Avian influenza – temporal and spatial prediction
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Avian influenza is an extremely infectious and transmissible poultry virus disease.

Contact with contaminated feed, water, bedding, equipment, vermin or clothing/footwear of people in contact with infected birds or contaminated environment.

Infection is by inhalation and ingestion.

Direct or indirect contact between domestic poultry and wild birds (usually waterfowl) is the most likely source of infection.
Datasets for model building

- Meteorological data
- Trajectories of wild birds
- Land cover
- Outbreaks
- Locations of farms
- Population density

INPUT DATA
Meteorological data

- Temperature
- Wind direction and speed
- Precipitation
- Pressure

ERA5 ECMWF reanalysis data. Data aggregated on a $0.25^\circ \times 0.25^\circ$ grid. Data with hourly interval.
Land cover classification gridded

- Horizontal resolution 300 m
- Temporal resolution - year
- 22 land cover classes
Outbreaks in Poland

2020/2021 season - 363 outbreaks of AIV on farms in Poland - 16 633 331 individuals utilized
Population density data

Data from the 2011 census

Spatial resolution: grid 1km
Model concept and expected model output

The output of the model are predictions about the occurrence of avian influenza in the aggregation grid, possible giving this information with probability.
Possible applications of the model

- The model can be used as an early warning system
- Tool for public health institutions - defining restrictions for poultry farmers
- Model as part of a poultry farm management system