



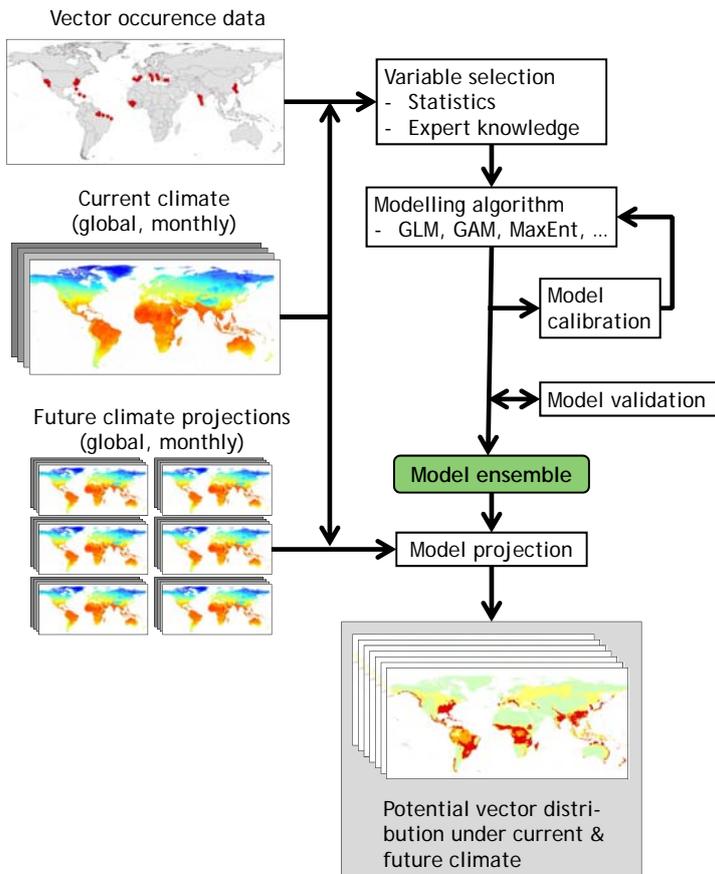
# The ZONOSIS RISKTOOL: Modelling Framework

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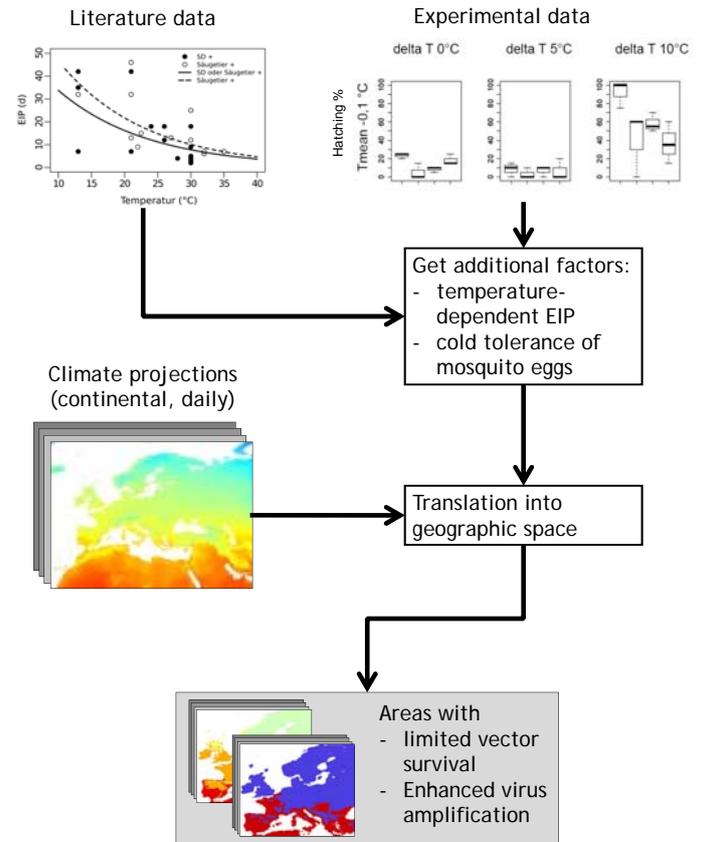
## Background

Given the recent spread of formerly "exotic" disease vectors such as the Asian Tiger Mosquito *Aedes albopictus*, the emergence of tropical diseases like Dengue in Europe and the potential increase of cases like this under the threat of global climate change, the need for models and maps identifying potential areas at risk of a disease spread rises. The Pilot study "Zoonose RISKTOOL" aims to build a modelling framework for the continental to regional scale risk assessment of zoonoses based on environmental and ecological drivers. We combine classic correlative species distribution models for vector species with mechanistic modules, incorporating additional factors such as the temperature-dependence of the Extrinsic Incubation Period of the pathogen or winter survival of arthropod vectors.

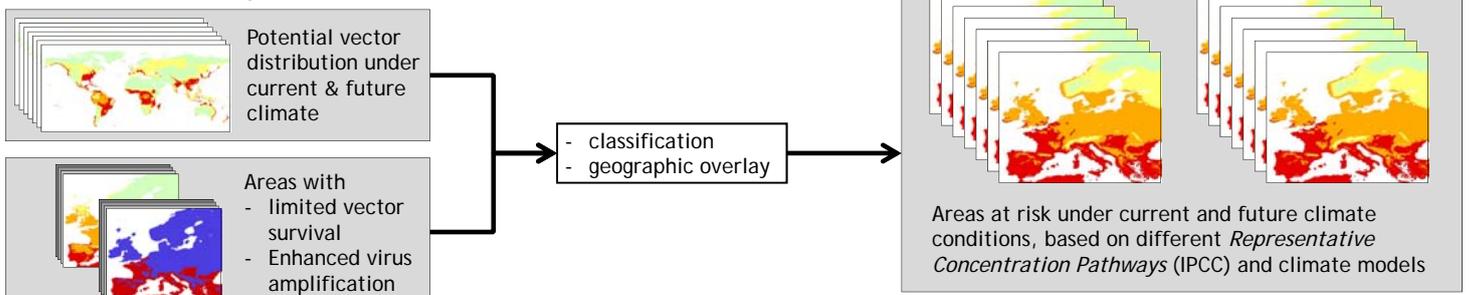
## Part 1: Vector Distribution



## Part 2: Additional Climatic Dependencies



## Part 3: Final Output



## Further References:

- Thomas, Beierkuhnlein (2013) Predicting ectotherm disease vector spread—benefits from multidisciplinary approaches and directions forward. *Naturwissenschaften* 100:395-405
- Fischer, Thomas et al. Climatic suitability of *Aedes albopictus* in Europe referring to climate change projections: Comparison of mechanistic and correlative niche modelling approaches. *Eurosurveillance*. in rev.
- Tjaden, Thomas et al. (2013) Extrinsic incubation period of dengue: Knowledge, backlog and applications of temperature-dependence. *Plos neglected tropical diseases*. doi:10.1371/journal.pntd.0002207
- Thomas, Obermayr et al. (2012) Low-temperature threshold for egg survival of a post-diapause and non-diapause European aedine strain, *Aedes albopictus* (Diptera: Culicidae). *Parasites & Vectors* 5:100
- Fischer, Thomas et al. (2011) Projection of climatic suitability for *Aedes albopictus* Skuse (Culicidae) in Europe under climate change conditions. *Global Planetary Change* 78:54-64
- Fischer, Thomas, Beierkuhnlein (2010) Climate change effects on vector-borne diseases in Europe. *Nova Acta Leopoldina* 112 (384): 99-107.

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