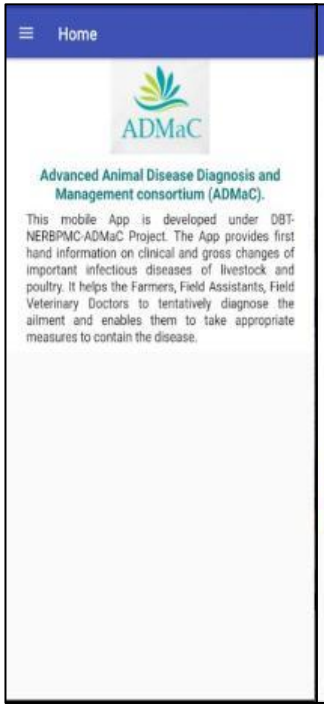
Monthly Bulletin (Archives)

LIVESTOCK DISEASE FOREWARNING – Mobile App (NADRES –V2)

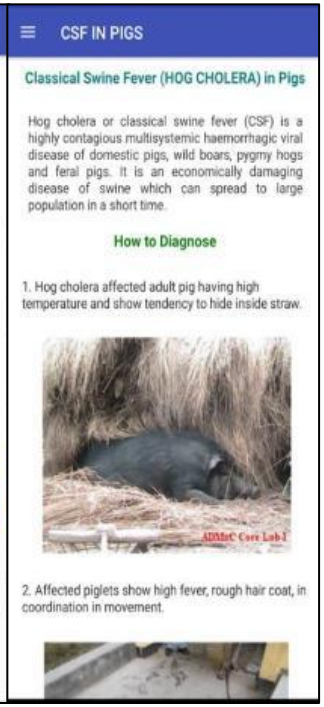
- Updated the recent version of the mobile app.
- Data on forewarning of 13 livestock diseases across 728 districts in India has been updated month-wise.
- Benefits to state governments official, academicians, for assessment of risk of livestock diseases in India.






Home
ADMaC
Advanced Animal Disease Diagnosis and Management consortium (ADMaC).
This mobile App is developed under DBT-NERBPMC-ADMaC Project. The App provides first hand information on clinical and gross changes of important infectious diseases of livestock and poultry. It helps the Farmers, Field Assistants, Field Veterinary Doctors to tentatively diagnose the ailment and enables them to take appropriate measures to contain the disease.


Forecast
Livestock Disease Forewarning
Select disease name
Black quarter
Select State name
ARUNACHAL PRADESH
Select district name
Anjaw
Select month name
April
SUBMIT
RESET

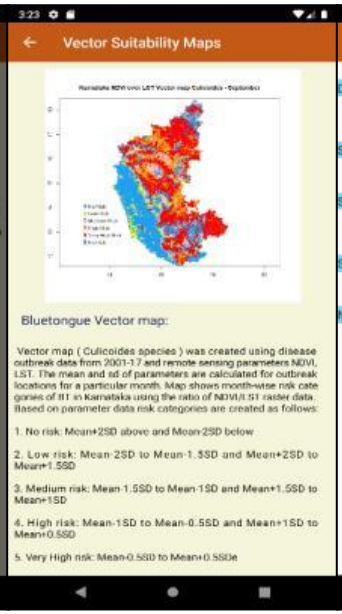

CSF IN PIGS
Classical Swine Fever (HOG CHOLERA) in Pigs
Hog cholera or classical swine fever (CSF) is a highly contagious multisystemic haemorrhagic viral disease of domestic pigs, wild boars, pygmy hogs and feral pigs. It is an economically damaging disease of swine which can spread to large population in a short time.
How to Diagnose
1. Hog cholera affected adult pig having high temperature and show tendency to hide inside straw.
2. Affected piglets show high fever, rough hair coat, in coordination in movement.

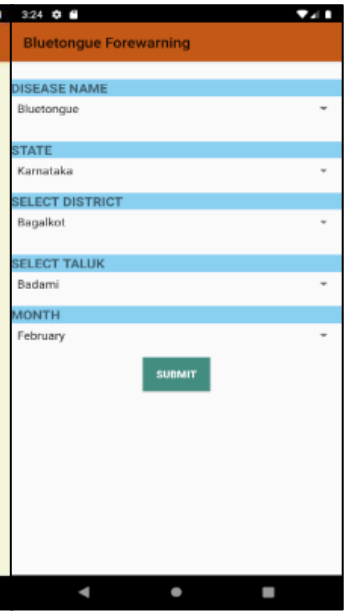

10:40
AINP on GIP
NIVEDI
ICAR
National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI) has the mandate to carry out research activities in the area o veterinary epidemiology and disease informatics.
AINP on GIP project works on disease data of Haemonchos received from different places of Rajasthan and its forewarning using remote sensing and climate disease modelling.This app provides information about rajasthan state and its livestock details along with environmental parameters.Also provides procedure of sample collection and analysis.
Objectives of the project:
1. Measurement of Risk parameters like Remote sensing variables, Meteorological variables, and Anthropometric environmental variables for GI parasitic diseases.
2. To Analyse the Risk Parameters for GI parasitic diseases.
3. To Develop mathematical models for GI parasitism with Haemonchus as a model parasite.
4. To Develop Anthelmintic resistance modeling.


10:43
AINP on GIP
DISEASE NAME
Haemonchosis
SELECT STATE
RAJASTHAN
SELECT DISTRICT
Sirohi
SELECT TALUK
Abu Road
SELECT MONTH
November
SUBMIT

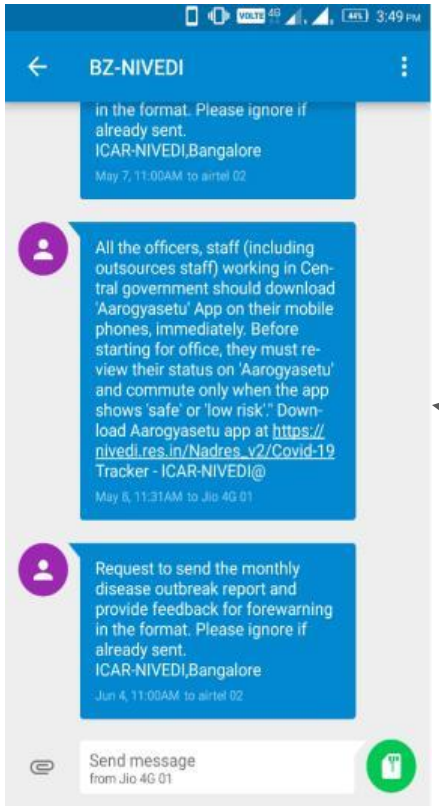

10:44
AINP on GIP
DISEASE NAME
Haemonchosis
NIVEDI
STATE : RAJASTHAN
DISEASE : Haemonchosis
DISTRICT : Sirohi
TALUK : Abu Road
MONTH : November
RESULT : Likelihood of occurrence
OK
November
SUBMIT

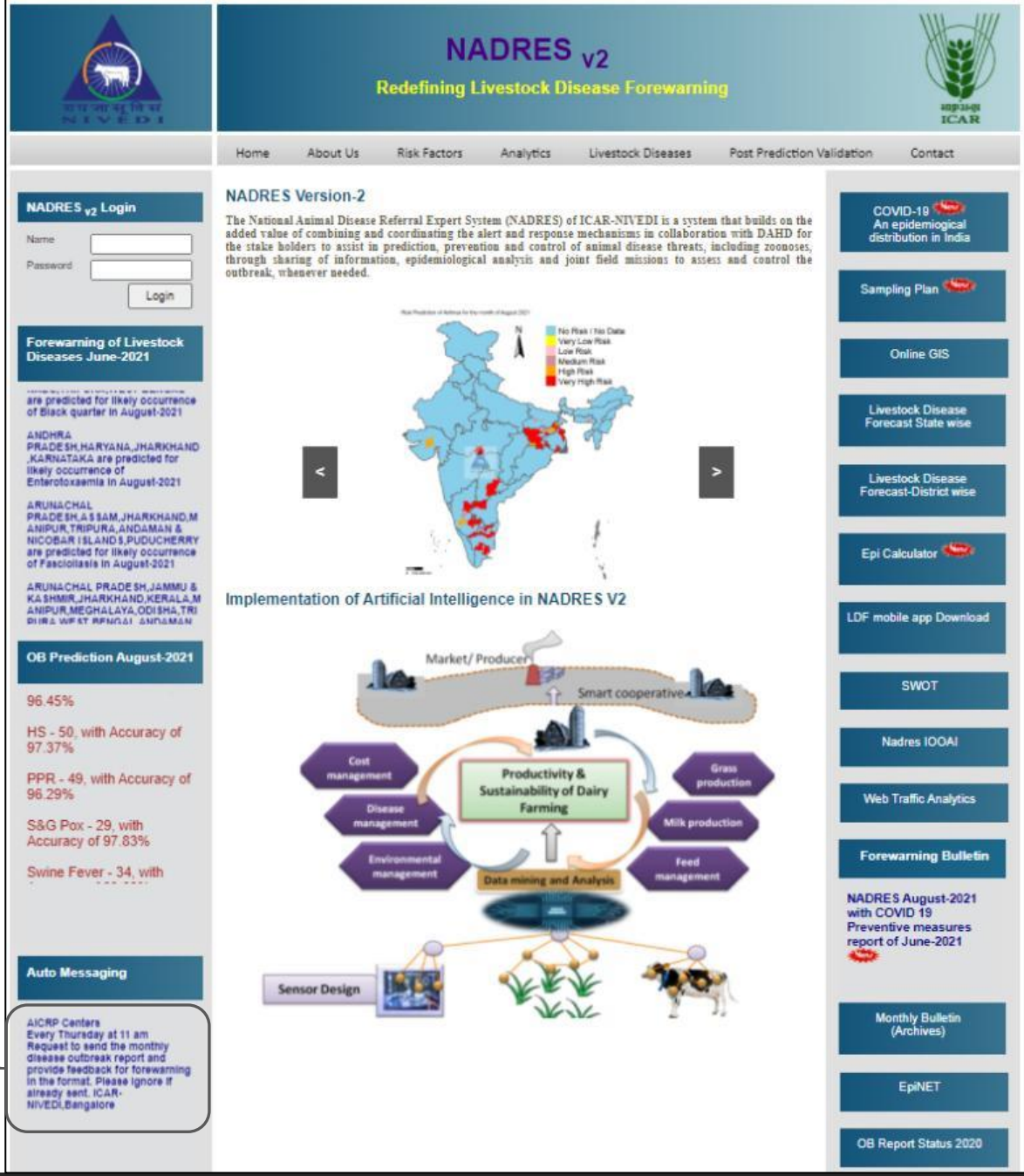

3:23
Bluetongue Forewarning
Home
Clinical Signs
Diagnosis
Preventive Measures
Spatial Distribution Maps
Vector Suitability Map
Bluetongue Forewarning
NICRA Team
Contact us


3:23
Vector Suitability Maps
Bluetongue Vector map:
Vector map (Culicoides species) was created using disease outbreak data from 2001-17 and remote sensing parameters NDVI, LST. The mean and sd of parameters are calculated for outbreak locations for a particular month. Map shows month-wise risk categories of BT in Karnataka using the ratio of NDVI/LST raster data. Based on parameter data risk categories are created as follows:
1. No risk: Mean+2SD above and Mean-2SD below
2. Low risk: Mean-2SD to Mean-1.5SD and Mean+2SD to Mean+1.5SD
3. Medium risk: Mean-1.5SD to Mean-1SD and Mean+1.5SD to Mean+1SD
4. High risk: Mean-1SD to Mean-0.5SD and Mean+1SD to Mean+0.5SD
5. Very High risk: Mean-0.5SD to Mean+0.5SDe


3:24
Bluetongue Forewarning
DISEASE NAME
Bluetongue
STATE
Karnataka
SELECT DISTRICT
Bagalkot
SELECT TALUK
Badami
MONTH
February
SUBMIT

Automated messages are sent to AICRP centres to send disease outbreak reports





Monthly Nadres Report

Informatics Lab <dilnivedi@gmail.com>
to pdandapat, bimalendu.m

Dear Sir/Madam

We didn't receive a monthly outbreak report. So please kindly resend the outbreak reports for the month of January-2020 to may-2020

Thanking you--

--
(Your's Sincerely)

Spatial Epidemiology Lab
ICAR-NIVEDI
Bengaluru

Reply | Reply all | Forward

Nadres month Report

Informatics Lab <dilnivedi@gmail.com>
to ravihegde63

Dear Sir/Madam

We didn't receive a monthly outbreak report. So please kindly resend the outbreak reports for the month of january-2020

Thanking you--

--
(Your's Sincerely)

Spatial Epidemiology Lab
ICAR-NIVEDI
Bengaluru

Reply | Forward

Monthly Nadres report

Informatics Lab <dilnivedi@gmail.com>
to ddpathologistraj

Dear Sir/Madam

We didn't receive a monthly outbreak report. So please kindly resend the outbreak reports for the month of Febraury-2020

Thanking you--

--
(Your's Sincerely)

Spatial Epidemiology Lab
ICAR-NIVEDI
Bengaluru

Reply | Forward

Monthly Nadres report

Informatics Lab <dilnivedi@gmail.com>
to ddpathologistraj

Dear Sir/Madam

We didn't receive a monthly outbreak report. So please kindly resend the outbreak reports for the month of Febraury-2020

Thanking you--

--
(Your's Sincerely)

Spatial Epidemiology Lab
ICAR-NIVEDI
Bengaluru

Reply | Forward

NADRES v2

Redefining Livestock Disease Forewarning

ICAR

Home | About Us | Risk Factors | Analytics | Livestock Diseases | Post Prediction Validation | Contact

NADRES v2 Login

Name

Password

Login

Forewarning of Livestock Diseases August-2021

predicted for likely occurrence of Fascioliasis in October-2021

NDAMAN & NICOBAR ISLANDS,BIHAR,GOA,JAMMU & KASHMIR,JHARKHAND,KARNATAKA,KERALA,MANIPUR,MEGHALAYA,NAGALAND,ODISHA,TAMIL NADU,WEST BENGAL are predicted for likely occurrence of Foot and mouth disease in October-2021

JHARKHAND,KARNATAKA,MADHYA

OB Prediction October-2021

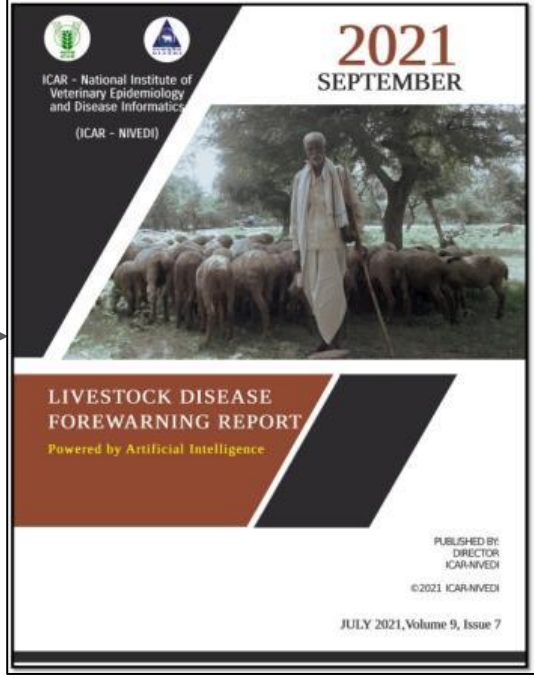
Accuracy of 97.64%

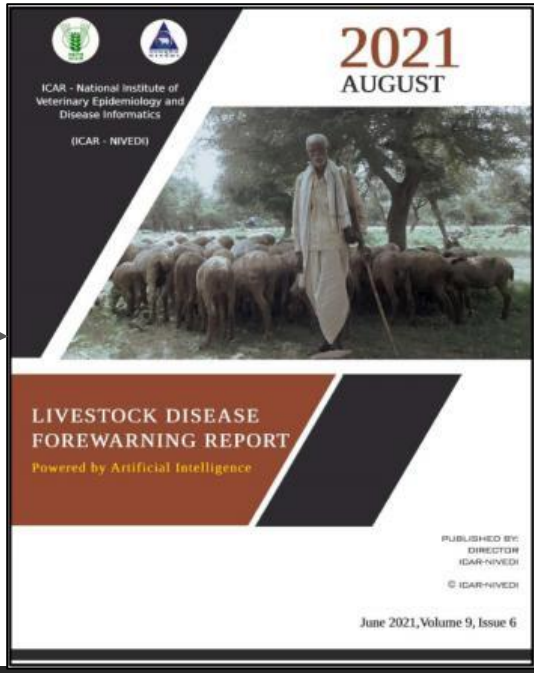
Trypanosomiasis -65, with Accuracy of 96.60%

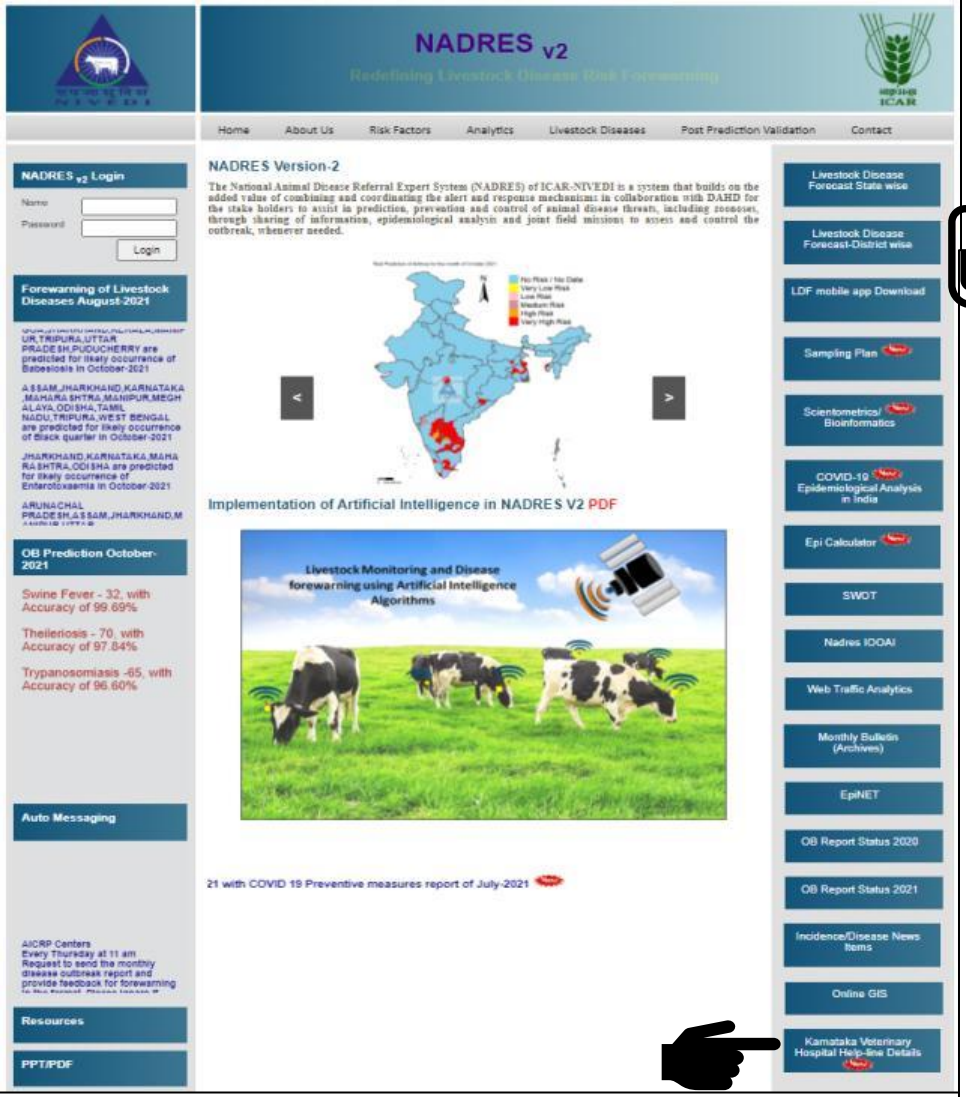
Monthly Prediction Bulletin

- NADRES September-2021 with COVID 19 Preventive measures report of July 2021
- NADRES August-2021 with COVID 19 Preventive measures report of June 2021
- NADRES JULY-2021 with COVID 19 Preventive measures report of May 2021
- NADRES JUNE-2021 with COVID 19 Preventive measures report of April 2021
- NADRES MAY-2021 with COVID 19 Preventive measures report of March 2021
- NADRES APRIL-2021 with COVID 19 Preventive measures report of February 2021
- NADRES MARCH-2021 with COVID 19 Preventive measures report of January 2021
- NADRES FEBRUARY-2021 with COVID 19 Preventive measures report of December 2020
- NADRES JANUARY-2021 with COVID 19 Preventive measures report of November 2020
- NADRES December-2020 with COVID 19 Preventive measures report of October- 2020
- NADRES November-2020 with COVID 19 Preventive measures report of September- 2020
- NADRES October-2020 with COVID 19 Preventive measures report of August- 2020
- NADRES September-2020 with COVID 19 Preventive measures report of July- 2020
- NADRES August-2020 with COVID 19 Preventive measures report of June- 2020
- NADRES July-2020 with COVID 19 Preventive measures report of May- 2020
- NADRES June-2020 with COVID 19 Preventive measures report of April- 2020
- Monthly prediction (May-2020) report of March- 2020
- Monthly prediction (Apirl-2020) report of February- 2020
- Monthly prediction (March-2020) report of January- 2020

- Livestock Disease Forecast State wise
- Livestock Disease Forecast-District wise
- LDF mobile app Download
- Sampling Plan (New)
- Scientometrics/ Bioinformatics (New)
- COVID-19 Epidemiological Analysis in India (New)
- Epi Calculator (New)
- SWOT
- Nadres IOOAI
- Web Traffic Analytics
- Monthly Bulletin (Archives)







Karnataka Veterinary Hospital Help-line Details

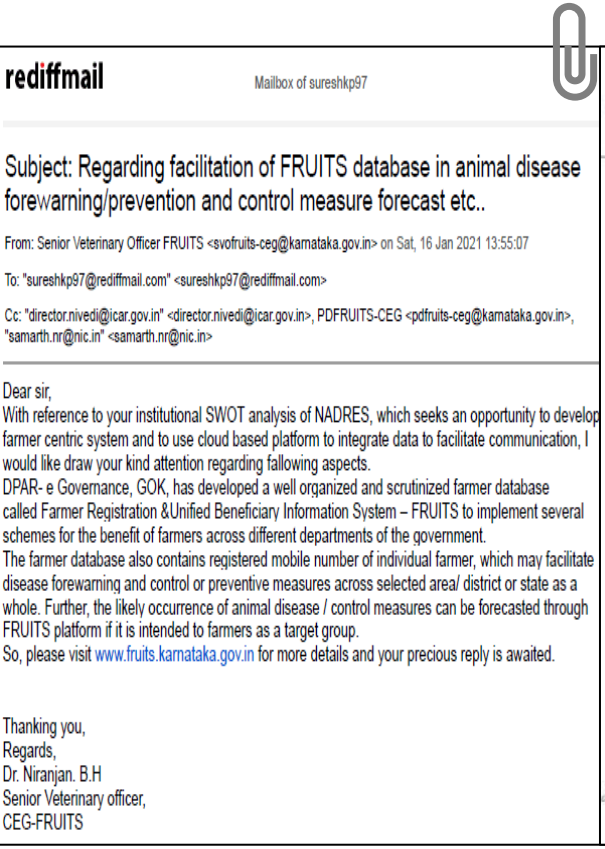
Bagalkote
Bangalore Rural
Bangalore Urban
Belgaum

District Name	Taluke Name	officer name	Address	Contact number	Postal Code
Bagalkote	Bagalkote	Dr.R.V.Jagapur	CVO (Specialization)	9448406366	Office of the Deputy Director (polyclinic) Animal Husbandry & Veterinary Service
Bagalkote	Bagalkote	Dr. V.K.Kovalli	Deputy Director Bagalkot	7760419811	Office of the Deputy Director (polyclinic) Animal Husbandry & Veterinary Service, Bagalkot-587101
Bagalkote	Bagalkote	Dr.Ravindr Hegade	Deputy Director Bagalkot	9611585781	Office of the Deputy Director Animal Husbandry & Veterinary Service Bagalkot- 587103
Bagalkote	Jamkhandi	N.V.Sankaraddi	Si.Veterinary Inspector	9448827793	Si.Veterinary Inspector Primary Veterinary Centers Hulyall Tq.Jamkhandi-586126
Bagalkote	Jamkhandi	A.H.Karikatti	Si.Veterinary Inspector	9901300740	Si.Veterinary Inspector Primary Veterinary Centers Kuchaganur Tq.Jamkhandi-
Bagalkote	Jamkhandi	R.A.Hagedal	Si.Veterinary Inspector	9880901289	Si.Veterinary Inspector Primary Veterinary Centers Surapalli Tq.Jamkhandi -
Bagalkote	Jamkhandi	R.M.Kulakarni	Si.Veterinary Inspector	9632880664	Si.Veterinary Inspector Primary Veterinary Centers Tubachi Tq.Jamkhandi-587119
Bagalkote	Jamkhandi	S.C.Metri	Si.Veterinary Inspector	8310795113	Si.Veterinary Inspector Primary Veterinary Centers Mareguddi Tq.Jamkhandi-
Bagalkote	Badami	S.G.Suragimath	Si.Veterinary Inspector	7676894930	Si.Veterinary Inspector Primary Veterinary Centers Layadgundi Tq.Badami-
Bagalkote	Bagalkote	S.N.Doddagadad	Si.Veterinary Inspector	9731324462	Si.Veterinary Inspector Primary Veterinary Centers Hire gulabal Tq.Bagalkote-
Bagalkote	Bagalkote	S.G.Shingalimath	Si.Veterinary Inspector	9886026707	Si.Veterinary Inspector Primary Veterinary Centers Bevoor Tq.Bagalkote-587115
Bagalkote	Bagalkote	Geerish Hireningapanavar	Si.Veterinary Inspector	9448923492	Si.Veterinary Inspector Primary Veterinary Centers Benakati Tq.Bagalkote-587111
Bagalkote	Bagalkote	I.S.Jigageni	Si.Veterinary Inspector	9945737769	Si.Veterinary Inspector Primary Veterinary Centers Gaddankeri Tq.Bagalkote-
Bagalkote	Hungud	G.S.Patil	Si.Veterinary Inspector	9845289899	Si.Veterinary Inspector Primary Veterinary Centers Nandawadgi Tq.Hungud-
Bagalkote	Hungud	A.H. Bennepanvar	Si.Veterinary Inspector	9538606649	Si.Veterinary Inspector Primary Veterinary Centers Chittargi Tq.Hungud-587112
Bagalkote	Hungud	S H Bengi	Si.Veterinary Inspector	9008057856	Si.Veterinary Inspector Primary Veterinary Centers Chik magi Tq.Hungud-587120
Bagalkote	Hungud	S C Hulahali	Si.Veterinary Inspector	9880373592	Si.Veterinary Inspector Primary Veterinary Centers Iddalage Tq.Hungud -587112
Bagalkote	Hungud	Dr:M.M.Hosamani I/C	Veterinary Officer	7892480724	Veterinary Dispensary Dhanur Tq.Hungud-587118

Risk Communication To Farmers

Farmer Registration and Unified beneficiary InformaTion System (FRUITS)

Karnataka state implements several schemes for the benefit of farmers. Farmers undertake different agriculture and agriculture related activities like growing Agriculture crops, Horticulture crops, Sericulture, Dairy, Poultry, Fishery etc. Each of this activity requires specialized knowledge and experience.



rediffmail

Mailbox of sureshkp97

Subject: Regarding facilitation of FRUITS database in animal disease forewarning/prevention and control measure forecast etc..

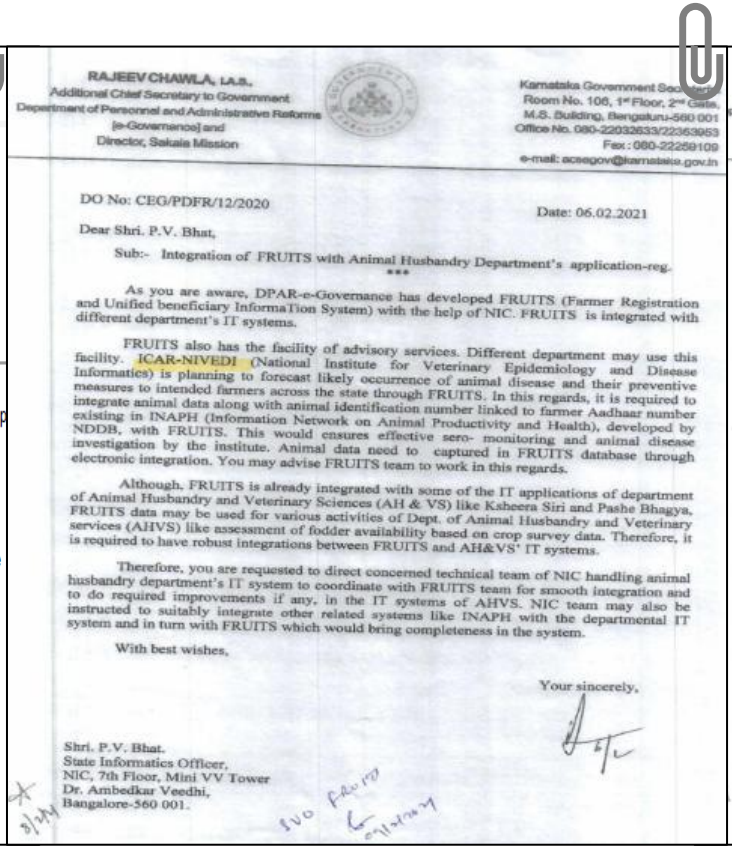
From: Senior Veterinary Officer FRUITS <svofruits-ceg@karnataka.gov.in> on Sat, 16 Jan 2021 13:55:07

To: "sureshkp97@rediffmail.com" <sureshkp97@rediffmail.com>

Cc: "director.nivedi@icar.gov.in" <director.nivedi@icar.gov.in>, PDFRUITS-CEG <pdfruits-ceg@karnataka.gov.in>, "samarth.nr@nic.in" <samarth.nr@nic.in>

Dear sir,
With reference to your institutional SWOT analysis of NADRES, which seeks an opportunity to develop farmer centric system and to use cloud based platform to integrate data to facilitate communication, I would like draw your kind attention regarding fallowing aspects.
DPAR- e Governance, GOK, has developed a well organized and scrutinized farmer database called Farmer Registration &Unified Beneficiary Information System – FRUITS to implement several schemes for the benefit of farmers across different departments of the government.
The farmer database also contains registered mobile number of individual farmer, which may facilitate disease forewarning and control or preventive measures across selected area/ district or state as a whole. Further, the likely occurrence of animal disease / control measures can be forecasted through FRUITS platform if it is intended to farmers as a target group.
So, please visit www.fruits.karnataka.gov.in for more details and your precious reply is awaited.

Thanking you,
Regards,
Dr. Niranjan. B.H
Senior Veterinary officer,
CEG-FRUITS



RAJEEV CHAWLA, I.A.S.,
Additional Chief Secretary to Government
Department of Personnel and Administrative Reforms
[e-Governance] and
Director, Sakala Mission

Karnataka Government Secretariat
Room No. 106, 1st Floor, 2nd Gate,
M.S. Building, Bengaluru-560 001
Office No. 080-22032633/22353953
Fax : 080-22259109
e-mail: acsegov@karnataka.gov.in

DO No: CEG/PDFR/12/2020

Date: 06.02.2021

Dear Shri. P.V. Bhat,

Sub:- Integration of FRUITS with Animal Husbandry Department's application-reg.

***

As you are aware, DPAR-e-Governance has developed FRUITS (Farmer Registration and Unified beneficiary InformaTion System) with the help of NIC. FRUITS is integrated with different department's IT systems.

FRUITS also has the facility of advisory services. Different department may use this facility. ICAR-NIVEDI (National Institute for Veterinary Epidemiology and Disease Informatics) is planning to forecast likely occurrence of animal disease and their preventive measures to intended farmers across the state through FRUITS. In this regards, it is required to integrate animal data along with animal identification number linked to farmer Aadhaar number existing in INAPH (Information Network on Animal Productivity and Health), developed by NDDB, with FRUITS. This would ensures effective sero- monitoring and animal disease investigation by the institute. Animal data need to captured in FRUITS database through electronic integration. You may advise FRUITS team to work in this regards.

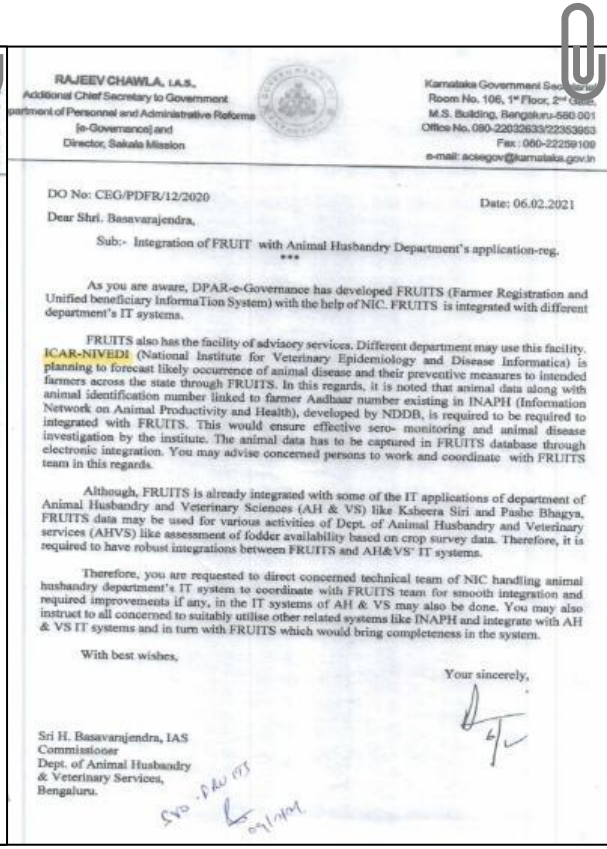
Although, FRUITS is already integrated with some of the IT applications of department of Animal Husbandry and Veterinary Sciences (AH & VS) like Ksheera Siri and Pashe Bhagya, FRUITS data may be used for various activities of Dept. of Animal Husbandry and Veterinary services (AHVS) like assessment of fodder availability based on crop survey data. Therefore, it is required to have robust integrations between FRUITS and AH&VS' IT systems.

Therefore, you are requested to direct concerned technical team of NIC handling animal husbandry department's IT system to coordinate with FRUITS team for smooth integration and to do required improvements if any, in the IT systems of AHVS. NIC team may also be instructed to suitably integrate other related systems like INAPH with the departmental IT system and in turn with FRUITS which would bring completeness in the system.

With best wishes,

Your sincerely,

Shri. P.V. Bhat,
State Informatics Officer,
NIC, 7th Floor, Mini VV Tower
Dr. Ambedkar Veedhi,
Bangalore-560 001.



RAJEEV CHAWLA, I.A.S.,
Additional Chief Secretary to Government
Department of Personnel and Administrative Reforms
[e-Governance] and
Director, Sakala Mission

Karnataka Government Secretariat
Room No. 106, 1st Floor, 2nd Gate,
M.S. Building, Bengaluru-560 001
Office No. 080-22032633/22353953
Fax : 080-22259109
e-mail: acsegov@karnataka.gov.in

DO No: CEG/PDFR/12/2020

Date: 06.02.2021

Dear Shri. Basavarajendra,

Sub:- Integration of FRUIT with Animal Husbandry Department's application-reg.

***

As you are aware, DPAR-e-Governance has developed FRUITS (Farmer Registration and Unified beneficiary InformaTion System) with the help of NIC. FRUITS is integrated with different department's IT systems.

FRUITS also has the facility of advisory services. Different department may use this facility. ICAR-NIVEDI (National Institute for Veterinary Epidemiology and Disease Informatics) is planning to forecast likely occurrence of animal disease and their preventive measures to intended farmers across the state through FRUITS. In this regards, it is noted that animal data along with animal identification number linked to farmer Aadhaar number existing in INAPH (Information Network on Animal Productivity and Health), developed by NDDB, is required to be required to integrated with FRUITS. This would ensure effective sero- monitoring and animal disease investigation by the institute. The animal data has to be captured in FRUITS database through electronic integration. You may advise concerned persons to work and coordinate with FRUITS team in this regards.

Although, FRUITS is already integrated with some of the IT applications of department of Animal Husbandry and Veterinary Sciences (AH & VS) like Ksheera Siri and Pashe Bhagya, FRUITS data may be used for various activities of Dept. of Animal Husbandry and Veterinary services (AHVS) like assessment of fodder availability based on crop survey data. Therefore, it is required to have robust integrations between FRUITS and AH&VS' IT systems.

Therefore, you are requested to direct concerned technical team of NIC handling animal husbandry department's IT system to coordinate with FRUITS team for smooth integration and required improvements if any, in the IT systems of AH & VS may also be done. You may also instruct to all concerned to suitably utilise other related systems like INAPH and integrate with AH & VS IT systems and in turn with FRUITS which would bring completeness in the system.

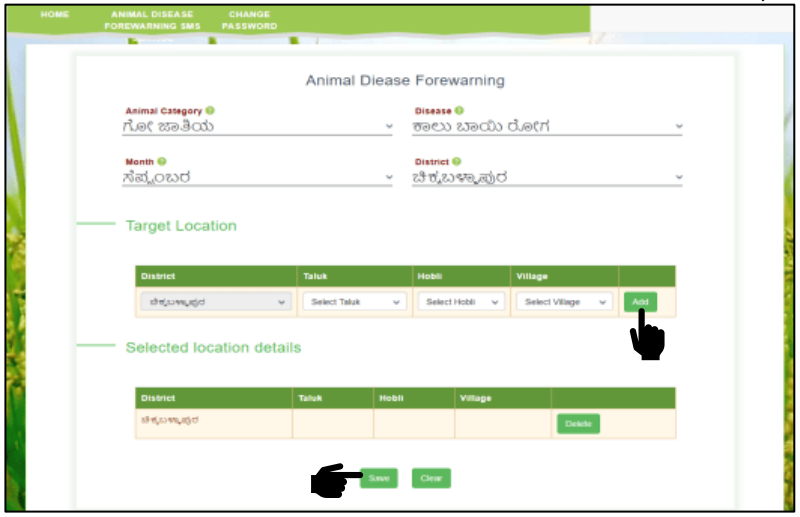
With best wishes,

Your sincerely,

Sri H. Basavarajendra, IAS
Commissioner
Dept. of Animal Husbandry
& Veterinary Services,
Bengaluru.

FARMERS Empowerment Through IT

Enter Disease Data in FRUITS by operator



Approving and Send SMS of disease forewarning to farmers by FRUITS Admin

Animal Category	Disease	SMS Details
ಗೋ ಜಾತಿಯ	ನೆರಡಿ ರೋಗ	ನಿಮ್ಮ ಗ್ರಾಮದಲ್ಲಿ ಮುಂಬರುವ ನವೆಂಬರ್ ತಿಂಗಳಲ್ಲಿ ರಾಸುಗಳಿಗೆ ನೆರಡಿ ರೋಗ ರೋಗ ಕಂಡುಬರುವ ಮುನ್ಸೂಚನೆ ಇರುವುದರಿಂದ ಹತ್ತಿರದ ಪಶುಚಿಕಿತ್ಸಾಲಯವನ್ನು ಸಂಪರ್ಕಿಸಿ. ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗಾಗಿ https://fruits.karnataka.gov.in/AnimalDiseaseDetails.aspx?AId=1&DId=1&Type=F ಕ್ಲಿಕ್ ಮಾಡಿ. From: FRUITS.
ಗೋ ಜಾತಿಯ	ಚಪ್ಪೆ ರೋಗ	ನಿಮ್ಮ ಗ್ರಾಮದಲ್ಲಿ ಮುಂಬರುವ ನವೆಂಬರ್ ತಿಂಗಳಲ್ಲಿ ರಾಸುಗಳಿಗೆ ಚಪ್ಪೆ ರೋಗ ರೋಗ ಕಂಡುಬರುವ ಮುನ್ಸೂಚನೆ ಇರುವುದರಿಂದ ಹತ್ತಿರದ ಪಶುಚಿಕಿತ್ಸಾಲಯವನ್ನು ಸಂಪರ್ಕಿಸಿ. ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗಾಗಿ https://fruits.karnataka.gov.in/AnimalDiseaseDetails.aspx?AId=1&DId=3&Type=F ಕ್ಲಿಕ್ ಮಾಡಿ. From: FRUITS.
ಗೋ ಜಾತಿಯ	ಕಾಲು ಬಾಯಿ ರೋಗ	ನಿಮ್ಮ ಗ್ರಾಮದಲ್ಲಿ ಮುಂಬರುವ ನವೆಂಬರ್ ತಿಂಗಳಲ್ಲಿ ರಾಸುಗಳಿಗೆ ಕಾಲು ಬಾಯಿ ರೋಗ ರೋಗ ಕಂಡುಬರುವ ಮುನ್ಸೂಚನೆ ಇರುವುದರಿಂದ ಹತ್ತಿರದ ಪಶುಚಿಕಿತ್ಸಾಲಯವನ್ನು ಸಂಪರ್ಕಿಸಿ. ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗಾಗಿ https://fruits.karnataka.gov.in/AnimalDiseaseDetails.aspx?AId=1&DId=7&Type=F ಕ್ಲಿಕ್ ಮಾಡಿ. From: FRUITS.
ಗೋ ಜಾತಿಯ	ಬೇಬಿಸಿಯಾ	ನಿಮ್ಮ ಗ್ರಾಮದಲ್ಲಿ ಮುಂಬರುವ ನವೆಂಬರ್ ತಿಂಗಳಲ್ಲಿ ರಾಸುಗಳಿಗೆ ಬೇಬಿಸಿಯಾ ರೋಗ ಕಂಡುಬರುವ ಮುನ್ಸೂಚನೆ ಇರುವುದರಿಂದ ಹತ್ತಿರದ ಪಶುಚಿಕಿತ್ಸಾಲಯವನ್ನು ಸಂಪರ್ಕಿಸಿ. ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗಾಗಿ https://fruits.karnataka.gov.in/AnimalDiseaseDetails.aspx?AId=1&DId=2&Type=F ಕ್ಲಿಕ್ ಮಾಡಿ. From: FRUITS.
ಗೋ ಜಾತಿಯ	ಗಂಟಲು ಬೇನೆ	ನಿಮ್ಮ ಗ್ರಾಮದಲ್ಲಿ ಮುಂಬರುವ ನವೆಂಬರ್ ತಿಂಗಳಲ್ಲಿ ರಾಸುಗಳಿಗೆ ಗಂಟಲು ಬೇನೆ ರೋಗ ಕಂಡುಬರುವ ಮುನ್ಸೂಚನೆ ಇರುವುದರಿಂದ ಹತ್ತಿರದ ಪಶುಚಿಕಿತ್ಸಾಲಯವನ್ನು ಸಂಪರ್ಕಿಸಿ. ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗಾಗಿ https://fruits.karnataka.gov.in/AnimalDiseaseDetails.aspx?AId=1&DId=8&Type=F ಕ್ಲಿಕ್ ಮಾಡಿ. From: FRUITS.

Anthrax

Black Quarter

FMD

Babesiosis

Bluetongue

NOVEMBER MONTH SMS REPORT -2021

Disease Name	District Name	No. of Farmers Received SMS	Disease Name	District Name	No. of Farmers Received SMS
Anthrax	Bangalore Rural	23513	FMD	Bangalore	24939
	Bellary	35622		Bangalore Rural	35625
	Chamarajanagar	25369		Bellary	23552
	Chikmagalur	25369		Chamarajanagar	25417
	Chitradurga	13984		Chikkaballapura	36740
	Davanagere	23136		Chikmagalur	14824
	Koppal	13952		Chitradurga	14013
	Mysore	107066		Dakshina Kannada	35990
	Tumkur	86360		Hassan	77507
Babesiosis	Bangalore	24939		Kodagu	2688
Black Quarter	Bagalkot	19170		Kolar	23105
	Hassan	77389		Mandya	107117
	Koppal	13952		Mysore	107270
	Shimoga	33083		Ramanagara	56371
	Tumkur	86361		Shimoga	33132
Bluetongue	Bagalkot	19178		Tumkur	86445
	Bellary	23552		Udupi	29532
	Chikkaballapura	36740		Yadgir	219
	Chitradurga	14013	Theileriosis	Bangalore	24939
	Davanagere	23221		Bangalore Rural	35625
	Koppal	14013		Ramanagara	56371
	Tumkur	86445	Totally 1407823 SMS has been sent in Karnataka for different Animal Disease		

NADRES Feedback

A&N

ICAR - National Institute of Veterinary Epidemiology and Disease Informatics

Customer/Client Feedback Form

Feedback for the Livestock Diseases forewarning bulletin of June 2021

1. **Details of the number of districts with diseases reported vs. forecast in your state.**

Sl. No	Diseases Name	No of districts outbreak occurred but not alerted**	Measure taken in case of disease forecasted: Yes or No**	Any other
1.	Anthrax	0	No	
2.	Babesiosis	0	No	
3.	Black Quarter	0	No	
4.	Bluetongue	0	No	
5.	Enterotoxaemia	0	No	
6.	Fascioliasis	0	Yes	
7.	Foot and mouth disease	0	No	
8.	Haemorrhagic septicaemia	0	No	
9.	Peste des Petits Ruminants	0	No	
10.	Sheep & Goat pox	0	No	
11.	Swine fever	0	No	
12.	Theileriosis	0	No	
13.	Trypanosomiasis	0	No	

**Details may be written here.

2. **What are the preventive measures taken in case of outbreak predicted?**

Awareness for deworming has been created through regular agromet advisory issued by our institute

3. **How would you rate your satisfaction with the following aspects of the services you have received or accessed?**

Description	Very satisfied	Satisfied	Unsatisfied	Not sure
Quality of services provided	Yes			
Timeliness of alerts received	Yes			
Benefits from forecasting of livestock diseases	Yes			
Your awareness of this service	Yes			

4.

Suggestions for further improvement of report.

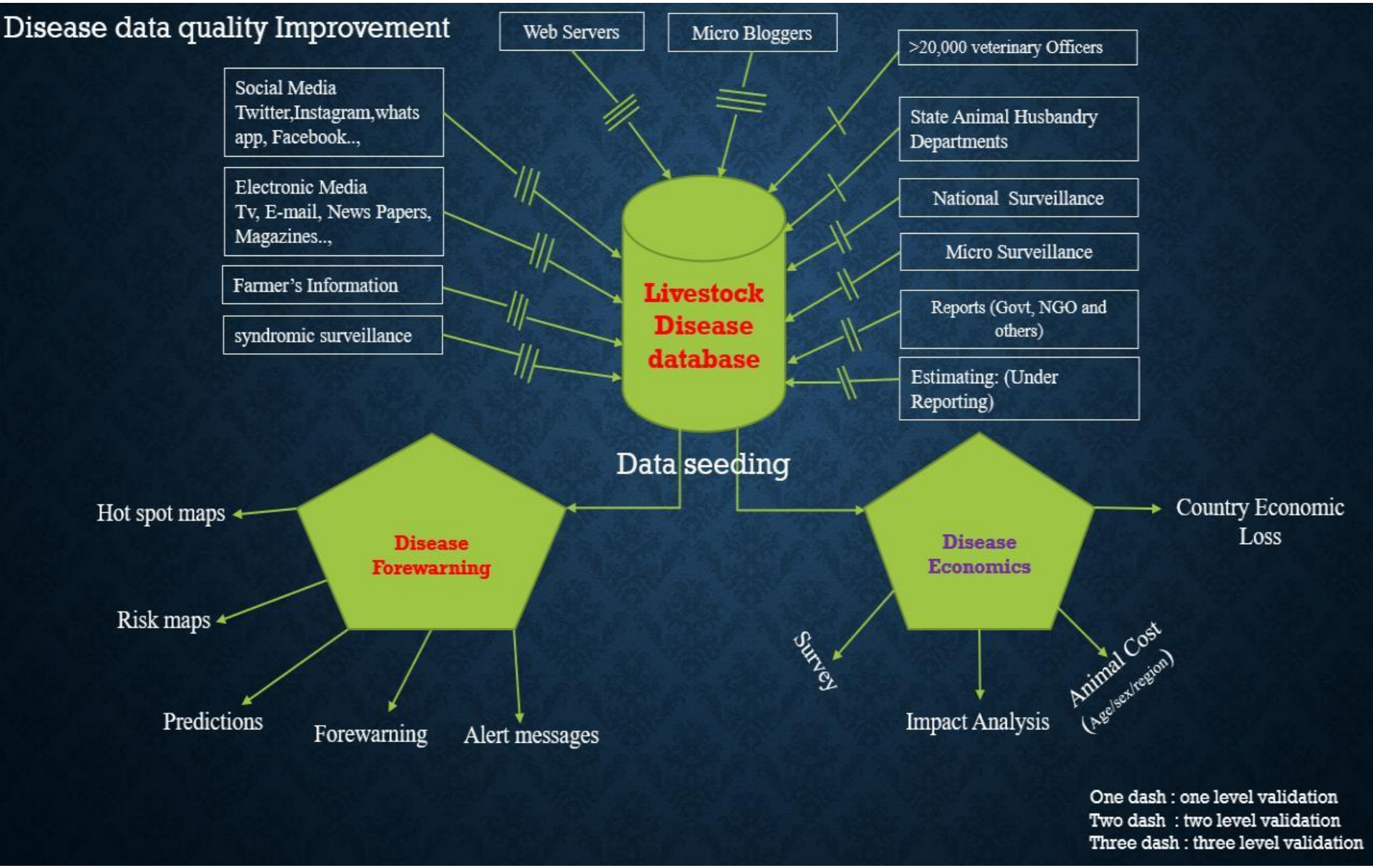
Jai Sunder

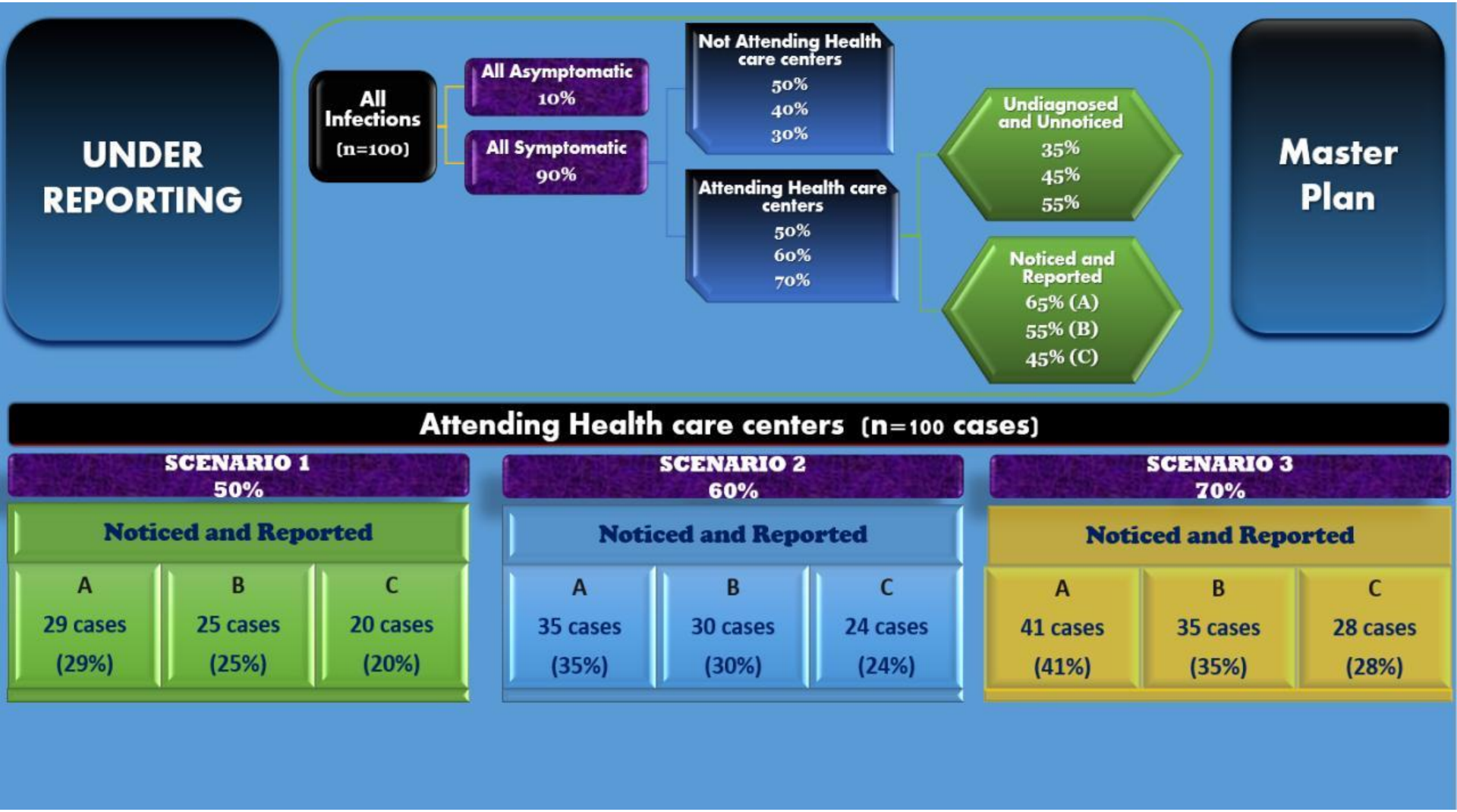
Pr Scientist & PI

AICRP-Port Blair

Year	total	Remarks
2020	25	Very satisfied
2021	11	Very satisfied

Future Challenges


Disease data quality Improvement
Web Servers
Micro Bloggers
>20,000 veterinary Officers
Social Media Twitter,Instagram,whats app, Facebook..,
State Animal Husbandry Departments
Electronic Media Tv, E-mail, News Papers, Magazines..,
National Surveillance
Micro Surveillance
Farmer's Information
Reports (Govt, NGO and others)
syndromic surveillance
Estimating: (Under Reporting)
Livestock Disease database
Data seeding
Hot spot maps
Disease Forewarning
Risk maps
Predictions
Forewarning
Alert messages
Disease Economics
Country Economic Loss
Survey
Impact Analysis
Animal Cost (Age/sex/region)
One dash : one level validation
Two dash : two level validation
Three dash : three level validation


UNDER REPORTING
All Infections (n=100)
All Asymptomatic 10%
All Symptomatic 90%
Not Attending Health care centers 50% 40% 30%
Attending Health care centers 50% 60% 70%
Undiagnosed and Unnoticed 35% 45% 55%
Noticed and Reported 65% (A) 55% (B) 45% (C)
Master Plan
Attending Health care centers (n=100 cases)
SCENARIO 1 50%
Noticed and Reported
A 29 cases (29%)
B 25 cases (25%)
C 20 cases (20%)
SCENARIO 2 60%
Noticed and Reported
A 35 cases (35%)
B 30 cases (30%)
C 24 cases (24%)
SCENARIO 3 70%
Noticed and Reported
A 41 cases (41%)
B 35 cases (35%)
C 28 cases (28%)

Estimation of Under-Reporting

- Estimation of outbreaks using farmer`s observation of clinical signs and validated further official surveillance report and claims of reporting tendencies from questionnaires.
- V= N x B x U x S.
- Where,

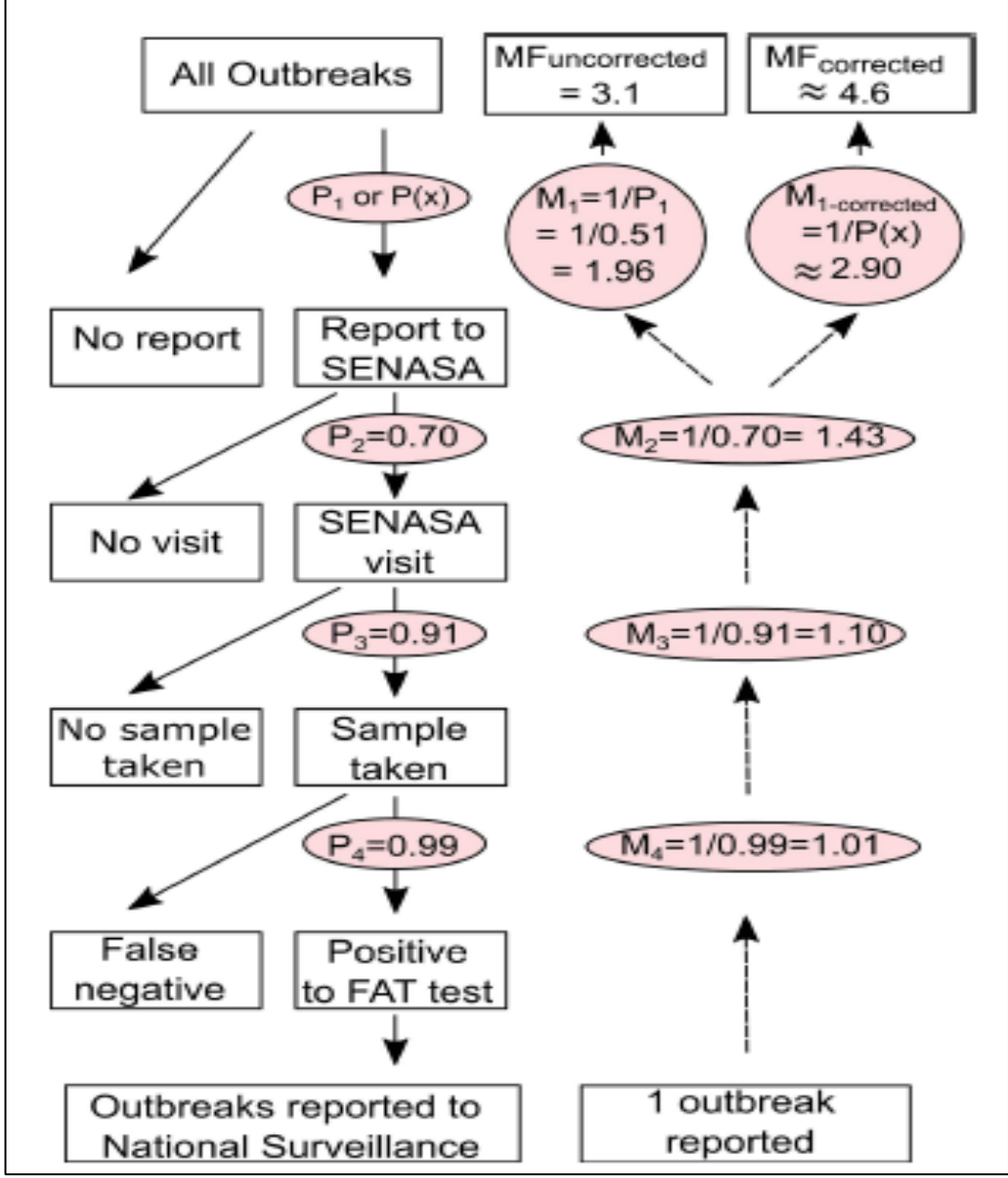
  V is the number of outbreaks/cases calculated.

  N is the total number of villages or farms (Epi unit) in a given districts (census data).

  B is the proportion of villages in a district experiencing the disease incidence.

  U is proportion of unvaccinated villages estimated from surveys.

  S is the proportion of farmers observed clinical signs from survey



Flow chart for estimating outbreaks

CONCEPT *TOWARDS THE DEVELOPMENT OF DISEASE EARLY WARNING SYSTEMS*