AI Solutions for Vector Surveillance: Towards Improving Public Health Initiatives in Northern Italy

Daniele Da Re[1], Francesca Dagostin[1], Marharyta Blaha[1,2], Alessandro Albieri[3], Paola Angelini[4], Annapaola Rizzoli[1], Giovanni Marini[1]

[1]Research and Innovation Centre, Fondazione Edmund Mach, San Michele all'Adige, Italy; [2]Center Agriculture Food Environment, University of Trento, San Michele all'Adige, Italy; [3]Centro Agricoltura Ambiente "G.Nicoli", Crevalcore, Italy; [4]Emilia-Romagna Region, Bologna, Italy

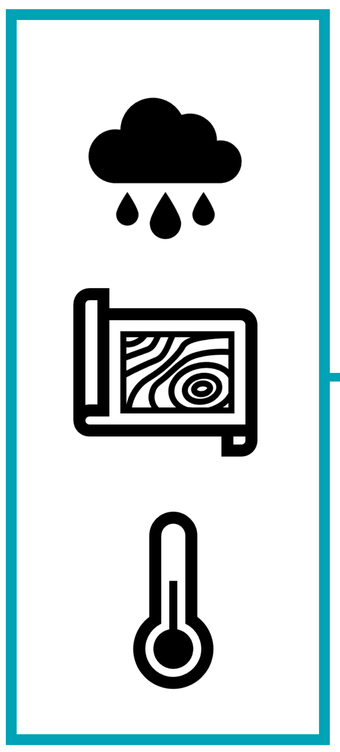
Understanding and predicting the seasonal activity of mosquitoes and ticks is crucial for preventing the spread of vector-borne diseases. Accurate risk mapping can empower communities to take proactive steps in protecting public health.

The Asian Tiger mosquito (*Aedes albopictus*), while commonly seen as a nuisance, is also a key vector for viruses like dengue and chikungunya, with outbreaks reported in recent years across Mediterranean Europe.

The tick *Ixodes ricinus*, widely found in the Alpine region, poses another public health concern as it can transmit infections such as Lyme borreliosis and tick-borne encephalitis.

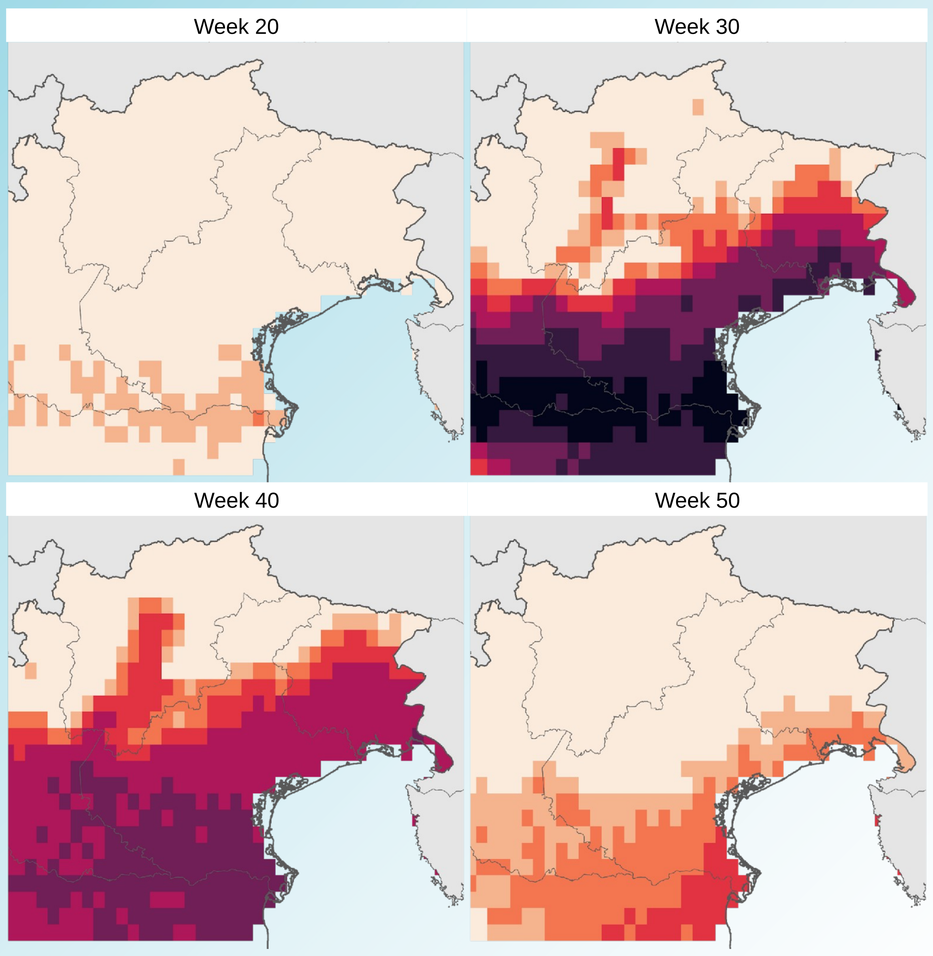
The common mosquito (*Culex pipiens*) is also a key vector, such as for West Nile Virus, a vector-borne disease that is rising due to climate change.

Surveillance and environmental data are combined with Artificial Intelligence models to predict (up to 2 weeks) presence and activity of these parasites.



Environmental covariates

AI algorithms



Targeted dissemination to local communities (seminars, social medias, etc)

Impact

- First effort at predicting ticks' activity in northern Italy
- First effort at predicting the seasonal activity of three vector species
- Real-time information on vector phenology and activity will facilitate personal protective measures
- Vectors phenology forecast can contribute to improve surveillance efforts and raise awareness about vector-borne diseases

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