BioSecure
Enhanced and cost-effective biosecurity in livestock production

UNIVERSITY OF COPENHAGEN

PRACTICE ABSTRACT # 31

Biosecurity Matters: Mapping the Risk of ASF and HPAI in Europe

The main objective of this study is to better understand and map the risk of African swine fever (ASF) and highly pathogenic avian influenza (HPAI) across Europe by combining disease data with information on biosecurity practices. The study shows how differences in biosecurity can influence where and how these diseases occur and provides useful insights that can help guide more effective prevention and control efforts.

This study explores the risk of ASF and HPAI across European regions (NUTS2 level) by combining disease data with information on biosecurity practices in pig and poultry production. By bringing together both public and restricted datasets, we developed a flexible pipeline in the software R to create spatial risk maps that show how differences in biosecurity implementation can influence the likelihood of disease occurrence.

Our findings indicate that regions with stronger biosecurity measures tend to have a lower probability of ASF outbreaks, with a statistically significant relationship observed. In contrast, no clear association was found for HPAI, likely due to limited data on poultry biosecurity and the stronger role of external factors such as wild bird presence, farm density, and environmental conditions.

Scenario analyses further showed that the impact of improving or reducing biosecurity is not the same everywhere - some regions benefit more than others. This highlights the importance of context-specific approaches when designing disease prevention strategies.

In a conclusion, the study demonstrates the value of combining spatial modelling with biosecurity data to better understand disease risks. While regional-level data can provide useful insights, incorporating detailed farm-level information - such as housing systems and management practices - would significantly improve the accuracy of predictions. This approach offers a practical framework for identifying high-risk areas and supporting targeted biosecurity to strengthen animal health preparedness across Europe.

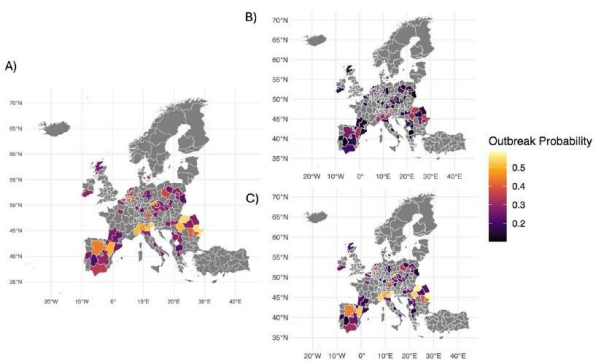


Figure 1: Estimate probability for ASF occurrence from the statistical model using case-control regions and collected biosecurity measure scores (mean values) (A) as a default, (B) improved biosecurity measure by 20%, and (C) reduced biosecurity measure mean values by 20%.

Effective biosecurity can substantially reduce the risk of African swine fever across a wide range of production systems.

By aligning prevention measures with specific farm management practices and local environmental conditions, producers can maximize disease control and strengthen herd protection against ASF.

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