SPATIO-TEMPORAL CLUSTERING OF FOOT AND MOUTH DISEASE IN THAILAND, 2011-2014

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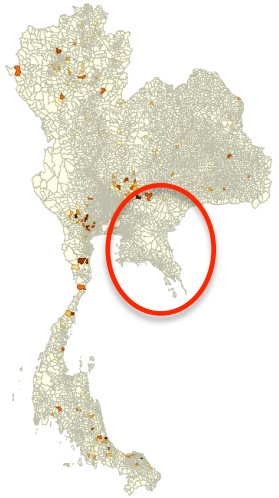
Introduction and objective I

- FMD is endemic in Thailand
- FMD free zone in eastern Thailand
  - NSP positive < 2% at animal level (DLD, 2012)
  - NSP positive <10% at herd level (DLD, 2012)
- In other parts of Thailand, FMD outbreak has been reported every year.



Introduction and objective II

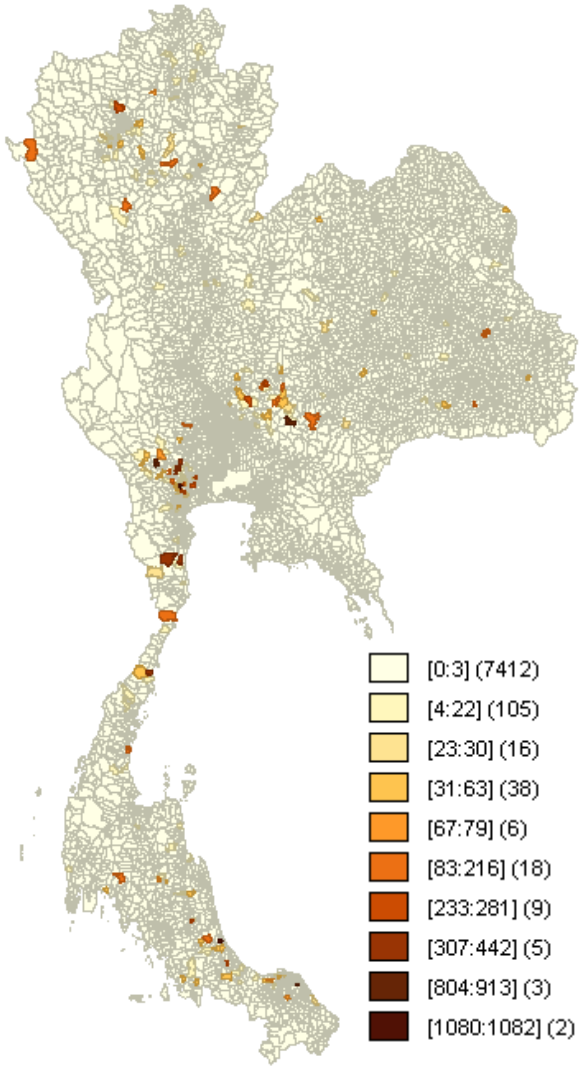
- To reduce the probability of FMD outbreak in the eastern part
- To control and prevent FMD effectively, understanding the pattern and the distribution of disease for the whole country is necessary
- In this study, the research was conducted on FMD outbreak focusing on time and spatial location

Methods and Data analysis

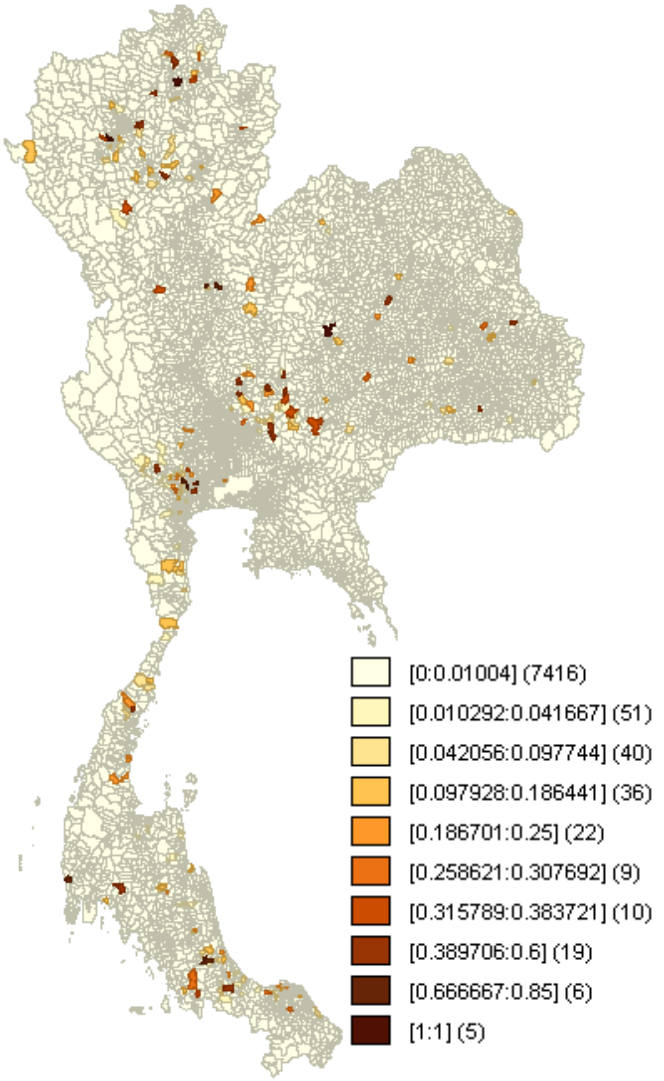
- Database based on data from DLD
  - FMD outbreak report from 2011-2014
  - Livestock population
- Subdistrict level
- Number of sick animals/FMD prevalence
- Temporal Cluster with discrete Poisson model in SatScan™
- Global Moran's I in ArcGIS software
- Local Indicators of Spatial Association (LISAs) cluster map in GeoDa™

FMD outbreak report in Thailand, 2011-2014 (267 outbreaks)

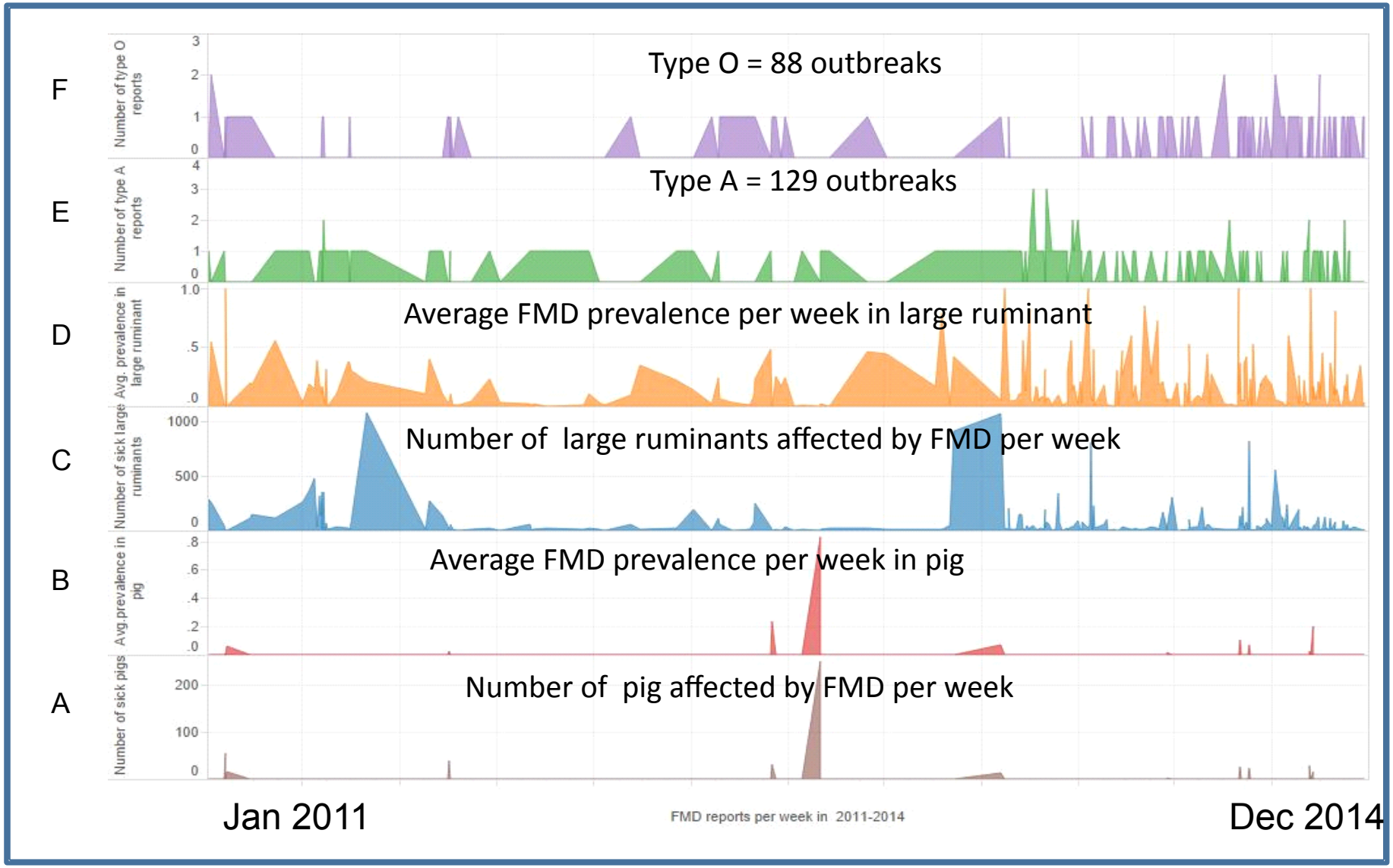
Number of affected animals



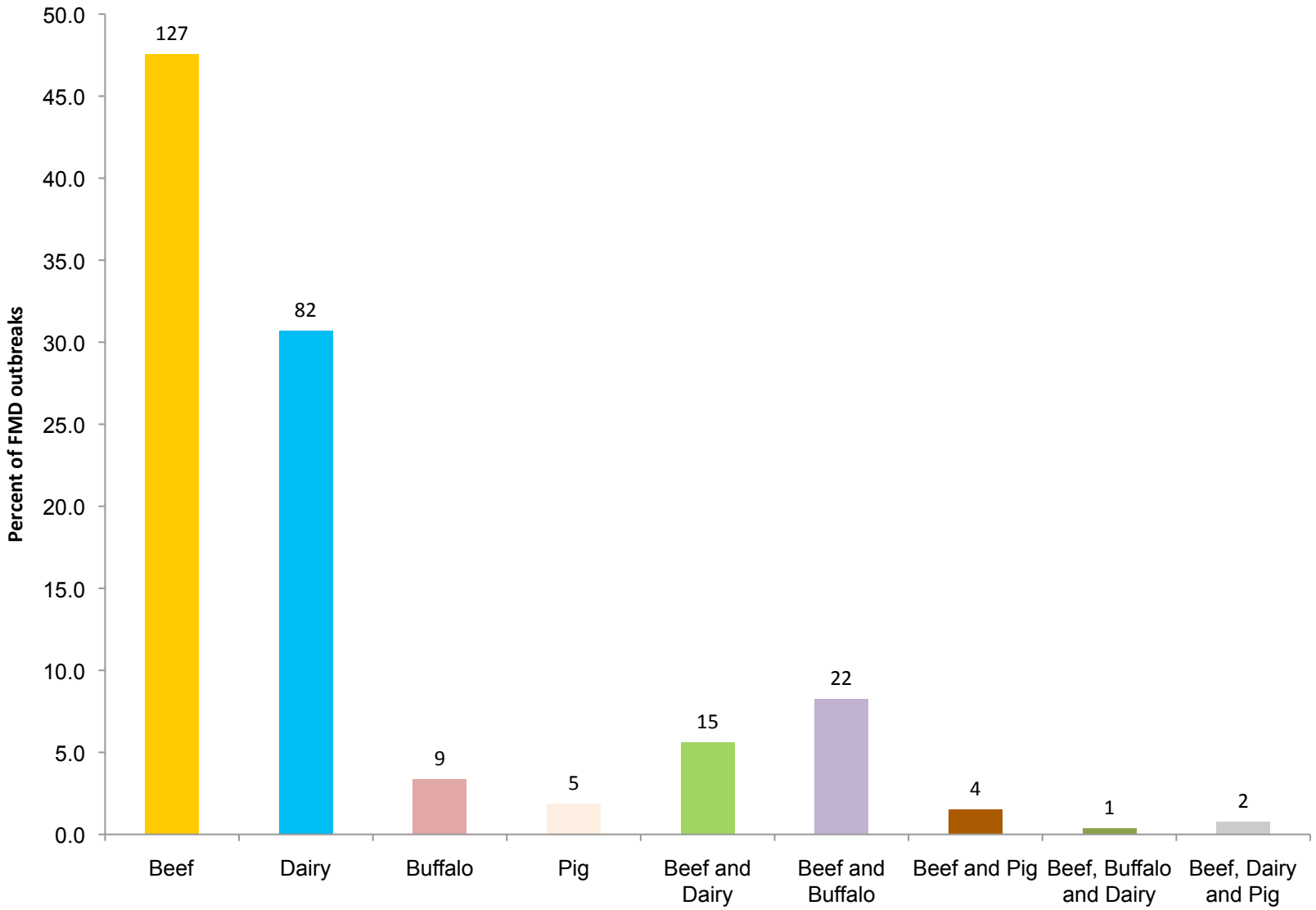
FMD prevalence



Species and serotype of outbreak

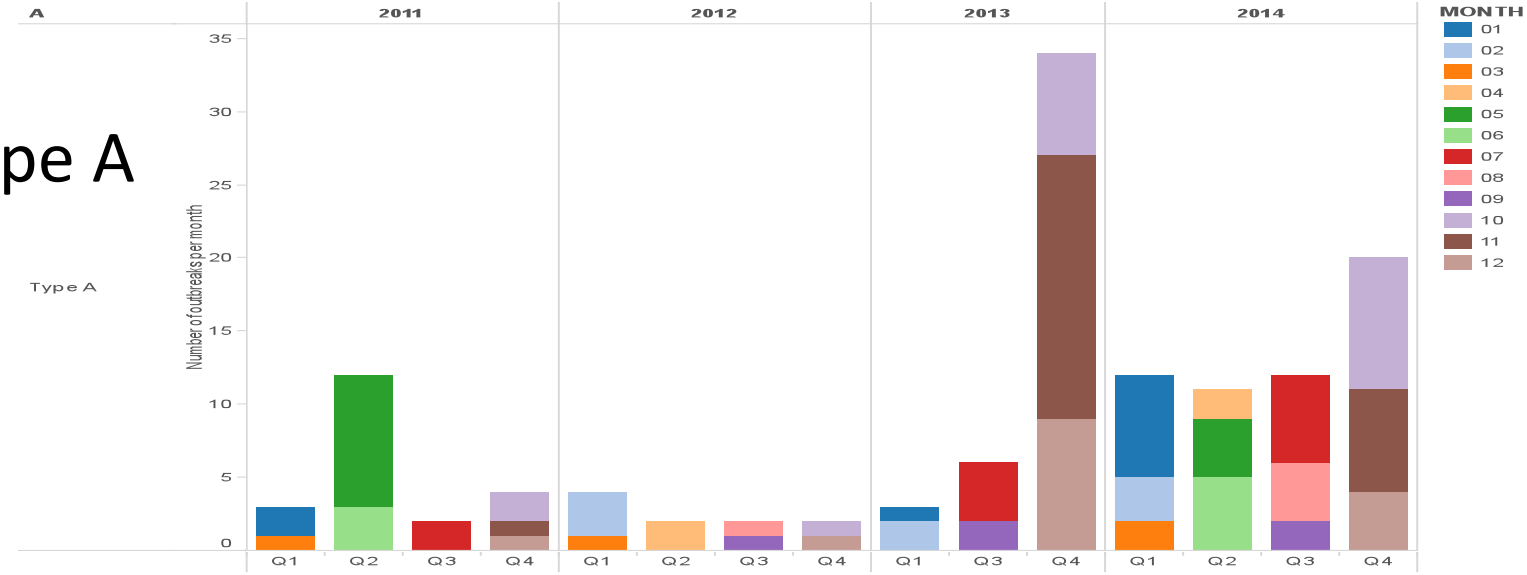


Species affected per outbreak

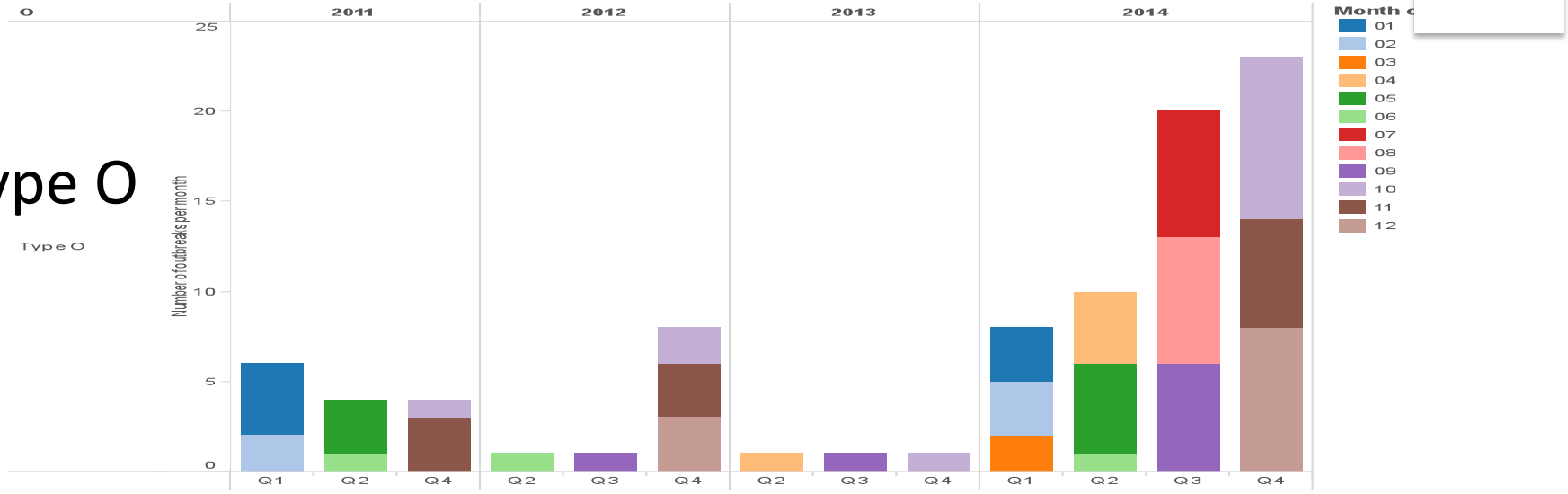


Number of FMD outbreaks per month of serotype A, O

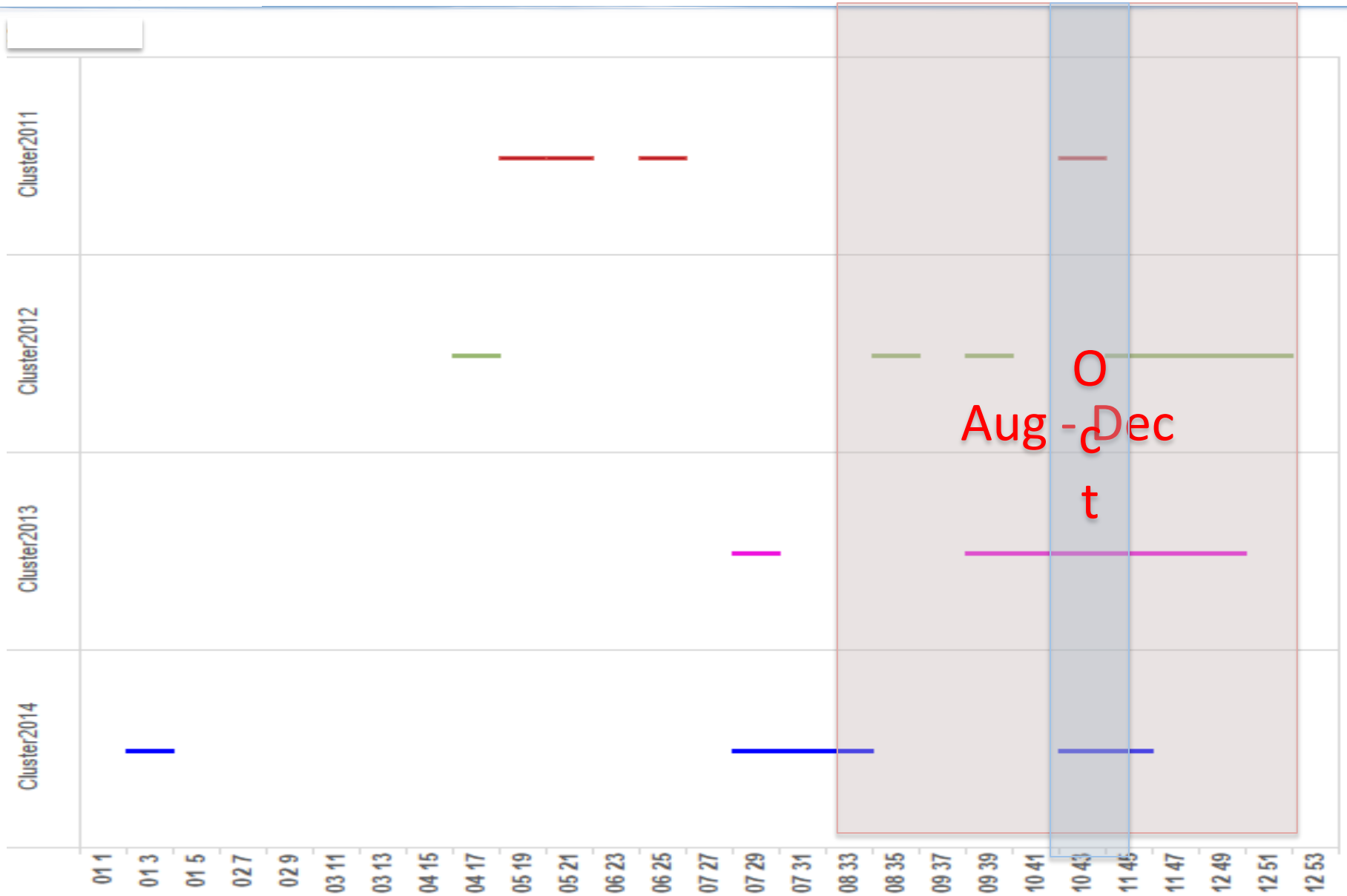
Type A



Type O

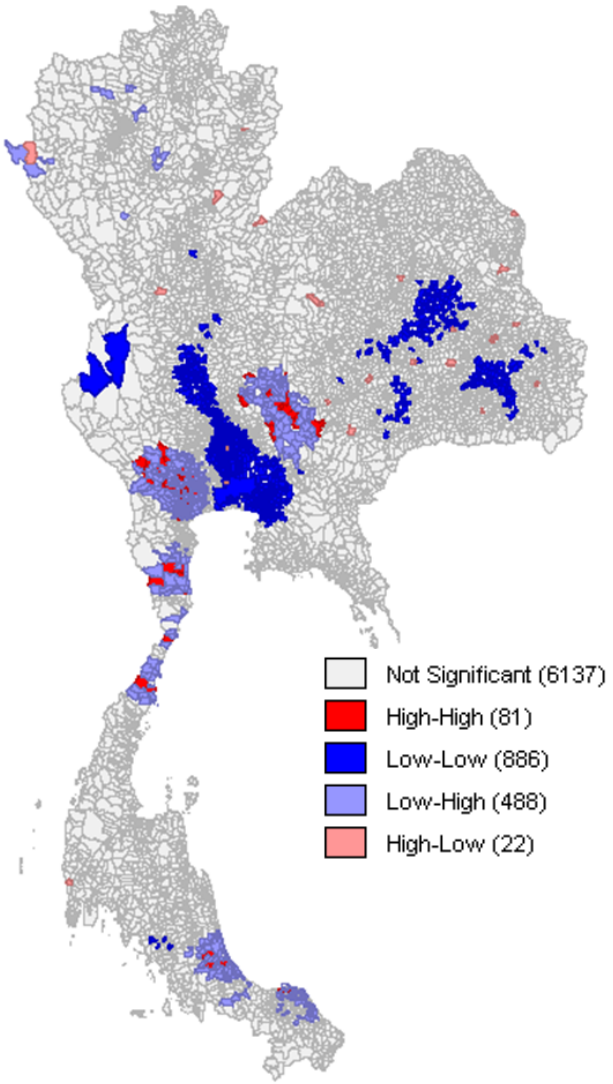


Temporal Cluster by SatScan™

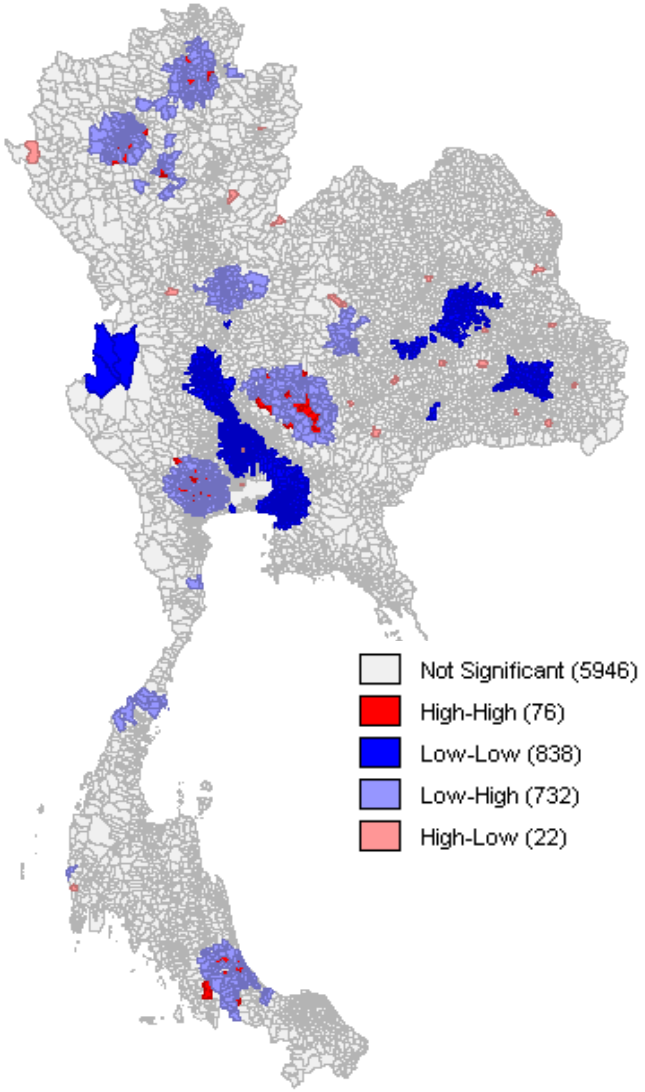


Local Indicators of Spatial Association (LISAs) cluster map

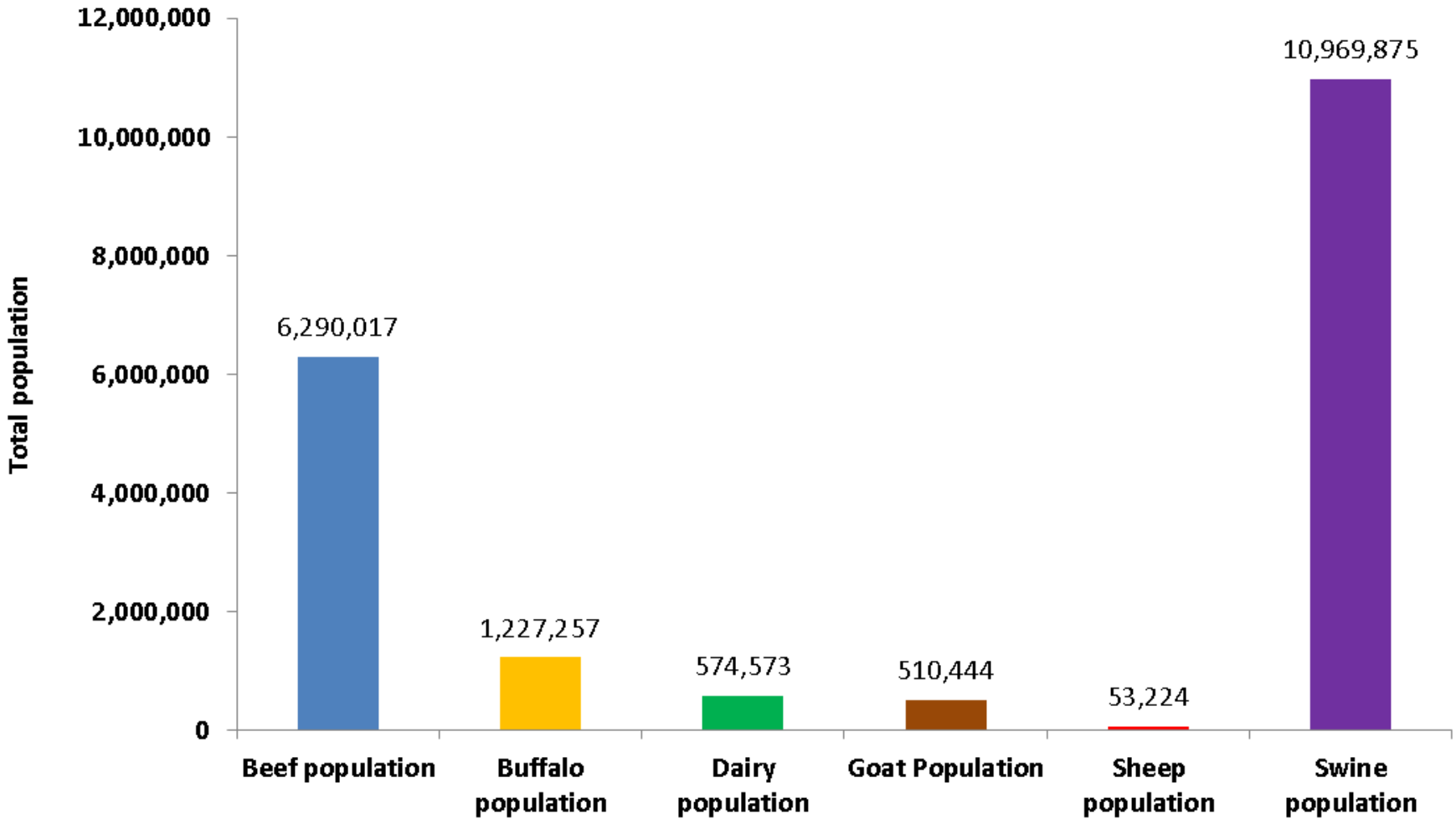
Number of affected animals



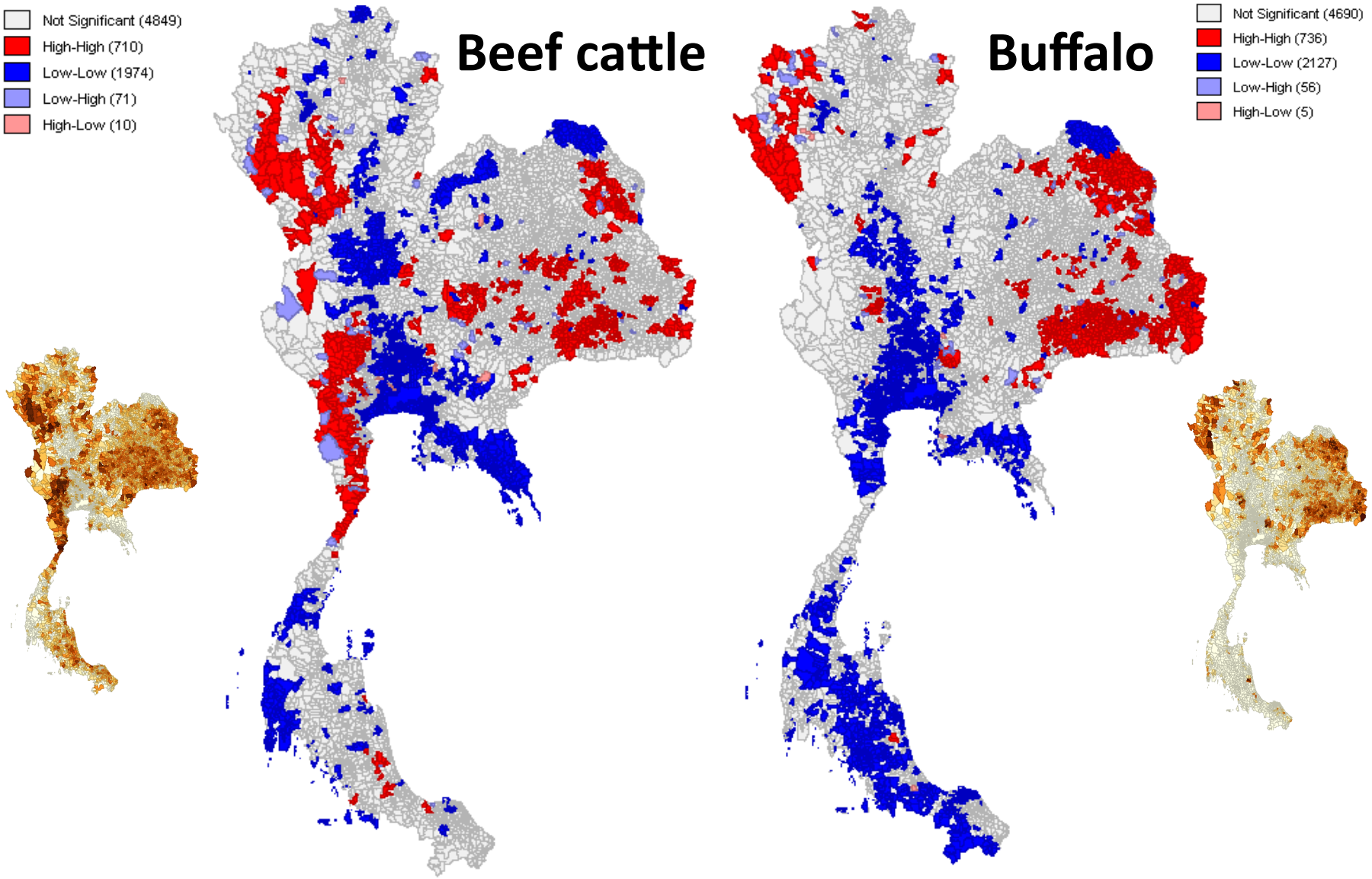
FMD Prevalence



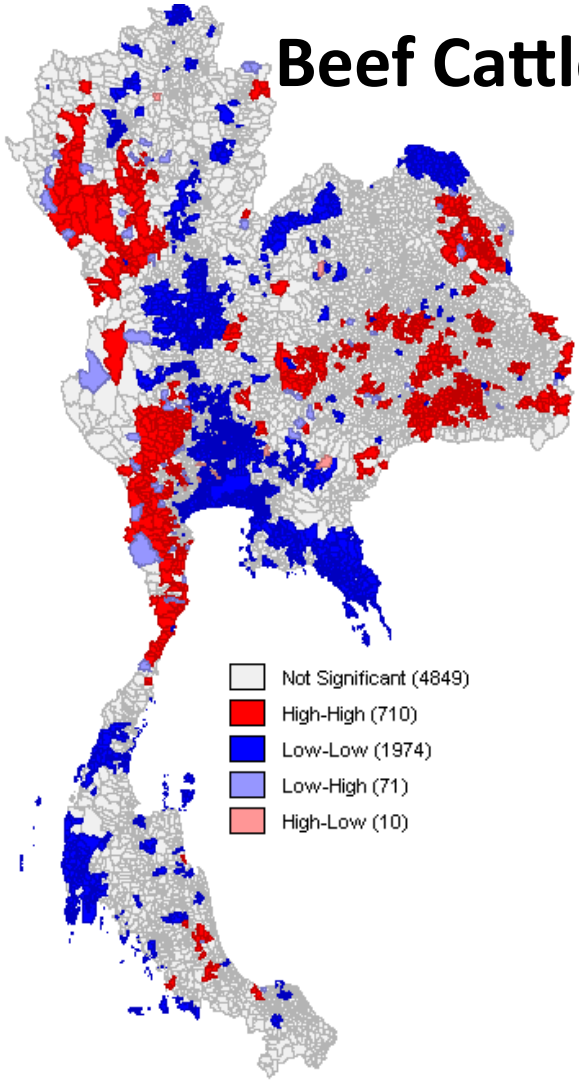
Livestock population

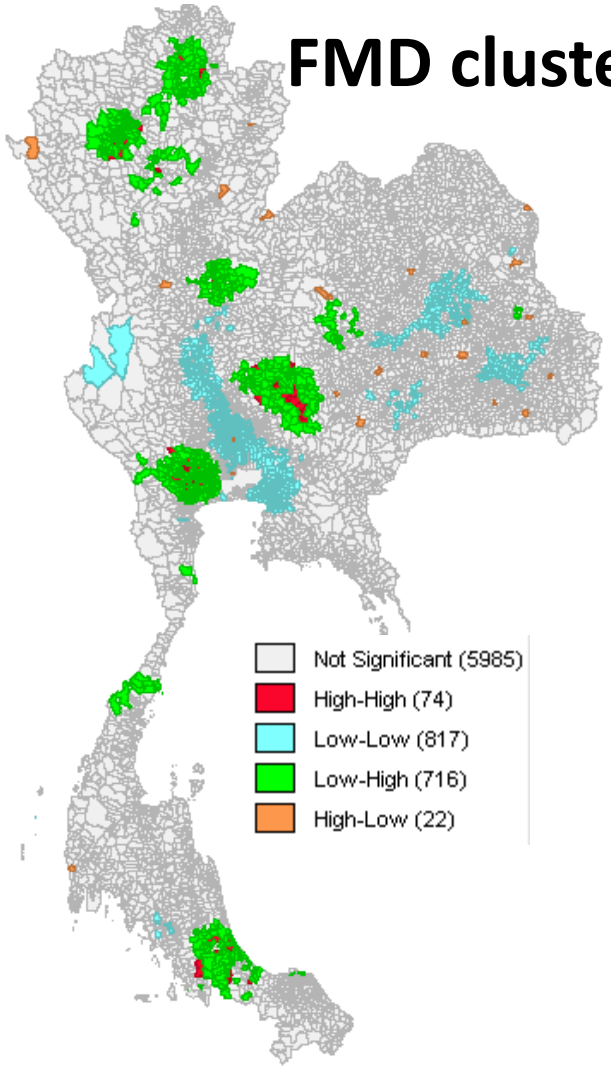


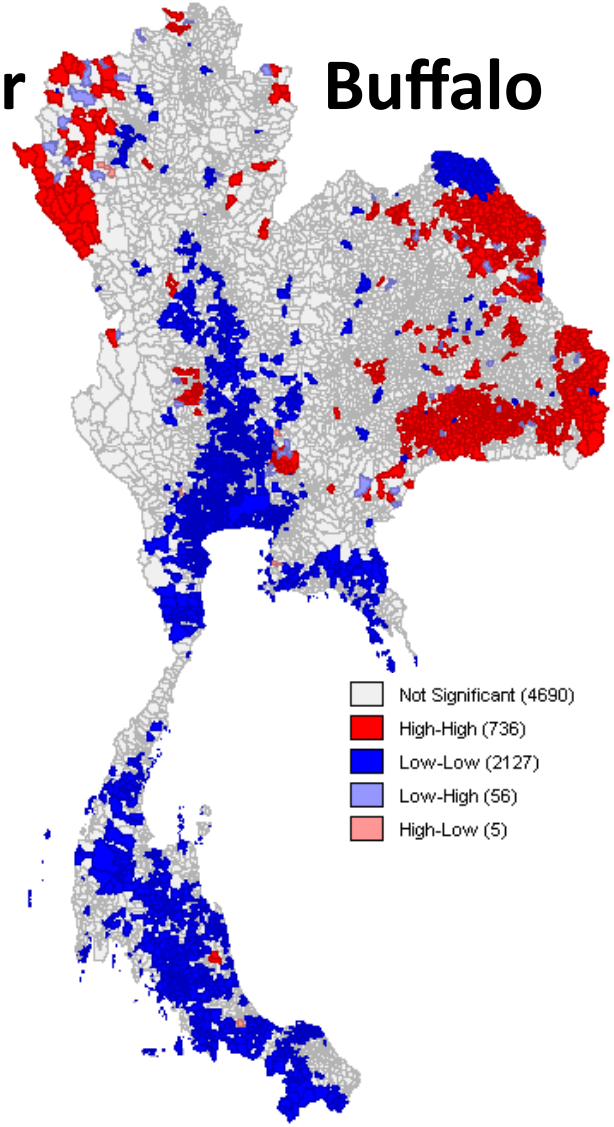
Livestock population cluster



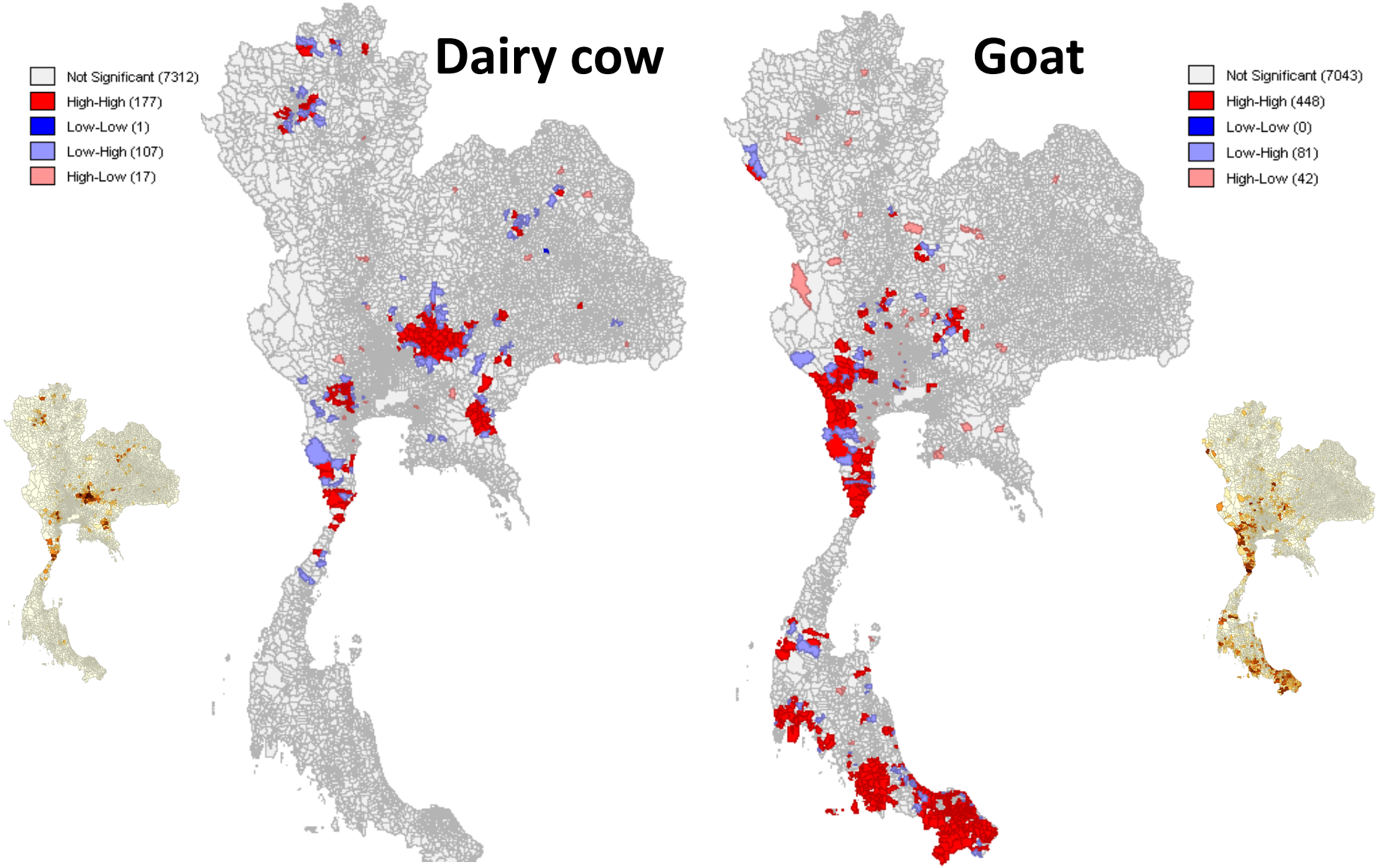
Comparison with FMD cluster





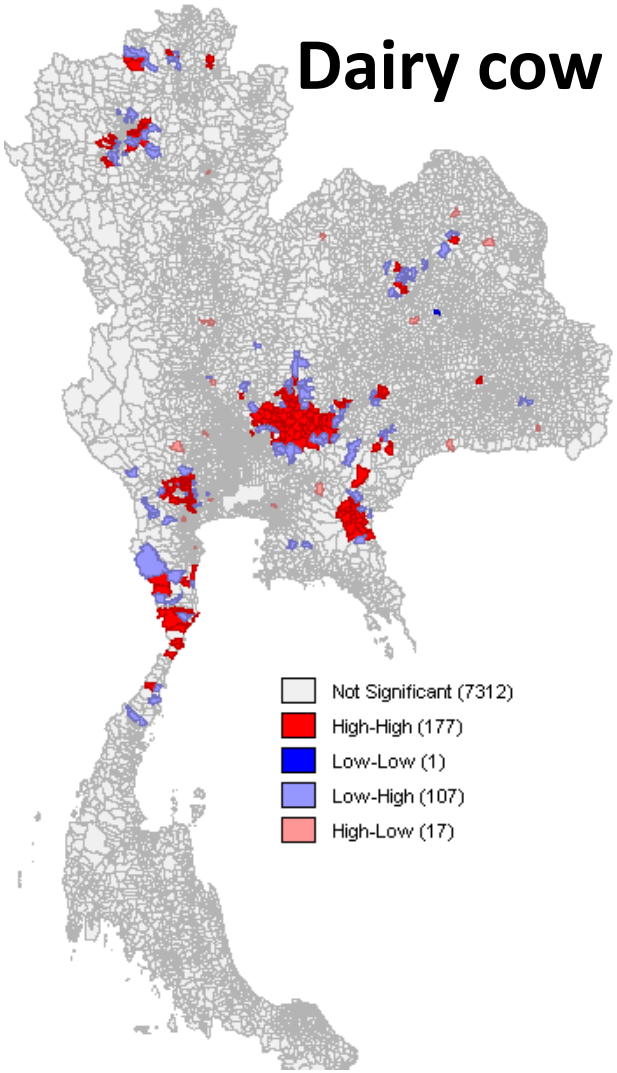


Livestock population cluster

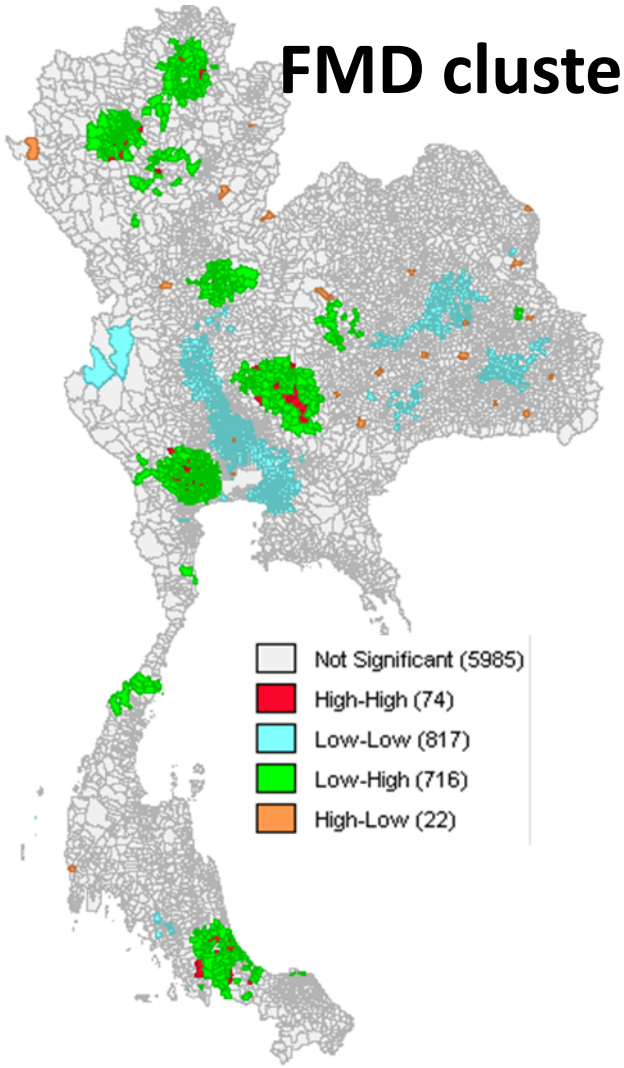


Comparison with FMD cluster

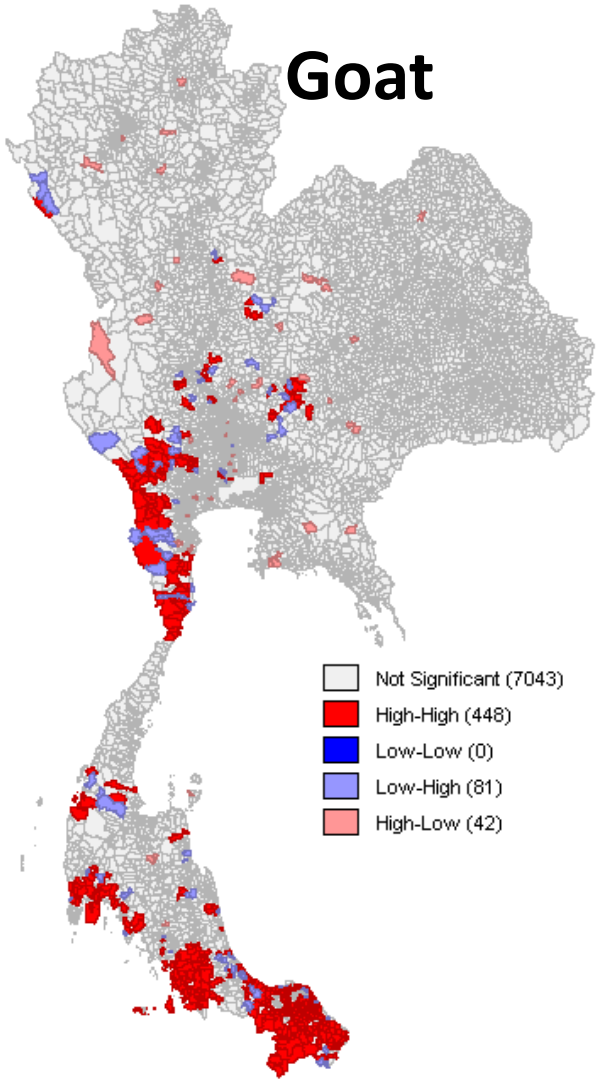
Dairy cow



FMD cluster

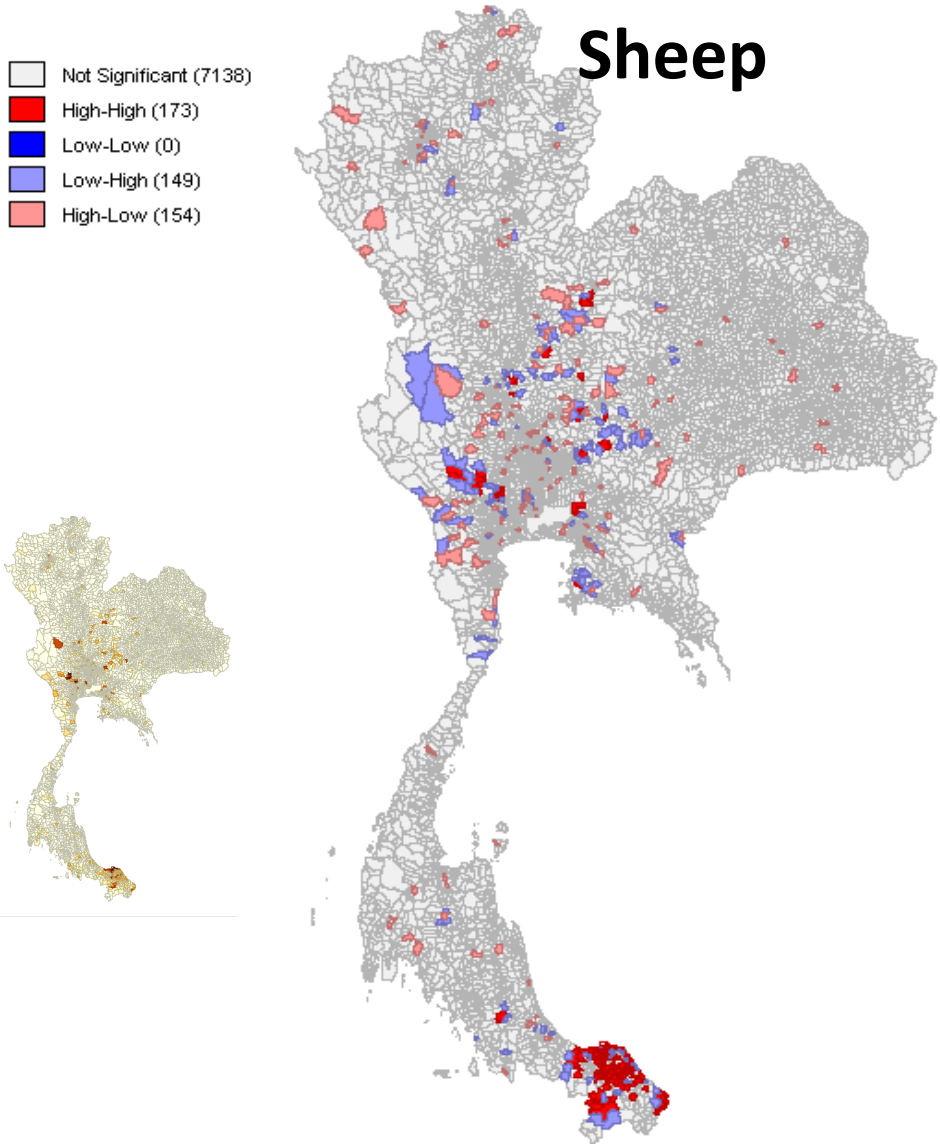


Goat

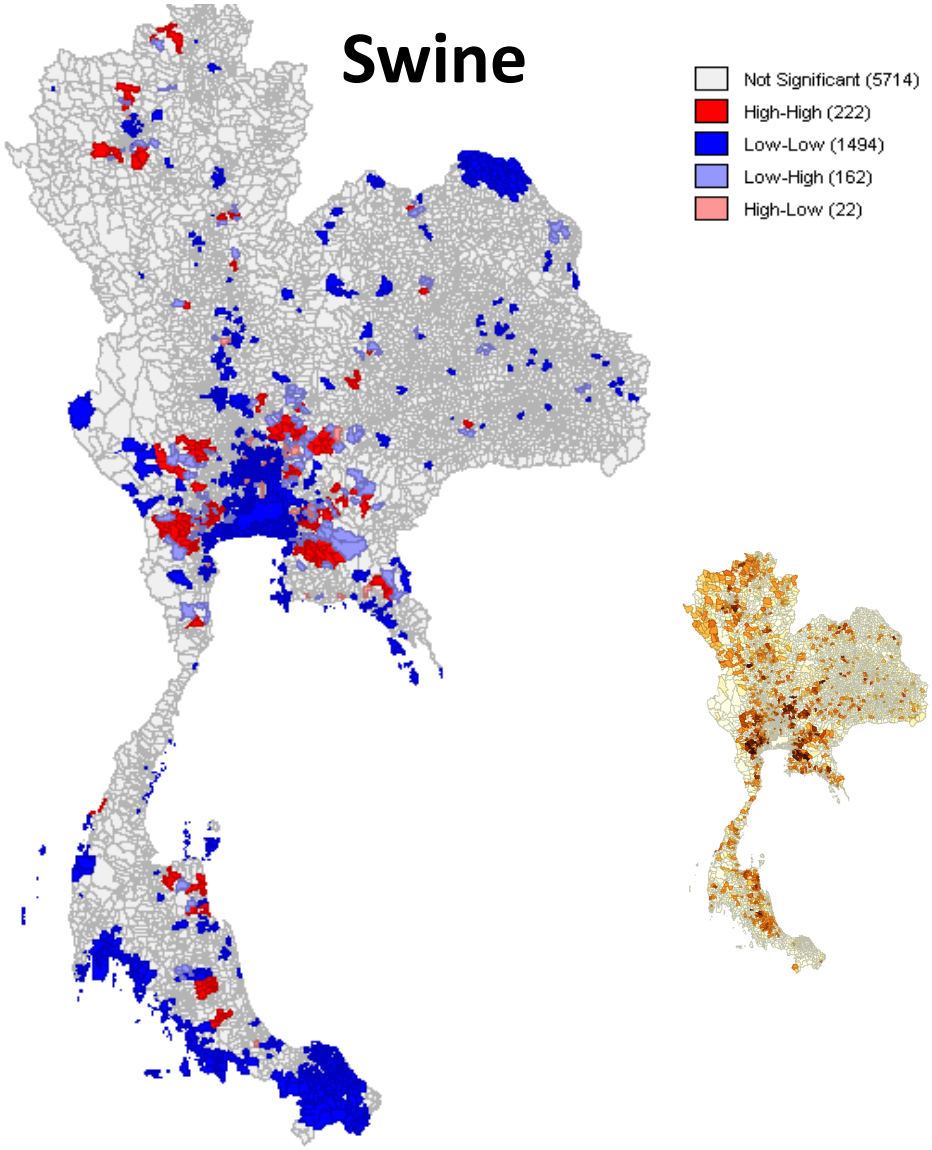


Livestock population cluster

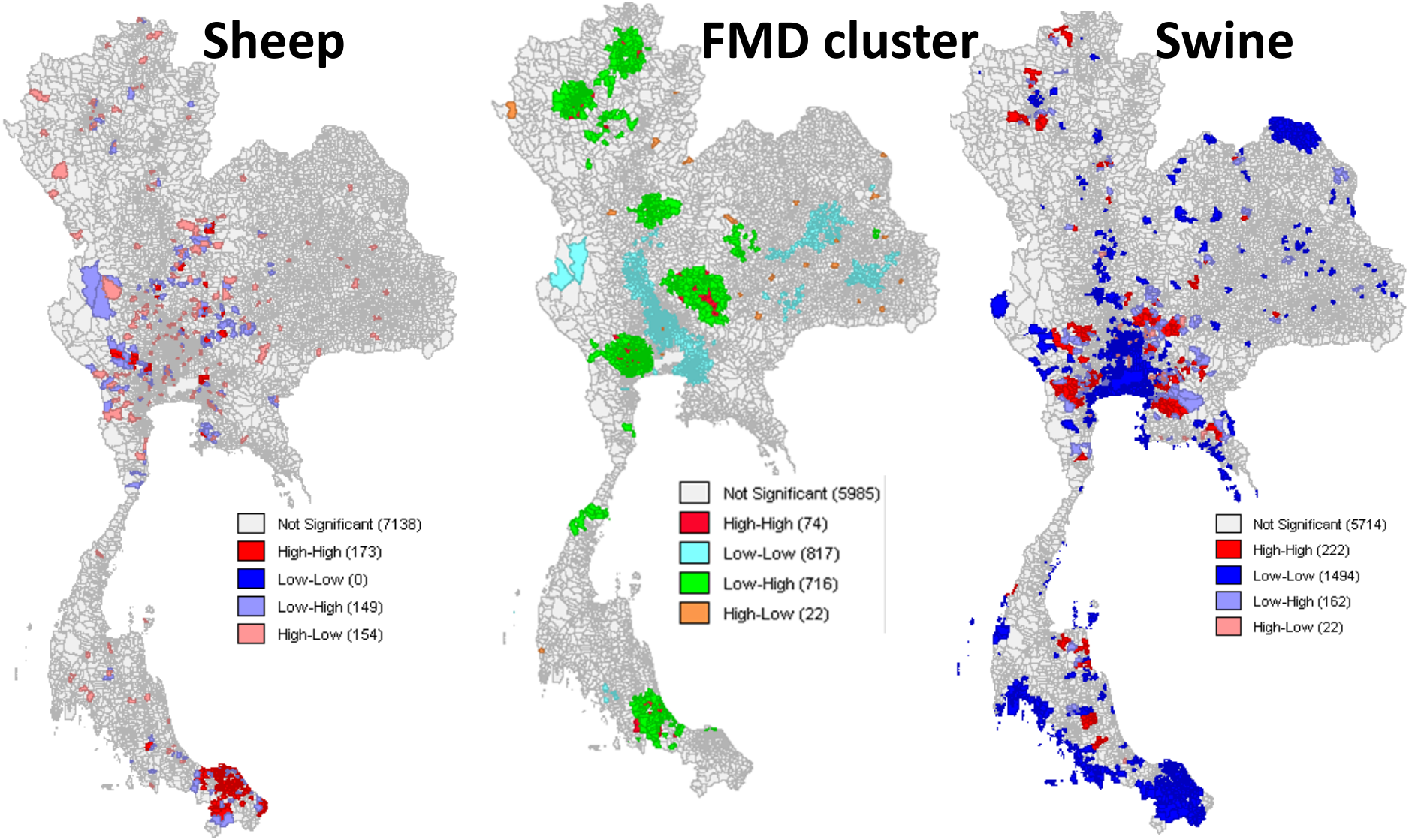
Sheep



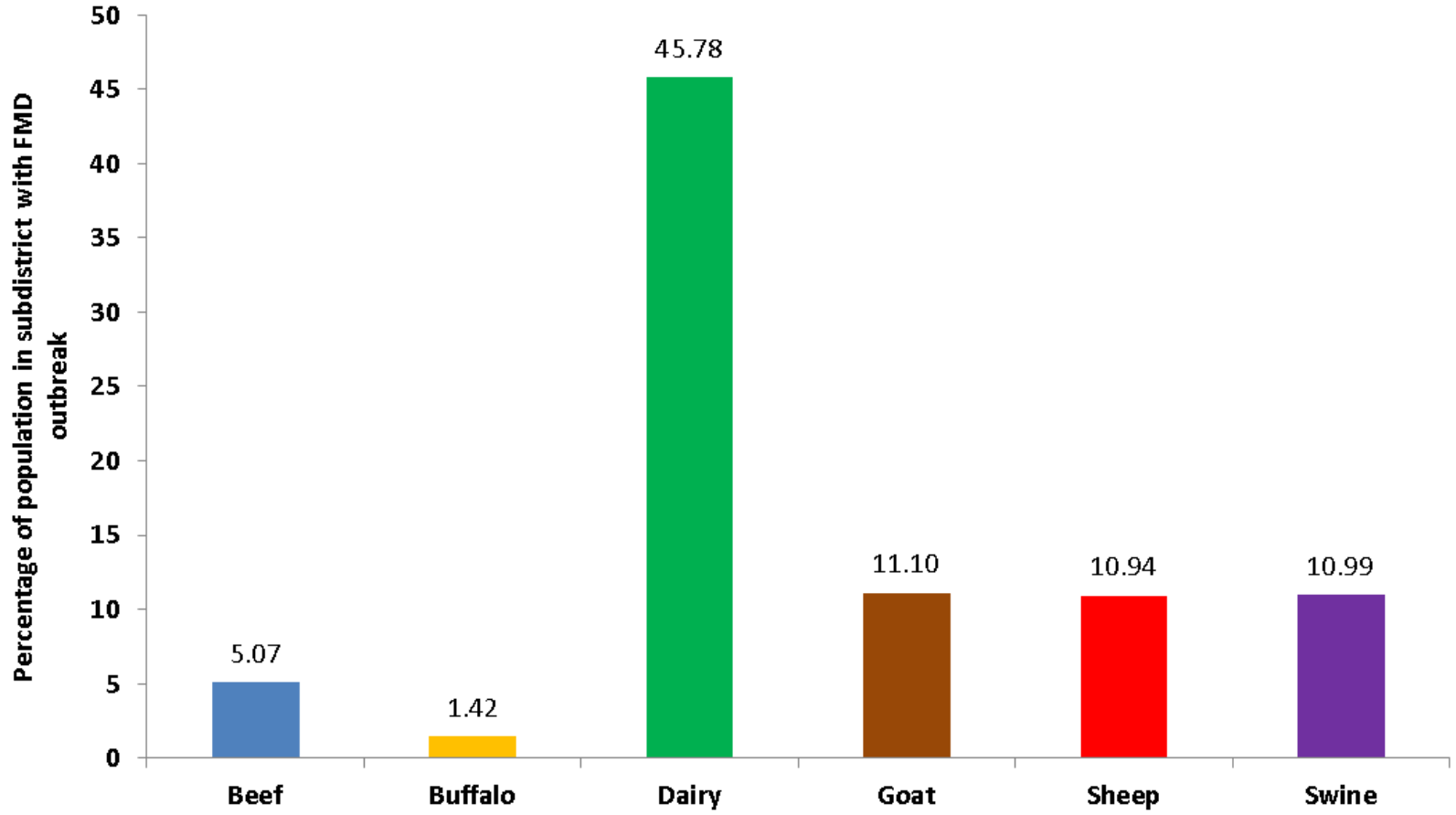
Swine



Comparison with FMD cluster

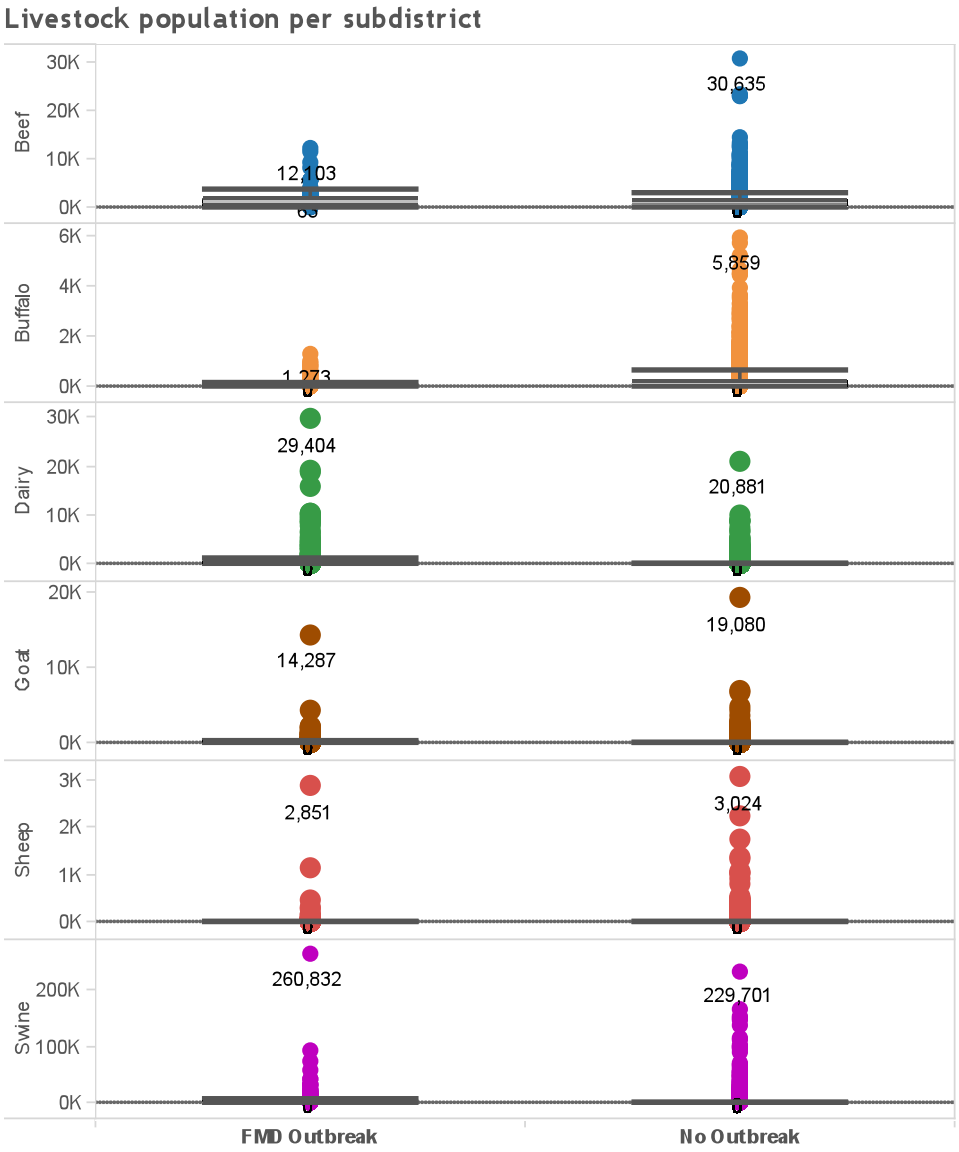


Percentage of population in subdistricts affected by FMD



Population distribution in subdistricts affected by FMD

Outbreak Subdistrict



No Outbreak Subdistrict

Conclusions

- The areas with the high number of diary cows were a high risk of FMD.
- The last quarter of a year was also often for FMD outbreak especially in October.
- To prevent and control FMD effectively, allocate the available resources to specific area and suitable times.

Acknowledgements

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