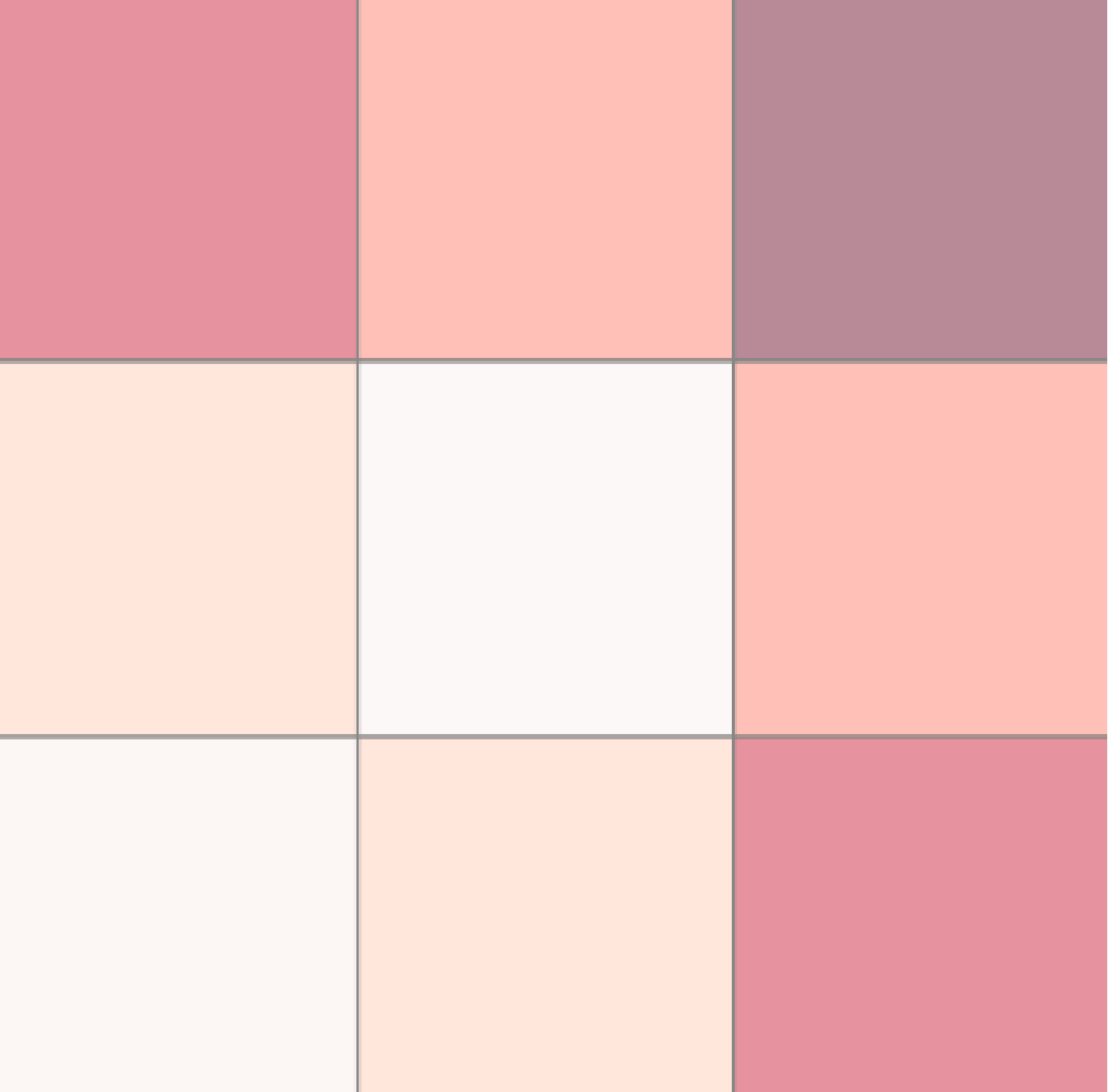
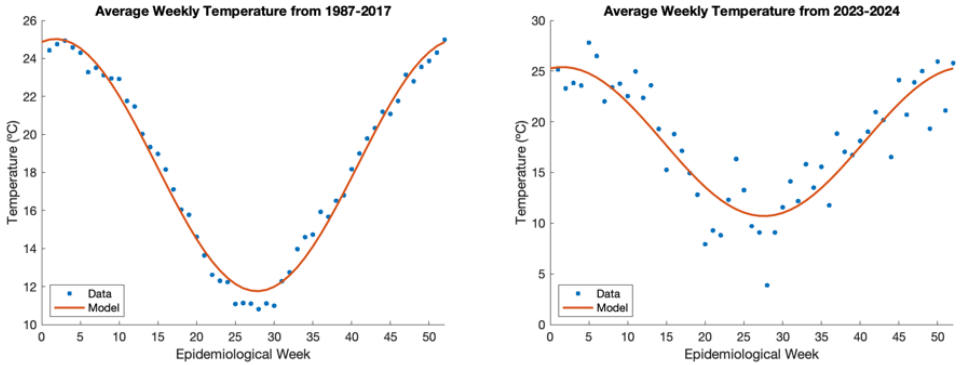


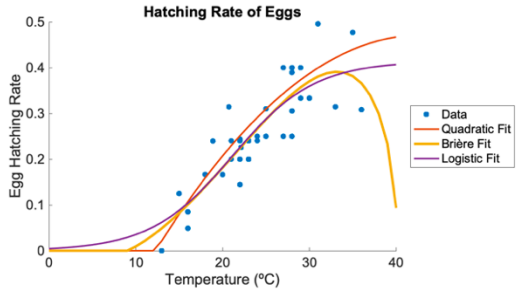
# Microclimates and mosquito-borne diseases

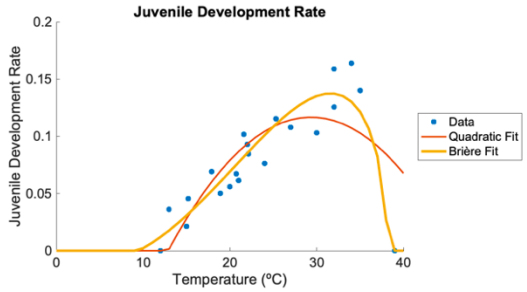
EEID Workshop 2026

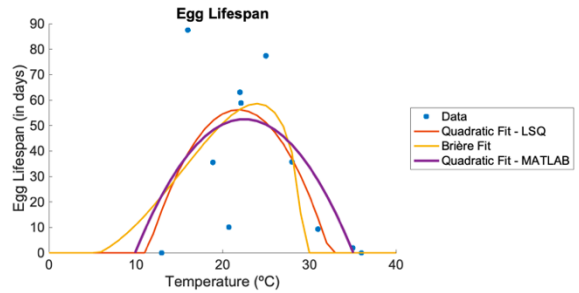
# Temperature and mosquito-borne disease

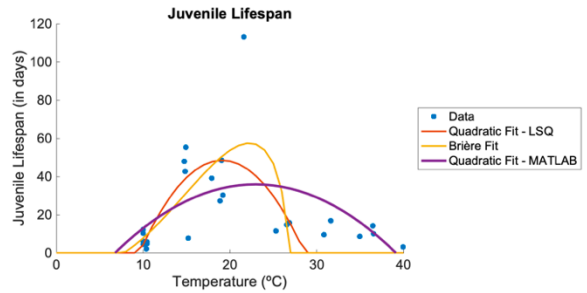
Temperature dependence in traits and population dynamics models.

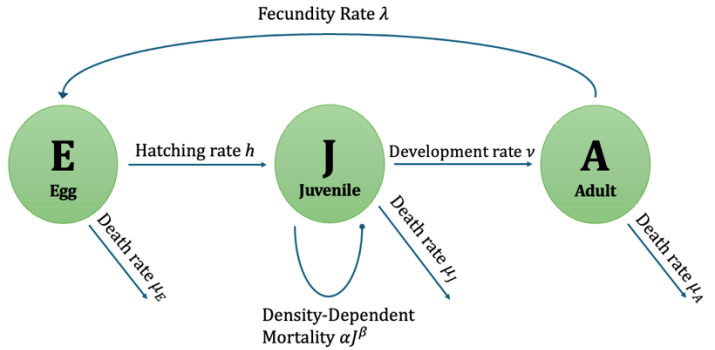


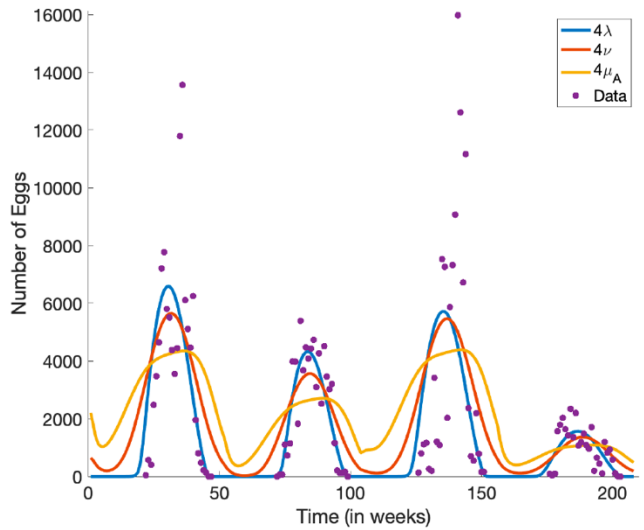



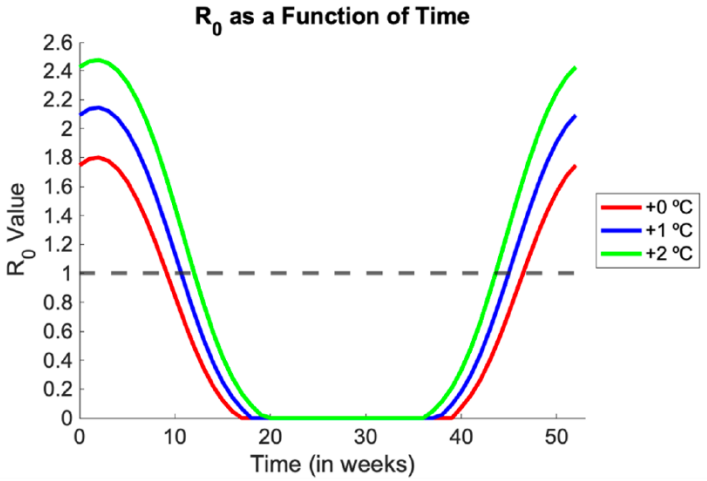



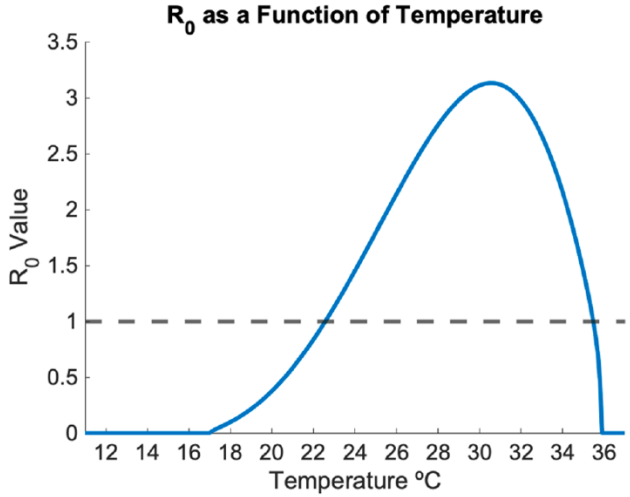



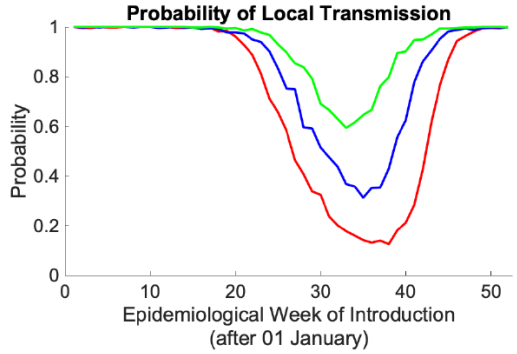



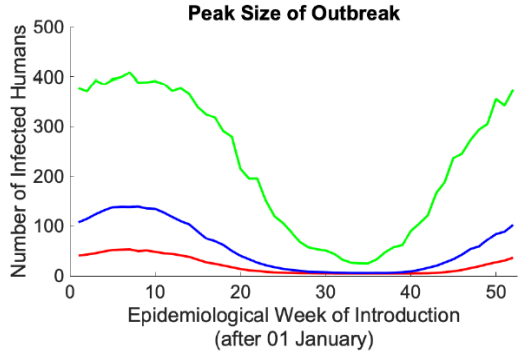
# Temperature-based model: Motivation

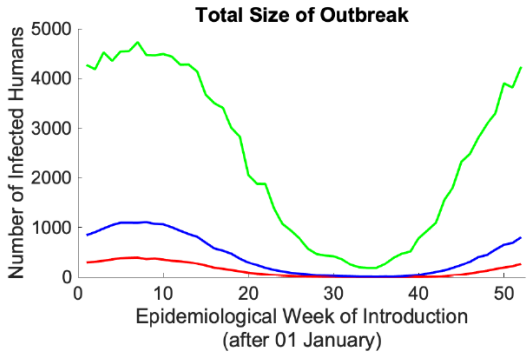
Temperature dependence in traits and disease dynamics.

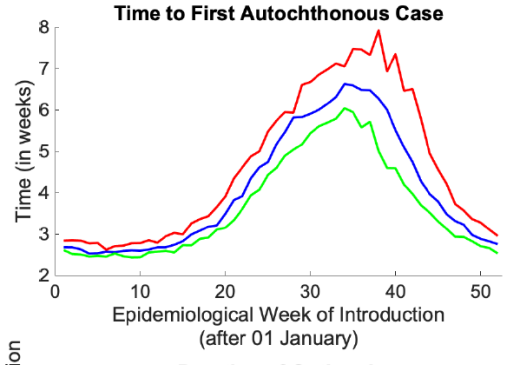


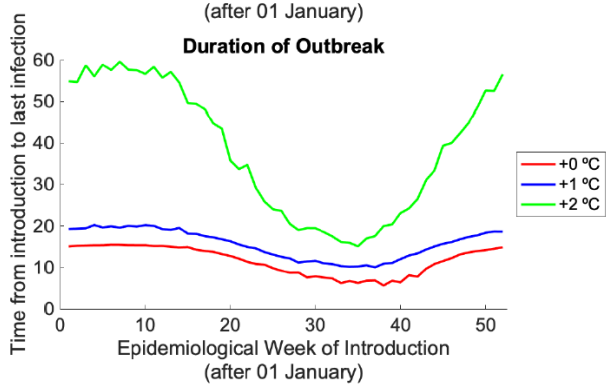



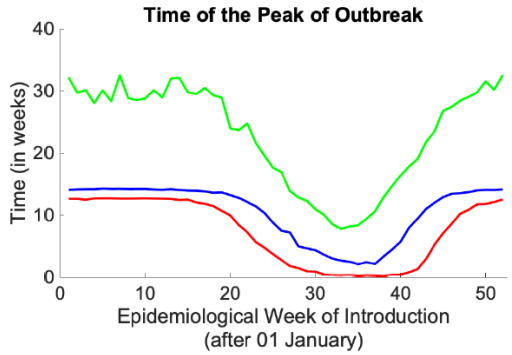



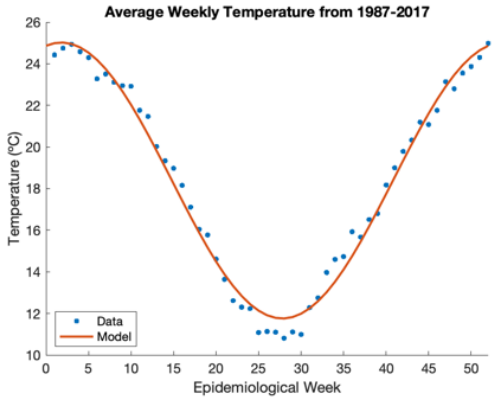



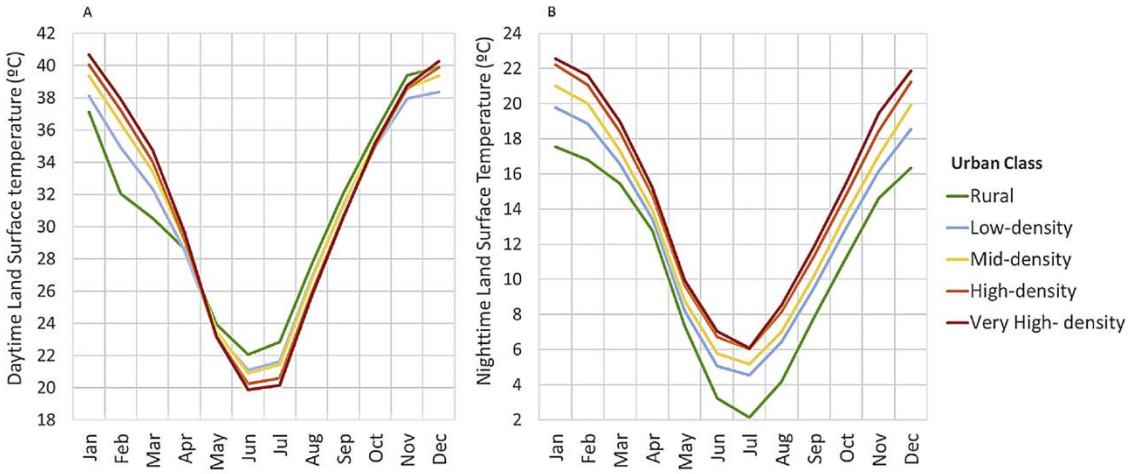



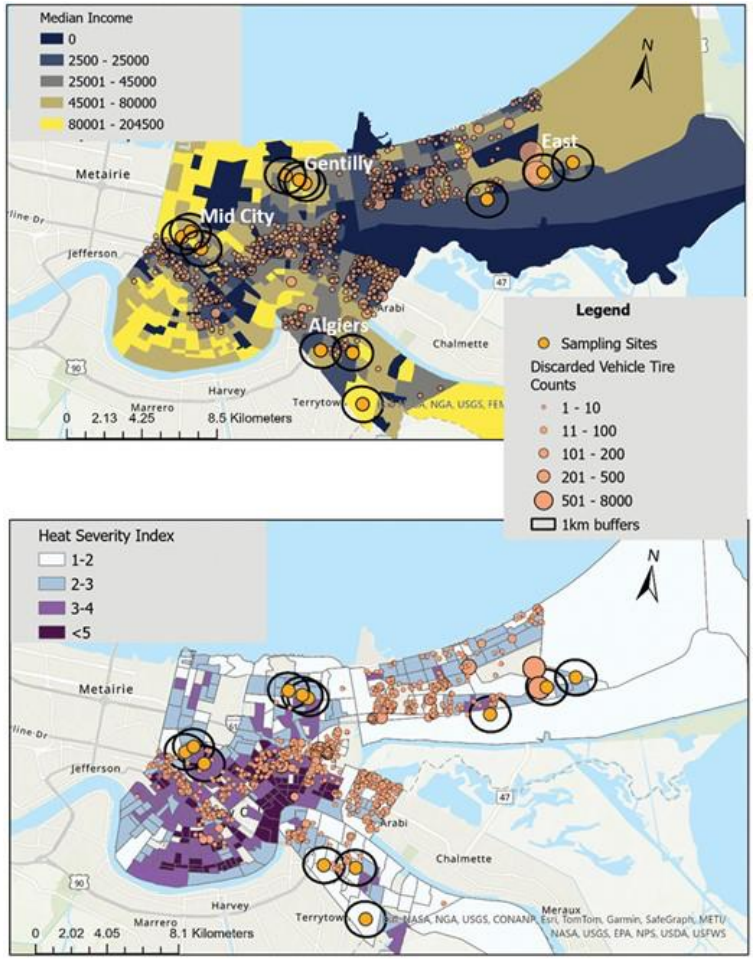



# Microclimates and Urban Heat Islands

Temperature can vary widely throughout an urban area depending on factors such as groundcover and population density.

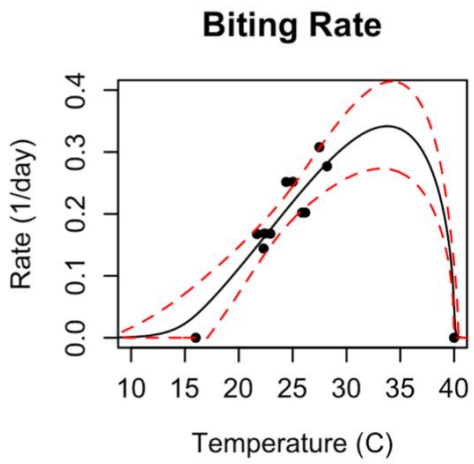


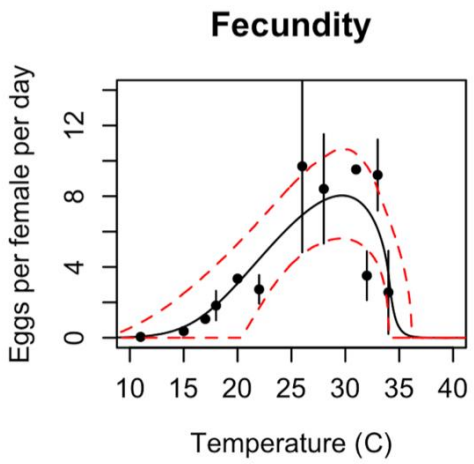

Temperature differences in Córdoba, Argentina

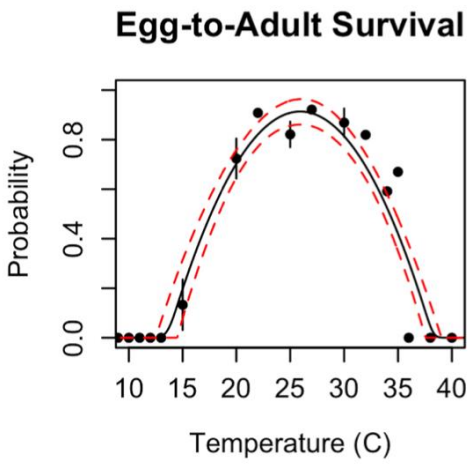


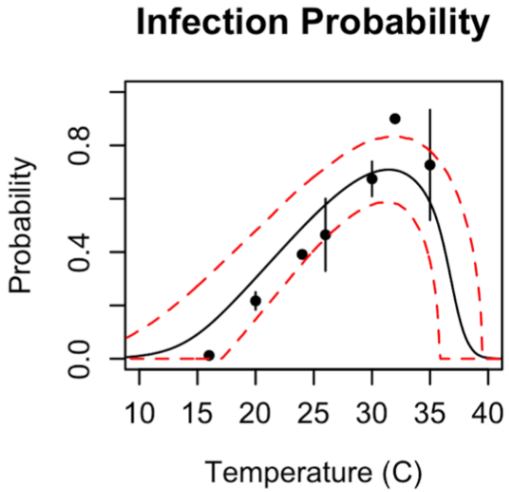

Urban Heat Islands in New Orleans, Louisiana

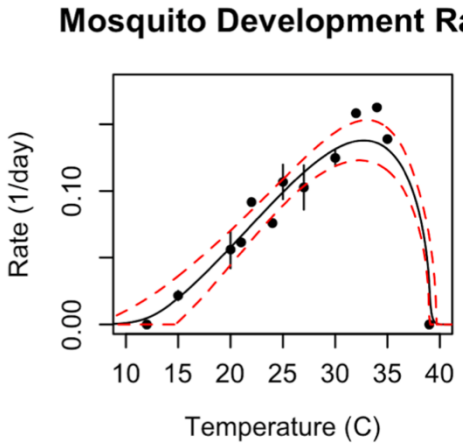
# Temperature-dependent traits

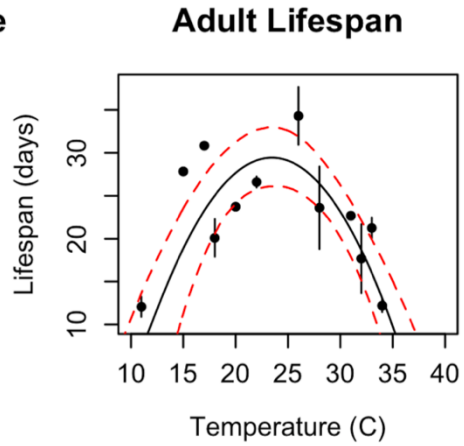


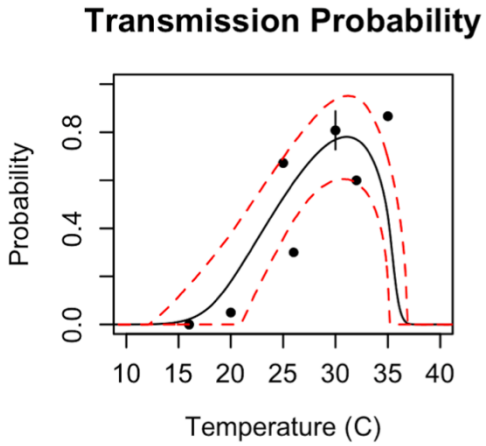



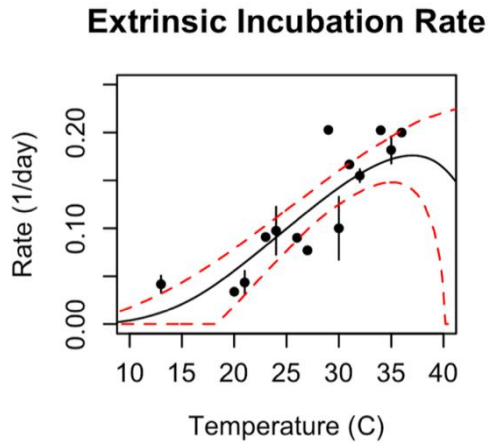



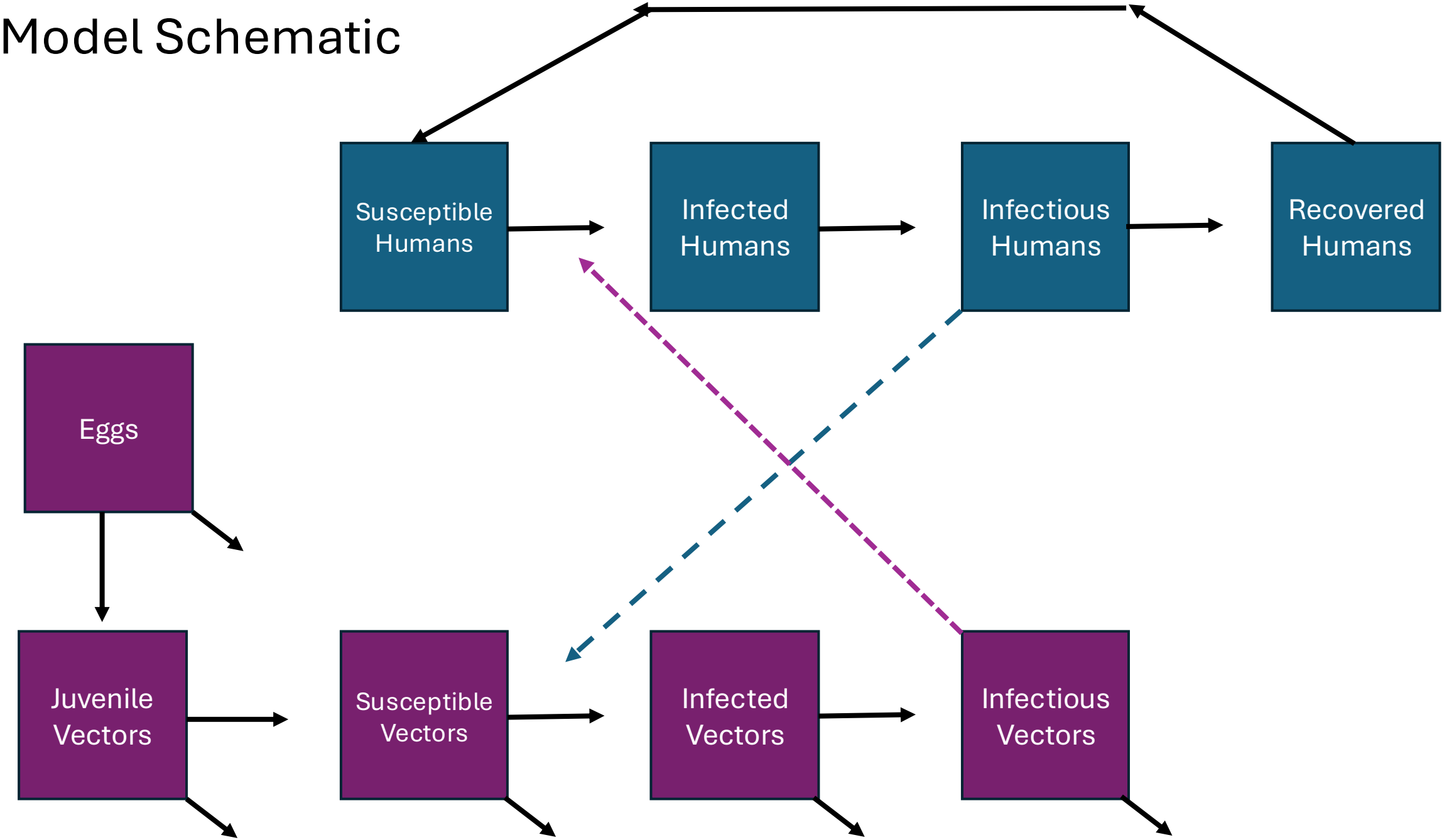




Mordecai et al. 2017. Detecting the impact of temperature on transmission of Zika, dengue, and chikungunya using mechanistic models.

# Model Schematic



# Project Goals

- How do microclimates and Urban Heat Islands impact the ability of dengue to spread in a city with interconnected subpopulations?
- How do the timing and location of introductions of dengue impact outbreak size and spread throughout the city?

- How does this change with different climate change scenarios?
- How can control be implemented in interconnected areas with microclimates?
- What are some sensitivities to model assumptions?