



Mapping the risk of introduction of highly pathogenic avian influenza virus to Swedish poultry

Aim

Highly pathogenic avian influenza (HPAI) caused 17 outbreaks in poultry in Sweden in 2020/2021, to date the largest animal health event on record in Sweden, and another five between 2021-2023. High-risk areas have been established during the last three winter seasons where prevention measures are applied, including housing of poultry. The aim of this work is to conduct a spatiotemporal risk assessment for the introduction of HPAI to Swedish poultry from wild birds to better target prevention measures.

Data

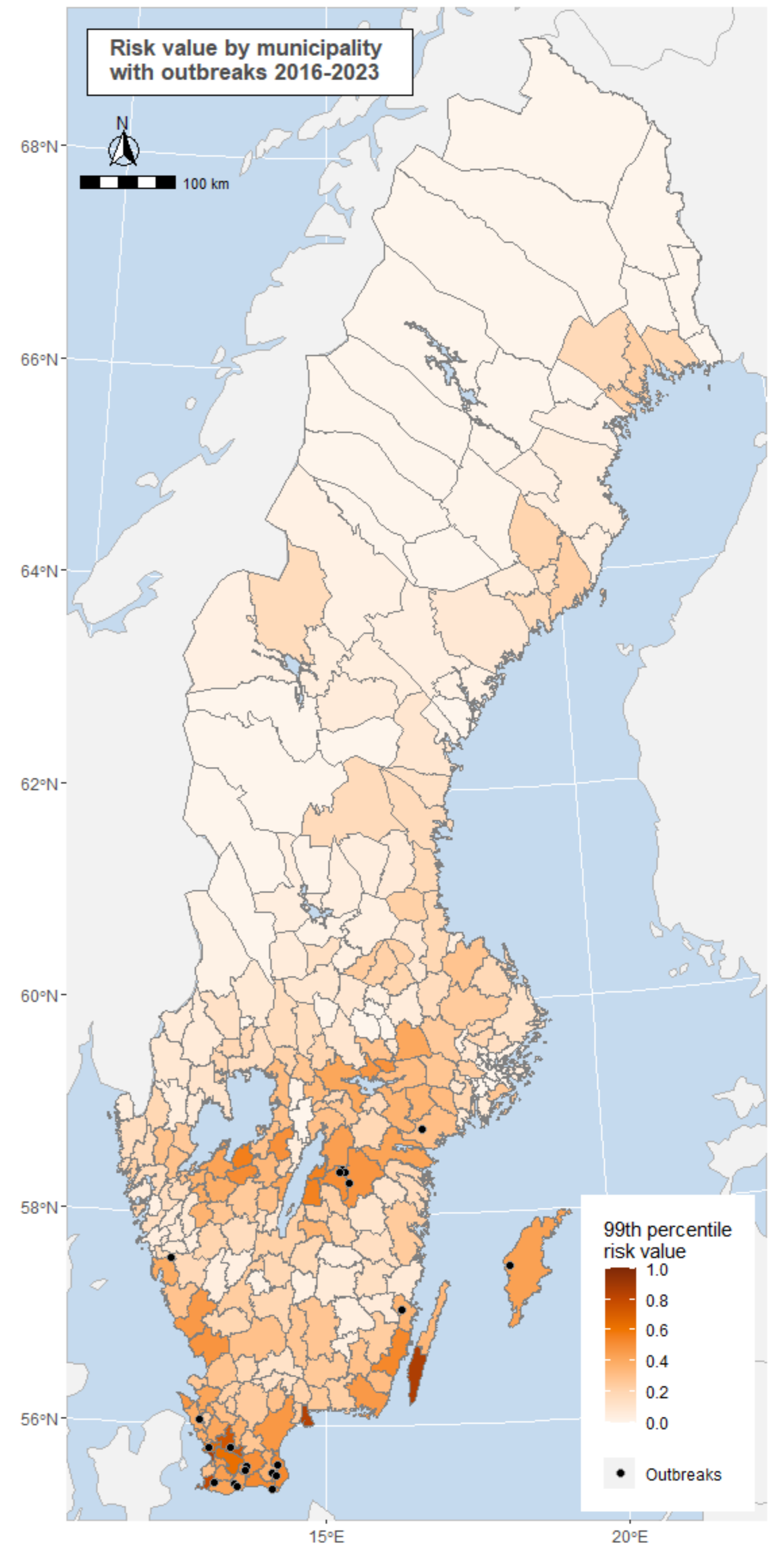
Risk factor data was based on literature review, expert opinion, and data availability. A raster calculation was applied to assess the relative environmental infectious pressure and risk of HPAIV introduction to poultry for each 1 km² cell.

Risk factor (r_i)	Weight assigned (w_i)
Wild bird observations	Ducks: 0.18, Geese: 0.15, Swans: 0.11, Larids: 0.06
Air temperature	0.27
Agriculture	0.07
Reported cases of HPAI in wild birds	0.27

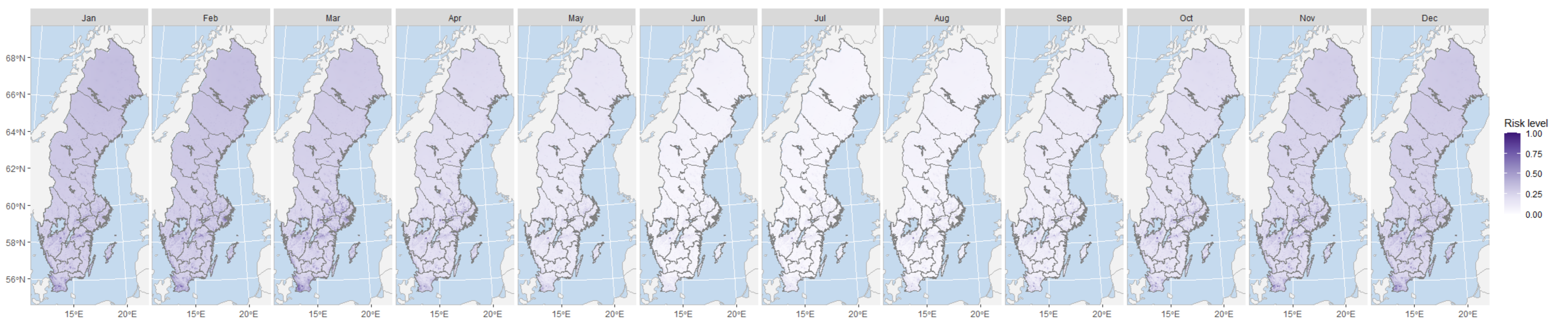
Raster calculations

$$\text{Environmental infectious pressure} = \sum_{i=1}^n w_i r_i$$

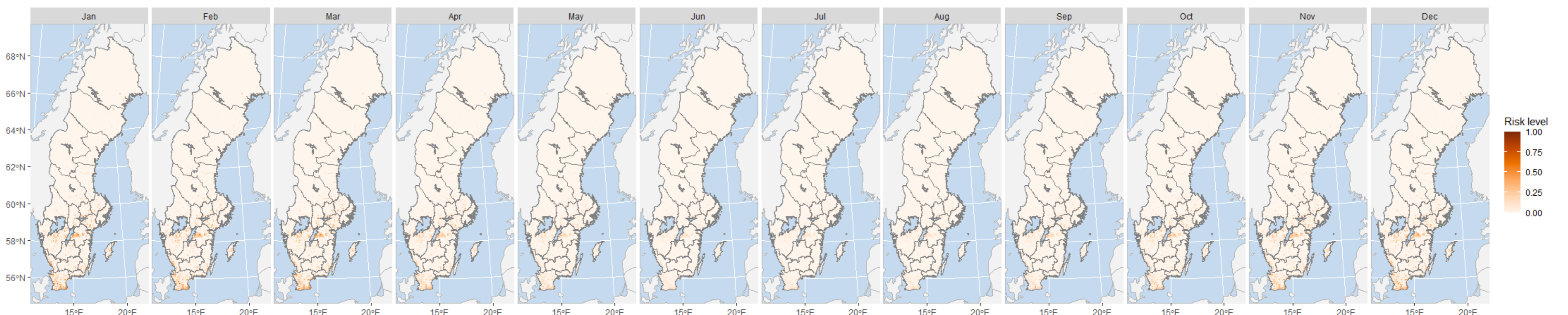
$$\text{Risk}_{\text{intro}} = \text{Environmental infectious pressure} \times \text{PoultryDensity}$$



Environmental infectious pressure



Risk of introduction of HPAIV to poultry



Conclusion

The results indicate a **large national and local variation of risk for HPAIV introduction to poultry**. The evolving HPAI situation calls for **continuous updates of the risk map**.

References

¹Grant, M., Bröjer, C., Zohari, S., Nöremark, M., Uhlhorn, H., Jansson, D.S., 2022. Highly Pathogenic Avian Influenza (HPAI H5Nx, Clade 2.3.4.4.b) in Poultry and Wild Birds in Sweden: Synopsis of the 2020-2021 Season. *Veterinary Sciences* 9, 344.



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