Doc Title

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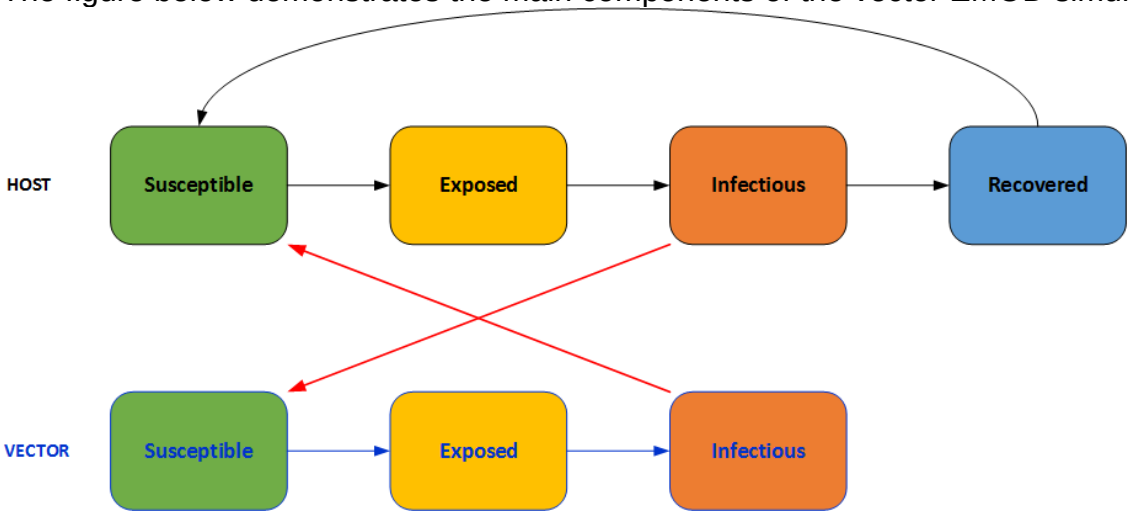
1. Vector model overview

1.1 Vector model overview

The EMOD vector model inherits the generic model functionality and introduces vector transmission and mosquito population dynamics. Interventions can be deployed within simulations for a variety of transmission settings with different transmission intensities, vector behaviors, and seasonally-driven ecologies. Climate data is necessary to simulate the effect of climatalogical impacts on vector biology. To use the vector model, set the configuration parameter Simulation_Type to VECTOR_SIM.
The figure below demonstrates the main components of the vector EMOD simulation type.



1.2 Model implementation structure

There are two categories of possible implementations of the basic model, each with different computational efficiencies, resolutions, and flexibilities. The first is an individual model, where it simulates every individual mosquito in the population or can utilize a sampled subset of mosquitoes to represent the population as the whole. The second is a modified cohort simulation, with or without explicit mosquito ages.

2. Malaria model

2.1 Malaria model

The malaria model inherits the functionality of the vector model and introduces human immunity, within-host parasite dynamics, effects of antimalarial drugs, and other aspects of malaria biology to simulate malaria transmission. For example, individuals can have multiple infections and both innate and adaptive responses to antigens. To use the malaria model, set the configuration parameter Simulation_Type to MALARIA_SIM.

2.2 Model components

The malaria model is complex, with numerous configurable parameters. The following network diagram breaks down the model into various model components, and illustrates how they interact with one another. The components on the network diagram correspond to the structural components listed below. Note that there is not perfect overlap between the labels on the network diagram and the structural components; this is because the network is drawn with increased detail in order to provide clarity in how the model functions and the components interact. The following pages will describe in detail how the structural components function.