2023 Harvard/University of Global Health Equity
Mathematical Modeling for Infectious Disease Planning

Defining additional compartments ("L and A") for your disease of focus

Time: 20 minutes
This activity sheet will serve as a guide to help you define additional compartments for the SIR model you have developed for your disease of focus.

At the end of the activity, you would have:

a) an extended model for your disease of focus, which more closely describes the transmission dynamics,
b) equations describing the extended model
c) the equations of your extended model in BM code

1. Assume the disease for your project has a latent period.
   i) When might it be necessary to include a separate compartment for individuals in the latent stage?
   ii) Given that individuals enter the latent stage before entering the infectious and symptomatic (I) stage, redraw the SIR model diagram to include a **latent** "**L**" compartment. [Note: If modeling a multi-host infectious agent such as the causative agent for malaria, please consider whether "L" is relevant for *both* host classes]

2. Briefly explain why you would include or exclude an asymptomatic compartment in your model.

3. If asymptomatic infection is relevant to your disease of focus, update your compartmental model structure to include a compartment for **asymptomatic** "**A**" individuals.