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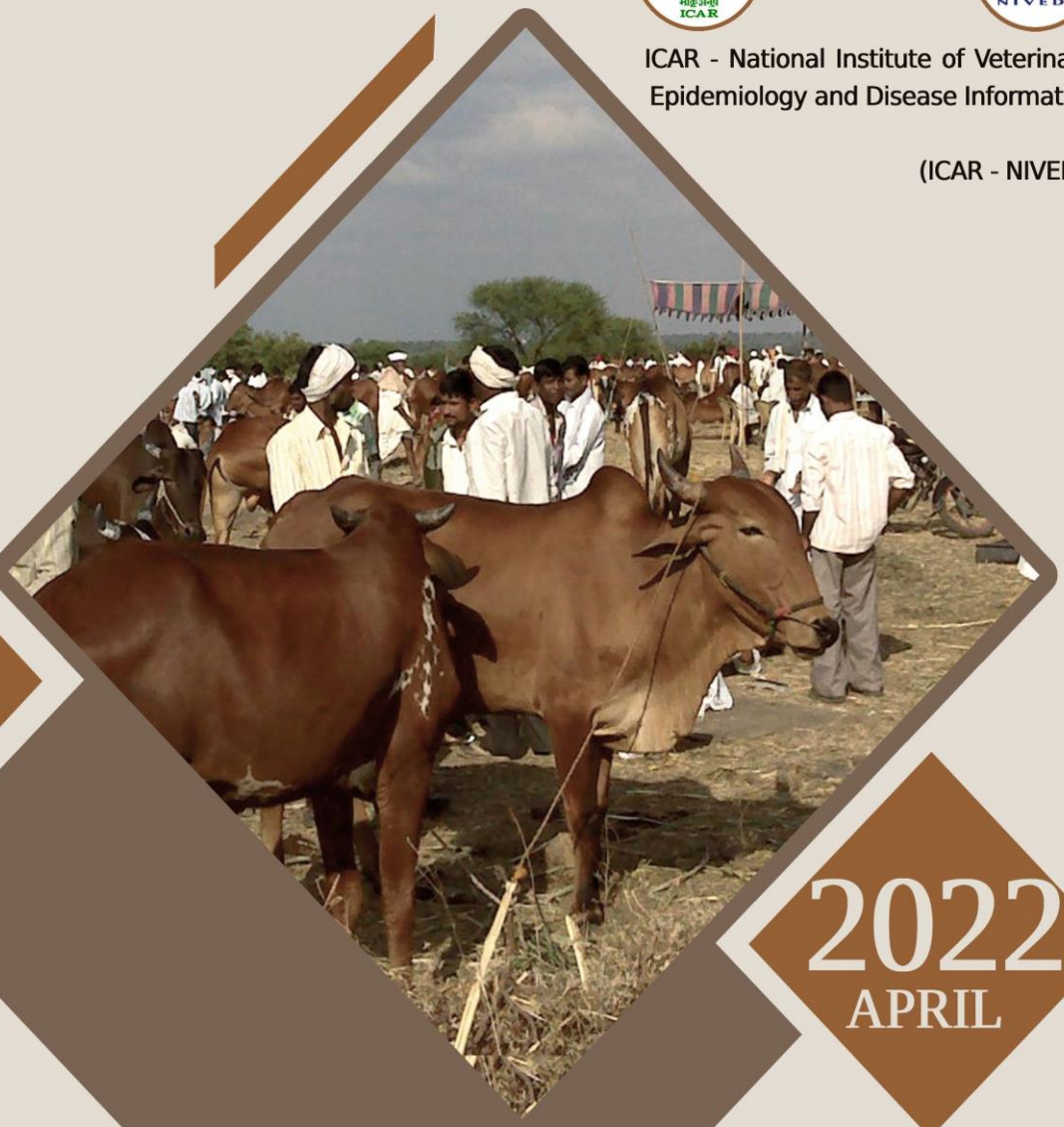

2022
APRIL

LIVESTOCK DISEASE FOREWARNING BULLETIN

Powered by Artificial Intelligence

PUBLISHED BY:
DIRECTOR
ICAR-NIVEDI

NOW LINKED WITH
FARMER REGISTRATION AND UNIFIED BENEFICIARY INFORMATION SYSTEM
(FRUITS)

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Disclaimer

The forewarnings are based on the retrospective disease data available in the NADRES database. Hence, for those states wherein data is limited/less, the forewarning may not be realistic. Further the forewarning will not take into consideration the control measures that are *in situ*.

Acknowledgment

I would like to acknowledge the constant support and inspiration from Hon'ble Secretary, DARE, and Director General, ICAR, Government of India, New Delhi.

I would like to express sincere everlasting gratitude to Hon'ble Deputy Director General (Animal Science) for his constant encouragement, support, and guidance.

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Director (Acting)
ICAR- NIVEDI

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1. About the Bulletin…

Livestock sector plays a crucial role in the rural economy of India as around 20.5 million people depend upon livestock for their livelihood. Even though the investment in the livestock sector is meagre, tremendous achievements have been observed in the sector during the last decade. As it is an important component in poverty alleviation programmes, continuous emphasis is being laid on this sector for enhancing the quality of the primary and secondary products in the international market, which in turn demands improved animal health. Therefore, livestock development programmes cannot succeed unless a well-organized animal health service is built up and in place for safeguarding the livestock against economically important diseases.

India has made a noteworthy success in the eradication of Rinderpest (RP), CBPP, AHS and Dourine. However, there are several other infectious and non-infectious diseases prevailing in the country causing huge annual economic loss. Prevention, control and eradication of the animal diseases need a thorough understanding of the epidemiology as well their economic impact.

National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI) has the mandate to carry out research activities in the area of veterinary epidemiology and disease informatics. With the eradication of RP successfully, India has not only proved its ability to face the challenges but also to succeed, despite various limitations. Similar efforts are needed to control and eradicate diseases like FMD, PPR, Brucellosis, CSF, HS etc., which cause huge economic loss annually to the livestock industry. To this end, ICAR-NIVEDI has identified 13 priority diseases, based on the past incidence patterns and has built a strong database of these diseases. The database, which is the backbone of the National Animal Disease Referral Expert System (NADRESv2), is used for providing monthly livestock disease forewarning, which is compiled in this monthly bulletin to alert the animal husbandry departments, both at the National/state level, to take appropriate control measures. We hope users/stakeholders find this bulletin useful in their quest to control livestock diseases. This forewarning bulletin will assist the field Veterinarians in adopting appropriate preventive and control measures, thereby reducing the occurrence of livestock disease outbreaks.

2. SUMMARY OF THE FOREWARNING BULLETIN....

The association between infectious diseases and the climate was known from ancient times. Hippocrates observed in the 5th century that epidemics were associated with natural phenomenon rather than divinities or demons. In modern times, our increasing capabilities to detect and predict climate variations joined with growing evidence for global climate change, have powered interest in understanding the impacts of climate on animal health, particularly the emergence and transmission of infectious disease agents. Simple reasoning suggests that climate can affect infectious disease patterns because disease agents (viruses, bacteria, and parasites) and their vectors are sensitive to temperature, moisture, and other ambient environmental conditions.

India being an agriculture-based country, the livestock sector plays a vital role in contributing to the economy. A robust reporting and forewarning system enable the concerned authorities in disease preparedness and awareness of the risk associated with livestock disease. Therefore, the economic loss due to morbidity and mortality of the animals is reduced thereby helps to increase the productivity in terms of egg, meat, and dairy products. National Animal Disease Referral Expert System database is a weather-based forewarning system enabled with an artificial intelligence system developed by ICAR- National Institute of Veterinary Epidemiology & Disease Informatics Bengaluru, Karnataka state, India that forecast potential threats from pathogens two months in advance to provide the stakeholders with sufficient timeline for awareness and preparedness to act. Artificial Intelligence(AI) and Machine Learning (ML) models use the programmed algorithms that receive and analyse input data to predict output (Infectious risk prediction) values within an acceptable range. As new data fed into these algorithms, they learn and optimize their operations to improve performance, developing intelligence over time.

Summary

The livestock disease forecasting for April 2022 revealed Jharkhand, Assam, Karnataka, Uttar Pradesh and Kerala as the top five states with high predicted livestock disease outbreaks.

Among the predicted diseases, control programmes are in full swing for FMD and PPR in the country and due attention is demanded by the predicted disease outbreaks of these diseases. Among the expected disease outbreaks, the predicted FMD outbreaks are high in Karnataka (10) followed by Meghalaya (6), Manipur (5), Kerala (5) and Arunachal Pradesh (5) and whereas predicted PPR outbreaks are high in West Bengal (13) and Jharkhand (13). Further the co-occurrence of FMD and HS can be expected in Assam, Jharkhand, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Odisha, Rajasthan, Tripura and West Bengal. Among the different diseases in livestock, the predicted outbreaks are expected to be high for PPR (76).

The major challenges for the effective disease control programme being the lack of thorough understanding about the complexity of disease dynamics, wide host range of pathogens, widening of niche of pathogens due to climate change etc. The effective control programme for major livestock diseases in the country can be efficiently addressed by planning and execution of available control measures in the high risk areas and routine surveillance and monitoring of diseases.

Table S1. Summary of State wise Livestock Disease forewarning for April 2022

Sl. No	State Name	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis	Total number of diseases predicted
1	Andaman and Nicobar	1	0	0	0	0	3	0	1	0	0	2	0	0	**07**
2	Andhra Pradesh	2	0	0	0	0	0	0	1	0	4	0	0	0	**07**
3	Arunachal Pradesh	0	0	0	0	0	0	5	0	1	0	5	0	0	**11**
4	Assam	1	1	14	0	3	8	3	6	4	2	15	1	0	**58**
5	Bihar	0	1	0	0	0	0	0	1	1	0	1	2	2	**08**
6	Chandigarh	0	0	0	0	0	0	0	0	0	0	0	0	0	**00**
7	Chhattisgarh	0	0	0	0	0	0	0	0	0	1	0	0	0	**01**
8	Dadra and Nagar Haveli	0	0	0	0	0	0	0	0	0	0	0	0	0	**00**
9	Daman and Diu	0	0	0	0	0	0	0	0	0	0	0	0	0	**00**
10	Goa	0	0	0	0	0	0	0	0	0	0	0	0	0	**00**
11	Gujarat	0	0	0	0	0	0	1	1	2	1	0	0	0	**05**
12	Haryana	0	0	0	0	1	0	0	0	5	2	3	0	0	**11**
13	Himachal Pradesh	0	0	1	0	1	0	2	0	3	1	0	0	0	**08**
14	Jammu and Kashmir	0	0	0	0	0	0	0	0	0	5	0	0	0	**05**
15	Jharkhand	0	23	4	0	4	23	4	5	13	4	2	20	24	**126**
16	Karnataka	7	0	4	0	7	0	10	4	6	13	0	0	0	**51**
17	Kerala	3	2	0	0	1	0	5	5	7	0	1	11	0	**35**
18	Lakshadweep	0	0	0	0	0	0	0	0	0	0	0	0	0	**00**
19	Madhya Pradesh	1	0	2	0	0	0	0	2	0	0	1	0	0	**06**
20	Maharashtra	2	0	3	0	2	0	2	3	7	5	1	4	0	**29**
21	Manipur	0	0	6	0	0	5	5	1	0	1	4	0	0	**22**
22	Meghalaya	0	0	1	0	0	0	6	3	0	0	8	0	0	**18**
23	Mizoram	0	0	0	0	0	0	0	1	0	0	8	0	0	**09**
24	Nagaland	0	0	1	0	0	0	0	2	0	0	4	0	0	**07**
25	NCT of Delhi	0	0	0	0	0	0	0	0	0	0	0	0	0	**00**
26	Odisha	5	0	0	0	0	0	3	5	3	0	1	1	2	**20**
27	Puducherry	0	2	0	0	0	1	0	0	0	1	0	0	1	**05**
28	Punjab	0	0	0	0	0	0	0	0	1	0	2	0	0	**03**
29	Rajasthan	0	0	1	0	0	0	2	1	2	0	1	0	0	**07**
30	Sikkim	0	0	0	0	0	0	0	0	1	0	1	0	0	**02**
31	Tamil Nadu	2	0	1	0	0	0	0	0	1	0	0	0	0	**04**
32	Telangana	1	0	0	0	3	0	0	1	0	5	0	0	0	**10**
33	Tripura	1	2	1	0	0	1	1	2	0	1	4	0	0	**13**
34	Uttar Pradesh	0	14	0	0	0	5	2	0	4	4	0	20	0	**49**
35	Uttarakhand	0	0	0	0	0	0	1	0	1	0	0	0	0	**02**
36	West Bengal	1	2	7	0	0	0	1	2	13	0	0	3	1	**30**
Total number of districts likely to report		**27**	**47**	**46**	**0**	**22**	**46**	**53**	**46**	**76**	**50**	**64**	**62**	**30**	**569**

*Number of predicted disease incidence was summarised considering only High risk and Very high risk

3. INTRODUCTION TO NADRES v2

The geographic and seasonal distribution of many infectious diseases are associated with climate and therefore the possibility of using seasonal climate forecasts as predictive indicators in disease early warning system (EWS) became imminent. In this context, ICAR-NIVEDI, in its quest for achieving better livestock health, had developed an interactive web portal named "National Animal Disease Referral Expert System (NADRES)" during early part of the first decade of the millennium. The web portal, which was developed from the financial support of National Agricultural Technology Project, was launched in the year 2005. The portal which is interactive, allows the user/stakeholder to access livestock disease forewarning (n=13) at the district level for entire country two months in advance. The portal which was initially built on oracle platform was later changed to MySQL platform to store the administrator provided disease information and other relevant meteorological and risk factor information. However, with the availability of remote sensed satellite images and the advancement in information technology and statistical algorithms, the upgradation of NADRES became inevitable. To this end, a newer version of NADRES (NADRES *V2*) has been developed and is ready for release.

How it is different from previous version?

In brief, it can be said that NADRES $_{V2}$ underwent a sea change not only in its internal structure but also in its physical design. As a result, now the central menu bar consists of Home, About us, Risk factors, Analysis, Livestock disease, post prediction validation and contact details**.** Risk factors menu comprises of details on resolution, time interval, units and source of 11 meteorological and 5 remote sensing parameters**.** Analytics menu has various analysis options**.** The newly created livestock disease menu has the details regarding species affected, clinical signs and preventive measures to be adopted for the 13 economically important diseases**.** Post prediction validation menu contains the outbreak reports vs prediction**.** The menu bar on the RHS tabs include online GIS, state wise Livestock disease forecast, district wise Livestock disease forecast, Epi-calculator, download links for mobile app, etc**.** The website now hosts disease maps in the form of choropleth maps for 13 diseases in two time periods **(**1990-2000 and 2000-2018**).** Similarly, disease trends plots exhibit periodic regression plots providing future trend for the disease**.** On the LHS, Login menu is provided for authorized persons to login and enter disease details and other related parameters**.** Disease maps provide choropleth maps for 13 diseases in two time periods **(**1990-2000 and 2000-2018**)** is presented**.** Disease trends- Periodic regression plots are exhibited for prediction of the diseases**.** Auto-messaging option has been created to send the reminders in the form of text messages to concerned PI's and Co-PI's of AICRP centers for submission of outbreak reports**.** This message is sent weekly to all the concerned officials**.** Additionally, a message is sent to the concerned veterinary officers in Karnataka for initiation of preventive measures for the forewarned diseases at the block level**.** Plans are in place to incorporate farmers' and local vets' mobile numbers in to the list so that they may be asked to initiate preventive measures for the forewarned diseases**.**

Fig 3.1. NADRES V_2 Home page

The forewarning methodology used is unique and has not been used earlier for livestock disease forewarning in India**.** Following few paragraphs describe about the forewarning methodology used**.** It is a well**-**known fact that weather plays an important role in the precipitation of many diseases and therefore, the climatic parameters such as land surface temperature **(**LST**)**, precipitation, wind velocity, humidity etc are considered as risk parameters**.** These parameters along with other non**-**climatic parameters such as livestock population, density, Normalized Differential Vegetation Index **(**NDVI**)**, soil moisture constitute the overall risk parameters**.** A total of 24 such parameters are collected**/**generated at village level and then aggregated to district level before these are used for analysis**.**

In addition to the output provided at interactive web portal, the NADRES output are also published in the form of monthly livestock disease forewarning bulletins**.** The prediction results come with a disclaimer that forewarnings do not take into account of the control measures that already in situ and also may not be realistic for those regions where the data is either unavailable or limited. This bulletin provides the likely occurrence of the 13 shortlisted diseases two months in advance at the district level, disease forewarning maps, prediction accuracy, details on diseases, species affected, clinical signs and its preventive measures**.**

In summary, it can be said that NADRES $_{V2}$ has underwent substantial changes not only in its internal structure but also in its physical design and can be a useful tool for visitors of the website, farmers, vets, policy makers etc.

4. Forewarning Methodology

I. Materials

Livestock disease data

Previous 10 years′ livestock disease outbreak data retrieved from the NADRES database linked with Risk factors data.

Livestock population data

The population data at village level for five major livestock species viz., cattle, buffalo, sheep, goat and pigs were obtained from 20th Livestock census (2019) fromDepartment of statistics, DAHD, GOI.

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
		Total	190904	193462	1.3
2	Buffalo	Total	108702	109852	1.1
3	Sheep	Exotic	3781	4088	8.1
		Indigenous	61288	70172	14.5
		Total	65069	74260	14.1
4	Goat	Total	135173	148885	10.1
5	Pig	Exotic	2456	1897	-22.8
		Indigenous	7837	7159	-8.7
		Total	10293	9056	-12
6	Yaks	Total	77	58	-24.7
7	Mithuns	Total	298	386	29.5
8	Horses & Ponies	Total	625	342	-45.3
9	Mules	Total	196	84	-57.1
10	Donkeys	Total	319	124	-61.1
11	Camels	Total	400	252	-37
Total Livestock		**512056**	**536761**	**4.8**	

Meteorological and Remotely Sensed Data:

The parameters such as air temperature **(**^{0}C**)**, perceptible water (mm), pressure **(**millibar**)**, relative humidity (%) and sea level pressure **(**millibar**)** were extracted from National Centre for environmental prediction **(**NCEP**).** The parameters such as potential evapotranspiration **(**PET**)**, Enhanced Vegetation Index **(**EVI**)**, Leaf Area Index **(**LAI**)**, Land Surface Temperature **(**LST**)**, Normalised Difference Vegetation Index **(**NDVI**)** were extracted from remote sensed images from MODIS website **(**https://modis.gsfc.nasa.gov/). In brief, the MODIS products from NASA-TERRA satellite was downloaded for the Indian locations by specifying the tiles (H24V5, H25V6, H24V6, H24V7, H25V7, H25V8, H26V7, H26V6) from 2001 to till date.

The details are given below;

PRODUCT	Science Data Sets (HDF Layers)
MOD15A2H	Lai_500m(Leaf area index) 8 days average
MOD16A2	PET_500m (Total Potential Evapotranspiration) 8 days average
MOD11A2	LST_Day_1km (Daytime Land Surface Temperature) 8 days average
MOD13A1	i. 500m 16 days NDVI (Normalized Difference Vegetation Index) ii. Enhanced Vegetation Index (EVI) 16 days average

The downloaded HDF files (Datasets, which are multidimensional arrays (layers) of a homogeneous type) were converted to GeoTIFF files (single layer data) using R packages, which were later used to extract the parameters by linking it with the sinusoidal values of the Indian villages. The scale factors were multiplied for the extracted values as specified by the MODIS data products to get the values of the parameters. As shown above, the atmospherically corrected NDVI was collected on 16-day interval at 250-meter resolution using MODIS product MOD13A1 and LST was collected on 8-day interval using MOD11A2 at 1 KM resolution.

The parameters such as rainfall, soil moisture and wind speed were obtained from Global Land DataAssimilation System of NASA (https://disc.gsfc.nasa.gov). The remaining parameters were downloaded from climatic research unit (CRU) of University of East Anglia website. It is worth mentioning that the entire process of extraction, assimilation, processing and aligning have been done using R programming language and R environment. After aligning the climatic and non-climatic data with the disease and the livestock population data (aggregated at the district level), the statistical analysis was performed in the R environment.

Initially, two regression models and six machine learning models were applied to test their suitability to fit the data and in all, three models; one regression model (Generalized Linear Model (GLM) and two machine learning models, *viz.*, Gradient Boosting Machine Learning Algorithm (GBM) and Random Forest (RF), which fitted to data well were incorporated for the purpose of disease prediction. The models were trained using the case and control data available at ICAR-NIVEDI. Validation of the models were done by dividing the total observations for a particular disease into marker samples and validation samples and accuracy was tested in terms of discrimination power, which was done using Receiving Operating Characteristics (ROC), Cohen Kappa (Heildke Skill Score) and True Skill statistics (TSS). Once the models produce the probability value, it was used for categorizing the risk. Briefly, when all the models produce the p value of more than 0.5, then the highest p value is used for determining the high-riskcategory. If all the models or any one model produces the p value of less than 0.5, then the lowest p value was used for categorizing lower risk. This was doneto minimize the false alert. Thus, the risk predictions based on the probability values ranging from 0-1 are made as follows; Very High Risk (p=0.81-1.0), High Risk (p=0.61-0.80), Moderate Risk (p=0.41-0.60), Low Risk (p=0.21-0.40), Very Low Risk (p=0.0-0.20) and No Risk (p=0.0) for the occurrence of a said disease. It is believed that categorizing districts in to various risk categories will help the stake holders to effectively utilize the available resources (money and manpower).

II. NADRES v2 Data Flow and Data Processing Diagram

A) Data Flow Diagram:

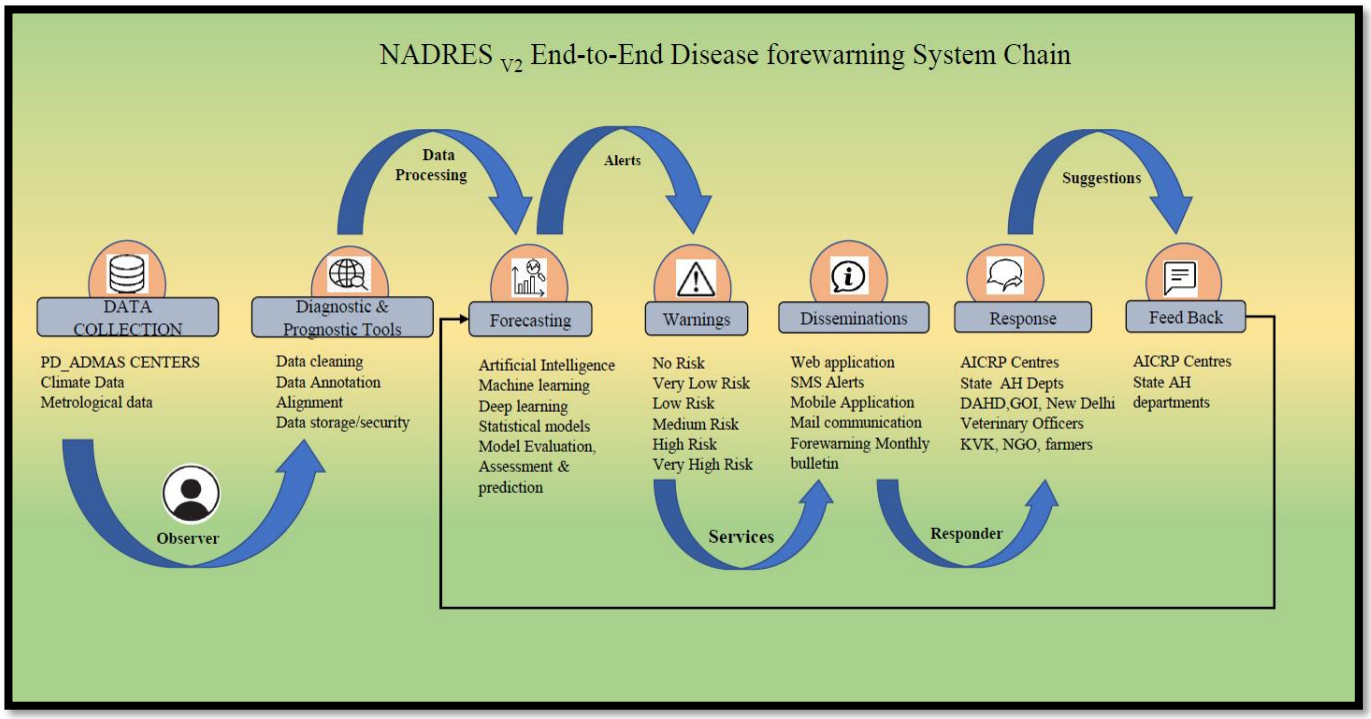


Fig 4.1. NADRES V2 Data Flow Diagram.

B) Artificial Intelligence enabled Data Capturing and Forewarning System:

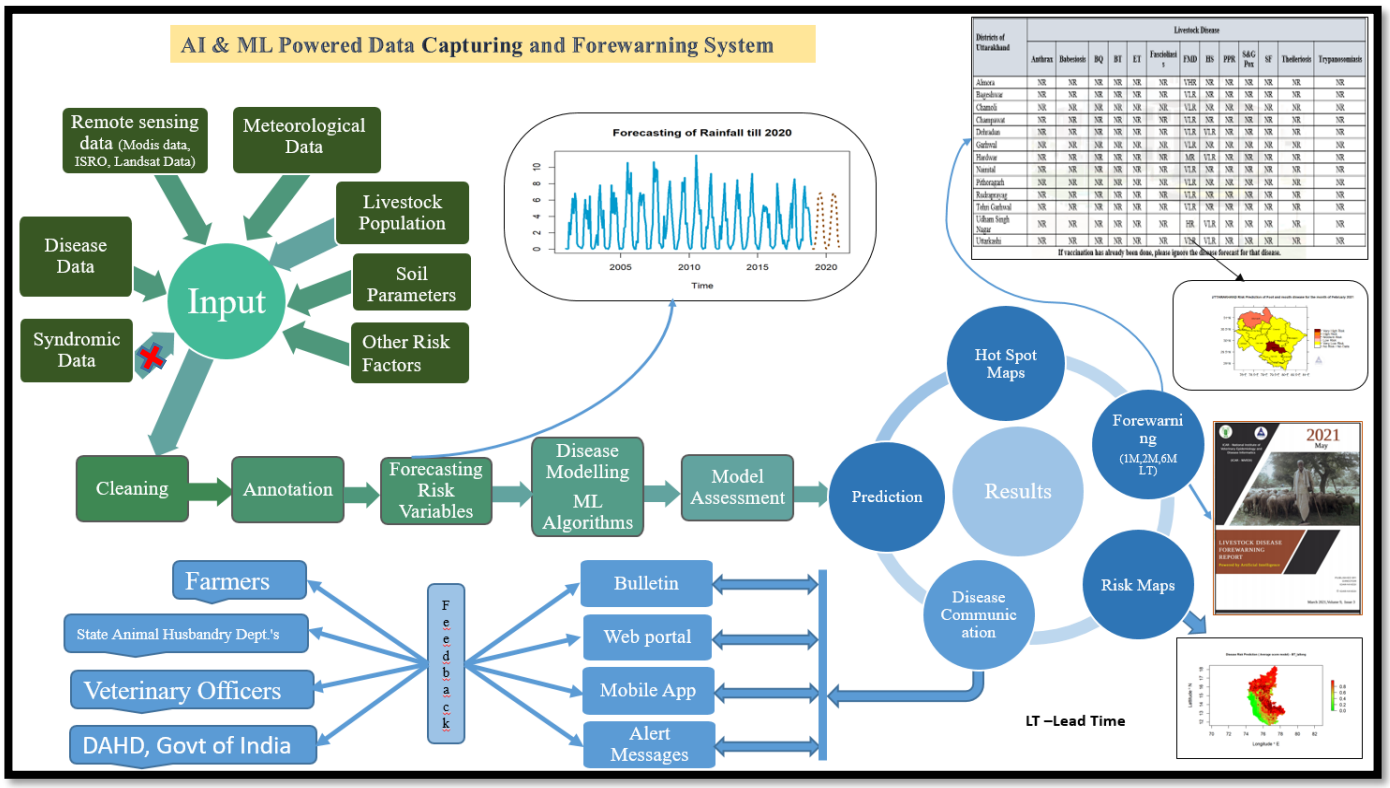


Fig 4.2. Data Capturing and Forewarning system

III. Weighted Outbreak Score

The outbreak data for the month of forecasting is extracted from NADRES database for the period of 10 years from current year. Outbreak data of 13 important livestock diseases are considered. The data is aggregated at district level and the weighted score is defined based on the number of outbreaks for each district in each month considering last 10 years. The weightage score was assigned as 0 for less than three number of outbreaks in the last 10 years for selected month, score 1 for 3–6 number of outbreaks and 2 for more than 6 outbreaks. This weightage score for each district is labelled as risk variable in building the models and risk maps.

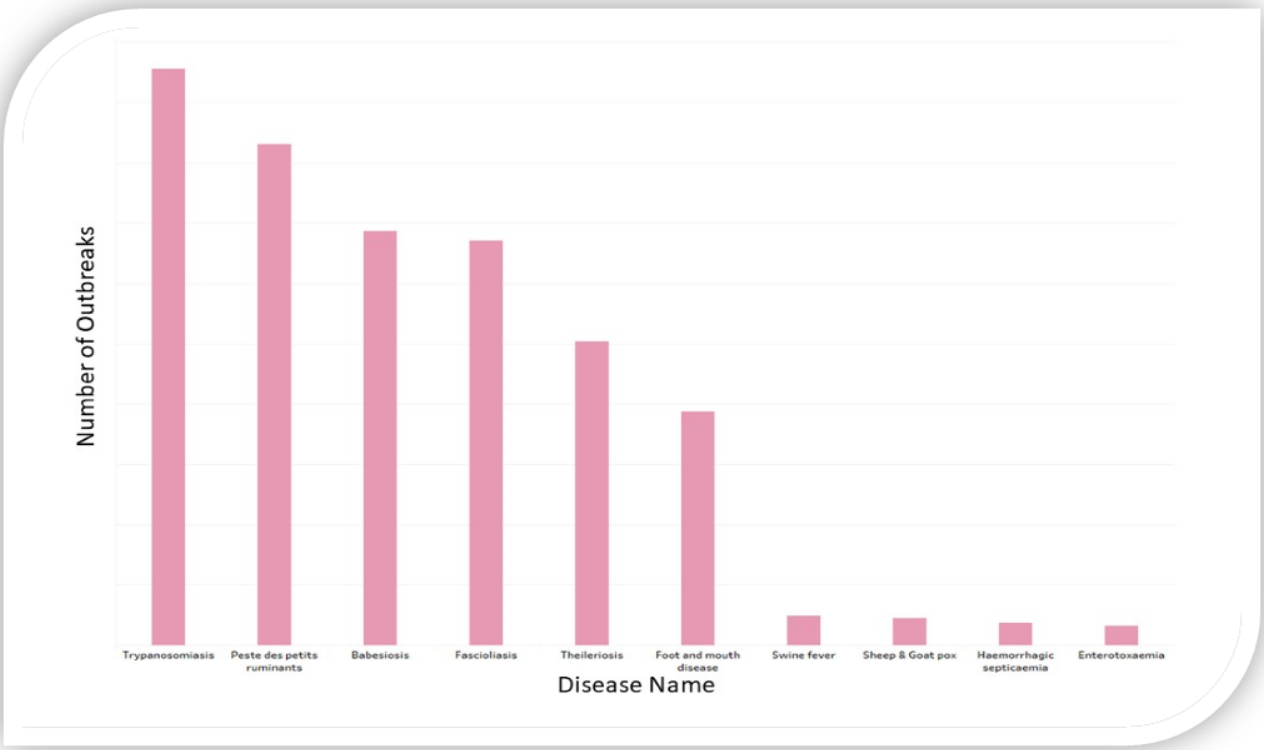


Fig 4.3. Top ten livestock diseases (2021)

IV. Forecasting of Weather Parameters

Weather forecasting has been one of the most challenging problems around the world because of both its practical value in meteorology and popular sphere for scientific research. Weather forecast systems are among the most complex equation systems that computer has to solve. A great quantity of data, coming from satellites, ground stations and sensors located around our planet send daily information that must be used to foresee the weather situation in next hours and days all around. Weather forecasts provide critical information about future weather. There are various techniques involved in weather forecasting, from relatively simple observation of the sky to highly complex computerized mathematical models. Further, forecast products by Indian Metrological department were used for validationof our forecasts (https://mausam.imd.gov.in/imd_latest/contents/extendedrangeforecast.php).

Following are the basic steps of forecasting process:

1. Determine the forecast's purpose
2. Establish a time horizon
3. Select a forecasting technique
4. Gather and analyse data
5. Perform the forecast
6. Monitor the forecast and use it in prediction of disease

Statistical Models used for forecasting of weather and remotely sensed variables

ARIMA stands for Autoregressive Integrated Moving Average. ARIMA is also known as Box-Jenkins approach. Box and Jenkins claimed that non-stationary data can be made stationary by differencing the series, Y_t. The general model for Y_t is written as,

$$\mathbf{Y_t = \phi_1 Y_{t-1} + \phi_2 Y_{t-2} \ldots \phi_p Y_{t-p} + \epsilon_t + \theta_1 \epsilon_{t-1} + \theta_2 \epsilon_{t-2} + \ldots \theta_q \epsilon_{t-q}}$$

Where, Y_t is the differenced time series value, ϕ and θ are unknown parameters and ϵ are independent identically distributed error terms with zero mean. Here, Y_t is expressed in terms of its past values and the current and past values of error terms.

The ARIMA Model combines three basic Methods:

- Auto Regression (AR) – In auto-regression the values of a given time series data are regressed on their own lagged values, which is indicated by the "p" value in the model.
- Differencing (I-for Integrated) – This involves differencing the time series data to remove the trend and convert a non-stationary time series to a stationary one. This is indicated by the "d" value in the model. If d = 1, it looks at the difference between two-time series entries, if d = 2 it looks at the differences of the differences obtained at d =1, and so forth.
- Moving Average (MA) – The moving average nature of the model is represented by the "q" value which is the number of lagged values of the error term.

This model is called Autoregressive Integrated Moving Average or ARIMA (p, d,q) of Y_t. We will follow the steps enumerated below to build our model. ARIMA models were run in 18 combinations of p, d, q. Based on the minimum AIC value, the order of ARIMA model was selected. This order was used for the prediction of all the weather parameters used in developing disease forewarning models.

V. Implementation of Principal Component Analysis

Large datasets are gradually common and are often difficult to interpret. 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) reduce 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.

VI. Machine Learning Models

Disease outbreak data were aligned with generated risk variables to the respective latitude and longitude, which were subjected to climate-disease modelling. A number of models were fit to aligned data and tested for accuracy in terms of discrimination power. Two regression models, Generalized Linear Models (GLM) and Generalized Additive Models (GAM) and six machine learning algorithms, i.e. Random Forest (RF), Boosted Regression Tree (BRT), Artificial Neural Network (ANN), Multiple Adaptive Regression Spline (MARS), Flexible Discriminant Analysis (FDA) and Classification Tree Analysis (CTA) were employed for disease modelling. Different modelling methods return different types of 'model object' and all these model objects could be used for the predict function to make predictions for any combinations of values of independent variables. Response plots were created to explore and understand model predictions.

The fitted models were assessed for their discriminating power using Receiving Operating Characteristic (ROC) curve, Cohen's Kappa (Heildke Skill Score) and True Skill Statistics (TSS). These measures were used to evaluate the quality of predictions based on presence-absence data. Raster Stack was used to combine the results of individual predictions by different model methods. All the models were assessed for overfitting.

The outcome of best fitted models was in probability of disease occurrence and was categorised into 6 risk levels as No risk (NR), Very low risk (VLR), Low risk (LR), Moderate risk (MR), High risk (HR) and Very high risk (VHR) for enabling the stakeholders to take appropriate control measures by suitably allocating available resources.

5. Accuracy of Prediction

Serial No.	Diseases	Accuracy (%)
1.	Anthrax	99.54
2.	Babesiosis	98.15
3.	Black Quarter	96.14
4.	Blue Tongue	99.38
5.	Enterotoxaemia	99.54
6.	Fascioliasis	99.54
7.	Foot and mouth disease	96.45
8.	Haemorrhagic septicaemia	97.38
9.	Peste des Petits Ruminants	96.14
10.	Sheep & Goat pox	95.22
11.	Swine fever	95.83
12.	Theileriosis	96.30
13.	Trypanosomosis	96.76

Aggregation and prediction of livestock diseases at district level leading to higher accuracy.

- **Formula Used:** The **Accuracy** of disease prediction was calculated using the following formula.

$$\frac{\text{TP} + \text{TN}}{\text{Total}} * 100$$

TP-True Positive Observations, TN-True Negative Observations, Total- Total observations.

- Internal Accuracy was performed using 10 years of data. Accuracy obtained was >90% for all the diseases predicted.
- Despite the power of climate and disease risk models, considerable uncertainties remain, identifying these uncertainties, highlighting importance of improved data may improve the model accuracy, realism, confidence, together with translating uncertainties in model inputs into uncertainties in model outputs, are important benefits of modelling.

6. Moran′s I for clustering of Livestock diseases

Moran's I is a tool that measures spatial autocorrelation (feature similarity) based on both feature locations and feature values simultaneously. Given a set of

features and an associated attribute, it evaluates whether the pattern expressed is clustered, dispersed, or random. The tool calculates the Moran's I Index value and both a Z score and p-value evaluating the significance of that index. In general, a Moran's Index value near +1.0 indicates clustering while an index value near -1.0 indicates dispersion.

Autocorrelation tool, the null hypothesis states that"there is no spatial clustering of the values associated with the geographic features in the study area ."When the p-value is small and the absolute value of the Z score is large enough that it falls outside of the desired confidence level, the null hypothesis can be rejected . If the index value is greater than 0, the set of features exhibits a clustered pattern .If the value is less than 0, the set of features exhibits a dispersed pattern.

7. R Software

R is a programming language and software environment for statistical analysis, graphics representation and reporting. R is a simple and effective programming language, which includes conditionals, loops, user defined recursive functions and input and output facilities. R statistical software version 3.1.3 (version 3.4.3, R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/) was used as an integrated suite for data mining, calculation and graphical display. Several R packages like *openxlx, raster, RMySQL, rgdal, RColorBrewer, sqldf, sp, spdep, xlsx, plyr, randomFores, dismo, SDMTool, dplyr, tmap* and *data table*were used for data extraction, data alignment, annotation, analysis, modelling and risk mapping.

8. Forewarning of Livestock Disease for the Month of April, 2022

i) District wise Livestock Disease forewarning:

District wise Livestock Disease Risk Forewarning for April 2022: Andaman and Nicobar

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

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Andhra Pradesh

Districts of Andhra Pradesh	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Anantapur	NR	NR	VLR	LR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Chittoor	NR	NR	VLR	VLR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR
East Godavari	NR	NR	VLR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR
Guntur	NR	NR	NR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Krishna	NR	VLR	NR	VLR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
Kurnool	***VHR***	NR	VLR	VLR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Prakasam	NR	NR	NR	VLR	NR	NR	NR	VLR	VLR	***VHR***	NR	VLR	NR
Sri Potti Sriramulu Nellore	NR	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Srikakulam	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Visakhapatnam	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vizianagaram	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
West Godavari	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Y.S.R.	***VHR***	NR	VLR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Arunachal Pradesh

Districts of Arunachal Pradesh	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Anjaw	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Changlang	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibang Valley	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
East Kameng	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR
East Siang	NR	NR	NR	NR	NR	NR	***VHR***	NR	VLR	NR	***VHR***	NR	NR
Kurung Kumey	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR
Lohit	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Lower Dibang Valley	NR	NR	VLR	NR	NR	NR	***VHR***	VLR	VLR	NR	***VHR***	NR	NR
Lower Subansiri	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR	NR
Papum Pare	NR	NR	NR	NR	NR	NR	***VHR***	NR	***VHR***	NR	***VHR***	NR	NR
Tawang	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR	NR
Tirap	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Upper Siang	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Upper Subansiri	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
West Kameng	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
West Siang	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Assam

Districts of Assam	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Baksa	NR	NR	***VHR***	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR	NR
Barpeta	NR	NR	NR	NR	NR	***VHR***	NR	VLR	***VHR***	NR	NR	NR	NR
Bongaigaon	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Cachar	NR	NR	NR	NR	***VHR***	***VHR***	NR	VLR	***VHR***	NR	NR	NR	NR
Chirang	NR	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR
Darrang	NR	NR	***VHR***	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Dhemaji	NR	VLR	***VHR***	NR	NR	***VHR***	NR	VLR	NR	NR	***VHR***	***HR***	NR
Dhubri	NR	NR	***VHR***	NR	NR	NR	***VHR***	***VHR***	VLR	NR	NR	NR	NR
Dibrugarh	NR	NR	***VHR***	NR	NR	***VHR***	NR	VLR	NR	NR	***VHR***	VLR	NR
Dima Hasao	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Goalpara	NR	NR	VLR	NR	***VHR***	NR	***VHR***	VLR	VLR	NR	NR	NR	NR
Golaghat	NR	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR
Hailakandi	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Jorhat	NR	NR	***VHR***	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR	NR
Kamrup	NR	NR	***VHR***	NR	NR	***VHR***	***VHR***	VLR	VLR	NR	***VHR***	NR	NR
Kamrup Metropolitan	NR	NR	MR	NR	NR	***VHR***	NR	***HR***	VLR	NR	***VHR***	NR	NR
Karbi Anglong	NR	NR	NR	NR	NR	NR	NR	***HR***	NR	NR	***VHR***	NR	NR
Karimganj	NR	NR	NR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR	NR
Kokrajhar	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	***HR***	NR	NR
Lakhimpur	NR	NR	***VHR***	NR	NR	***VHR***	NR	***VHR***	NR	NR	***VHR***	VLR	NR
Morigaon	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Continued

Districts of Assam	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Nagaon	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Nalbari	***VHR***	NR	***HR***	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR
Sivasagar	NR	NR	***VHR***	NR	NR	NR	NR	***VHR***	***VHR***	***VHR***	***HR***	VLR	NR
Sonitpur	NR	NR	MR	NR	NR	NR	NR	VLR	NR	***VHR***	***VHR***	NR	NR
Tinsukia	NR	***HR***	***VHR***	NR	NR	NR	NR	***VHR***	NR	NR	***VHR***	VLR	NR
Udalguri	NR	VLR	***VHR***	NR	NR	NR	NR	NR	VLR	NR	***VHR***	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Bihar

Districts of Bihar	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Araria	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Arwal	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Aurangabad	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Banka	NR	VLR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Begusarai	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Bhagalpur	NR	VLR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Bhojpur	NR	***HR***	VLR	NR	NR	NR	NR	NR	NR	NR	***VHR***	HR	***VHR***
Buxar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Darbhanga	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gaya	NR	VLR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Gopalganj	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Jamui	NR	VLR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Jehanabad	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR
Kaimur (Bhabua)	NR	NR	NR	NR	NR	NR	NR	NR	MR	NR	NR	VLR	NR
Katihar	NR	VLR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Khagaria	NR	MR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	MR
Kishanganj	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Lakhisarai	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Madhepura	NR	VLR	NR	NR	NR	NR	NR	***VHR***	VLR	NR	NR	NR	NR
Madhubani	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Munger	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Muzaffarpur	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR	NR	VLR	NR

Continued

Districts of Bihar	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Nalanda	NR	VLR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Nawada	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Pashchim Champaran	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Patna	NR	VLR	VLR	NR	NR	NR	NR	NR	VLR	NR	MR	VLR	***VHR***
Purba Champaran	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Purnia	NR	NR	VLR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Rohtas	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Saharsa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Samastipur	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Saran	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Sheikhpura	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Sheohar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Sitamarhi	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Siwan	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Supaul	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vaishali	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Chandigarh

Districts of Chandigarh	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Chandigarh	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Chhattisgarh

Districts of Chhattisgarh	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Bastar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bijapur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bilaspur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dakshin Bastar Dantewada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dhamtari	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Durg	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Janjgir-champa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Jashpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kabeerdham	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Korba	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Koriya	NR	NR	NR	NR	NR	NR	NR	NR	NR	VHR	NR	NR	NR
Mahasamund	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Narayanpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Raigarhh	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Raipur	NR	NR	NR	VLR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
Rajnandgaon	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Surguja	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Uttar Bastar Kanker	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Dadra and Nagar Haveli

Districts of Dadra and Nagar Haveli	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Dadra and Nagar Haveli	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Daman and Diu

Districts of Daman and Diu	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Daman	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Diu	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Goa

Districts of Goa	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
North Goa	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
South Goa	NR	VLR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Gujarat

Districts of Gujarat	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Ahmadabad	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Amreli	NR	NR	VLR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Anand	NR	NR	NR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Banas Kantha	NR	VLR	VLR	VLR	NR	NR	***VHR***	VLR	NR	***VHR***	NR	NR	NR
Bharuch	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Bhavnagar	NR	NR	NR	VLR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
Dohad	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Gandhinagar	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR	NR	NR	NR
Jamnagar	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Junagadh	NR	NR	VLR	NR	NR	NR	NR	***HR***	NR	NR	NR	NR	NR
Kachchh	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Kheda	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Mahesana	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Narmada	NR	NR	VLR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Navsari	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Panch Mahals	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Patan	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Porbandar	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Rajkot	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Sabar Kantha	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Surat	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Surendranagar	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Tapi	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR
The Dangs	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vadodara	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Valsad	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Haryana

Districts of Haryana	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Ambala	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bhiwani	NR	NR	NR	NR	***VHR***	NR	NR	NR	***VHR***	NR	NR	NR	NR
Faridabad	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fatehabad	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR
Gurgaon	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Hisar	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	***VHR***	VHR	NR	NR
Jhajjar	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR
Jind	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	VLR	NR
Kaithal	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	***VHR***	NR	NR
Karnal	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Kurukshetra	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mahendragarh	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mewat	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Palwal	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Panchkula	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Panipat	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rewari	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Rohtak	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Sirsa	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	VLR	NR
Sonipat	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Yamunanagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Himachal Pradesh

Districts of Himachal Pradesh	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Bilaspur	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR
Chamba	NR	NR	NR	VLR	NR	NR	NR	NR	VLR	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	VLR	NR	NR	NR	NR
Kinnaur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kullu	NR	NR	VLR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR	NR
Lahul & Spiti	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mandi	NR	NR	VLR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR
Shimla	NR	NR	***HR***	NR	***VHR***	NR	***VHR***	VLR	***VHR***	NR	NR	NR	NR
Sirmaur	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR
Solan	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Una	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Jammu and Kashmir

Districts of Jammu and Kashmir	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Anantnag	NR	NR	NR	NR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Badgam	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Bandipore	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Baramula	NR	NR	MR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Doda	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ganderbal	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Jammu	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kargil	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kathua	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kishtwar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kulgam	NR	NR	NR	NR	NR	NR	NR	NR	VLR	VHR	NR	NR	NR
Kupwara	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Leh(Ladakh)	NR	VLR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Pulwama	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Punch	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Rajouri	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ramban	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Reasi	NR	VLR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Samba	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Shupiyan	NR	NR	NR	NR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Srinagar	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Udhampur	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Jharkhand

Districts of Jharkhand	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Bokaro	NR	***VHR***	***VHR***	NR	***VHR***	***VHR***	NR	***VHR***	***VHR***	NR	NR	***VHR***	***VHR***
Chatra	MR	***VHR***	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR	***VHR***	***VHR***
Deoghar	NR	***VHR***	VLR	NR	NR	***VHR***	***VHR***	VLR	***VHR***	NR	NR	***VHR***	***VHR***
Dhanbad	NR	***VHR***	MR	NR	NR	***VHR***	***VHR***	VLR	***VHR***	NR	NR	***VHR***	***VHR***
Dumka	NR	***VHR***	***VHR***	NR	NR	***VHR***	***VHR***	***VHR***	***VHR***	NR	NR	***VHR***	***VHR***
Garhwa	NR	***VHR***	MR	VLR	NR	***VHR***	NR	VLR	VLR	NR	MR	***VHR***	***VHR***
Giridih	NR	***VHR***	NR	NR	NR	***VHR***	NR	NR	***HR***	NR	NR	***VHR***	***VHR***
Godda	NR	***VHR***	NR	NR	NR	***VHR***	NR	***HR***	***VHR***	NR	NR	***HR***	***VHR***
Gumla	NR	***HR***	NR	NR	NR	***VHR***	MR	NR	***VHR***	NR	NR	***VHR***	***VHR***
Hazaribagh	NR	***VHR***	***VHR***	NR	NR	***VHR***	NR	VLR	***VHR***	NR	***VHR***	***VHR***	***VHR***
Jamtara	NR	***VHR***	VLR	NR	NR	***VHR***	NR	VLR	LR	NR	NR	***VHR***	***VHR***
Khunti	NR	***VHR***	NR	NR	NR	***VHR***	MR	MR	***VHR***	***VHR***	NR	VLR	***VHR***
Koderma	NR	MR	VLR	NR	NR	***VHR***	NR	NR	VLR	NR	NR	VLR	***VHR***
Latehar	NR	***VHR***	NR	NR	NR	***VHR***	NR	VLR	NR	NR	NR	***HR***	***VHR***
Lohardaga	NR	***HR***	VLR	NR	NR	***VHR***	NR	VLR	MR	NR	NR	***VHR***	***VHR***
Pakur	NR	***VHR***	NR	NR	NR	***HR***	NR	NR	NR	NR	NR	***VHR***	***VHR***
Palamu	NR	***VHR***	MR	NR	NR	***VHR***	NR	VLR	MR	NR	NR	***VHR***	***VHR***
PashchimiSinghbhum	NR	***VHR***	VLR	NR	***VHR***	***VHR***	NR	VLR	***HR***	NR	NR	***VHR***	***VHR***
Purbi Singhbhum	NR	***VHR***	NR	NR	NR	***VHR***	NR	***VHR***	***VHR***	***VHR***	NR	***VHR***	***VHR***
Ramgarh	NR	***VHR***	VLR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	***VHR***
Ranchi	NR	***VHR***	NR	NR	***HR***	***VHR***	NR	NR	***VHR***	***VHR***	NR	***VHR***	***VHR***
Sahibganj	NR	***VHR***	***VHR***	NR	***VHR***	***VHR***	***VHR***	***HR***	***HR***	***VHR***	***VHR***	***VHR***	***VHR***
Seraikela - Kharsawan	NR	***VHR***	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR	MR	***VHR***
Simdega	NR	***VHR***	NR	NR	NR	***VHR***	NR	NR	MR	NR	NR	***VHR***	***VHR***

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Karnataka

Districts of Karnataka	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Bagalkot	NR	NR	NR	VLR	NR	NR	NR	VLR	NR	***VHR***	NR	NR	NR
Bangalore	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	***VHR***	NR	NR	NR
Bangalore Rural	NR	NR	NR	NR	NR	NR	***VHR***	VLR	VLR	***HR***	NR	NR	NR
Belgaum	NR	NR	NR	NR	***VHR***	NR	NR	VLR	VLR	NR	NR	NR	NR
Bellary	***VHR***	NR	VLR	VLR	***VHR***	NR	NR	VLR	VLR	MR	NR	NR	NR
Bidar	NR	NR	VLR	NR	NR	NR	NR	NR	***HR***	NR	NR	NR	NR
Bijapur	NR	NR	NR	VLR	NR	NR	NR	NR	***HR***	***VHR***	NR	NR	NR
Chamarajanagar	***VHR***	NR	VLR	NR	NR	NR	NR	NR	***HR***	MR	NR	NR	NR
Chikkaballapura	NR	NR	NR	VLR	MR	NR	***VHR***	NR	***HR***	***VHR***	NR	NR	NR
Chikmagalur	NR	NR	MR	NR	NR	NR	***VHR***	VLR	NR	NR	NR	NR	NR
Chitradurga	***VHR***	NR	VLR	MR	NR	NR	NR	VLR	VLR	***VHR***	NR	NR	NR
Dakshina Kannada	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Davanagere	***VHR***	NR	NR	NR	NR	NR	NR	***HR***	NR	***VHR***	NR	NR	NR
Dharwad	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Gadag	NR	NR	NR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR

Continued

Districts of Karnataka	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Gulbarga	NR	NR	VLR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Hassan	NR	NR	VLR	NR	***VHR***	NR	***VHR***	VLR	VLR	***VHR***	NR	NR	NR
Haveri	NR	NR	NR	NR	***VHR***	NR	NR	VLR	***HR***	***VHR***	NR	NR	NR
Kodagu	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Kolar	NR	NR	NR	NR	NR	NR	***VHR***	VLR	VLR	***VHR***	NR	NR	NR
Koppal	***VHR***	NR	VLR	NR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Mandya	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Mysore	NR	NR	***VHR***	NR	***HR***	NR	***VHR***	VHR	VLR	NR	NR	NR	NR
Raichur	***VHR***	NR	NR	VLR	NR	NR	NR	VLR	MR	NR	NR	NR	NR
Ramanagara	NR	NR	VLR	NR	NR	NR	***VHR***	VLR	VLR	NR	NR	NR	NR
Shimoga	NR	NR	***HR***	NR	***VHR***	NR	***VHR***	***VHR***	VLR	NR	NR	NR	NR
Tumkur	***HR***	NR	***HR***	NR	***VHR***	NR	***VHR***	***VHR***	***HR***	***VHR***	NR	NR	NR
Udupi	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Uttara Kannada	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Yadgir	NR	NR	***VHR***	VLR	NR	NR	NR	VLR	VLR	***VHR***	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Kerala

Districts of Kerala	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Alappuzha	NR	NR	NR	NR	NR	NR	***VHR***	VLR	***VHR***	NR	NR	***HR***	NR
Ernakulum	NR	***VHR***	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	***VHR***	NR
Idukki	NR	***VHR***	NR	NR	NR	NR	***VHR***	NR	NR	NR	***VHR***	***HR***	NR
Kannur	NR	NR	NR	NR	NR	NR	***VHR***	NR	***VHR***	NR	NR	***VHR***	NR
Kasaragod	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR
Kollam	***VHR***	MR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	***HR***	NR
Kottayam	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Kozhikode	***VHR***	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	***VHR***	NR
Malappuram	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	***VHR***	NR
Palakkad	NR	VLR	NR	NR	NR	NR	NR	***HR***	MR	NR	NR	***VHR***	MR
Pathanamthitta	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	***VHR***	NR
Thiruvananthapuram	***VHR***	NR	NR	NR	***HR***	NR	***VHR***	***HR***	***VHR***	NR	NR	***HR***	NR
Thrissur	NR	NR	NR	NR	NR	NR	NR	***VHR***	***VHR***	NR	NR	VLR	MR
Wayanad	NR	NR	NR	NR	NR	NR	***VHR***	NR	***VHR***	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Lakshadweep

Districts of Lakshadweep	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Lakshadweep	NR	NR	NR	NR	NR	NR	MR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Madhya Pradesh

Districts of Madhya Pradesh	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Alirajpur	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Anuppur	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Ashoknagar	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Balaghat	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Barwani	NR	NR	VLR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Betul	***VHR***	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Bhind	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bhopal	NR	NR	VLR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR
Burhanpur	NR	NR	NR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Chhatarpur	NR	NR	VLR	NR	NR	NR	NR	VLR	MR	NR	NR	NR	NR
Chhindwara	NR	NR	***VHR***	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Damoh	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Datia	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
Dewas	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Dhar	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Dindori	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
East Nimar	NR	NR	VLR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Guna	NR	NR	VLR	NR	NR	NR	NR	VLR	VLR	NR	***VHR***	NR	NR
Gwalior	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
Harda	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Hoshangabad	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Indore	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Jabalpur	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR
Jhabua	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Katni	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR

Continued

Districts of Madhya Pradesh	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Khargone(West Nimar)	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Mandla	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Mandsaur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Morena	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Narsimhapur	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Neemuch	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Panna	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Raisen	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Rajgarh	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Ratlam	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Rewa	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Sagar	NR	NR	***HR***	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Satna	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sehore	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Seoni	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Shahdol	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Shajapur	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Sheopur	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Shivpuri	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sidhi	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Singrauli	NR	NR	VLR	NR	NR	NR	NR	VLR	VLR	NR	NR	VLR	NR
Tikamgarh	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Ujjain	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Umaria	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vidisha	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Maharashtra

Districts of Maharashtra	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Ahmadnagar	NR	NR	***VH***R	MR	NR	NR	***HR***	***VHR***	***VHR***	***VHR***	NR	***VHR***	NR
Akola	NR	NR	VLR	VLR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Amravati	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	***HR***	NR
Aurangabad	NR	NR	***VHR***	MR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Bhandara	NR	NR	VLR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Bid	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Buldana	NR	NR	VLR	VLR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Chandrapur	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Dhule	NR	NR	NR	VLR	NR	NR	NR	VLR	***VHR***	NR	***VHR***	VLR	NR
Gadchiroli	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gondiya	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Hingoli	NR	NR	NR	NR	NR	NR	NR	***VHR***	VLR	NR	NR	NR	NR
Jalgaon	NR	NR	NR	VLR	NR	NR	NR	NR	***VHR***	NR	NR	VLR	NR
Jalna	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kolhapur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Latur	NR	NR	***VHR***	NR	***VHR***	NR	NR	NR	VLR	NR	NR	NR	NR
Mumbai	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Mumbai Suburban	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Nagpur	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Nanded	NR	NR	VLR	VLR	NR	NR	NR	NR	***VHR***	NR	NR	VLR	NR
Nandurbar	NR	NR	NR	VLR	NR	NR	NR	VLR	***VHR***	NR	NR	VLR	NR
Nashik	NR	NR	NR	VLR	NR	NR	***VHR***	***VHR***	***VHR***	***VHR***	NR	***HR***	NR
Osmanabad	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR

Continued

Districts of Maharashtra	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Parbhani	***VHR***	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Pune	***VHR***	NR	NR	NR	NR	NR	NR	NR	***VHR***	***VHR***	NR	NR	NR
Raigarh	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Ratnagiri	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Sangli	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	***VHR***	NR
Satara	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	***VHR***	NR	NR	NR
Sindhudurg	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Solapur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Thane	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Wardha	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Washim	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Yavatmal	NR	NR	VLR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Manipur

Districts of Manipur	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Bishnupur	NR	NR	*VHR*	NR	NR	***VHR***	***VHR***	***VHR***	NR	NR	NR	NR	NR
Chandel	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR
Churachandpur	NR	NR	***VHR***	NR	NR	NR	***VHR***	MR	NR	NR	***VHR***	NR	NR
Imphal East	NR	NR	***HR***	NR	NR	***VHR***	***VHR***	NR	NR	NR	***HR***	NR	NR
Imphal West	NR	NR	***VHR***	NR	NR	***VHR***	***VHR***	VLR	NR	NR	***VHR***	NR	NR
Senapati	NR	NR	VLR	NR	NR	***VHR***	NR	VLR	NR	NR	NR	NR	NR
Tamenglong	NR	VLR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Thoubal	NR	NR	***VHR***	NR	NR	***VHR***	***VHR***	VLR	NR	***HR***	NR	NR	NR
Ukhrul	NR	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Meghalaya

Districts of Meghalaya	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
East Garo Hills	NR	NR	VLR	NR	NR	NR	NR	***HR***	NR	NR	***VHR***	NR	NR
East Jaintia Hills	NR	NR	NR	NR	NR	NR	***VHR***	***HR***	NR	NR	***VHR***	NR	NR
East Khasi Hills	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	***VHR***	NR	NR
Jaintia Hills	NR	NR	NR	NR	NR	NR	***VHR***	VLR	NR	NR	NR	NR	NR
North Garo Hills	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR
Ribhoi	NR	NR	VLR	NR	NR	NR	***VHR***	VLR	NR	NR	NR	NR	NR
South Garo Hills	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Southwest Garo Hills	NR	NR	VLR	NR	NR	NR	VHR	MR	VLR	NR	***VHR***	NR	NR
Southwest Khasi Hills	NR	NR	VLR	NR	NR	NR	MR	VLR	NR	NR	***VHR***	NR	NR
West Garo Hills	NR	NR	VLR	NR	NR	NR	NR	LR	NR	NR	***VHR***	NR	NR
West Khasi Hills	NR	NR	***VHR***	NR	NR	NR	***VHR***	***HR***	NR	NR	***VHR***	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Mizoram

Districts of Mizoram	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Aizawl	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR	NR
Champhai	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	***VHR***	NR	NR
Kolasib	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	***VHR***	VLR	NR
Lawngtlai	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR	NR
Lunglei	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	***VHR***	VLR	NR
Mamit	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR	NR
Saiha	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR	NR
Serchhip	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	***VHR***	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Nagaland

Districts of Nagaland	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Dimapur	NR	NR	VLR	NR	NR	NR	NR	***VHR***	NR	NR	***HR***	NR	NR
Kiphire	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kohima	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR
Longleng	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR	NR
Mokokchung	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mon	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Peren	NR	NR	***HR***	NR	NR	NR	NR	***VHR***	NR	NR	***VHR***	NR	NR
Phek	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Tuensang	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Wokha	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Zunheboto	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	MR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: NCT of Delhi

Districts of NCT of Delhi	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Central	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
East	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
New Delhi	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
North	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
North East	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
North West	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	VLR	NR
South	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
South West	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
West	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Odisha

Districts of Odisha	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Anugul	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Balangir	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Baleshwar	NR	NR	VLR	NR	NR	NR	NR	VLR	VLR	NR	NR	VLR	NR
Bargarh	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Baudh	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Bhadrak	NR	NR	VLR	NR	NR	NR	***VHR***	LR	NR	NR	NR	NR	NR
Cuttack	***VHR***	NR	VLR	NR	NR	NR	***VHR***	***VHR***	VHR	NR	NR	NR	NR
Debagarh	NR	VLR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Dhenkanal	NR	NR	VLR	NR	NR	NR	***HR***	VLR	NR	NR	NR	NR	NR
Gajapati	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Ganjam	NR	NR	VLR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR
Jagatsinghapur	NR	NR	VLR	NR	NR	NR	NR	***VHR***	NR	NR	NR	VLR	NR
Jajapur	NR	NR	VLR	NR	NR	NR	NR	MR	NR	NR	NR	NR	NR
Jharsuguda	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***
Kalahandi	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
Kandhamal	***VHR***	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Kendrapara	NR	NR	VLR	NR	NR	NR	NR	LR	***VHR***	NR	NR	NR	NR
Kendujhar	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Khordha	NR	NR	VLR	NR	NR	NR	NR	NR	***VHR***	NR	NR	***HR***	NR
Koraput	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Malkangiri	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	***VHR***	NR	NR

Continued

Districts of Odisha	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Mayurbhanj	NR	NR	NR	VLR	NR	NR	NR	NR	LR	NR	NR	VLR	NR
Nabarangapur	NR	NR	VLR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Nayagarh	NR	NR	MR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Nuapada	NR	NR	MR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puri	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR
Rayagada	***VHR***	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	VLR	NR
Sambalpur	***VHR***	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Subarnapur	NR	NR	VLR	NR	NR	NR	NR	***HR***	NR	NR	NR	NR	NR
Sundargarh	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	***VHR***

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Puducherry

Districts of Puducherry	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Karaikal	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mahe	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Puducherry	NR	***VHR***	NR	VLR	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR
Yanam	NR	NR	NR	VLR	NR	***VHR***	NR	VLR	NR	NR	NR	VLR	***VHR***

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Punjab

Districts of Punjab	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Amritsar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Barnala	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VHR	NR	NR
Bathinda	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Faridkot	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fatehgarh Sahib	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Firozpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gurdaspur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Hoshiarpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Jalandhar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kapurthala	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ludhiana	NR	NR	NR	NR	NR	NR	NR	VLR	HR	NR	MR	NR	NR
Mansa	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Moga	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Muktsar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VHR	NR	NR
Patiala	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	MR	NR	NR
Rupnagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sahibzada Ajit Singh Nagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sangrur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Shahid Bhagat Singh Nagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tarn Taran	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Rajasthan

Districts of Rajasthan	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Ajmer	NR	NR	NR	VLR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR
Alwar	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Banswara	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Baran	NR	NR	VLR	NR	NR	NR	NR	VLR	***HR***	NR	NR	NR	NR
Barmer	NR	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Bharatpur	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Bhilwara	NR	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Bikaner	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bundi	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chittaurgarh	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Churu	NR	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Dausa	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Dhaulpur	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Dungarpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ganganagar	NR	NR	VLR	NR	NR	NR	***VHR***	VLR	NR	NR	NR	NR	NR
Hanumangarh	NR	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Jaipur	NR	NR	NR	VLR	NR	NR	***VHR***	***VHR***	VLR	NR	NR	NR	NR
Jaisalmer	NR	NR	NR	VLR	NR	NR	NR	NR	MR	NR	NR	NR	NR
Jalor	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Jhalawar	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR	NR
Jhunjhunun	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Jodhpur	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Karauli	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR

Continued

Districts of Rajasthan	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Kota	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Nagaur	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR	NR	NR	NR
Pali	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Pratapgarh	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rajsamand	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Sawai Madhopur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sikar	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Sirohi	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tonk	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Udaipur	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Sikkim

Districts of Sikkim	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
East District	NR	NR	MR	NR	NR	NR	NR	NR	***VHR***	NR	NR	MR	NR
North District	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
South District	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
West District	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Tamil Nadu

Districts of Tamil Nadu	Livestock Disease												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Ariyalur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chennai	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Coimbatore	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Cuddalore	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dharmapuri	NR	NR	***VHR***	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Dindigul	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Erode	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Kancheepuram	***VHR***	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Kanniyakumari	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Karur	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Krishnagiri	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Madurai	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Nagapattinam	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Namakkal	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Perambalur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Pudukkottai	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Ramanathapuram	NR	NR	NR	NR	NR	NR	NR	VLR	VLR	NR	NR	VLR	NR
Salem	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Sivaganga	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Thanjavur	NR	NR	VLR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
The Nilgiris	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Theni	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Thiruvallur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Thiruvarur	NR	NR	VLR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Thoothukkudi	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR	NR	NR	NR

Continued

Districts of Tamil Nadu	Livestock Disease												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Tiruchirappalli	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tirunelveli	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Tiruppur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tiruvannamalai	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vellore	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Viluppuram	***VHR***	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virudhunagar	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Telangana

Districts of Telangana	Livestock Diseases												
	Anthrax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Adilabad	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Hyderabad	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Karimnagar	NR	NR	VLR	VLR	NR	NR	NR	VLR	VLR	***VHR***	NR	NR	NR
Khammam	NR	NR	NR	VLR	***VHR***	NR	NR	NR	VLR	NR	NR	NR	NR
Mahbubnagar	NR	NR	MR	LR	***VHR***	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Medak	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Nalgonda	***VHR***	NR	VLR	VLR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	NR
Nizamabad	NR	NR	NR	VLR	NR	NR	NR	NR	MR	NR	NR	NR	NR
Rangareddy	NR	NR	VLR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Warangal	NR	NR	VLR	VLR	***VHR***	NR	NR	NR	***HR***	***VHR***	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease forewarning for April 2022: Tripura

Districts of Tripura	Livestock Disease												
	Ant*hr*ax	**Babesiosis**	**BQ**	**BT**	**ET**	**Fascioliasis**	**FMD**	**HS**	**PPR**	**S&G Pox**	**SF**	**Theileriosis**	**Trypanosomosis**
Dhalai	NR	VLR	VLR	NR	NR	NR	NR	VLR	NR	NR	***VHR***	NR	NR
North Tripura	NR	NR	VLR	NR	NR	NR	NR	VLR	VLR	NR	***VHR***	NR	NR
South Tripura	NR	***HR***	VLR	NR	NR	NR	NR	***HR***	NR	***VHR***	***VHR***	NR	NR
West Tripura	***VHR***	***VHR***	***HR***	NR	NR	***VHR***	***VHR***	***HR***	NR	NR	***VHR***	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Uttar Pradesh

Districts of Uttar Pradesh	Livestock Disease												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Agra	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Aligarh	NR	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Allahabad	NR	NR	VLR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Ambedkar Nagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Amethi	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Auraiya	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Azamgarh	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Baghpat	NR	MR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bahraich	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	MR	NR
Ballia	NR	***VHR***	VLR	NR	NR	***VHR***	NR	NR	NR	NR	NR	***VHR***	MR
Balrampur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Banda	NR	VLR	VLR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Bara Banki	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR	***HR***	NR
Bareilly	NR	MR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR
Basti	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bijnor	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR	***VHR***	NR
Budaun	NR	***VHR***	NR	NR	NR	NR	VHR	NR	NR	***VHR***	NR	***VHR***	NR
Bulandshahr	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Chandauli	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Chitrakoot	NR	***VHR***	VLR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR
Deoria	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Etah	NR	***VHR***	NR	NR	NR	NR	NR	NR	***VHR***	NR	NR	***HR***	NR
Etawah	NR	***HR***	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Faizabad	NR	***HR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Farrukhabad	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Continued

Districts of Uttar Pradesh	Livestock Disease												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Fatehpur	NR	***VHR***	NR	NR	NR	NR	NR	NR	MR	NR	NR	***VHR***	NR
Firozabad	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Gautam Buddha Nagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ghaziabad	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ghazipur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gonda	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR
Gorakhpur	NR	***HR***	NR	NR	NR	NR	NR	NR	***VHR***	***VHR***	NR	***VHR***	NR
Hamirpur	NR	NR	VLR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Hapur	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Hardoi	NR	MR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR
Jalaun	NR	NR	NR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Jaunpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Jhansi	NR	NR	VLR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Jyotiba Phule Nagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	VHR	NR	VLR	NR
Kannauj	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kanpur Dehat	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	MR	NR
Kanpur Nagar	NR	VLR	NR	NR	NR	NR	NR	NR	***HR***	NR	NR	***HR***	NR
Kanshiram Nagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Kaushambi	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Kheri	NR	***VHR***	NR	NR	NR	***VHR***	NR	NR	VLR	NR	NR	VLR	NR
Kushinagar	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR
Lalitpur	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	VLR	NR
Lucknow	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
MahaJanuarya Nagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mahoba	NR	NR	VLR	VLR	NR	NR	NR	VLR	NR	NR	NR	NR	NR

Continued

Districts of Uttar Pradesh	Livestock Disease												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Mahrajganj	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	MR
Mainpuri	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mathura	NR	MR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR
Mau	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Meerut	NR	NR	NR	NR	NR	***VHR***	***VHR***	NR	***VHR***	NR	NR	***HR***	NR
Mirzapur	NR	VLR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR
Moradabad	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR
Muzaffarnagar	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	NR
Pilibhit	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Pratapgarh	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	***VHR***	NR
Rae Bareli	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Rampur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Saharanpur	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	MR	NR
Sambhal	NR	VLR	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR
Sant Kabir Nagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sant Ravidas Nagar	NR	NR	NR	NR	NR	***VHR***	NR	NR	NR	NR	NR	VLR	NR
Shahjahanpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Shamli	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Shrawasti	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Siddharthnagar	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Sitapur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	VLR	NR
Sonbhadra	NR	***VHR***	NR	NR	NR	NR	NR	NR	NR	NR	NR	***HR***	MR
Sultanpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Unnao	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	MR	NR
Varanasi	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: Uttarakhand

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

If vaccinated, please ignore the disease forecast.

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

District wise Livestock Disease Risk Forewarning for April 2022: West Bengal

Districts of West Bengal	Livestock Disease												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Bankura	NR	NR	LR	VLR	NR	NR	***VHR***	NR	***VHR***	NR	NR	VLR	NR
Bardhhaman	NR	NR	***VHR***	VLR	NR	NR	NR	NR	***VHR***	NR	NR	VLR	NR
Birbhum	NR	VLR	VLR	NR	NR	NR	NR	NR	***HR***	NR	NR	VLR	NR
Dakshin Dinajpur	NR	NR	***VHR***	NR	NR	NR	NR	VLR	***HR***	NR	NR	VLR	NR
Darjiling	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Haora	NR	***VHR***	***VHR***	NR	NR	NR	NR	***VHR***	***VHR***	NR	NR	MR	NR
Hugli	NR	VLR	***VHR***	NR	NR	NR	NR	VLR	***VHR***	NR	NR	***VHR***	NR
Jalpaiguri	NR	NR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Koch Bihar	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Kolkata	NR	VLR	VLR	NR	NR	NR	NR	NR	MR	NR	NR	VLR	NR
Maldah	NR	MR	VLR	NR	NR	NR	NR	NR	LR	NR	NR	VLR	NR
Murshidabad	***VHR***	***VHR***	NR	NR	NR	NR	NR	NR	***HR***	NR	NR	NR	NR
Nadia	NR	NR	VLR	NR	NR	NR	NR	**VHR**	***VHR***	NR	NR	VLR	NR
North Twenty-Four Parganas	NR	NR	VLR	NR	NR	NR	NR	NR	***HR***	NR	NR	VLR	NR
Paschim Medinipur	NR	NR	MR	VLR	NR	NR	NR	VLR	***VHR***	NR	NR	***HR***	NR
Purba Medinipur	NR	NR	VLR	NR	NR	NR	NR	VLR	***VHR***	NR	NR	VLR	NR
Puruliya	NR	MR	***HR***	NR	NR	NR	NR	NR	***VHR***	NR	NR	VLR	***VHR***
South Twenty Four Parganas	NR	NR	***VHR***	NR	NR	NR	NR	VLR	***VHR***	NR	NR	***HR***	NR
Uttar Dinajpur	NR	VLR	***HR***	NR	NR	NR	NR	VLR	VLR	NR	NR	NR	NR

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

II) Glimpse about the risk of predicted diseases:

The Livestock disease risk obtained based on the Machine Learning algorithm were further categorized into risk events using High Risk and Very High Risk.

1. Andaman and Nicobar

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	South Andaman	One	Antrax
2.	Nicobars, North & Middle Andaman and South Andaman	Three	Fascioliasis
3.	Nicobars	One	Haemorrhagic Septicaemia
4.	Nicobars and South Andaman	Two	Swine Fever

2. Andhra Pradesh

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Kurnool and Y.S.R	Two	Anthrax
2.	East Godavari	One	Haemorrhagic Septicaemia
3.	Anantapur, Chittoor, Prakasam and Kurnool	Four	Sheep & Goat pox

3. Arunachal Pradesh

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	East Siang, Lower Dibang Valley, Lower Subansiri, Papum Pare and Tawang	Five	Foot and Mouth Disease
2.	Papum Pare	One	Peste des Petits Ruminants
3.	East Siang, East Kameng, Kurung Kumey, Lower Dibang Valley and Papum Pare	Five	Swine Fever

4. Assam

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Nalbari	One	Antrax
2.	Tinsukia	One	Babesiosis
3.	Baksa,Chirang,Darrang,Dhemaji,Dhubri,Dibrugarh,Golaghat,Jorhat,Kamrup,Lakhimpur,Nalbari,Sivasagar,Tinsukia and Udalguri	Fourteen	Black Quarter
4.	Cachar, Goalpara and Nalbari	Three	Enterotoxaemia
5.	Barpeta,Cachar,Dhemaji,Dibrugarh ,Kamrup, Kamrup Metropolitan,Kokrajhar and Lakhimpur	Eight	Fascioliasis
6.	Dhubri,Goalpara and Kamrup	Three	Foot and Mouth Disease
7.	Dhubri,Kamrup Metropolitan, Karbi Anglong,Lakhimpur,Sivasagar and Tinsukia	Six	Haemorrhagic Septicaemia
8.	Barpeta,Cachar,Karimganj and Sivasagar	Four	Peste des Petits Ruminants
9.	Sivasagar and Sonitpur	Two	Sheep & Goat pox
10.	Baksa,Chirang,Dhemaji,Dibrugarh, Golaghat,Jorhat,Kamrup,Kamrup Metropolitan, Karbi Anglong, Kokrajhar,Lakhimpur, Sivasagar,Sonitpur, Tinsukia and Udalguri	Fifteen	Swine Fever
11.	Dhemaji	One	Theileriosis

5. Bihar

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Bhojpur	One	Babesiosis
2.	Madhepura	One	Haemorrhagic Septicaemia
3.	Muzaffarpur	One	Peste des Petits Ruminants
4.	Bhojpur	One	Swine Fever
5.	Bhojpur and Jehanabad	Two	Theileriosis
6.	Patna	Two	Trypanosomiasis

6. Chhatttisgarh

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Koriya	One	Sheep & Goat pox

7. Gujarat

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Banas Kantha	One	Foot and Mouth Disease
2.	Junagadh	One	Haemorrhagic Septicaemia
3.	Gandhinagarand Tapi	Two	Peste des Petits Ruminants
4.	Banas Kantha	One	Sheep & Goat pox

8. Haryana

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Bhiwani	One	Enterotoxaemia
2.	Bhiwani,Hisar,Jind,Kaithal and Sirsa	Five	Peste des Petits Ruminants
3.	Hisar and Jhajjar	Two	Sheep & Goat pox
4.	Fatehabad,Hisar and Kaithal	Three	Swine Fever

9. Himachal Pradesh

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Shimla	One	Black Quarter
2.	Shimla	One	Enterotoxaemia
3.	Kullu and Shimla	Two	Foot and Mouth Disease
4.	Bilaspur,Mandi and Shimla	Three	Peste des Petits Ruminants
5.	Sirmaur	One	Sheep & Goat pox

10. Jammu & Kashmir

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Anantnag,Badgam, Kulgam, Pulwama and Shupiyan	Five	Sheep & Goat pox

11. Jharkhand

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	All twenty-three districts except Koderma	Twenty-three	Babesiosis
2.	Dumka,Bokaro,Hazaribagh and Sahibganj	Four	Black Quarter
3.	Bokaro, Pashchimi Singhbhum, Ranchi and Sahibganj	Four	Enterotoxaemia
4.	All twenty-two districts except Ramghar	Twenty-three	Fascioliasis
5.	Deoghar, Dhanbad, Dumka and Sahibganj	Four	Foot and Mouth Disease

6.	Bokaro,Dumka,Godda, Purbi Singhbhum and Sahibganj	Five	Haemorrhagic Septicaemia
7.	Bokaro, Deoghar, Dhanbad, Dumka, Giridih, Godda, Gumla, Hazaribagh, Khunti, Pashchimi inghbhum, Purbi Singhbhum, Ranchi and Sahibganj	Thirteen	Peste des Petits Ruminants
8.	Khunti, Purbi Singhbhum, Ranchi and Sahibganj	Four	Sheep & Goat pox
9.	Hazaribagh, Sahibganj	Two	Swine Fever
10.	Bokaro, Chatra, Deoghar, Dhanbad, Dumka, Garhwa, Giridih, Godda, Gumla, Hazaribagh, Jamtara, Latehar, Lohardaga, Pakur, Palamu, Pashchimi Singhbhum, Purbi Singhbhum, Ranchi, Sahibganj and Simdega	Twenty	Theileriosis
11.	All twenty-three districts	Twenty-four	Trypanosomosis

12. Karnataka

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Bellary, Chamarajanagar,Chitradurga,Davanagere,Koppal,Raichur and Tumkur	Seven	Anthrax
2.	Mysore, Shimoga, Tumkur and Yadgiri	Four	Black Quarter
3.	Belgaum, Bellary, Hassan, Haveri, Mysore, Shimoga andTumkur	Seven	Enterotoxaemia
4.	Bangalore, Bangalore Rural, Chikkaballapura, Chikmagalur, Hassan, Kolar, Mysore, Ramanagara, Shimoga and Tumkur	Ten	Foot and Mouth Disease
5.	Davanagere, Mysore,Shimoga and Tumkuru	Four	Haemorrhagic Septicaemia
6.	Bidar, Bijapur, Chamarajanagar, Chikkaballapura, Haveri, and Tumkur	Six	Peste des Petits Ruminants

7.	Bagalkot, Bangalore, Bangalore Rural, Bijapur, Chikkaballapura, Chitradurga, Davanagere, Hassan, Haveri, Kolar, Koppal, Tumkur and Yadgir	Thirteen	Sheep & Goat pox

13. Kerala

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Kollam, Kozhikode and Thiruvananthapuram	Three	Anthrax
2.	Ernakulam and Idukki	Two	Babesiosis
3.	Thiruvananthapuram	One	Enterotoxaemia
4.	Alappuzha, Idukki, Kannur, Thiruvananthapuram and Wayanad	Five	Foot and Mouth Disease
5.	Kollam, Palakkad, Pathanamthitta, Thiruvananthapuram and Thrissur	Five	Haemorrhagic Septicaemia
6.	Alappuzha, Kannur, Kozhikode, Malappuram, Thiruvananthapuram, Thrissur and Wayanad	Seven	Peste des Petits Ruminants
7.	Idukki	One	Swine Fever
8.	All districts except Kottayam, Thrissur and Wayanad	Eleven	Theileriosis

14. Madhya Pradesh

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Betul	One	Anthrax
2.	Chhindwara and Sagar	Two	Black Quarter
3.	Bhopal and Jabalpur	Two	Haemorrhagic Septicaemia
4.	Guna	One	Swine Fever

15. Maharashtra

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Parbhani and Pune	Two	Anthrax
2.	Ahmadnagar, Aurangabad, Latur	Three	Black Quarter
3.	Latur and Satara	Two	Enterotoxaemia
4.	Ahmadnagar and Nashik	Two	Foot and Mouth Disease
5.	Ahmadnagar, Hingoli and Nashik	Three	Haemorrhagic Septicaemia
6.	Ahmadnagar, Dhule, Jalgaon, Nanded, Nandurbar, Nashik, Pune,	Seven	Peste desPetitsRuminants
7.	Ahmadnagar ,Nashik, Pune, Sangli and Satara	Five	Sheep & Goat pox
8.	Dhule	One	Swine Fever
9.	Ahmadnagar, Amravati, Nashik and Sangli	Four	Theileriosis

16. Manipur

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Bishnupur, Churachandpur, Imphal East, Imphal West, Thoubal and Ukhrul	Six	Black Quarter
2.	Bishnupur, Imphal East, Imphal West, Senapati and Ukhrul	Five	Fascioliasis
3.	Bishnupur, Churachandpur, Imphal East, Imphal West and Thoubal	Five	Foot and Mouth Disease
4.	Bishnupur	One	Haemorrhagic Septicaemia
5.	Thoubal	One	Sheep & Goat pox
6.	Chandel, Churachandpur, Imphal East and Imphal West	Four	Swine Fever

17. Meghalaya

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	West Khasi Hills	One	Black Quarter
2.	East Khasi Hills, East Jaintia Hills, Jaintia Hills, Ribhoi,Southwest Garo Hills and West Khasi Hills	Six	Foot and Mouth Disease
3.	East Jaintia Hills, East Garo Hills and West Khasi Hills	Three	Haemorrhagic Septicaemia
4.	East Khasi Hills, East Jaintia Hills, East Garo Hills, North Garo Hills, Southwest Garo Hills, Southwest Khasi Hills, West Garo Hills and West Khasi Hills	Eight	Swine fever

18. Mizoram

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Champhai	One	Haemorrhagic Septicaemia
2.	Aizawl, Champhai, Kolasib, Lawngtlai, Lunglei, Mamit, Saiha and Serchhip	Eight	Swine Fever

19. Nagaland

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Peren	One	Black Quarter
2.	Dimapur and Peren	Two	Haemorrhagic Septicaemia
3.	Dimapur, Kohima, Longleng, and Peren	Four	Swine fever

20. Odisha

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Cuttack, Kandhamal,Koraput, Rayagada and Sambalpur	Five	Anthrax
2.	Bhadrak, Cuttack and Dhenkanal	Three	Foot and Mouth Disease
3.	Cuttack, Ganjam, Jagatsinghapur, Puri and Subarnapur	Five	Haemorrhagic Septicaemia
4.	Cuttack, Kendrapara and Khordha	Three	Pestedes Petits Ruminants
5.	Malkangiri	One	Swine fever
6.	Khordha	One	Theileriosis
7.	Jharsuguda and Sundargarh	Two	Trypanosomosis

21. Puducherry

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Karaikaland and Puducherry	Two	Babesiosis
2.	Yanam	One	Fascioliasis
3.	Puducherry	One	Sheep & Goat pox
4.	Yanam	One	Trypanosomosis

22. Punjab

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Ludhiana	One	Pestedes Petits Ruminants
2.	Barnala and Muktsar	One	Swine Fever

23. Rajasthan

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Hanumangarh	One	Black Quarter
2.	Ganganagar and Jaipur	Two	Foot and Mouth Disease
3.	Jaipur	One	Haemorrhagic Septicaemia
4.	Baran and Nagaur	Two	Peste desPetitsRuminants
5.	Jhalawar	One	Swine Fever

24. Sikkim

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	East District	One	Peste desPetitsRuminants
2.	West District	One	Swine Fever

25. Tamil Nadu

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Kancheepuram and Viluppuram	Two	Anthrax
2.	Dharmapuri	One	Black Quarter
3.	Thoothukkudi	One	Peste desPetitsRuminants

26. Telangana

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Nalgonda	One	Anthrax
2.	Khammam, Mahbubnagar and Warangal	Three	Enterotoxaemia
3.	Warangal	One	Peste desPetitsRuminants
4.	Karimnagar, Mahbubnagar, Medak, Nalgonda and Warangal	Five	Sheep & Goat pox

27. Tripura

Sl. No	Disease prone districts	Number of disease prone for districts	Disease Name
1.	West Tripura	One	Anthrax
2.	South Tripura and West Tripura	Two	Babesiosis
3.	West Tripura	One	Black Quarter
4.	West Tripura	One	Fascioliasis
5.	West Tripura	One	Foot and Mouth Disease
6.	South Tripura and West Tripura	Two	Haemorrhagic Septicaemia
7.	South Tripura	One	Sheep & Goat pox
8.	Dhalai, North Tripura, South Tripura and West Tripura	Four	Swine Fever

28. Uttar Pradesh

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Ballia, Bijnor, Budaun, Chitrakoot, Etah, Etawah, Faizabad, Farrukhabad, Fatehpur, Gorakhpur, Kheri, Pratapgarh, Saharanpur, Sonbhadra	Fourteen	Babesiosis
2.	Ballia, Bara Banki, Kheri, Meerut and Sant Ravidas Nagar (Bhadohi)	Five	Fascioliasis
3.	Budaun and Meerut	Two	Foot and Mouth Disease
4.	Etah, Gorakhpur, Kanpur Nagar and Meerut	Four	Peste desPetitsRuminants
5.	Bijnor, Budaun, Gorakhpur and Jyotiba Phule Nagar	Four	Sheep & Goat pox
6.	Ballia, Bara Banki, Bareilly, Bijnor, Budaun, Chitrakoot, Etah, Fatehpur, Gonda, Gorakhpur, Hardoi, Kanpur Nagar, Kushinagar, Mathura, Meerut,	Twenty	Theileriosis

	Mirzapur, Moradabad, Muzaffarnagar, Pratapgarh and Sonbhadra		

29. Uttarakhand

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Dehradun	One	Foot and Mouth Disease
2.	Uttarkashi	One	Peste desPetitsRuminants

30. West Bengal

Sl. No	Disease prone districts	Number of districts prone for disease	Disease Name
1.	Murshidabad	One	Anthrax
2.	Haora and Murshidabad	Two	Babesiosis
3.	Barddhaman, Dakshin Dinajpur, Haora, Hugli, Puruliya, South Twenty Four Parganas and Uttar Dinajpur	Seven	Black Quarter
4.	Jalpaiguri	One	Fascioliasis
5.	Bankura	One	Foot and Mouth Disease
6.	Haora and Nadia	Two	Haemorrhagic Septicaemia
7.	Bankura, Barddhaman, Birbhum, Dakshin Dinajpur, Haora, Hugli, Murshidabad, Nadia, North Twenty-Four Parganas, Paschim Medinipur, Purba Medinipur, Puruliya and South Twenty Four Parganas	Thirteen	Peste desPetitsRuminants
8.	Hugli, Paschim Medinipur and South Twenty Four Parganas	Three	Theileriosis
9.	Puruliya	One	Trypanosomosis

III) Diseases, Species affectedClinical signs and its preventive measures.

Sl No.	Disease	Species Affected	Clinical Signs	Preventive Measures
1	Anthrax (AX)	Most of the mammals and ruminants are highly susceptible. Pigs and Horses are moderately susceptible. Carnivores are relatively resistant.	Convulsion and sudden death with oozing of blood from natural orifices such as rectum and nose prior to death. Occasionally oedema develops in the throat and shoulder over a period of one week before death.	Ring vaccination and reporting of the disease is advised. Vaccination to be done in consultation with the veterinarians and as decided by state animal husbandry authorities. Strict biosecurity measures may be followed. Carcass may be disposed by deep burying covered with lime powder. Contaminated area may be disinfected with 4% formalin or 10% caustic soda. Grazing area may be restricted.
2	Babesiosis (BA)	Cattle. Cross breeds are more susceptible.	High temperature, jaundice like symptoms, yellowish mucosal membrane of eye, rectum and coffee colour urine.	Periodical application of acaricides in and around the animal shed and on the animals. For therapeutic application, Diaminazine or Imidocarb can be useful.
3.	Black Quarter (BQ)	Common disease of cattle and sheep, but occasionally goats and pigs also suffer from the disease.	High fever and lameness followed by swelling in the neck, shoulder, lumbar, gluteal and sacral regions. Skin over the affected area become dark and crepitate on palpation. Loss of feed intake, colic, lateral recumbency, dyspnoea and death.	Affected animals may be treated with suitable antibiotics. Vaccination to be done in consultation with the veterinarians and as decided by state animal husbandry authorities. Strict biosecurity measures may be followed. Grazing area may be restricted. Carcass may be disposed hygienically.

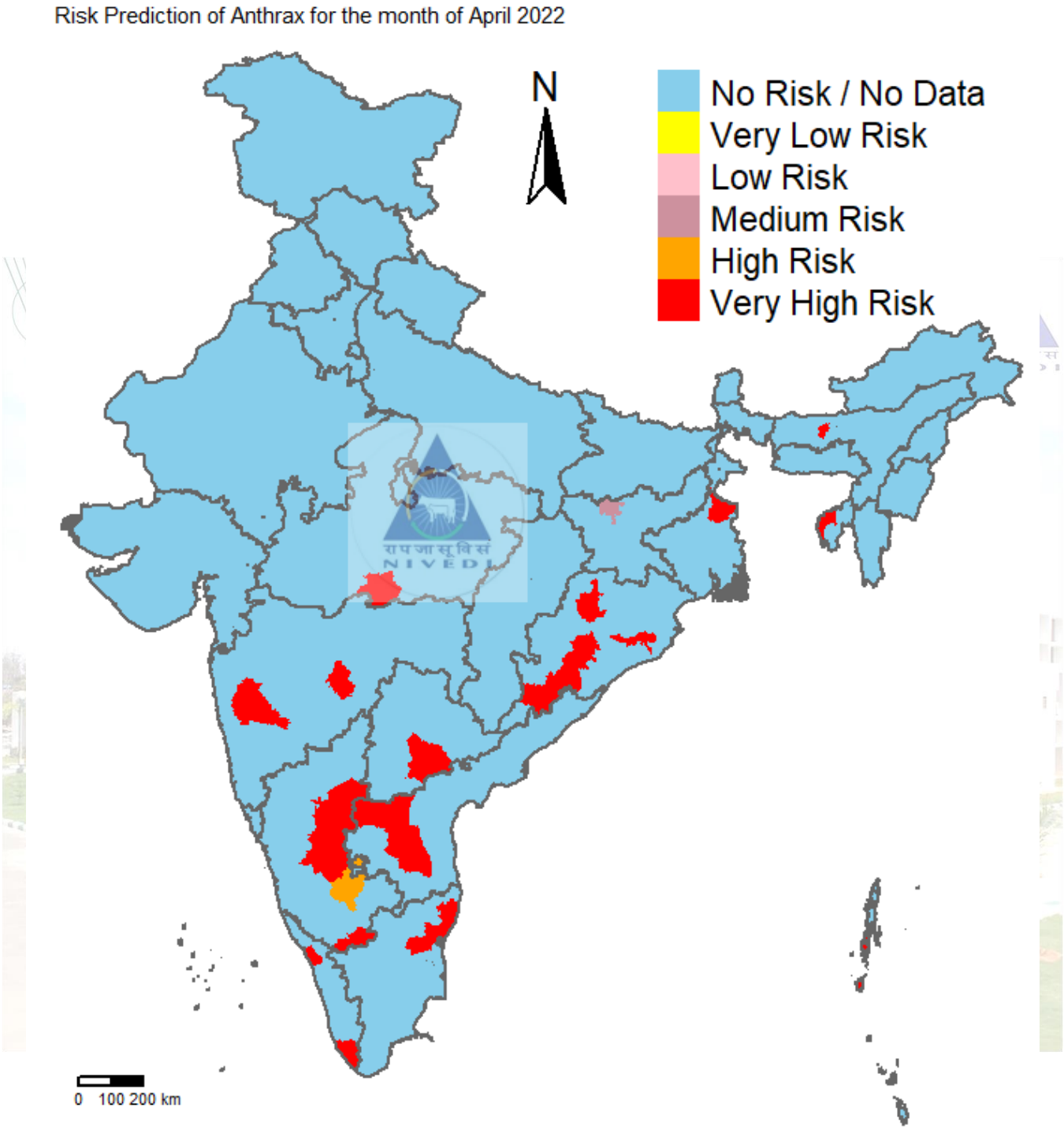
4.	Bluetongue (BT)	Sheep are more susceptible than goats.	Fever, swelling of face, neck, eyelids respiratory distress, nasal discharge, Salivation, necrotic ulcers on tongue, dental pad, gum, lips hyperaemia of muzzle and may bleed at muco-cutaneous junction. Affected tongue may become swollen, cyanotic and purple blue in colour – 'bluetongue'.	Vector control using insecticides and good water management. Vaccination of susceptible animals preferably in the month of May. Do not shear sheep during winter months. Restriction in animal movement, segregation of affected animals and symptomatic treatment. Strict biosecurity measures.
5.	Enterotoxaemia (ET)	Common disease of sheep and goats especially among the young animals.	Dullness, opisthosomas, convulsions, coma and sudden death. Affected adult sheep, which survive for several days May show diarrhoea and staggering.	Affected animals may be treated with suitable antibiotics. Vaccination to be done in consultation with the veterinarians and as decided by State Animal Husbandry Authorities. Strict biosecurity measures may be followed. Carcass may be disposed hygienically. Grazing area to be restricted, stall fed, vitamins and probiotics may be provided.
6.	Fascioliasis (FA)	Cattle, buffalo, sheep and goats.	Progressive anaemia, pale mucous membrane, sub-mandibular oedema (Bottle jaw), loss of appetite, weakness, isolated from flock while grazing, loss in production.	The animal should not be allowed to graze in water stagnant fields or submerged fodder should not be given directly to the animals. The submerged fodder can be processed through hay/silage preparation in order to destroy the metacercariae. The affected animals can be treated with Carbon tetrachloride/ Rafoxanide/Nitroxynil/ Niclofolan /Closantel/Oxyclozanide, under the strict supervision of veterinarian.

7.	Foot and Mouth Disease (FMD)	Cattle, buffalo, sheep, goats and pigs are often affected domesticated species, but the disease is more severe in cattle and pigs.	Fever, loss of feed intake, drop in milk production, drooling of saliva like ropey string, vesicles develop on the tongue, lips, gums, and palate and eventually rupture. Concurrent to oral lesions, vesicles also appear in inter digital skin and coronary band of the feet. The animal may open and close its mouth with a characteristic smacking sound. Sheep and goats may show lameness. In pigs, lesions may be seen on snout and also on the feet.	Regular vaccination and seromonitoring. Disinfection with sodium carbonate (4%) or 10% washing soda and strict biosecurity measures to be followed and animal movement may be controlled.
8.	Haemorrhagic septicaemia (HS)	Common disease for cattle and buffaloes, but can also occur among other species such as pigs, sheep, goats and many wild animals.	The disease starts with high fever, respiratory distress and haemorrhages maybe seen on the mucous membranes. There is lacrymation, nasal discharge, drop in milk production and anorexia. As the disease progress ear droops and the animals will be prostrated with cyanosis of mucous membranes. There may be oedema along the head, neck, thorax, vulva and anal areas. Sudden death occurs within few hours of clinical signs.	Affected animals may be treated with suitable antibiotics. Vaccination to be done in consultation with the veterinarians and as decided by state animal husbandry authorities. Strict biosecurity measures may be followed. Carcass may be disposed hygienically and stress factors may be reduced by following good animal husbandry practices.

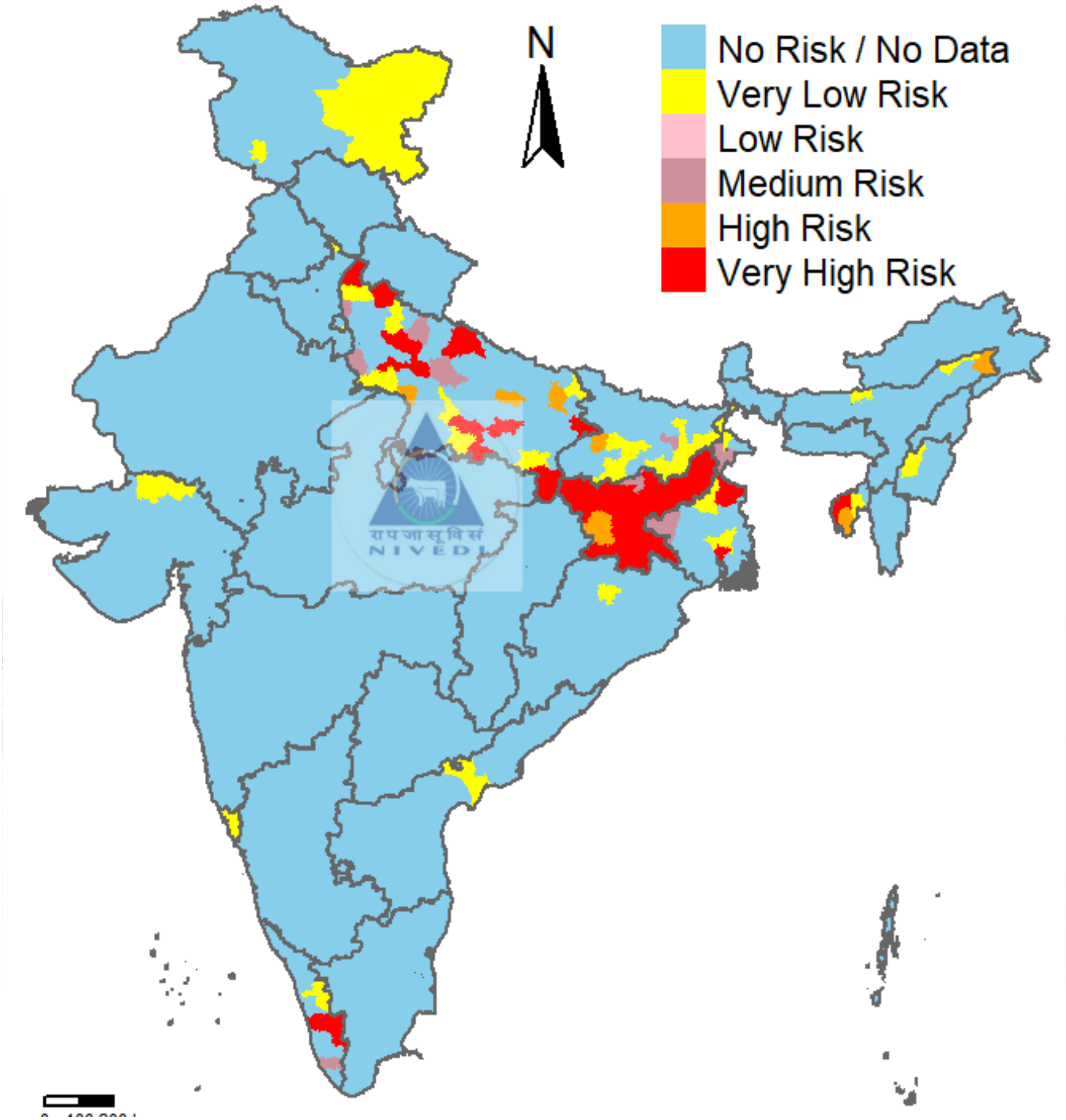
9.	Peste desPetits Ruminants(*PPR*)	Goats and sheep are most affected domestic animals.	Fever, nasal and ocular discharge, respiratory distress, necrotic lesions in buccal mucosa, gum, dental pad, palate, tongue and diarrhoea. Animals may die because of dehydration and pneumonia.	Vaccination of susceptible animals of above 3 months old age. Restriction on animal movement, strict biosecurity measures and proper disposal of carcass.
10.	Sheep and Goat pox (SGP)	Sheep and Goats	Respiratory distress and pock lesions over the non-hairy parts of body, more common in teat, udder, scortum, head, neck, ear, perineum, inner aspect of thighs and under tail.	Vaccination of susceptible animals of above 3 months old age. Symptomatic treatment of affected animals. Restriction on animal movement, strict biosecurity measures and proper disposal of carcass.
11.	Swine Fever (SF)	Pigs	Fever, Conjunctivitis, purplish discolouration of snout, ears, abdomen, inner side of the legs and staggering gait.	Vaccination of susceptible animals. Restriction on animal movement, strict biosecurity measures and proper disposal of carcass.
12.	Theileriosis (TE)	Large Ruminants. Cross bred cattle are more vulnerable.	High temperature, yellowish eye, sometime eye maybe heavily swollen, icteric mucosal membrane of rectum, dark yellowish urine, sometime may reach to coffee colour. Antibiotic is of no use to check the fever.	Periodical application of acaricides in and around the animal shed and on the animals. Therapeutic treatment with Buparvaquone can be useful in both early and advanced stages of the infection.

13.	Trypanosomosis (TR)	Domestic and wild carnivores and herbivores including cattle, buffalo, horse, donkey, camel, dog and cats. Buffaloes are known as carriers.	Fluctuating high fever which is not responded by antibiotics, swollen lymph gland, chronic emaciation and weakness, loss of appetite, gradual loss of production.	The affected animal should be treated with Diaminazine compounds or chloride and sulphate salts of Quinapyramine. Periodical spray of insecticide in and around animal shed to remove the flies.

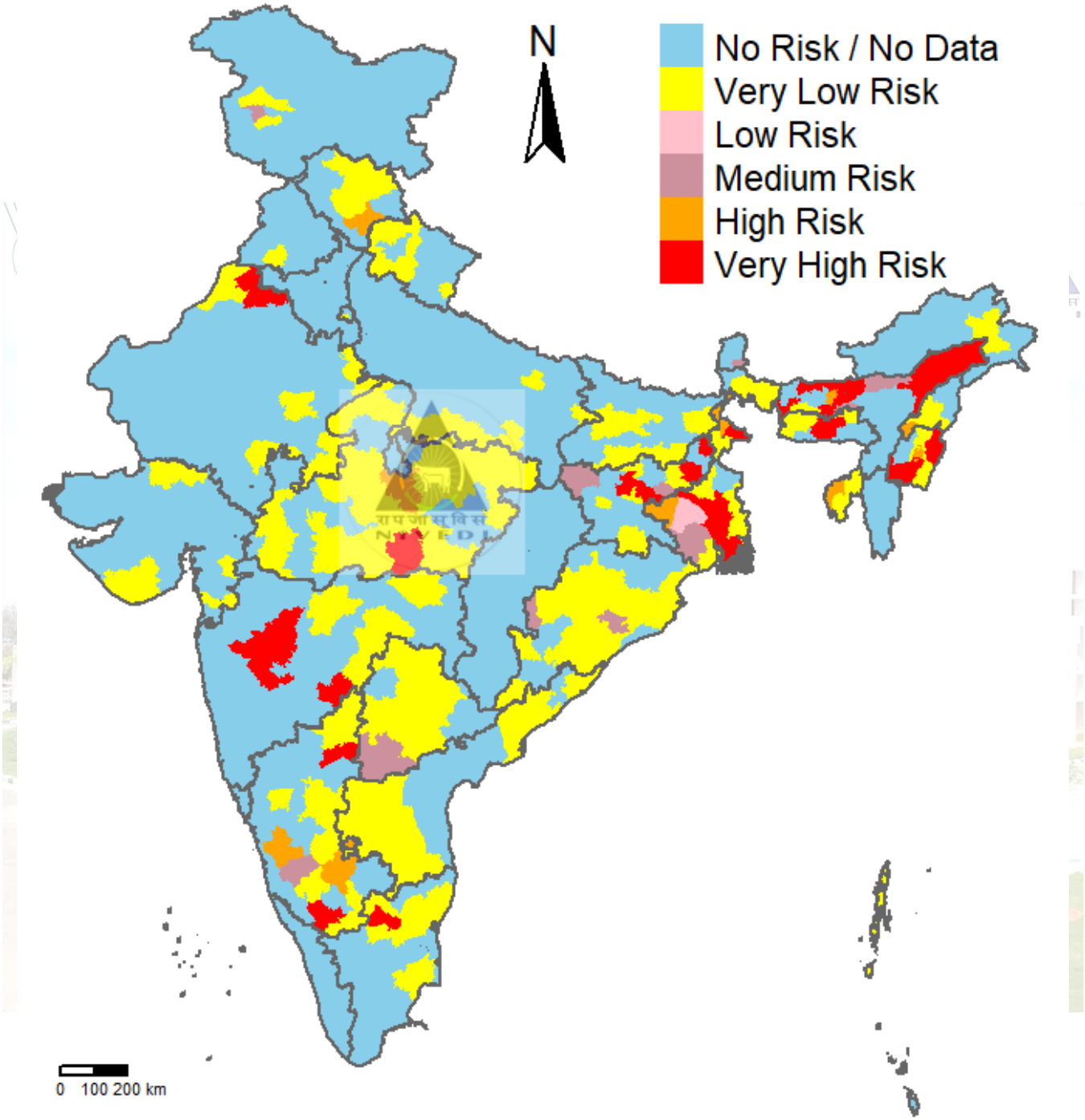
IV) Risk Prediction - Livestock Disease Forewarning Maps



Risk Prediction of Babesiosis for the month of April 2022



Risk Prediction of Black quarter for the month of April 2022



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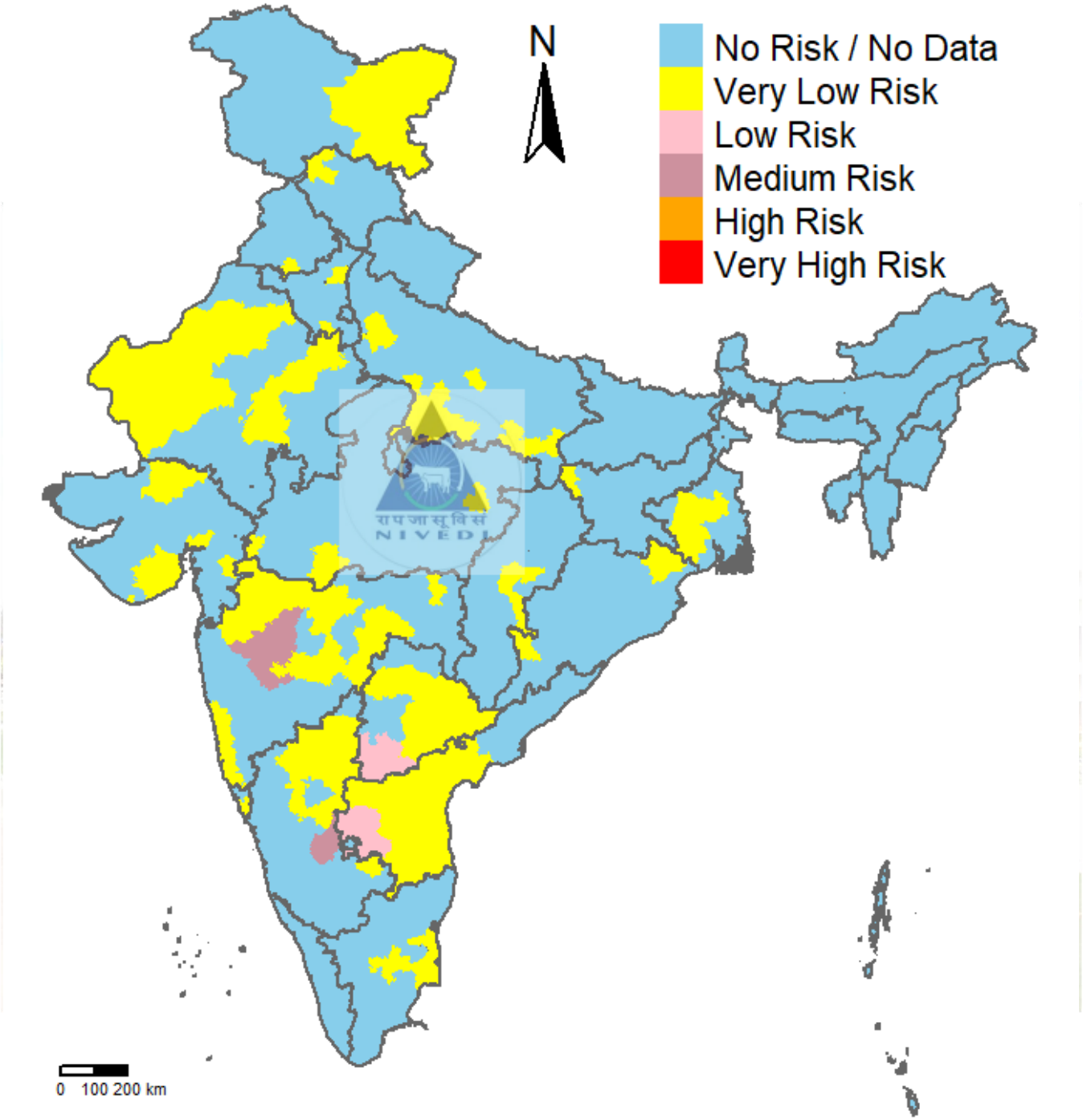
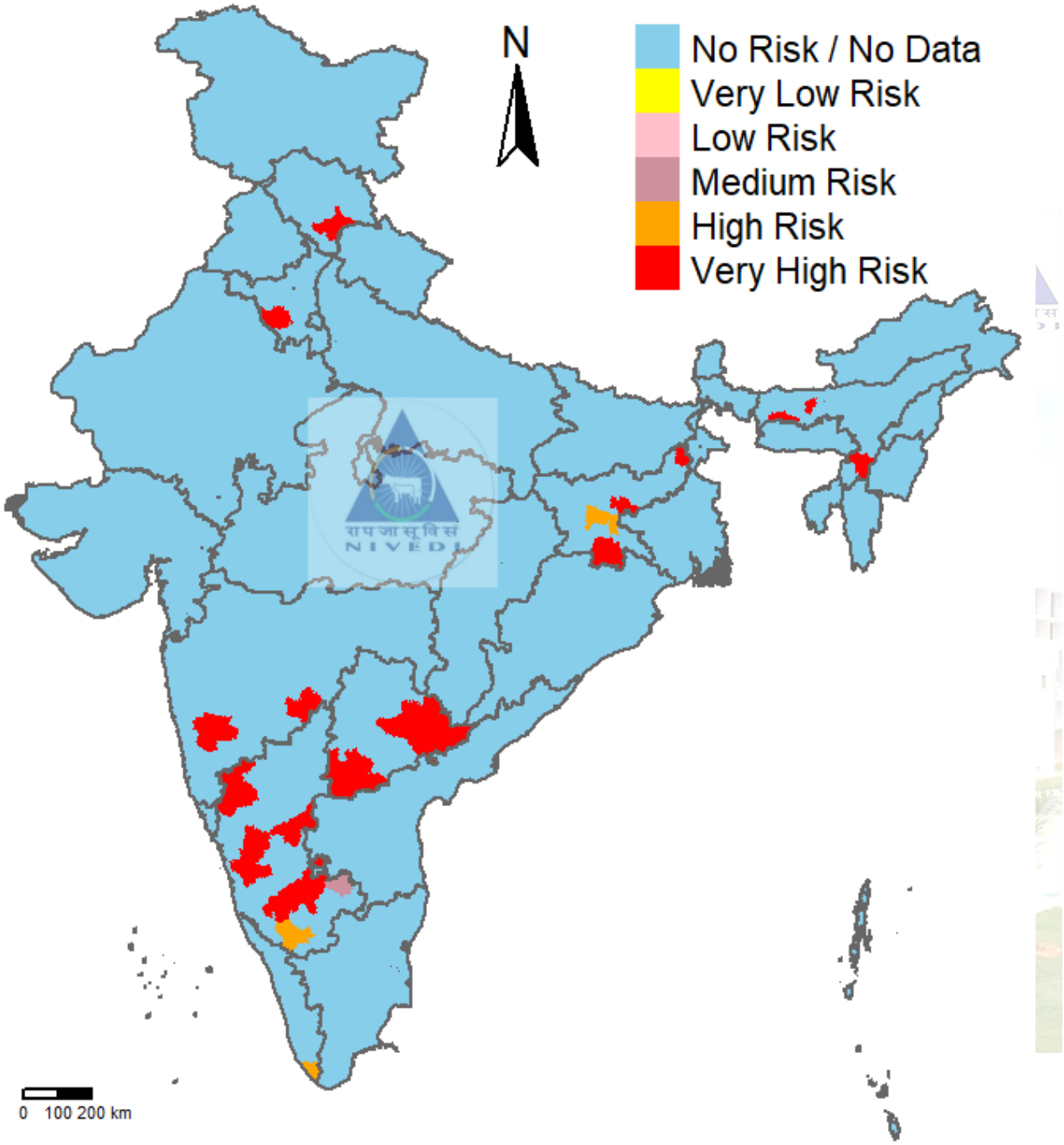
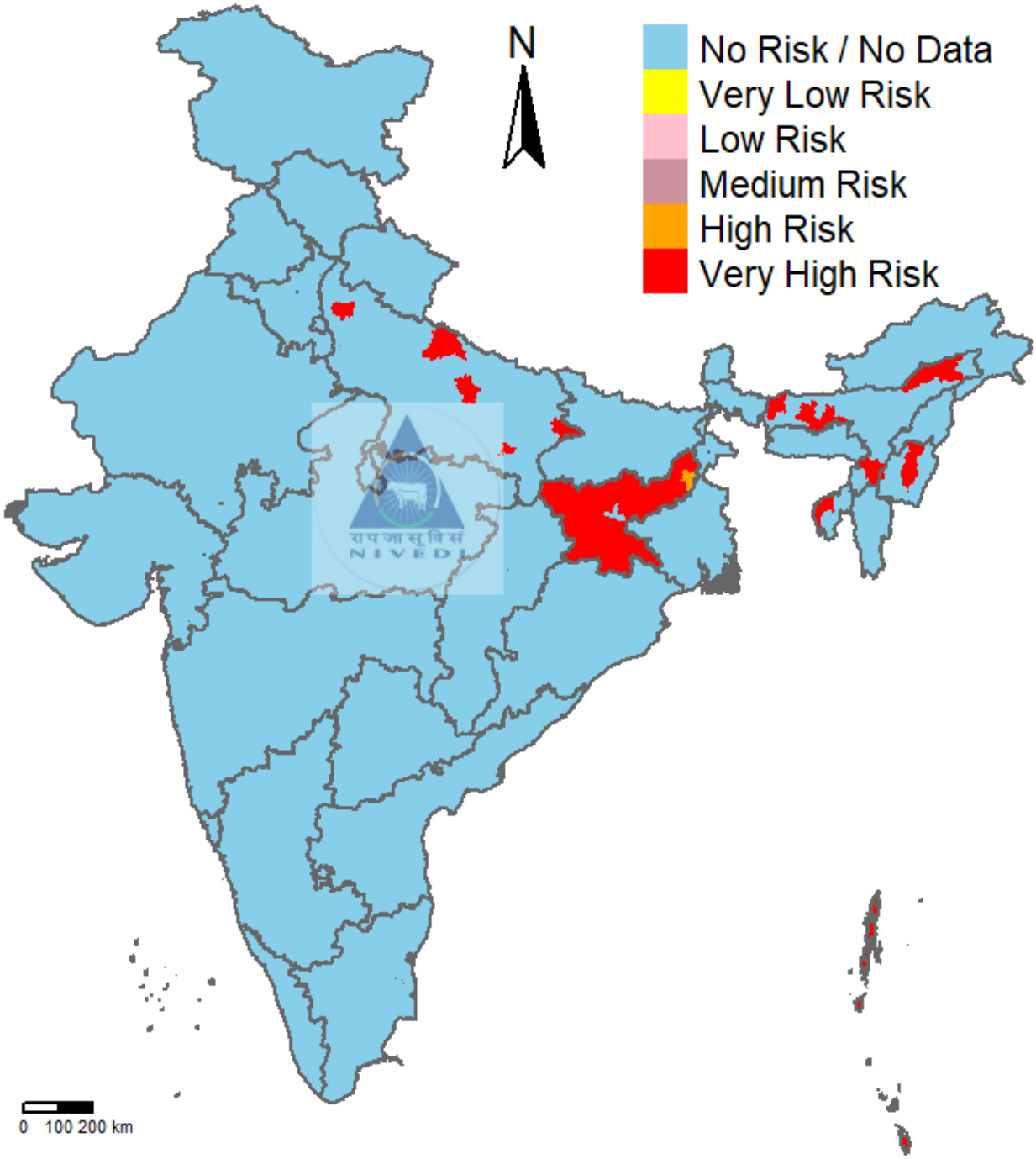
Risk Prediction of Bluetongue for the month of April 2022



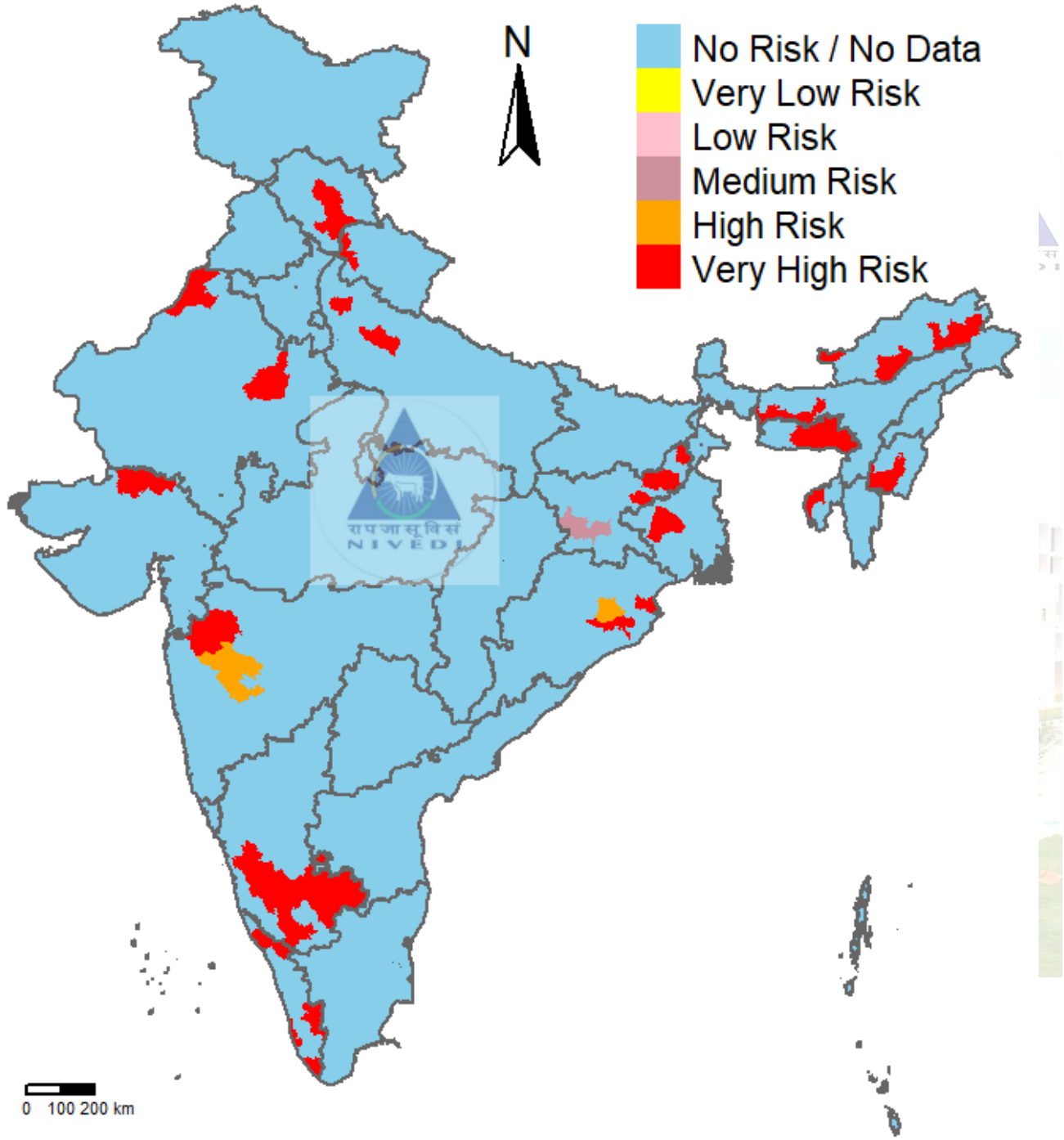
Risk Prediction of Enterotoxemia for the month of April 2022



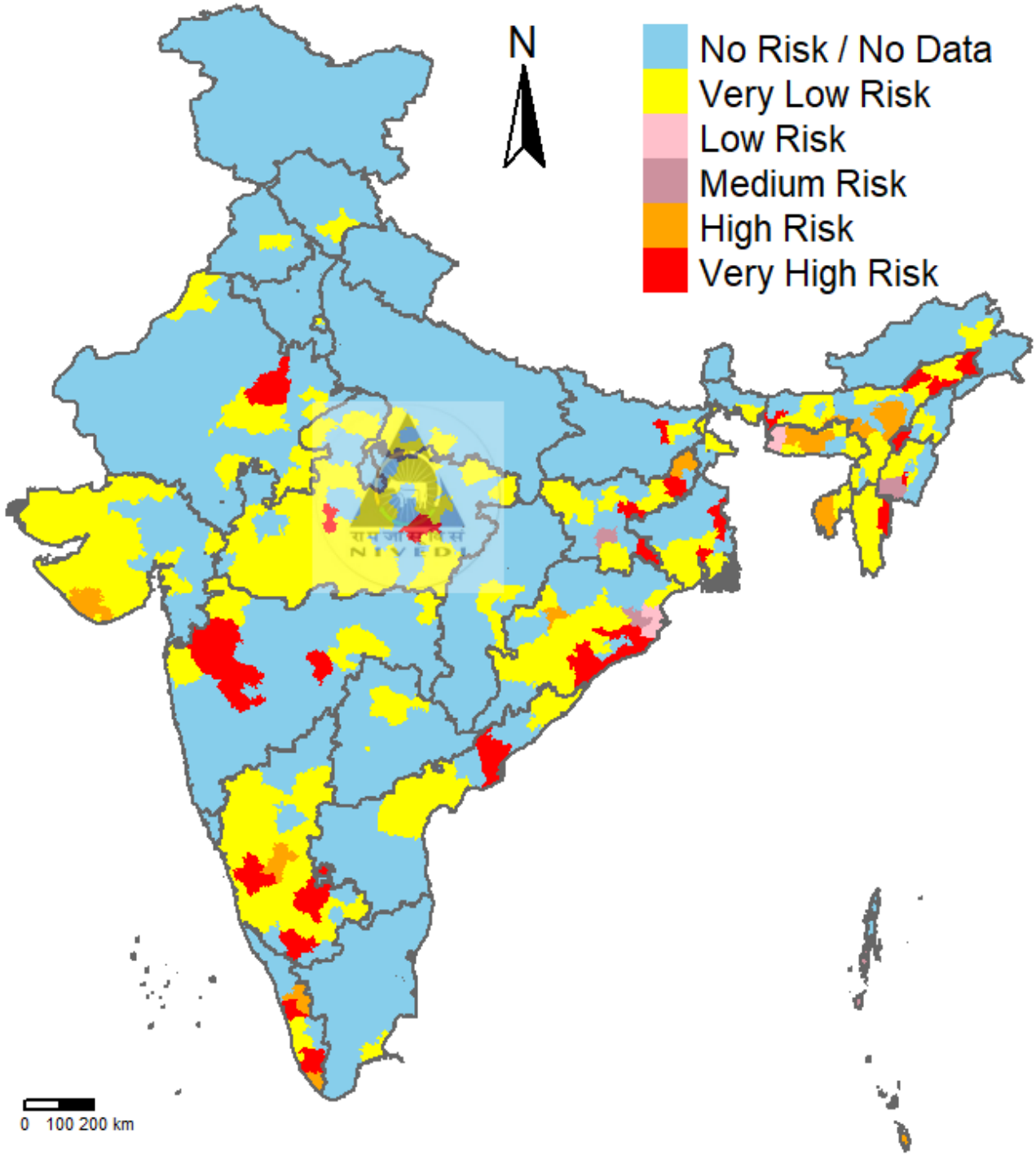
Risk Prediction of Fascioliasis for the month of April 2022



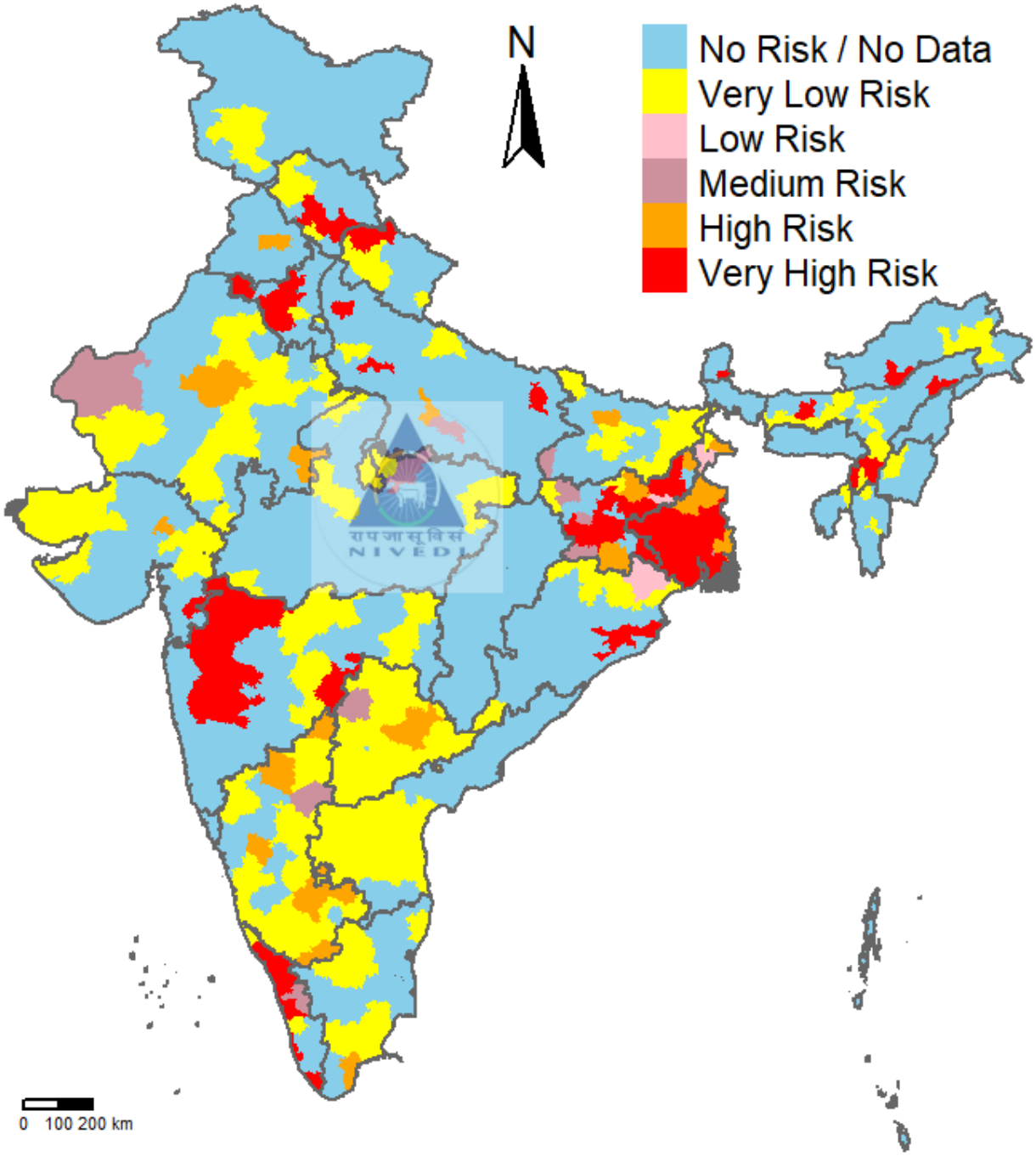
Risk Prediction of Foot and mouth disease for the month of April 2022



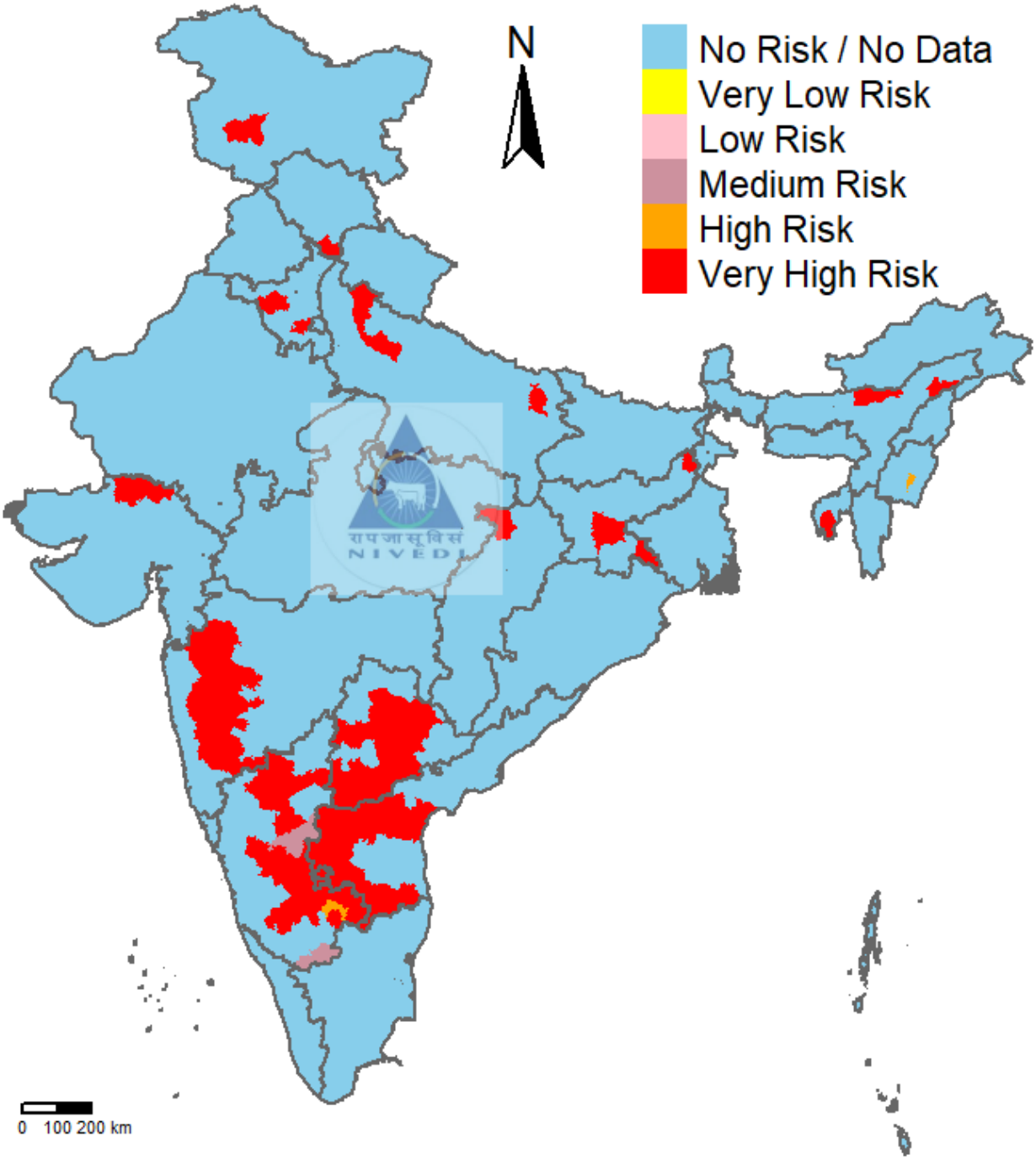
Risk Prediction of Haemorrhagic septicaemia for the month of April 2022



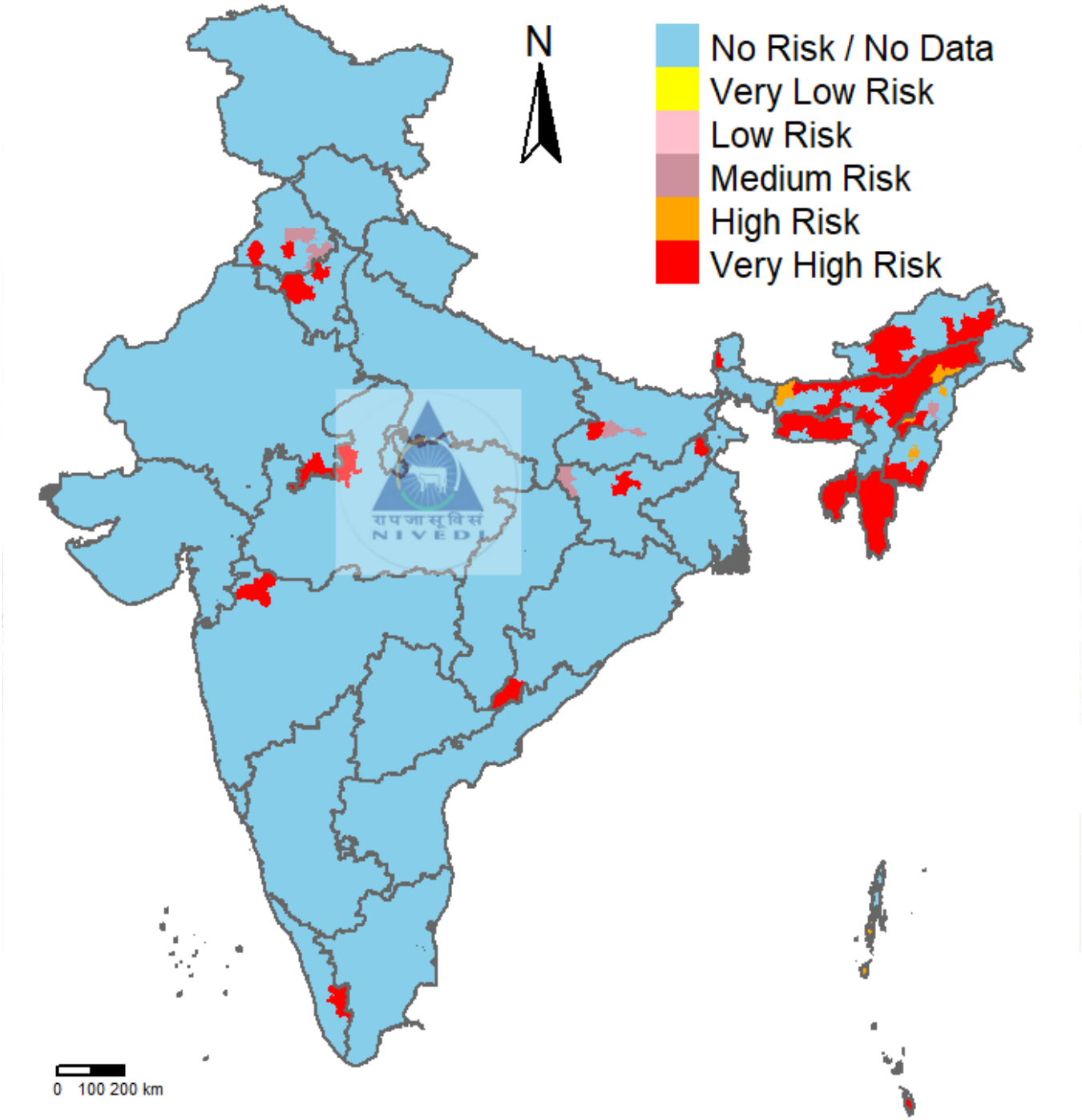
Risk Prediction of Peste des petits ruminants for the month of April 2022



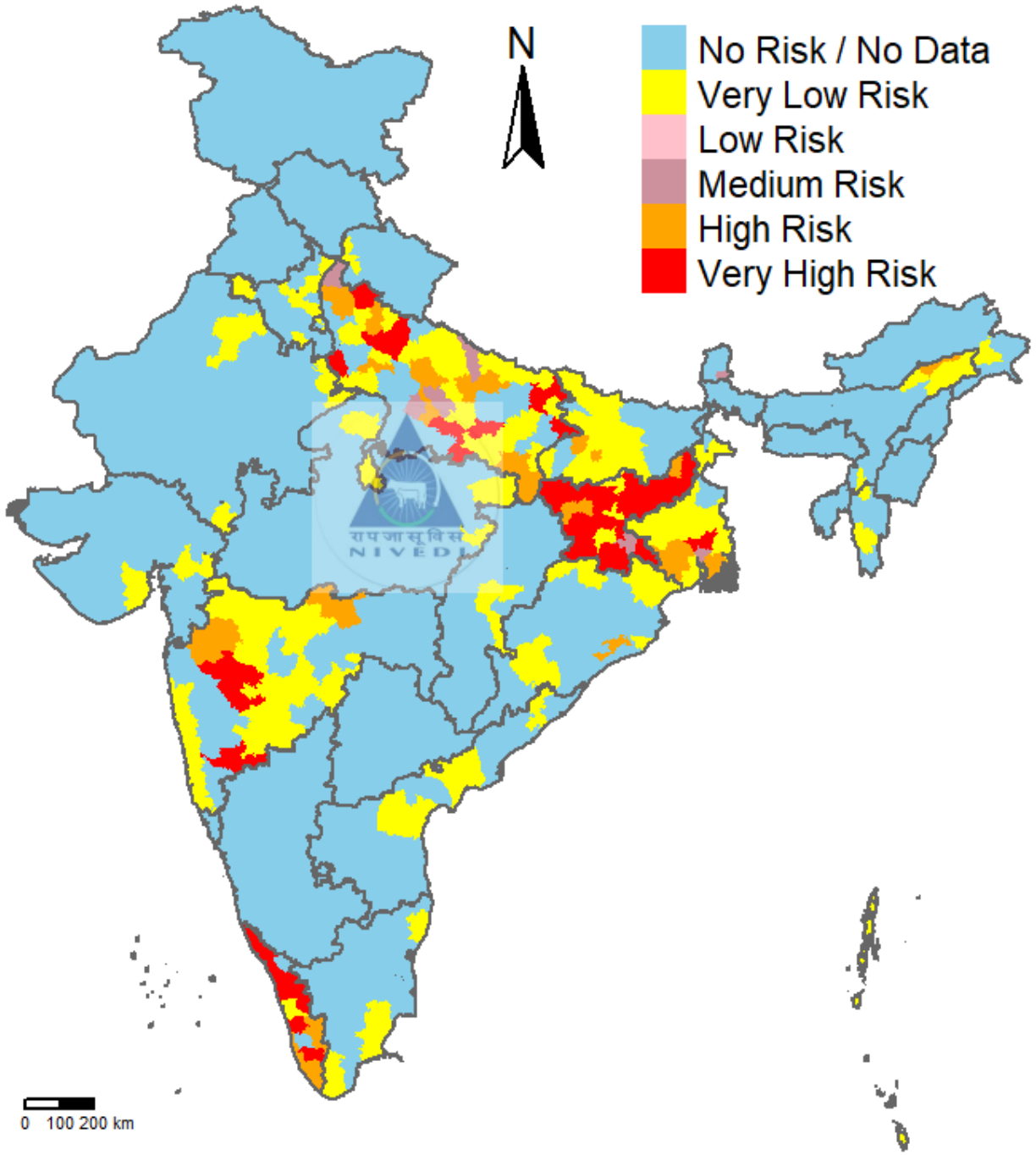
Risk Prediction of Sheep and Goat pox for the month of April 2022



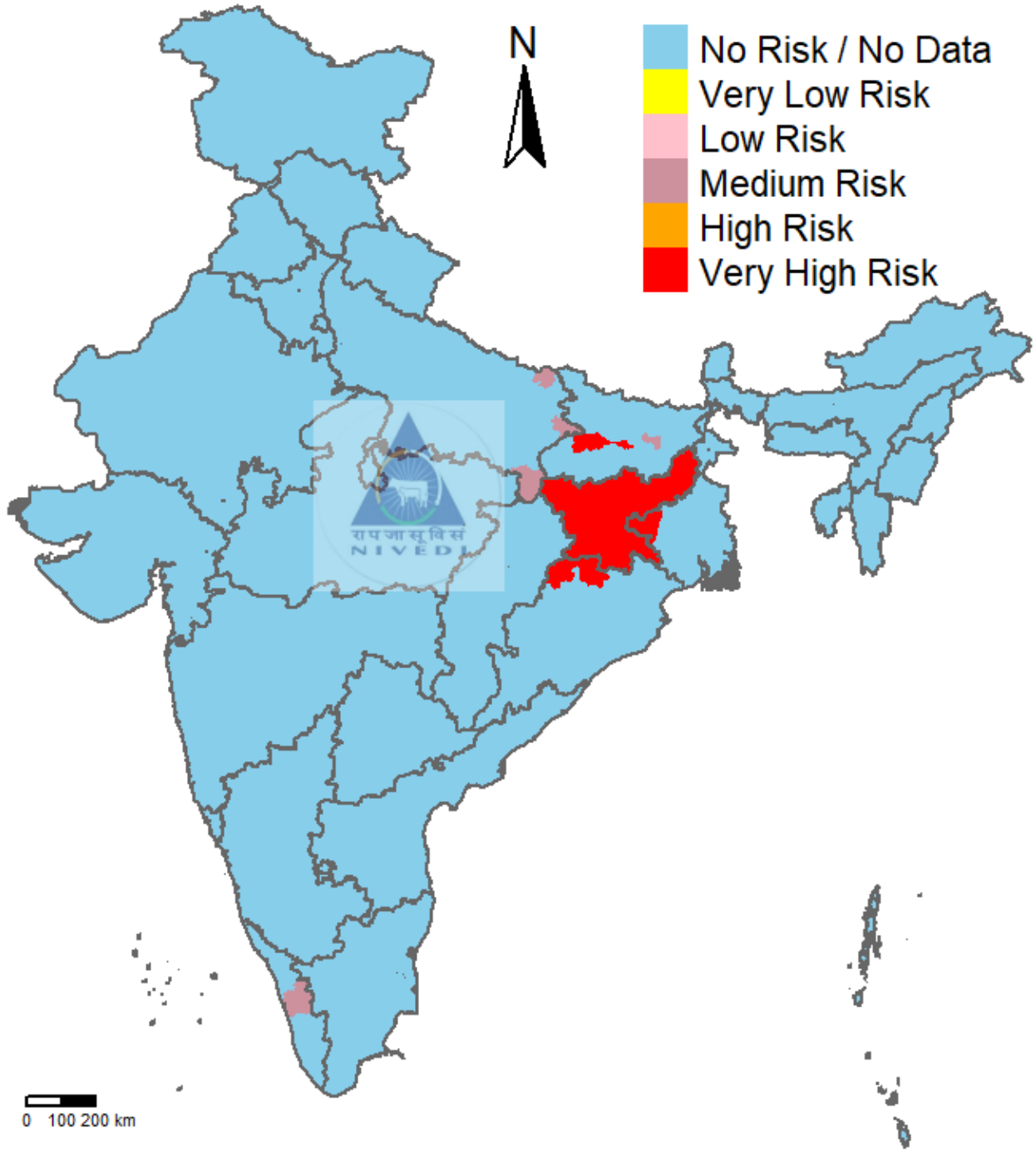
Risk Prediction of Swine fever for the month of April 2022



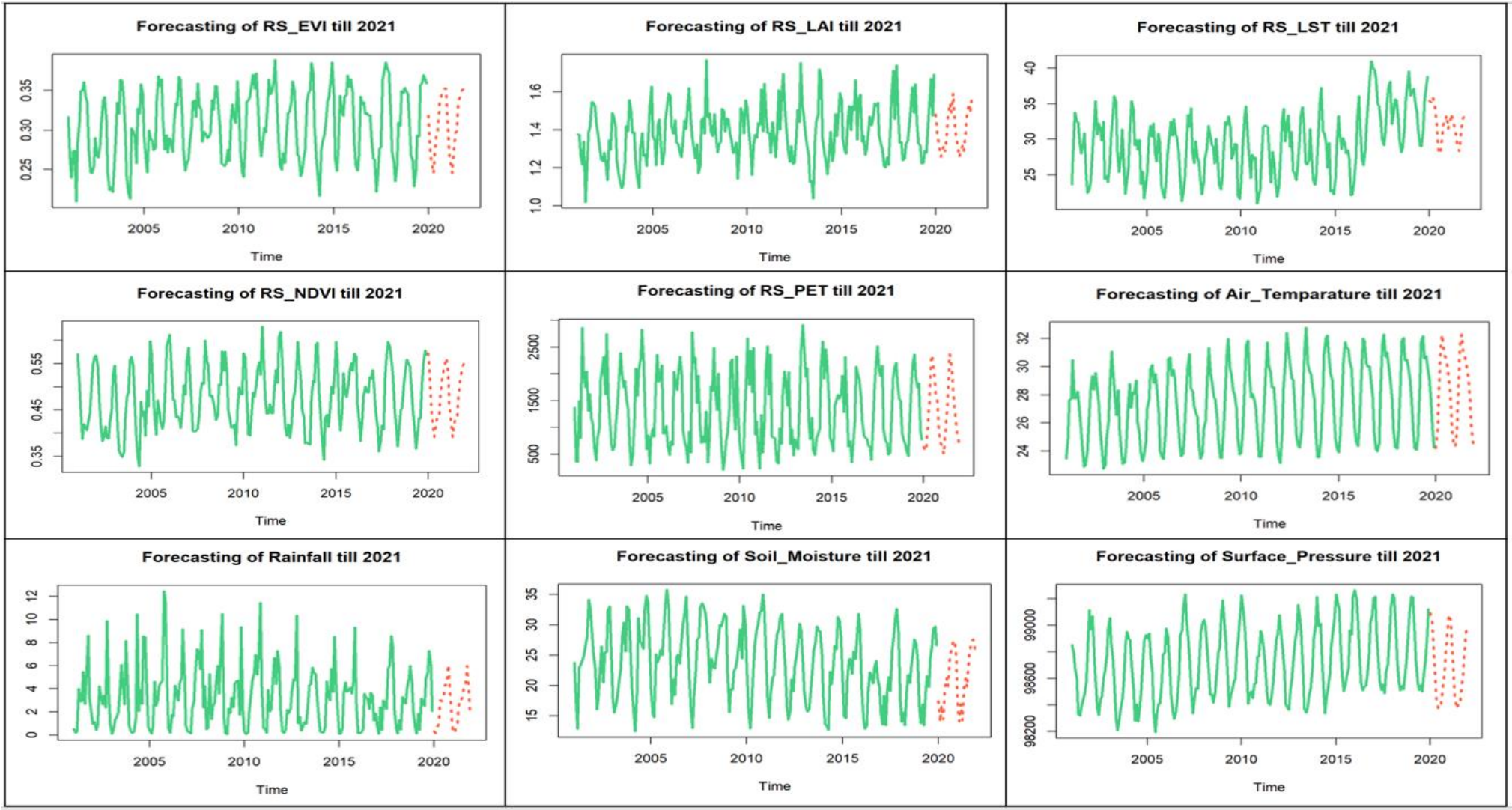
Risk Prediction of Theileriosis for the month of April 2022

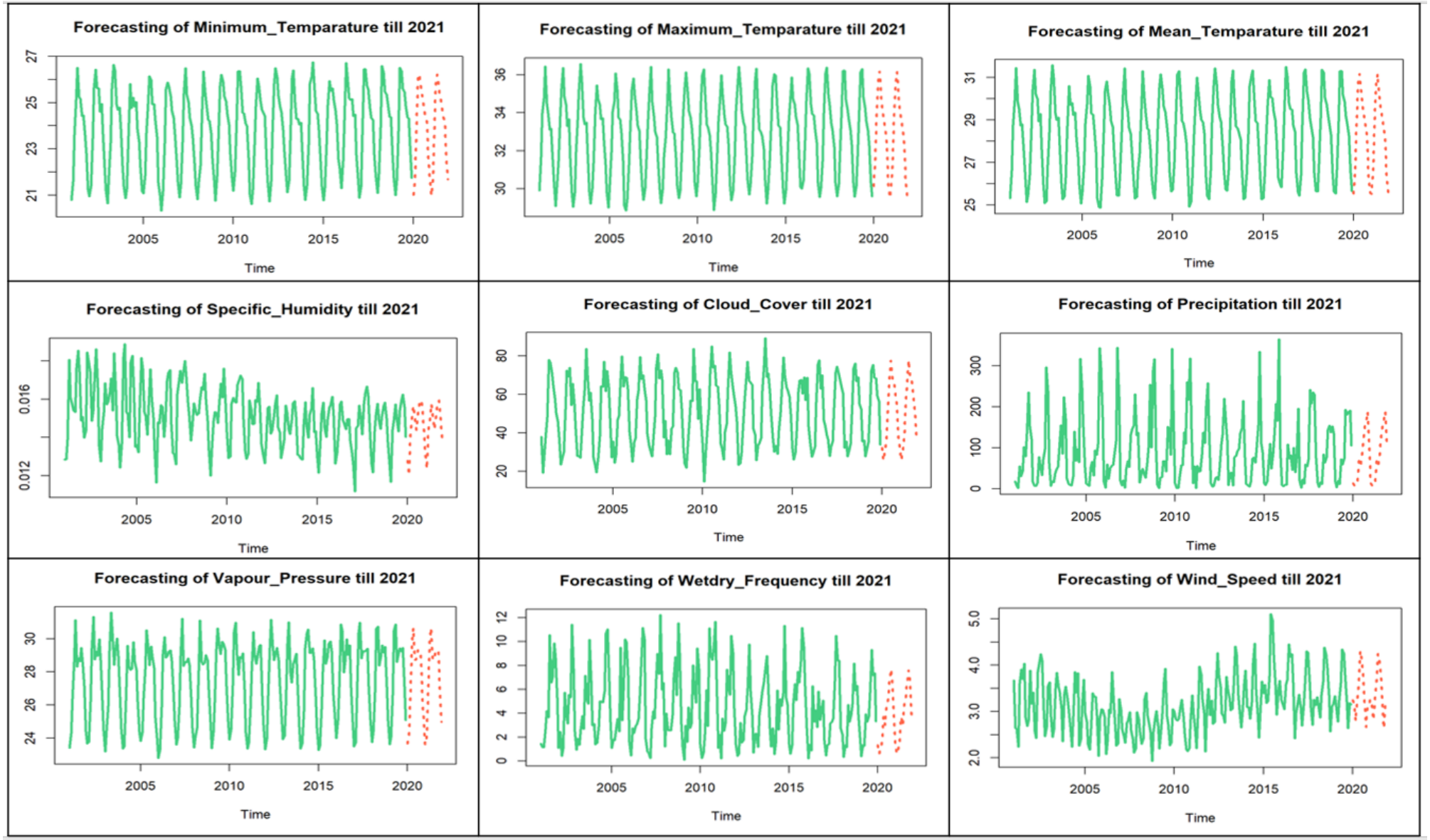


Risk Prediction of Trypanosomiasis for the month of April 2022



V) Forecasting of remote sensing and meteorological parameters till April, 2022 (*Ex. Tamil Nadu*)




Forecasting of Minimum_Temparature till 2021
Forecasting of Maximum_Temparature till 2021
Forecasting of Mean_Temparature till 2021
Forecasting of Specific_Humidity till 2021
Forecasting of Cloud_Cover till 2021
Forecasting of Precipitation till 2021
Forecasting of Vapour_Pressure till 2021
Forecasting of Wetdry_Frequency till 2021
Forecasting of Wind_Speed till 2021
Time

VI) SIGNIFICANT WEATHER PARAMETERS TABLE

Disease Names	Significant Parameters
Anthrax	Precipitable Water, Surface Pressure
Babesiosis	Air Temperature, Precipitation, Surface Pressure, Minimum Temperature, Vapour Pressure, Dew Point Temperature, Wind Speed, NDVI and LST Night
Black quarter	Precipitable Water, Precipitation, Surface Pressure, Sea Level Pressure and Vapour Pressure
Bluetongue	Air Temperature, Cloud, Precipitable Water, Precipitation, Surface Pressure, Uwind, Vwind, Vapour Pressure, Elevation, NDVI and PET
Classical Swine Fever	Cloud, Precipitation, relative humidity Minimum Temperature, Vapour Pressure and Rainfall
Enterotoxaemia	Surface Pressure, NDVI and PET
Fascioliasis	Air Temperature, Precipitation, relative humidity, Temperature, Maximum Temperature, Vapour Pressure, Vwind, Rainfall, Soil Moisture, NDVI and EVI
Foot and Mouth Disease	Precipitable Water, Uwind, Vwind, wet_dry frequency, LST Night and EVI
Haemorrhagic Septicaemia	Cloud, Precipitation and Vwind
Peste des Petits Ruminants	Cloud, Precipitable Water, Surface Pressure, Sea Level Pressure, Maximum Temperature, Vwind and NDVI
Sheep & Goat pox	Cloud, Surface Pressure, Maximum Temperature, Vwind, DTP, NDVI and PET
Theileriosis	Air Temperature, Precipitation, Vapour Pressure, NDVI and LST Night
Trypanosomosis	Air Temperature, Precipitation, Surface Pressure, Vapour Pressure, NDVI and LST Night

Table 7.1: Significant weather parameters govern the Livestock disease incidence (forecast).

9. Post prediction Validation

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

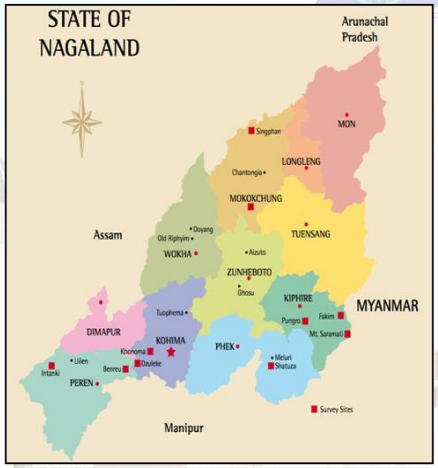
Following reports of a good number of buffaloes dying in a recent outbreak of suspected Haemorrhagic septicaemia (HS), a team from Animal Husbandry and Veterinary Services (AH&VS) department visited the affected areas under Medziphema on April 12. (Haemorrhagic septicaemia is a contagious bacterial disease that affects cattle and water buffaloes with a high mortality rate in infected animals).

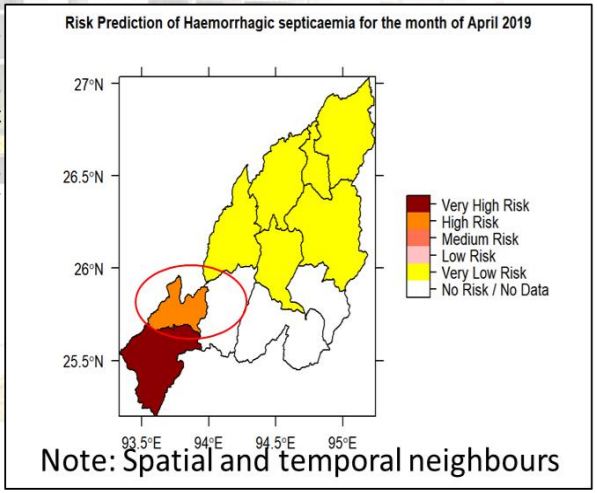
AH&VS, deputy director & principal investigator, AICRP-ADMAS, Dr S. Amenla Walling, in a press release reported that the team consisted of the department's director, Dr Temsumeren, along with additional director, Dr. Budhi Lama, and other officials from the department. The press release added that the 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

ProMED
INTERNATIONAL SOCIETY
FOR INFECTIOUS DISEASES

FMD POST PREDICTION

District wise Livestock Disease Risk Forewarning for April 2021: Arunachal Pradesh

Districts of Arunachal Pradesh	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fascioliasis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomiasis
Anjaw	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Changlang	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibang Valley	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
East Kameng	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
East Siang	NR	NR	NR	NR	NR	NR	*VHR*	NR	VLR	NR	*VHR*	NR	NR
Kurung Kumey	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lohit	NR	VLR	VLR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lower Dibang Valley	NR	NR	VLR	NR	NR	NR	VLR	VLR	VLR	NR	*VHR*	NR	NR
Lower Subansiri	NR	NR	NR	NR	NR	NR	*VHR*	NR	NR	NR	NR	VLR	NR
Papum Pare	NR	NR	NR	NR	NR	NR	*VHR*	NR	*VHR*	NR	*VHR*	NR	NR
Tawang	NR	NR	NR	NR	NR	NR	*HR*	NR	NR	NR	NR	NR	NR
Tirap	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Upper Siang	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Upper Subansiri	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
West Kameng	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
West Siang	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.

Published Date: 2021-04-14 14:06:16
Subject: PRO/SOAS> Foot & mouth disease - India: (Arunachal Pradesh) mithun
Archive Number: 20210414.8306219

FOOT & MOUTH DISEASE - INDIA: (ARUNACHAL PRADESH) MITHUN
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Date: Tue 13 Apr 2021 6:32 AM IST
Source: The Sentinel [edited]
https://www.sentinelassam.com/north-east-india-news/arunachal-news/many-mithuns-infected-with-fmd-foot-and-mouth-disease-533689

A large number of mithuns [or gayal, a large domestic bovine] have been affected by FMD (foot-and-mouth disease) in various parts of Arunachal Pradesh, and a few have died, said official sources on Monday [13 Apr 2021].

Animal Husbandry & Veterinary Department Deputy director Dr Taba Heli, a top mithun expert in North Eastern region, reported that the disease has taken a severe form in the entire Siang belt, particularly in East Siang, West Siang, and Upper Siang districts.

Though the number of deaths is yet to be known, the disease has spread in scattered areas of Papum Pare district also. The Department has allocated district funds for procurement of medicines to take all possible steps to contain the disease, he said. Mithun deaths have been reported also from Itanagar and Jullang area.

Pointing out that mithuns are the pride of indigenous people in the state, Nyishi Elite Society president Bengia Tolum has urged the department to take all possible steps to save them.

--
Communicated by:
ProMED-SoAs from HealthMap Alerts
<promed-SoAs@promedmail.org>

ANDAMAN AND NICOBAR REPORT JUNE-2020

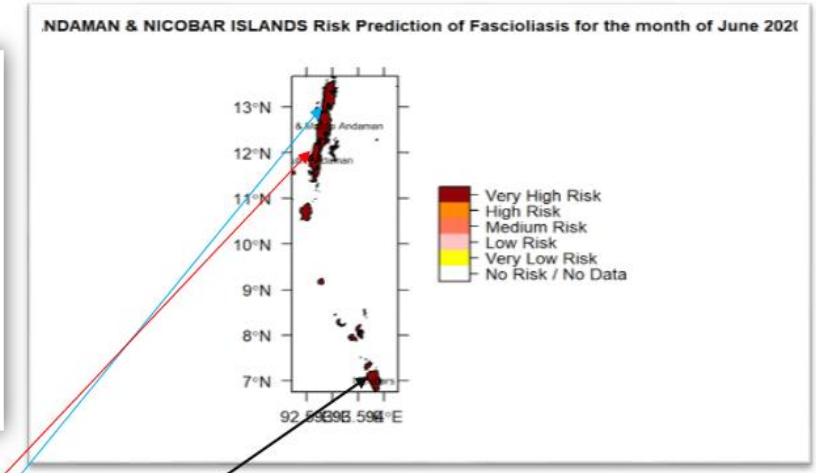
NIVEDI Prediction

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 and Nicobar Report June-2020

monthly report June 2020

1 message

Jai Sunder <jaisunder@rediffmail.com> Wed, Jul 8, 2020 at 10:53 PM
To: Rahman Hibabur <pcadmas@gmail.com>, Director NIVEDI <director.nivedi@icar.gov.in>
Cc: sharan patil <sharanspin123@rediffmail.com>, Divakar Hemadri <divakar.hemadri@gmail.com>

Sir,
Please find attached herewith monthly report for the month of June 2020.

Regards

Dr. Jai Sunder, ARS, FASA
Pr. Scientist (Veterinary Microbiology)
Division of Animal Sciences
ICAR-CIARI, Port Blair- 744 101
A&N Islands
09434281840
03192-245983

June_20.docx
25K

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

HIMACHAL PRADESH REPORT JULY-2020

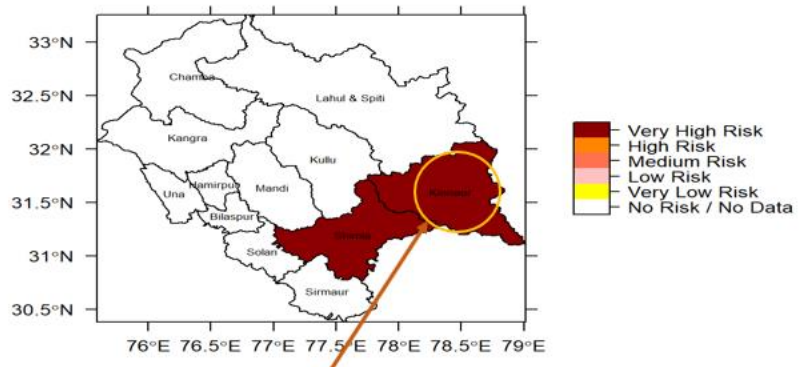
NIVEDI Prediction

District wise Livestock Disease forewarning for July 2020: Himachal Pradesh

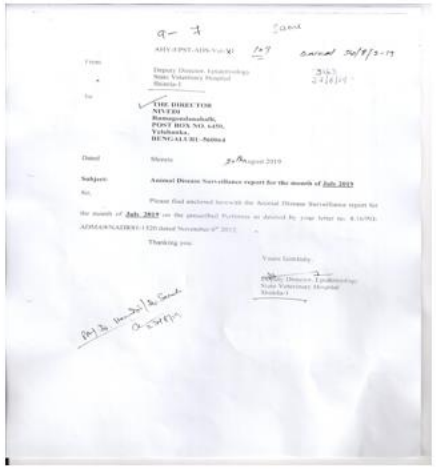
Districts of Himachal pradesh	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fasciolosis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomiasis
Bilaspur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chamba	NR	NR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR	NR
Hamirpur	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kangra	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)

NAME OF THE COLLABORATING UNIT : AICRP-ADMAS of NIVEDI SHIMLA, HIMACHAL PRADESH

ADDRESS OF THE COLLABORATING UNIT : PI-AICRP-ADMAS of NIVEDI-cum-Deputy Director Epidemiology, State Veterinary Hospital Complex Cart Road Shimla-171001, Phone: 0177-2650938, 94180-61810 Email: munish_batta@hotmail.com; greckhitender@yahoo.com

REPORT FOR THE MONTH OF : July 2019

DATE OF REPORT : 20.08.2019

Name of the village*	Latitude and longitude of the village	Postal pin code of the village	Name of the district	Name of the disease	Species affected*	Year	Month	Number of outbreaks	Number susceptible	Number attacked	Number of deaths	Number of vaccination
Jurag	30.6458° N 77.4764° E	173022	Sirmaur	Sheep Pox	Sheep	2019	July	1	300	41	0	259
Chuara	31.5581475° N 77.9467311° E	172101	Kinnaur	Sheep Pox	Sheep	2019	July	1	200	40	5	160

*If you know the exact place of the outbreak please mention it.

* Kindly specify the species i.e., cattle, buffalo and not bovines and similarly write individually for goats and sheep

Co-PI-AICRP-ADMAS of NIVEDI

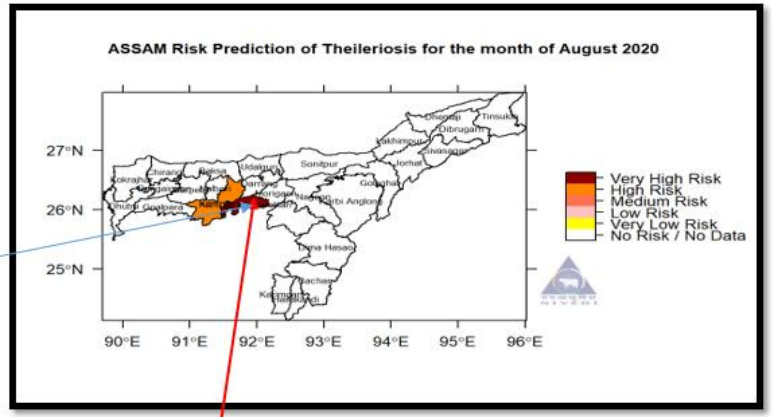
PI-AICRP-ADMAS of NIVEDI

ASSAM REPORT AUGUST-2020

NIVEDI Prediction

District wise Livestock Disease forewarning for August 2020: Assam

Districts of Assam	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fasciolosis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomiasis
Baksa	NR	NR	VHR	NR	NR	NR	NR	VHR	VLR	NR	NR	NR	NR
Barpeta	NR	NR	VHR	NR	NR	NR	VLR	VHR	NR	NR	VHR	NR	NR
Bongaigaon	NR	NR	VHR	NR	NR	NR	NR	VHR	VHR	NR	VHR	NR	NR
Cachar	NR	NR	VHR	NR	NR	VHR	NR	VHR	NR	NR	NR	NR	NR
Chirang	NR	NR	VHR	NR	NR	NR	NR	HR	NR	NR	NR	NR	NR
Darrang	NR	VHR	VHR	NR	NR	NR	NR	HR	VHR	NR	NR	NR	NR
Dhemaji	NR	NR	VHR	NR	NR	VHR	NR	VHR	NR	NR	VHR	NR	NR
Dhubri	NR	NR	VHR	NR	NR	VHR	VLR	VHR	HR	NR	NR	NR	NR
Dibrugarh	NR	NR	VHR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Dima Hasao	NR	NR	VLR	NR	NR	NR	VLR	VLR	VLR	NR	NR	NR	NR
Goalpara	NR	NR	VHR	NR	VHR	NR	VLR	VHR	VLR	NR	VHR	NR	NR
Golaghat	NR	NR	VLR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Hailakandi	NR	NR	MR	NR	NR	NR	NR	VLR	NR	NR	NR	NR	NR
Jorhat	NR	NR	VHR	NR	NR	VHR	NR	VLR	VLR	NR	VHR	NR	NR
Kamrup	NR	NR	VLR	NR	NR	VHR	VLR	VLR	HR	NR	VHR	HR	NR
Kamrup Metropolitan	NR	NR	VHR	NR	NR	VHR	VLR	VHR	HR	NR	VHR	VHR	NR
Karbi Anglong	NR	NR	VLR	NR	VHR	NR	VLR	VLR	NR	VHR	NR	NR	NR
Karimganj	NR	NR	VHR	NR	NR	NR	NR	VHR	VLR	NR	NR	NR	NR
Kokrajhar	NR	NR	VHR	NR	VHR	NR	VLR	VLR	NR	NR	VHR	NR	NR
Lakhimpur	NR	NR	VLR	NR	VHR	VHR	NR	VLR	VLR	NR	VHR	NR	NR
Morigaon	NR	NR	VHR	NR	NR	NR	NR	VHR	VLR	NR	VHR	NR	NR



Assam Report August-2020

Gmail - Monthly Reports_June_July_August2020_Guwahati Centre

Gmail

ICAR NIVEDI <pcadmas@gmail.com>

Monthly Reports_June_July_August2020_Guwahati Centre

1 message

Dr Durlav Prasad Bora <drdpbora@gmail.com> Mon, Oct 5, 2020 at 4:27 PM

To: pcadmas@gmail.com

Dear Sir

I am sending herewith the monthly reports for the months of June, July and August, 2020.

Kindly acknowledge the receipt of the same.

Best Regards

Durlav P Bora

PI, AICRP on ADMAS

Guwahati Centre

--

Dr Durlav Prasad Bora MVSc,PhD (IVRI)

Assistant Professor (Sr. Scale)

Department of Microbiology

College of Veterinary Science

Assam Agricultural University

Khanapara, Guwahati-781022

ASSAM (INDIA)

Phone +919954533400

+919435594808

Researchgate: https://www.researchgate.net/profile/Durlav_Bora3

ORCID ID: https://orcid.org/0000-0002-5629-7939

Scopus Author ID: 7003809722

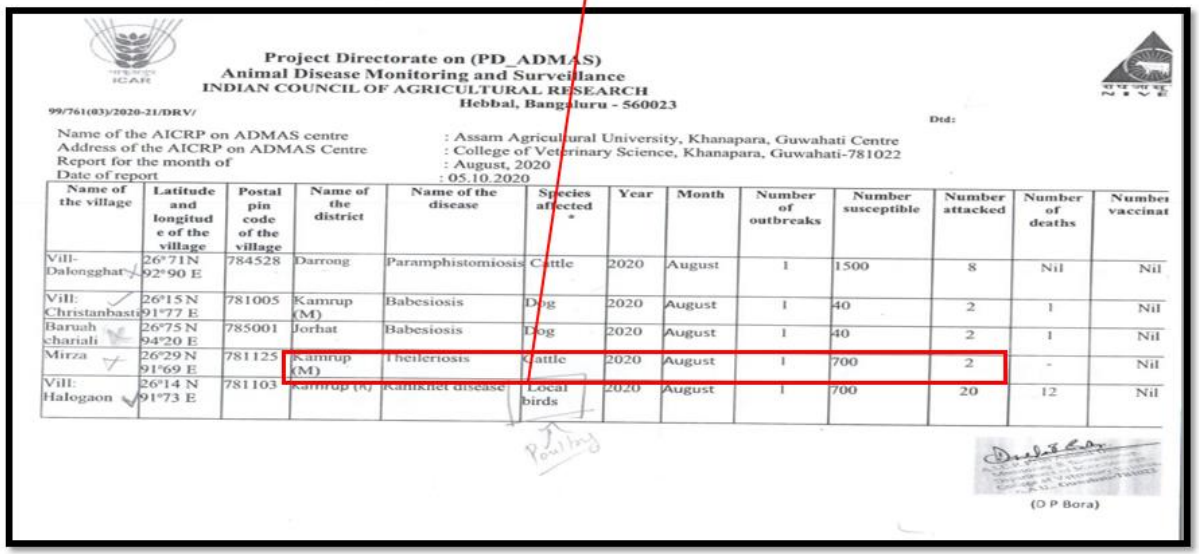
Web of Science ResearcherID: AAE-4450-2020

3 attachments

Monthly report_August2020_ICAR-ADMAS.doc 517?K

Monthly report_June2020_ICAR-ADMAS.doc 517?K

Monthly report_July 2020_ICAR-ADMAS.doc 517?K



Project Directorate on (PD_ADMAS)
Animal Disease Monitoring and Surveillance
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
Hebbal, Bangaluru - 560023

99/761(03)/2020-21/DRV/ Dtd:

Name of the AICRP on ADMAS centre : Assam Agricultural University, Khanapara, Guwahati Centre
Address of the AICRP on ADMAS Centre : College of Veterinary Science, Khanapara, Guwahati-781022
Report for the month of : August, 2020
Date of report : 05.10.2020

Name of the village	Latitude and longitude of the village	Postal pin code of the village	Name of the district	Name of the disease	Species affected *	Year	Month	Number of outbreaks	Number susceptible	Number attacked	Number of deaths	Number vaccinat
Vill-Dalongghat	26°71N 92°90 E	784528	Darrong	Paramphistomiosis	Cattle	2020	August	1	1500	8	Nil	Nil
Vill: Christanbasti	26°15 N 91°77 E	781005	Kamrup (M)	Babesiosis	Dog	2020	August	1	40	2	1	Nil
Baruah chariali	26°75 N 94°20 E	785001	Jorhat	Babesiosis	Dog	2020	August	1	40	2	1	Nil
Mirza	26°29 N 91°69 E	781125	Kamrup (M)	Theileriosis	Cattle	2020	August	1	700	2	-	Nil
Vill: Halogaon	26°14 N 91°73 E	781103	Kamrup (R)	Ranikhet disease	Local birds	2020	August	1	700	20	12	Nil

(D P Bora)

KARNATAKA REPORT SEPTEMBER-2021

ProMED
INTERNATIONAL SOCIETY
FOR INFECTIOUS DISEASES

Published Date: 2021-09-30 11:40:53
Subject: PRO/SOAS> Foot & mouth disease - India (10): (Karnataka) cattle
Archive Number: 20210930.8698795

FOOT & MOUTH DISEASE - INDIA (10): (KARNATAKA) CATTLE

A ProMED-mail post
http://www.promedmail.org
ProMED-mail is a program of the
International Society for Infectious Diseases
http://www.isid.org

Date: Fri 24 Sep 2021 18:33 IST
Source: The Hindu [edited]
https://www.thehindu.com/news/national/karnataka/foot-and-mouth-disease-reported-in-hassan/article36652024.ece

District wise Livestock Disease Risk Forewarning for September 2021: Karnataka

Districts of Karnataka	Livestock Diseases												
	Anthrax	Babesiosis	BQ	BT	ET	Fasciolosis	FMD	HS	PPR	S&G Pox	SF	Theileriosis	Trypanosomosis
Gulbarga	NR	NR	VLR	VLR	NR	NR	VLR	VLR	NR	*VHR*	NR	NR	NR
Hassan	NR	NR	*VHR*	VLR	NR	NR	*VHR*	VLR	VLR	*VHR*	NR	NR	NR
Haveri	*VHR*	NR	VLR	NR	NR	NR	*HR*	*HR*	NR	*HR*	NR	NR	NR
Kodagu	NR	NR	*HR*	NR	NR	NR	*VHR*	VLR	NR	NR	NR	NR	NR
Kolar	NR	NR	NR	VLR	NR	NR	*HR*	VLR	NR	NR	NR	NR	NR
Koppal	*VHR*	NR	VLR	VLR	NR	NR	LR	MR	VLR	NR	NR	NR	NR
Mandya	NR	NR	NR	VLR	NR	NR	*VHR*	VLR	NR	NR	NR	NR	NR
Mysore	NR	NR	*VHR*	NR	NR	NR	*VHR*	VLR	VLR	NR	NR	NR	NR
Raichur	*VHR*	NR	VLR	NR	NR	NR	VLR	LR	VLR	NR	NR	NR	NR
Ramanagara	NR	NR	NR	VLR	NR	NR	*VHR*	NR	VLR	NR	NR	NR	NR
Shimoga	NR	NR	*VHR*	NR	*VHR*	NR	*VHR*	MR	VLR	NR	NR	NR	NR
Tumkur	*VHR*	NR	*HR*	VLR	NR	NR	*VHR*	*VHR*	VLR	NR	NR	NR	NR
Udupi	NR	NR	NR	NR	NR	NR	*HR*	NR	NR	NR	NR	NR	NR
Uttara Kannada	NR	NR	NR	NR	NR	NR	*HR*	VLR	NR	NR	NR	NR	NR
Yadgir	NR	NR	VLR	VLR	NR	NR	VLR	VLR	VLR	NR	NR	NR	NR

The outbreak of foot-and-mouth disease (FMD) among cattle in Hassan has left both farmers and veterinarians worried.

Cases have been reported from Arkalgud, Arsikere, Channarayapatna, and Sakleshpur taluks. While the farming community, depending on cattle for regular income, are worried about their livelihood, the veterinarians are struggling hard to provide treatment, amidst a shortage of staff members.

The Department of Veterinary and Animal Husbandry has reported over 150 cases in the district so far. As of [Fri 24 Sep 2021], the animals in 16 villages of the district are being treated. So far the death of one animal had been reported. However, farmers claim more animals have died over the last month. The death of cattle has an impact on milk production, affecting milk producers.

The vaccination for cattle is done once in six months under the National Animal Disease Control Programme. However, the vaccination drive was not done in the last year, owing to the COVID-19 pandemic. "The outbreak of foot and mouth disease is due to the failure of the government in conducting the vaccination. If the vaccination had been done as per the schedule, farmers would not have suffered", H Yoga Ramesh, president of Potato Club in Arkalgud, told media.

Following reports of the disease, veterinarians have been treating affected animals. "Against 24 sanctioned posts of veterinary doctors in Arkalgud taluk, we are only five people. Every doctor is in charge of 2 or more hospitals. We are struggling hard to treat animals", said a veterinarian.

Unless the vacancies were filled up the department cannot deliver services fully. There was a shortage of staff members of other cadres as well, he added.

Considering the cases, the department has launched a ring vaccination programme. Under this, the animals in a 5-kilometre [3.1 mi] radius of the village, where the disease breakout was reported, would be vaccinated. "We have sufficient stock for the ring vaccination. We are planning a mass vaccination in October [2021], where we will cover 6.58 lakh [658 000] animals," said KR Ramesh, Deputy Director of Veterinary and Animal Husbandry in Hassan.

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ProMED-SoAs from HealthMap Alerts
<promed-SoAs@promedmail.org>

9.1 Correlational Assessment

The number of outbreaks predicted and outbreaks actually reported were reported in table 9.1. It has been observed from the table that outbreaks predicted two months in advance and timely alerts were issued that helped the stakeholders to take appropriate preventive measures with in time and accordingly the reported outbreaks were very less. Though the use of artificial intelligence system is more beneficial for accurately predicting the livestock disease outbreaks, there are yet number of limitations, namely, there are expected to be under reporting and also non-reporting cases which created the uncertainties in the model predictions while translating model inputs in to model outputs. However, identifying these uncertainties in the prediction using statistical models and highlighting the importance of quality data may improve the model accuracy and confidence while building the model for livestock disease forecasting.

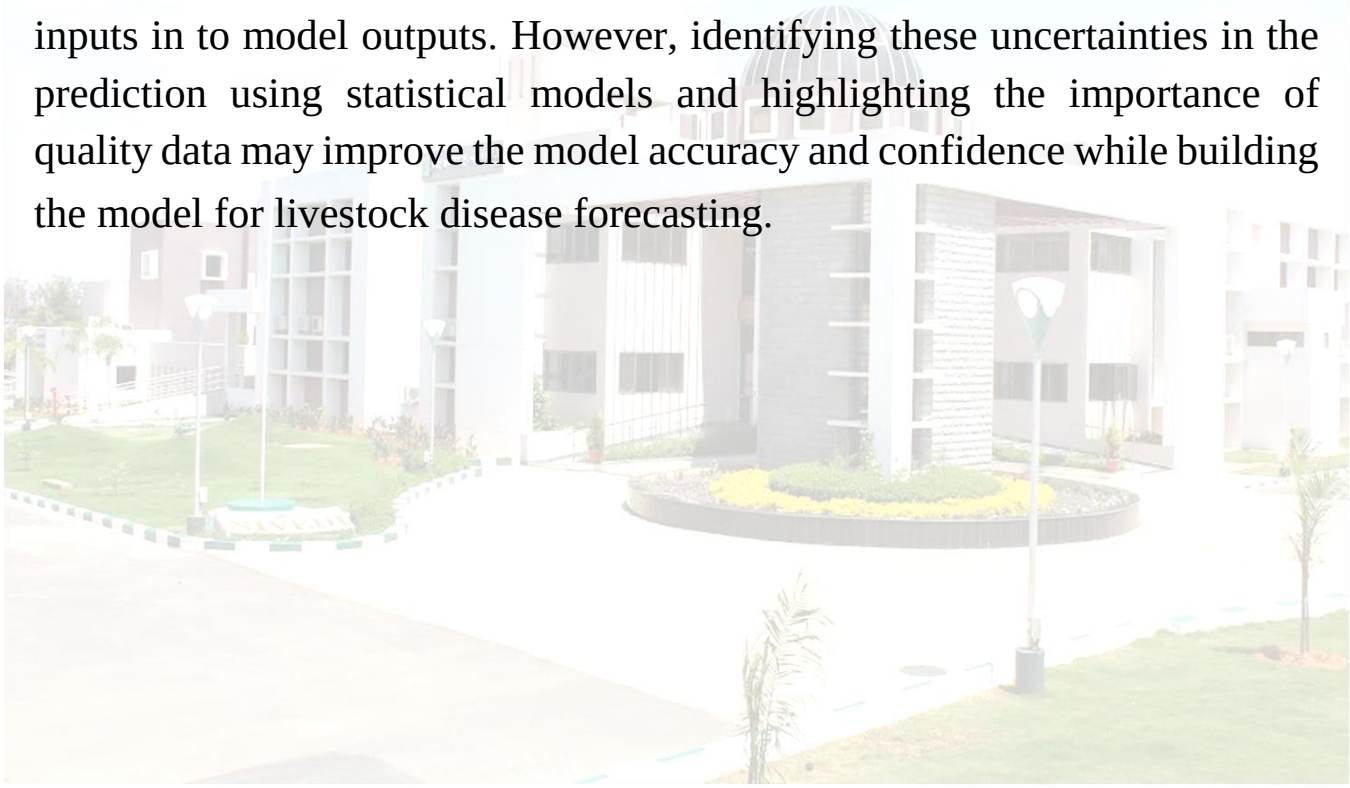


Table 9.1: Number of districts predicted for livestock diseases risk events and reported outbreaks

Sl No	Livestock diseases	September-2020		October-2020	
		No. of districts predicted for the disease risk events	No. of districts reported the disease outbreaks*	No. of districts predicted for the disease risk events	No. of districts reported the disease outbreaks*
1	Anthrax	40	8	34	12
2	Babesiosis	34	12	36	7
3	Black quarter	59	18	52	12
4	Bluetongue	1	NA	NA	NA
5	Enterotoxaemia	16	6	20	4
6	Fascioliasis	48	29	59	14
7	Foot and mouth disease	92	13	104	26
8	Haemorrhagic septicaemia	81	22	52	6
9	Peste des petits ruminants	56	16	46	15
10	Sheep & Goat pox	27	2	32	9
11	Swine fever	34	8	31	4
12	Theileriosis	33	17	39	12
13	Trypanosomosis	39	13	42	17

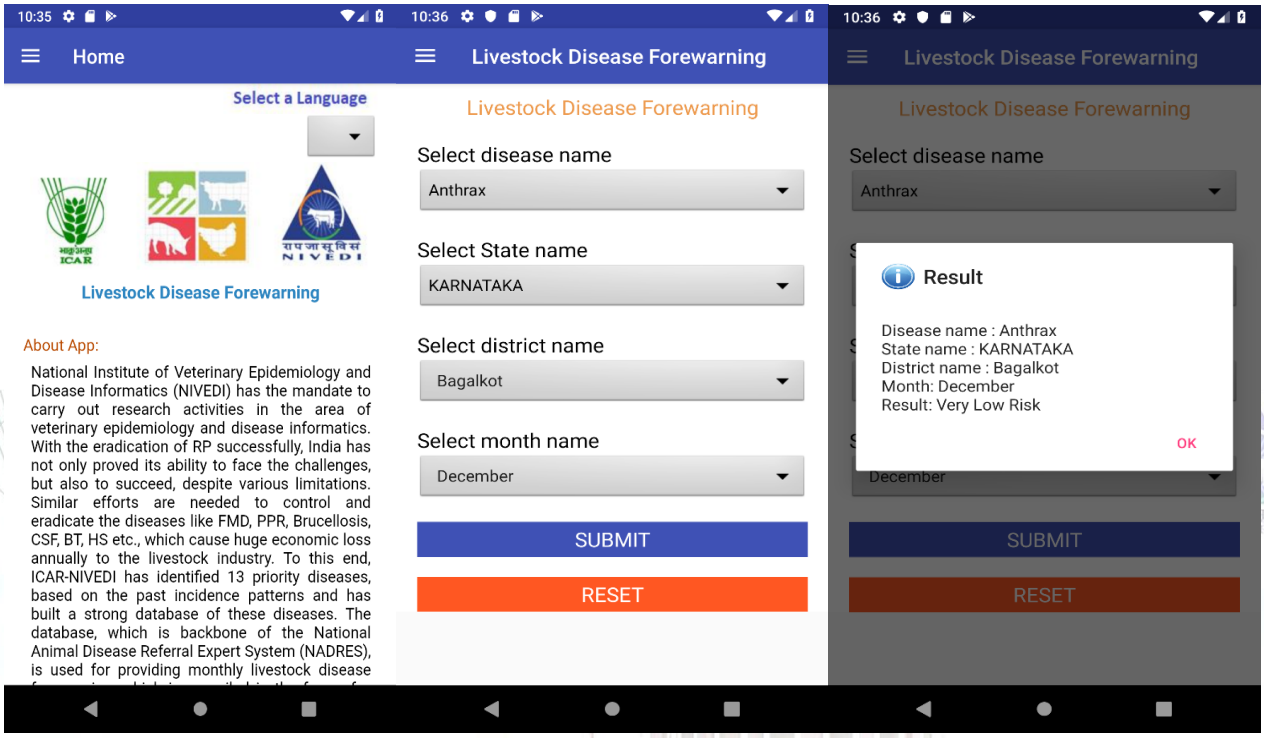
*Which takes in to account of action taken for prediction and non-reporting of cases

10. Launch of Mobile Android app&link to download

Livestock forewarning application **(**LDF**)** can be downloaded using the following link: http://www.nivedi.res.in/android_nadres/LDF.apk or in the google play store https://play.google.com/store/apps/details?id=info.androidhive.ldf

Further launch of LDF application was done and published in newspapers

Livestock Disease Forewarning (LDF Mobile App)



To extend the reach of the NADRES forewarning bulletin among the various stakeholders, a Mobile Application named Livestock Disease forewarning app "LDF-Mobile *App"* was developed. The forewarning methodology adapted in the "mobile app" remains the same as monthly bulletin; it provides user interface to know the predicted forewarning results stored in NADRES MySQL database. A PHP web-based service is developed in Java to extract the results of forewarning two months in advance by keying state name, district name and disease name and display the same in the mobile app. In addition to forewarning, the LDF-Mobile App also provides the details of clinical samples to be collected in case of outbreaks of the listed diseases for laboratory confirmationandimmediatepreventive measures to be taken up in case of positive prediction/disease confirmation. The LDF mobile app is available at ICAR-NIVEDI website. It is available on Google play store.

11. FARMERS EMPOWERMENT THROUGH IT: DISEASE RISK COMMUNICATION (COLLABORATION WITH FRUITS, NIC, GOVT. OF KARNATAKA)

In addition to NADRES V_2 (The National Animal Disease Referral Expert System), ICAR-NIVEDI collaborated with NIC, Govt. of Karnataka, Karnataka State for sending the SMS alerts directly to farmers who have registered in FRUITS (Farmers Registration and Unified Beneficiary Information System). The information alerts on risk prediction of six livestock diseases were sent through SMS to farmers is presented in Table 11.A. During January2022, a total of **10,80,099** SMS alerts were sent to farmers.

Table 11.A: Number of famers received the SMS alert through FRUITS application during January 2021

Disease Name	District Name	No. of farmers received SMS	Disease Name	District Name	No. of farmers received SMS
Anthrax	Bellary	2856.00	FMD	Bangalore Rural	36481.00
	Davanagere	24797.00		Chamarajanagar	26317.00
	Gulbarga	5831.00		Chikkaballapura	38000.00
	Haveri	24208.00		Chikmagalur	15514.00
	Koppal	14941.00		Gulbarga	5858.00
	Raichur	5569.00		Hassan	81018.00
	Tumkur	89772.00		Kodagu	2881.00
BQ	Chamarajanagar	26292.00		Kolar	24517.00
	Davanagere	24801.00		Mandya	110099.00
	Hassan	80910.00		Mysore	110931.00
	Mysore	110811.00		Ramanagara	58023.00
	Shimoga	34873.00		Shimoga	34926.00
	Tumkur	89873.00			
Total SMS Sent to Farmers					**1080099.00**

12. Appendix

a) R Code

```
#parsmonth_number=8; year_number=2006; current_year=2017;

nadres_func=function (current_year, year_number, month_number)

{

args= commandArgs(trailingOnly=TRUE)

if(length(args)<3) {

stop("Correct number of arguments must be supplied", call.=FALSE)

  }

current_year=args[1]

year_number=args[2]

month_number=args[3]

df_total<-NULL

month_name=data.frame(month=c(1:12),

month_names=c("February","February","October","October","May","October","October","October","October","October","January","January")

)

ss<-fread(file="NADRES.csv",header=T,check.names = F)

col_pars=names(ss)

vars= paste(col_pars[7:ncol(ss)],collapse = "+")

options(verbose = F)

for(disease in c(8,10,11,12,24,31,35,37,48,60,62,65,70,72,79))

{

# disease=8

rs<-dbSendQuery(mydb,"SELECT
index_state.state_name,index_state.state_id,index_district.district_id, index_district.district_name,
```

year_list.year, outbreak_data_final.month, ls_sp_index.species_name,disease_master.disease_id, disease_master.disease_name, outbreak_data_final.number_of_outbreaks, outbreak_data_final.number_susceptible, outbreak_data_final.number_of_attacks, outbreak_data_final.number_of_deaths

FROM ls_sp_index INNER JOIN (year_list INNER JOIN (disease_master INNER JOIN (index_district INNER JOIN (index_state INNER JOIN outbreak_data_final ON index_state.state_id= outbreak_data_final.state_id) ON index_district.district_id = outbreak_data_final.district_id) ON disease_master.disease_id= outbreak_data_final.disease_id) ON year_list.year = outbreak_data_final.year) ON ls_sp_index.species_id= outbreak_data_final.species_id; ")

```
data= fetch(rs, n=-1)

 # year change

data<-subset(data,data$year>=year_number&data$disease_id==disease)

df<-sqldf("SELECT state_id,state_name,district_id,district_name,disease_id,disease_name,month,sum(number_of_outbreaks)as outbreak FROM data GROUP BY state_id,district_id,state_name,district_name,month,disease_id,disease_name",drv="SQLite")

ss1<-subset(ss,ss$disease_id==disease)

attach(ss1,warn.conflicts = F)

attach(df,warn.conflicts = F)

dd<-merge(ss1, df, by = c("state_id","district_id","disease_id","month"),all.x=TRUE)

attach(dd,warn.conflicts = F)

out<-data.frame(outbreak)

out<-ifelse(outbreak>=1,1,0)

out[is.na(out)]<-0

final<-cbind(dd,out)

 final1<-final[which(final$disease_id==disease),]

cat("For disease: ",as.character(unique(ss1["disease_name"])),"\n")
```

```
ncs= ncol(final1)-5

temp= data.frame(final1[,8:ncs])

for(i in 1:ncol(temp)){

temp[is.na(temp[,i]), i] <- mean(temp[,i], na.rm = TRUE)

  }

 final2<-
cbind(final1$state_id,final1$state_name.x,final1$district_id,final1$district_name.x,final1$disease_id,final1$disease_name.x,final1$out,final1$month,temp)

setnames(final2,old=c("final1$state_id","final1$state_name.x","final1$district_id","final1$district_name.x","final1$disease_id","final1$disease_name.x","final1$out","final1$month"),new=c("state_id","state_name","district_id","district_name","disease_id","disease_name","out","month"))



formula=paste("out ~",vars)

as.formula(formula)

model<-glm(formula,data= final2, family = binomial(link="logit"),maxit=20)

new<-data.frame(final2[,8:ncol(final2)])

prediction<-predict(model,type="response")

n2=randomForest(as.formula(formula),final2)
 prediction_rf<-predict(n2,type="response")

 gbm_model=gbm.step(data=final2, gbm.x = 8:ncol(final2), gbm.y = 7, family = "bernoulli",
tree.complexity = 1, learning.rate = 0.01,
 bag.fraction= 0.5, n.trees = 5,keep.fold.fit=T,tolerance.method="fixed" , step.size= 5,n.folds =
10)
 prediction_gbm<-predict(gbm_model,n.trees=gbm_model$gbm.call$best.trees,type="response")
 prediction=numeric()
 for(i in 1:length(prediction_glm)) {
  # if(prediction_glm[i]>prediction_rf[i])
  # {
  #   if(prediction_glm[i]>prediction_gbm[i])
  #   {
  #     prediction[i]=prediction_glm[i]
  #   }
    if(prediction_glm[i] >= prediction_gbm[i] &&prediction_glm[i] >= prediction_rf[i])
    {
```

```
  prediction[i]=prediction_glm[i];
 }

 if(prediction_gbm[i] >= prediction_glm[i] &&prediction_gbm[i] >= prediction_rf[i])
 {
  prediction[i]=prediction_gbm[i];
 }

 if(prediction_rf[i] >= prediction_glm[i] &&prediction_rf[i] >= prediction_gbm[i]) {
  prediction[i]=prediction_rf[i];
 }

 }
summary(prediction)
vv<-round(prediction,2)

 df1<-cbind(final2,vv)

df_total<-rbind(df_total,df1)

gc()

}

f=function(m){

if(m<=0.0) i=1

else if(m>=0.0 && m<=0.20) i=2

else if(m>=0.21 && m<=0.40) i=3

else if(m>=0.41 && m<=0.60) i=4


else if(m>=0.61 && m<=0.80) i=5

elsei=6

}

df_total$cate=factor(mapply(f,df_total$vv),levels=1:6,labels=c("","","","MR","","HR"))

write.csv(df_total,"nadres_outbreak.csv")

###### ACCURACY

df_total=read.csv("nadres_outbreak.csv",header = T)
```

```
dir.create(path = paste(month_name[month_number,2],current_year))

df_poa=df_total

df_poa$cate=factor(mapply(f,df_poa$vv),levels=1:6,labels=c(0,0,0,0,1,1))

df_poa=df_poa[which(df_poa$month==month_name[month_number,1]),]

df_p=df_poa[,c("disease_name","out","cate")]

df_acc=cbind(data.frame(c(1:ow(df_tot_res))),data.frame(df_tp_tn[,1]),(df_tp_tn[,2]/df_tot_res[,2])*
100)

df_acc=setNames(df_acc,c("No","Disease","Accuracy"))

print(df_acc)

dis_acc=paste(paste(month_name[month_number,2]," ",current_year,"/",sep= ""),"Disease
Accuracy ",month_name[month_number,2]," ",current_year,".csv",sep="")

write.csv(df_acc,dis_acc,row.names = F)

##########PLOT

i=1

plot_dir=paste(paste(month_name[month_number,2],"
",current_year,"/",sep=""),month_name[month_number,2]," ",current_year," N",sep="")

dir.create(path = plot_dir)

disease = c(8,10,11,12,31,35,37,48,60,65,70,72,79)

while(i<=length(disease))

{

kar=readOGR(dsn = "1shp/2011_Dist.shp",verbose = FALSE)

cols=as.character(unique(df_total[df_total$disease_id==disease[i],"disease_name"]))

df_disease=df_total[which(df_total$month==month_name[month_number,1]
&df_total$disease_id==disease[i]),]

df_disease=df_disease[,c(2:5,(ncol(df_disease)-1))]
```

```
df_disease=setNames(df_disease,c("ST_CEN_CD","state_name","DT_CEN_CD","district_name","vv"))

kar@data=merge(data.frame(kar@data),data.frame(df_disease),by=c("ST_CEN_CD","DT_CEN_CD"),all.x=T)

kar$vv[is.na(kar$vv)]<-0

#View(kar@data)

colours<-c("#FFFFFF","#FFFF00","#FFC1C1","#FF7150","#FF8500","#FF0000")

kar$lb=factor(mapply(f,kar$vv),levels=1:6,labels=c("No Risk / No Data","Very Low Risk","LowRisk","MediumRisk","HighRisk","Very High Risk"))

cols=gsub("&", "and",cols)

disname= gsub("\\."," ",cols)

cat("Plot for disease:",disname,"\n")

plot_loc=paste(plot_dir,"/",disname,"/",sep="")

dir.create(plot_loc)

file_name=paste(plot_loc,disname,".png",sep="")

plot_title= paste(disname," risk prediction(",month_name[month_number,2],"
",current_year,")",sep="")

png(file_name)

print(spplot(obj=kar,c("lb"),col.regions=colours,main= plot_title,scales=list(draw = TRUE)))

dev.off()

i=i+1
```

b) Abbreviations

NADRES	:	National Animal Disease Referral Expert System
R	:	R environment for statistical computing
BQ	:	Black Quarter
BT	:	Bluetongue
ET	:	Enterotoxaemia
FMD	:	Foot and Mouth disease
HS	:	Haemorrhagic Septicaemia
PPR	:	Peste des Petits Ruminants
SGP	:	Sheep and Goat pox
SF	:	Swine Fewer
hPa	:	Hectopascals
NR	:	No risk/No data available
VLR	:	Very low risk
LR	:	Low risk
MR	:	Moderate risk
HR	:	High risk
VHR	:	Very high risk

13. INFECTION WITH SARS-COV-2 IN ANIMALS

Aetiology, Epidemiology, Diagnosis, Preventionand Control

Last updated on 3 July 2020

SARS-Coronavirus-2 (SARS-CoV-2) is the pathogenic agent that causes the disease COVID-19 and was first reported in December 2019. SARS-CoV-2 is thought to have emerged from an animal source and then spilled-over to the human population. Although genetically closely related viruses have been isolated from *Rhinolophus* bats, the exact source of SARS-CoV-2 and route of introduction into the human population has not been established.

The current pandemic of COVID-19 is being sustained through human-to-human transmission. Animal infections with SARS-CoV-2 have been reported by several countries. Several animal species have proven to be susceptible (Table 1) to infection with SARS-CoV-2 either naturally or by experimental infection. Important livestock species (pigs and poultry) have been demonstrated not to be susceptible to infection through experimental studies. Further studies are needed to understand if and how different animals could be affected by SARS-CoV-2.

It is important to monitor infections in animals to better understand their epidemiological significance for animal health, biodiversity, and human health. Evidence from risk assessments, epidemiological investigations, and experimental studies do not suggest that live animals or animal products play a role in SARS-CoV-2 infection of humans.

Infection with SARS-CoV-2 is not included in the OIE List of Diseases. However, consistent with the reporting obligations of Members outlined in Articles 1.1.4. and 1.1.6. of the OIE *Terrestrial Animal Health Code* relating to emerging diseases, the disease should be notified to the OIE through the OIE's World Animal Health Information System or via email.

Aetiology

Classification of the causative agent

Corona viruses (CoVs) are enveloped, positive-sense, single-stranded RNA viruses. SARS-CoV-2 is a *beta coronavirus*, a genus that includes several coronaviruses (SARS-CoV, MERS-CoV, bat SARS-like CoV, andothers) isolated from humans, bats, camels, and other animals.

Susceptibility to physical and chemical action.

SARS-CoV-2 is inactivated by 62–71 % ethanol, 0.5% hydrogen peroxide or 0.1% sodium hypochlorite, within 1 minute, or 0.05–0.2 % benzalkonium chloride or 0.02 % chlorhexidine digluconate.

Survival

In experimental conditions, SARS-CoV-2 remained viable in the environment after aerosolisation for at least 180 minutes. Experiences with other CoVs such as SARS-CoV, MERS-CoV, or endemic human corona viruses show that: They can persist on surfaces such as metal, glass or plastic for up to 9 days, but can be efficiently inactivated by surface disinfection procedures, as listed above.
SARS-CoV was found to remain infectious for 14 days at 4 °C, but for only 2 days at 20 °C in sewage water.

Epidemiology

Hosts

Although current evidence suggests that SARS-CoV-2 emerged from an animal source, that source has yet to be identified. The pandemic is driven by person-to-person transmission through respiratory droplets from coughing, sneezing, and talking. Genetic sequence data reveal that SARS-CoV-2 is genetically closely related to other corona viruses circulating in *Rhinolophus* bat (horseshoe bat) populations. To date, there is not enough scientific evidence to identify the source of SARS-CoV-2 or to explain the original route of transmission to humans (which may involve an intermediate host). Several animal species have tested positive for SARS-CoV-2, mostly as a result of close contact with humans infected with SARS-CoV-2. In addition, preliminary findings from experimental infection studies suggest that poultry and pigs are not susceptible to SARS-CoV-2 infection. The list of animal species for which information on natural or experimental infection is available is presented in Table 13.1.

Table 13.1. Summaryof findings in animals to date

Species	**Type of infection**	**Susceptibility** (none/low/high)	**Clinical signs**	**Transmission**
Pigs	Experimental	None	No	No
Poultry (chicken, ducks, and turkeys)	Experimental	None	No	No
Dogs	Natural and experimental	Low	No (possible in some cases)	No
Cats(domestic)	Natural and experimental	High	Yes (none to very mild in some cases)	Yes, between cats
Tigersandlions	Natural	High	Yes	Yes, between animals
Ferrets	Experimental	High	No (very mild in some cases)	Yes, between ferrets
Minks (Americanminks, *Neovisonvison*)	Natural	High	Yes	Yes, between minks and suggested from mink to humans
Egyptian fruit bats (*Rousettus aegyptiacus*)	Experimental	High	No	Yes, between Fruitbats
Golden Syrian hamsters	Experimental	High	Yes (none to very mild in some cases)	Yes, between hamsters
Macaques (*Macacafascicularis*and *Macacamulatta*)	Experimental	High	Yes	Yes

Transmission

Information on the routes of transmission of SARS-CoV-2 among animals is limited. However, as for other respiratory viruses, it appears to be transmitted to animals and between animals by direct contact (e.g droplets). SARS-CoV-2 has been found in secretions from the respiratory tract and in faeces.

Viraemia, incubation and infectious period

In laboratory settings, the incubation period in animals appears to be similar to the one seen in humans (i.e., between 2 and 14 days, with a mean duration of 5 days). However, more studies are required to solidly estimate the mean duration of incubation and the infectious periods.

Sources of virus

The main source of the virus is respiratory droplets and respiratory secretions, although it is possible to isolate SARS-CoV-2 from faeces of infected animals.

Pathogenesis

In laboratory settings, infected animals showed presence of the virus in the respiratory tract and, in some cases, lesions in the trachea and lungs, associated with dyspnoea and cough.

Occurrence and impact

There have been sporadic reports of companion animals and captive wild animals infected with SARS-CoV-2. With regard to production animals, to date, SARS-CoV-2 has only affected mink farms in the Netherlands, with high morbidity and low mortality.

Diagnosis

Knowledge about the susceptibility of different animal species to SARS-CoV-2 infection and clinical signs is, to date, limited (see Table 1).

Clinical diagnosis

Knowledge about clinical disease manifestations in animals is limited. Current evidence suggests clinical signs may include, but are not limited to, coughing, sneezing, respiratory distress, nasal discharge, ocular discharge, vomiting or diarrhoea, fever and lethargy. As in humans, asymptomatic infections occur.

Lesions

More studies are needed to systematically categorise the lesions resulting from infection with SARS-CoV-2 in animals.

In transgenic mice expressing the human version of the SARS-CoV-2 ACE2 receptor, the typical histopathology outcome was interstitial pneumonia with significant inflammatory cell infiltration around the bronchioles and blood vessels, and viral antigens were detected in bronchial epithelial cells and alveolar epithelial cells. These pathological findings were not seen in wild type mice infected with SARS-CoV-2. In golden Syrian hamsters, histopathological changes were reported in the respiratory tract and spleen. Rhesus macaques infected with SARS-CoV-2 presented lesions similar to those seen in humans. Juvenile cats infected with SARS-CoV-2 presented massive lesions in the

nasal and tracheal mucosa epithelia, and lungs. SARS-CoV-2 can replicate in the upper respiratory tract of ferrets without causing severe disease and only resulting in pathological findings such as severe lymphoplasmacytic perivasculitis and vasculitis, increased numbers of type II pneumocytes, macrophages, and neutrophils in the alveolar septa and alveolar lumen, and mild peri bronchitis in the lungs.

Differential diagnosis

All other causes for respiratory or digestive illness should be excluded before a tentative diagnosis for infection with SARS-CoV-2 is made. Existence of an epidemiological link with a confirmed infection in humans or other animals should be considered when narrowing down the list of differential diagnoses.

Laboratory confirmatory tests are necessary for a final diagnosis.

Laboratory diagnosis

Samples

Depending on the type of test, samples may include single or combinations of oropharyngeal, nasal, and rectal swabs, and blood. Faecal samples may be used in situations where direct sampling is not possible due to risks to the animal or testing staff. Tests should be validated for the purpose, species and matrix to be analysed.

Procedures

Agent identification

- Reverse-transcription polymerase chain reaction (RT-PCR);
- Reverse transcription loop-mediated isothermal amplification (RT-LAMP);
- Other molecular tests developed for use in humans;
- Virus isolation;
- Virus genome sequencing.

Detection of immune response:

- ELISA antibody test;
- Virus neutralisation test (VNT);
- Several other tests for antibody detection.

Prevention and control

Biosecurity and hygiene measures are key to preventing transmission of SARS-CoV-2. People who are suspected or confirmed to be infected with SARS-CoV-2 should restrict contact with mammalian animals, including pets, just like they would with people during their illness.

Animals suspected or confirmed to be infected with SARS-CoV-2 should remain separated from other animals and humans.

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EPIDEMIOLOGY OF COVID-19

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	26-06-20	15685	3.06	116.0	1.872	46.58		0.04		0.04
Cum 10 Lakh Cases	20 days	16-07-20	25602	2.49	481.1	1.802	44.51		0.07		0.07
Cum 15 Lakh Cases	12 days	28-07-20	34193	2.23	711.5	1.762	43.25		0.11		0.11
cum 20 Lakh Cases	9 days	06-08-20	41585	2.04	809.4	1.732	42.26		0.14		0.14
cum 25 Lakh Cases	8 days	14-08-20	49036	1.97	932.2	1.732	42.26		0.18		0.18
cum 30 Lakh Cases	8 days	22-08-20	56706	1.90	964.3	1.722	41.93		0.22		0.22
cum 35 Lakh Cases	7 days	29-08-20	63498	1.82	973.0	1.702	41.25		0.25		0.25
cum 40 Lakh Cases	6 days	04-09-20	69561	1.74	996.3	1.692	40.9		0.29		0.29
cum 45 Lakh Cases	6 days	10-09-20	76271	1.70	1111.0	1.692	40.9		0.32		0.32
cum 50 Lakh Cases	5 days	15-09-20	82066	1.64	1157.6	1.692	40.9		0.36		0.36
cum 55 Lakh Cases	6 days	21-09-20	88935	1.62	1146.0	1.692	40.9		0.39		0.39
cum 60 Lakh Cases	6 days	27-09-20	95542	1.59	1101.5	1.692	40.9		0.43		0.43
cum 65 Lakh Cases	6 days	03-10-20	101782	1.57	1039.3	1.692	40.9		0.47		0.47

cum 70 Lakh Cases	7 days	10-10-20	108334	1.55	937.0	1.702	41.25		0.50		0.50
cum 75 Lakh Cases	8 days	18-10-20	114610	1.53	784.5	1.722	41.93		0.54		0.54
cum 80 Lakh Cases	10 days	28-10-20	120527	1.51	591.7	1.752	42.92		0.57		0.57
cum 85 Lakh Cases	10 days	07-11-20	126121	1.48	559.3	1.772	43.57		0.61		0.61
cum 90 Lakh Cases	12 days	19-11-20	132162	1.47	503.2	1.972	49.29		0.65		0.65
cum 95 Lakh Cases	13 days	02-12-20	138648	1.46	498.9	2.332	57.12		0.68		0.68
cum 100 Lakh Cases	16 days	18-12-20	145136	1.45	405.3	3.083	67.56		0.72		0.72
cum 105 Lakh Cases	26 days	13-01-21	151727	1.45	253.6	2.673	62.59		0.75		0.75
cum 110 Lakh Cases	39 days	21-02-21	156385	1.42	119.4	2.052	51.27	10651012	0.79	0.76	1.55
cum 115 Lakh Cases	25 days	18-03-21	159370	1.39	119.4	2.092	52.2	35923500	0.83	2.58	3.40
cum 120 Lakh Cases	10 days	28-03-21	161843	1.35	247.5	2.202	54.59	55180875	0.86	3.96	4.82
cum 125 Lakh Cases	7 days	04-04-21	165101	1.32	464.4	2.202	54.59	76405697	0.90	5.48	6.38
cum 130 Lakh Cases	4 days	08-04-21	167642	1.29	640.5	2.112	52.65	91881530	0.93	6.59	7.53
cum 135 Lakh Cases	3 days	11-04-21	170179	1.26	838.0	2.012	50.3	102000401	0.97	7.32	8.29
cum 140 Lakh Cases	3 days	14-04-21	173123	1.24	981.0	1.902	47.42	111913288	1.00	8.03	9.04
cum 145 Lakh Cases	2 days	16-04-21	175649	1.21	1260.0	1.822	45.12	117305344	1.04	8.42	9.46
cum 150 Lakh Cases	2 days	18-04-21	178769	1.19	1560.0	1.742	42.59	121207098	1.08	8.70	9.78
cum 155 Lakh Cases	2 days	20-04-21	182533	1.18	1882.0	1.701	41.21	127428887	1.11	9.15	10.26
cum 160 Lakh Cases	2 days	22-04-21	186920	1.17	2193.0	1.641	39.06	132754608	1.15	9.53	10.68
cum 165 Lakh Cases	1 days	23-04-21	189544	1.18	2624.0	1.611	37.93	135658324	1.18	9.74	10.92

cum 170 Lakh Cases	2 days	25-04-21	195123	1.15	2789.0	1.581	36.75	139185173	1.22	9.99	11.21
cum 175 Lakh Cases	1 days	26-04-21	197894	1.13	2771.0	1.561	35.94	142524947	1.26	10.23	11.48
cum 180 Lakh Cases	2 days	28-04-21	204832	1.14	3469.0	1.531	34.68	147053392	1.29	10.55	11.85
cum 185 Lakh Cases	1 day	29-04-21	208330	1.13	3498.0	1.521	34.25	149268772	1.33	10.71	12.04
cum 190 Lakh Cases	1 day	30-04-21	211853	1.12	3523.0	1.511	33.82	151998107	1.36	10.91	12.27
cum 195 Lakh Cases	1 day	01-05-21	215542	1.11	3689.0	1.510	33.77	153626325	1.40	11.03	12.43
cum 200 Lakh Cases	2 days	03-05-21	222408	1.11	3433.0	1.501	33.38	156082136	1.44	11.20	12.64
cum 205 Lakh Cases	1 days	04-05-21	226188	1.10	3780.0	1.491	32.93	157750752	1.47	11.32	12.79
cum 210 Lakh Cases	1 days	05-05-21	230168	1.10	3980.0	1.491	32.93	159931238	1.51	11.48	12.98
cum 215 Lakh Cases	2 days	07-05-21	238270	1.10	4051.0	1.481	32.48	165190000	1.54	11.86	13.40
cum 220 Lakh Cases	1 day	08-05-21	242347	1.10	4077.0	1.481	32.48	167493857	1.58	12.02	13.60
cum 225 Lakh Cases	1 day	09-05-21	246116	1.09	3769.0	1.471	32.02	168304868	1.61	12.08	13.69
cum 230 Lakh Cases	2 days	11-05-21	254197	1.11	4040.0	1.471	32.04	173862643	1.65	12.48	14.13
cum 235 Lakh Cases	1 day	12-05-21	258317	1.10	4120.0	1.461	31.58	176045577	1.69	12.63	14.32
cum 240 Lakh Cases	1 day	13-05-21	262317	1.09	4000.0	1.461	31.58	178361846	1.72	12.80	14.52
cum 245 Lakh Cases	2 days	15-05-21	270284	1.10	3983.0	1.461	31.58	181544536	1.76	13.03	14.79
cum 250 Lakh Cases	2 days	17-05-21	278719	1.11	4217.0	1.461	31.58	183817204	1.79	13.19	14.98
cum 255 Lakh Cases	2 days	19-05-21	287122	1.13	4201.0	1.451	31.10	186410600	1.83	13.38	15.21
cum 260 Lakh Cases	2 days	21-05-21	295525	1.14	4202.0	1.451	31.10	189344105	1.87	13.59	15.45
cum 265 Lakh Cases	2 days	23-05-21	303720	1.15	4098.0	1.451	31.10	191877460	1.90	13.77	15.67

cum 270 Lakh Cases	2 days	25-05-21	311388	1.15	3834.0	1.451	31.10	196463495	1.94	14.10	16.04
cum 275 Lakh Cases	2 days	27-05-21	318895	1.16	3754.0	1.451	31.10	201438120	1.97	14.46	16.43
cum 280 Lakh Cases	3 days	30-05-21	329100	1.18	3402.0	1.451	31.10	208907723	2.01	14.99	17.00
cum 285 Lakh Cases	4 days	03-06-21	340702	1.20	2901.0	1.451	31.10	219831571	2.05	15.78	17.83
cum 290 Lakh Cases	5 days	08-06-21	344082	1.22	2565.0	1.451	31.10	223642281	2.08	16.86	18.94
cum 295 Lakh Cases	5 days	13-06-21	374305	1.27	4155.0	1.451	31.10	250656362	2.12	17.99	20.10
cum 300 Lakh Cases	9 days	22-06-21	390660	1.30	1817.0	1.461	31.58	289961746	2.15	20.81	22.96
cum 305 Lakh Cases	10 days	02-07-21	401050	1.31	1039.0	1.471	32.04	339447068	2.19	24.36	26.55
cum 310 Lakh Cases	13 days	15-07-21	412531	1.33	884.0	1.481	32.50	390286930	2.22	28.01	30.23
cum 315 Lakh Cases	13 days	28-07-21	422662	1.34	780.0	1.481	32.50	445696580	2.26	31.99	34.25
cum 320 Lakh Cases	13 days	10-08-21	429179	1.34	501.0	1.502	33.40	517799432	2.30	37.16	39.46
cum 325 Lakh Cases	14 days	24-08-21	434756	1.34	398.0	1.511	33.82	594552135	2.33	42.67	45.00
cum 330 Lakh Cases	12 days	05-09-21	440752	1.34	499.0	1.521	34.25	686693339	2.37	49.28	51.65
cum 335 Lakh Cases	15 days	20-09-21	445385	1.33	309.0	1.511	33.82	817737078	2.40	58.69	61.09
cum 340 Lakh Cases	22 days	12-10-21	451189	1.33	264.0	1.511	33.82	963825324	2.44	69.17	71.61
cum 345 Lakh Cases	37 days	20-11-21	465349	1.35	383.0	-	-				
cum 350 Lakh Cases	39 days	04-01-22	482017	1.38	427.0	-	-				
cum 355 Lakh Cases	4 days	08-01-22	483463	1.36	362.0	-	-				
cum 360 Lakh Cases	3 days	11-01-22	484213	1.35	250.0	-	-				
cum 365 Lakh Cases	2 days	13-01-22	485131	1.33	459.0	-	-				

cum 370 Lakh Cases	2 days	15-01-22	485752	1.31	311.0	-	-				
cum 375 Lakh Cases	2 days	17-01-22	486451	1.30	350.0	-	-				
cum 380 Lakh Cases	2 days	19-01-22	487202	1.28	376.0	-	-				
cum 385 Lakh Cases	1 day	20-01-22	487693	1.27	491.0	-	-				
cum 390 Lakh Cases	2 days	22-01-22	488884	1.25	596.0	-	-				
cum 395 Lakh Cases	1 day	23-01-22	489409	1.24	525.0	-	-				
cum 400Lakh Cases	2 days	25-01-22	490462	1.23	527.0	-	-				
cum 405 Lakh Cases	2 days	27-01-22	491700	1.21	619.0	-	-				
cum 410 Lakh Cases	2 days	29-01-22	493198	1.20	749.0	-	-				
cum 415 Lakh Cases	3 days	01-02-22	496242	1.20	1015.0	-	-				
cum 420 Lakh Cases	2 days	03-02-22	499424	1.19	1591.0	-	-				
Cum 425 Lakh cases											

DATASOURCE

1.WORLD WIDE DATA SET: https://data.humdata.org/dataset/novel-coronavirus-2019-ncov-cases
2.VACCINATION DATA SET: https://api.covid19india.org/

CFR: Case Fatality rate , number of deaths for every 100 cases
Prepared by Spatial Epidemiology Lab , ICAR-NIVEDI, Bengaluru

ICAR - National Institute of Veterinary Epidemiology and Disease Informatics

Customer/Client Feedback Form

Feedback for the Livestock Diseases Risk ForewarningBulletinofFebruary -2022, Volume 10 and Issue 02

(Please return this duly fill in after receiving the outbreak report ofApril-2022)

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

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

**Details may be written here.

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

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				
Timeliness of alerts received				
Benefits from forecasting of livestock diseases				
Your awareness of this service				

4. **Suggestions for further improvement of report.**

Sign and Signature with Designation

AICRP centre:

Dated:

भाकृअनुप
ICAR

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

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