Salzburg-dengue ABM: a prototypical agent-based model to simulate a dengue infection via *Aedes albopictus*, in Austria

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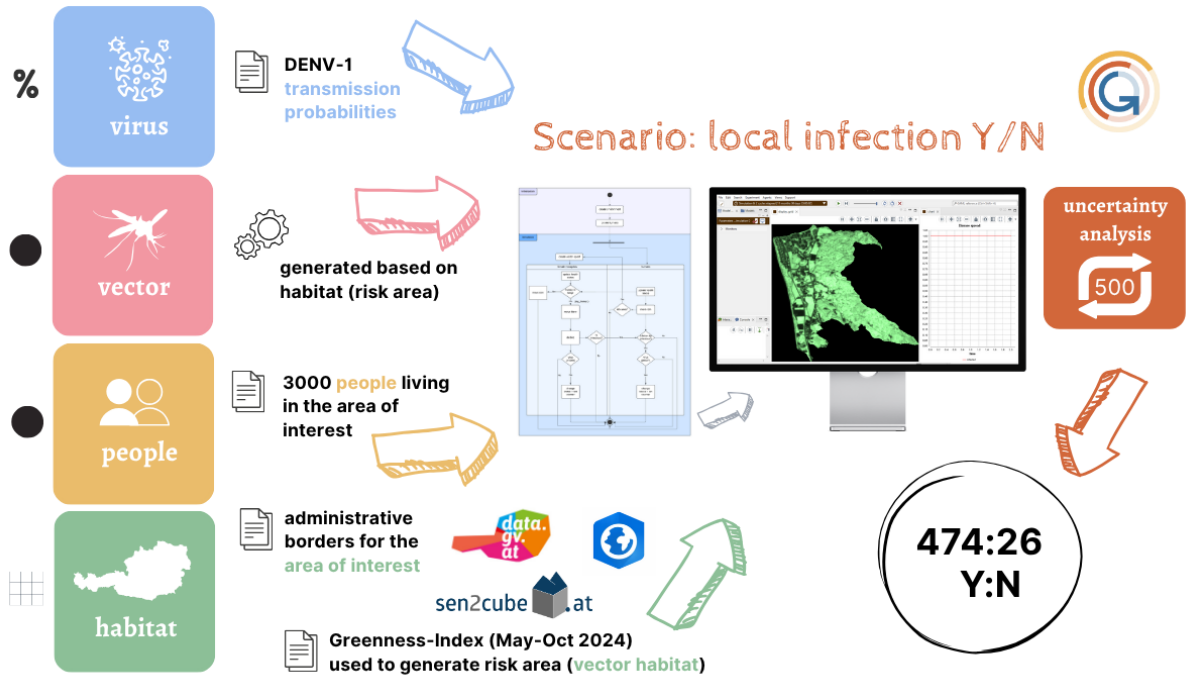

Figure 1: Graphical abstract of the model development, parts, workflow, and resulting infections.

Abstract

Aedes albopictus, commonly known as Tiger mosquitos, have been spreading worldwide for decades now, and have successfully conquered new habitats, such as the temperature zones in South and Middle Europe. As vectors of neglected tropical diseases such as dengue, their expansion poses a new risk for the diseases they can transmit. The presented Salzburg-dengue ABM is a prototypical agent-based model that aims to simulate the transmission process of dengue in a chosen area of interest in Austria, under the assumption that a traveler introduces the virus to an area where *Aedes albopictus* have become local in recent years. This theoretical model explores how, with the given probabilities for transmission, the infection process can be re-created, and infections can be caused in the simulation. The model is set in a spatio-temporal environment and simulates several days, using human and mosquito agents who move across the area. The study area is limited by administrative bounds, and a risk area is defined with the implementation of raster data with aggregated greenness values.

Keywords: epidemiological modelling, pattern-oriented modelling, spatial simulation, simulation model, neglected tropical diseases, DENV-1