

pyPM reference model 3.1

Dean Karlen / UVic and TRIUMF

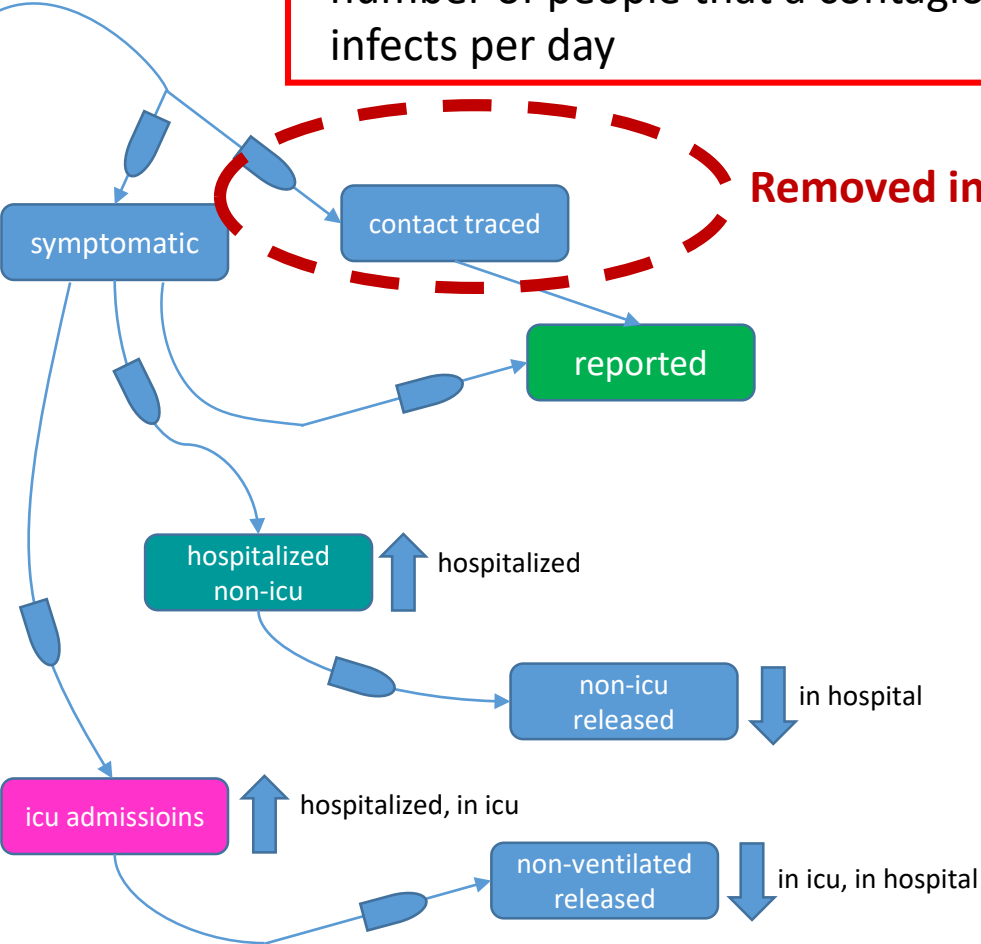
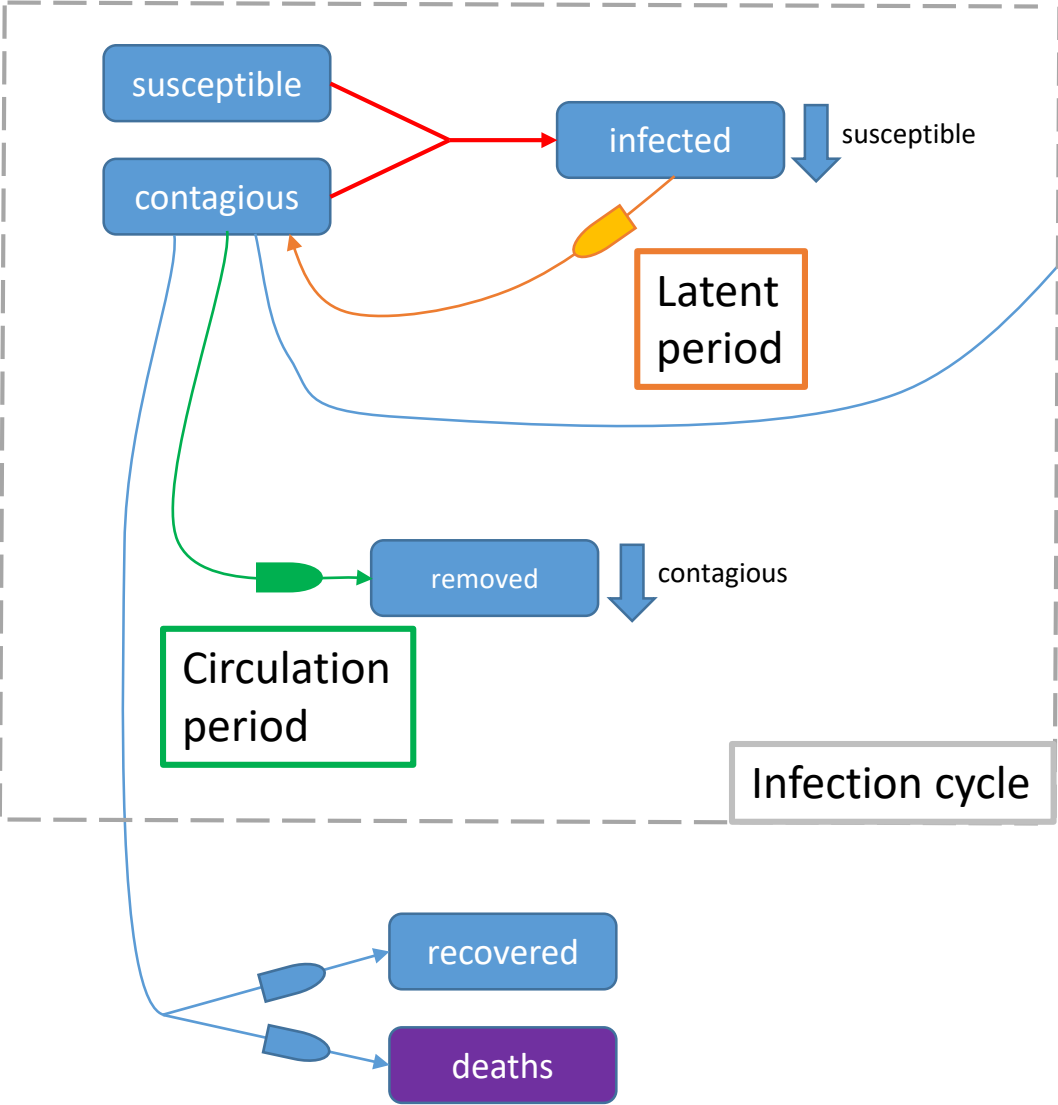
Department of Physics and Astronomy

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Basic pyPM.ca model

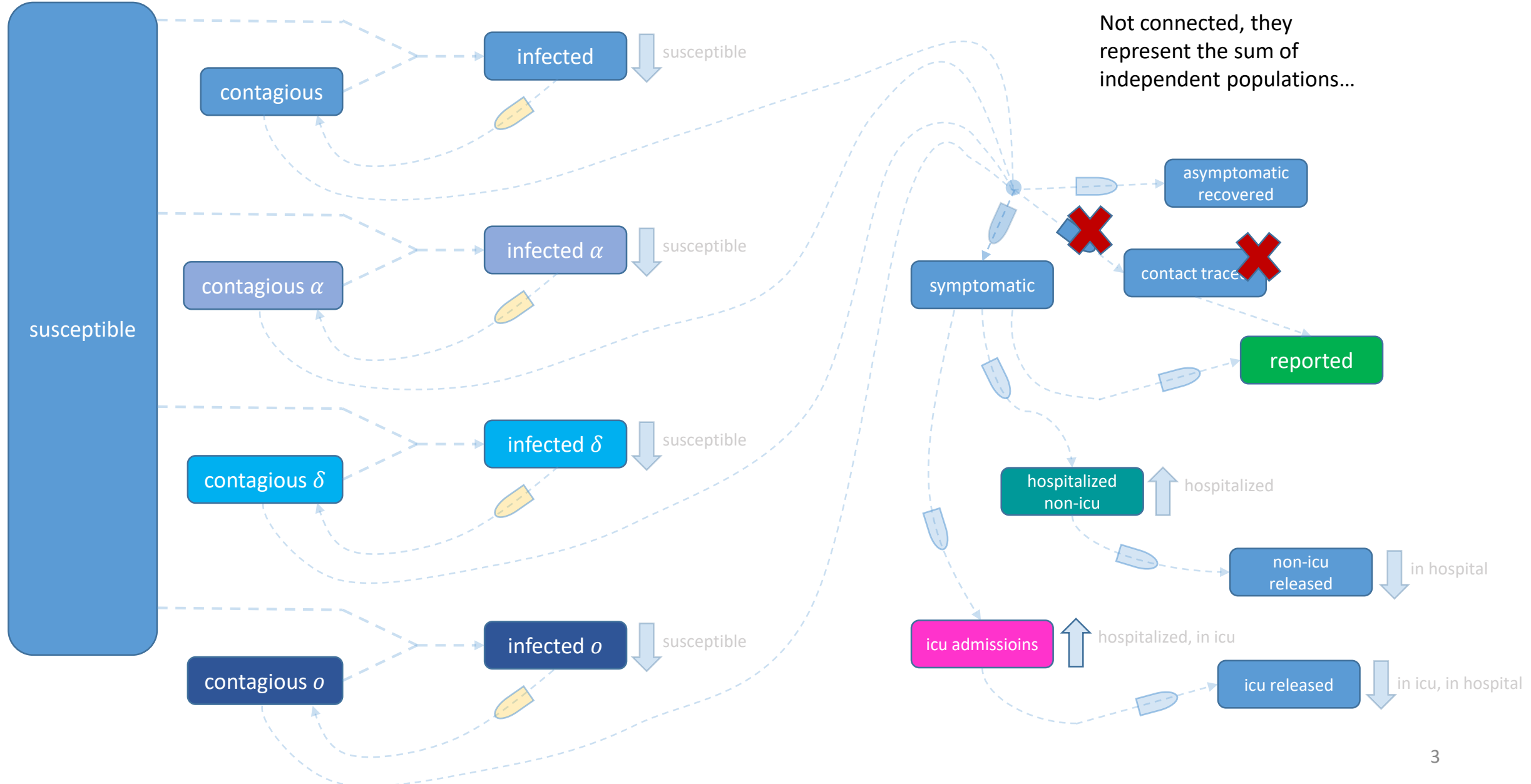
$$E[\Delta I_{t+1}] = \alpha \frac{E[S_t]}{E[N_t]} E[C_t]$$

α : transmission rate. Initially, the average number of people that a contagious person infects per day



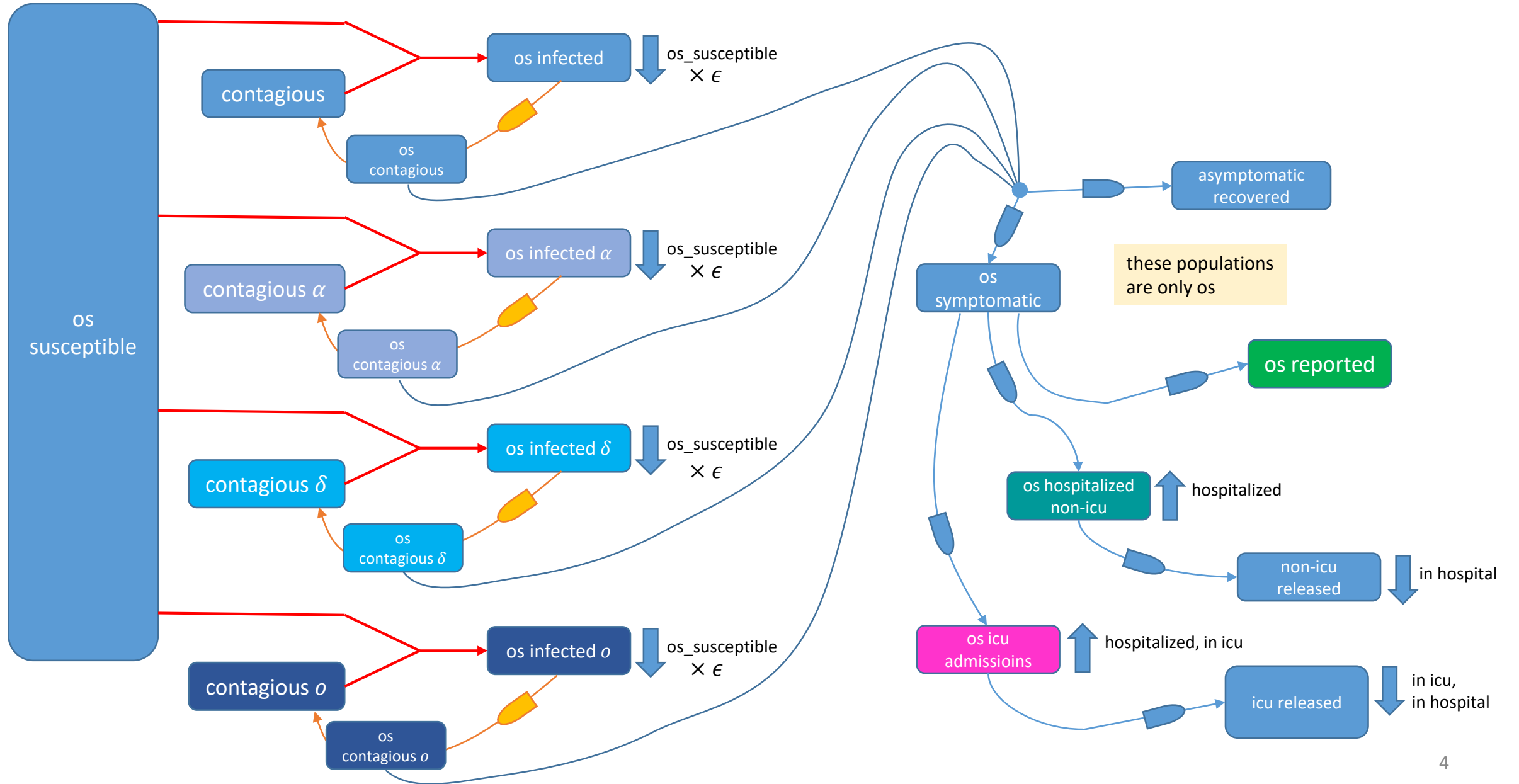
Infection cycles

“Collector” populations



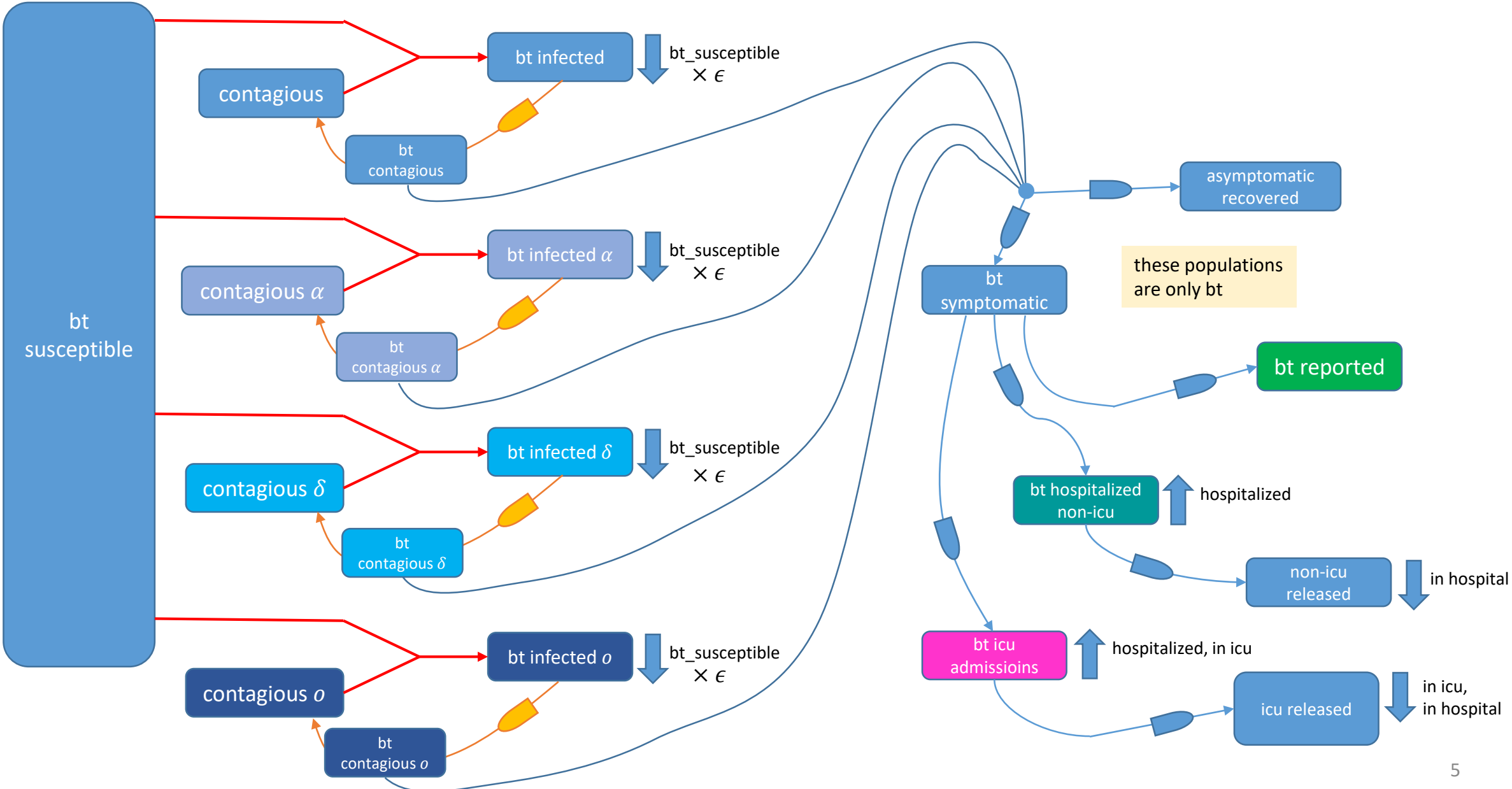
Infection cycles

Original susceptible populations



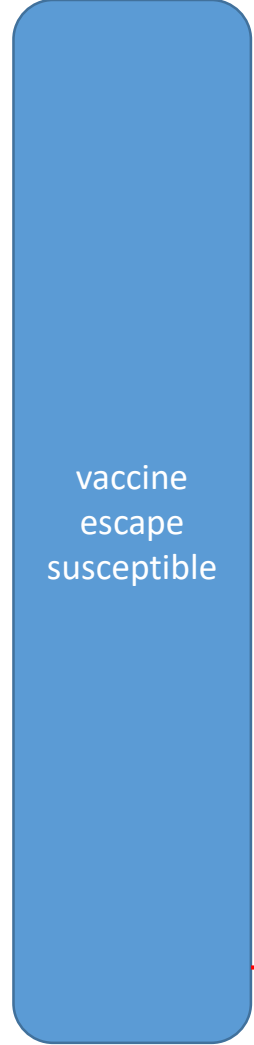
Breakthroughs in pyPM

Infection cycles



Vaccine escape in pyPM

Infection cycles



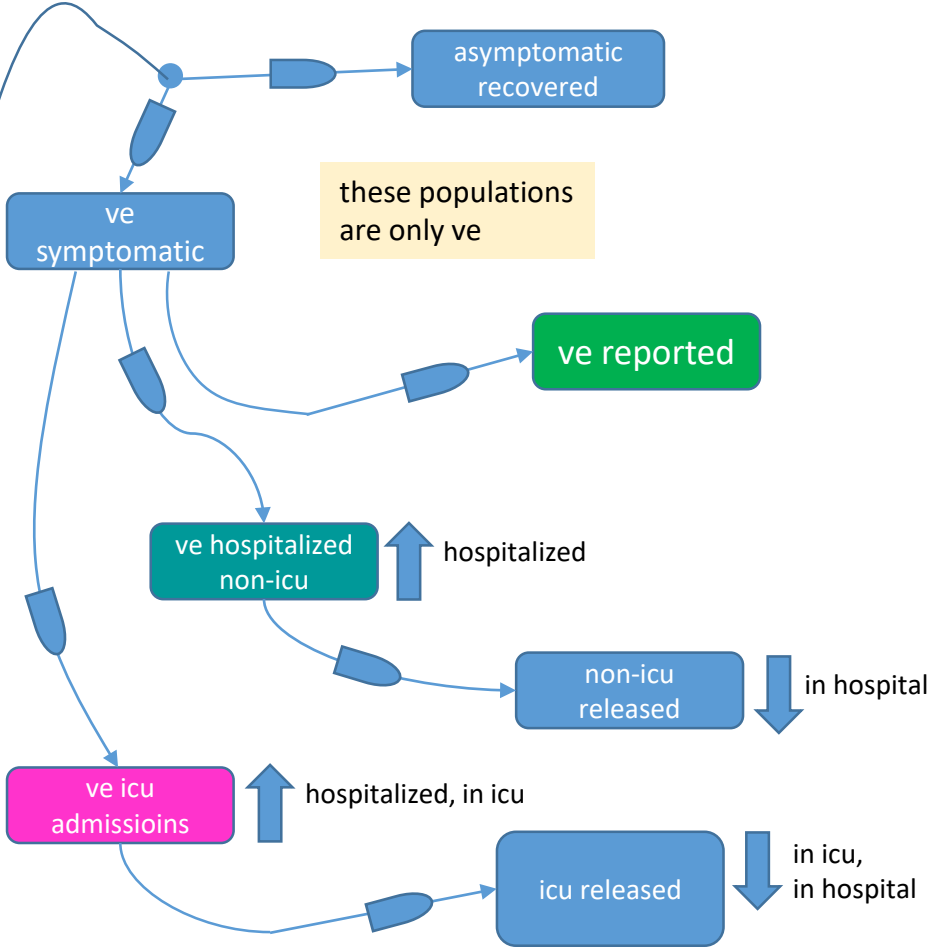
ve susceptible is separate from susceptible and bt susceptible



ve contagious is included in contagious



ve_susceptible $\times \epsilon$

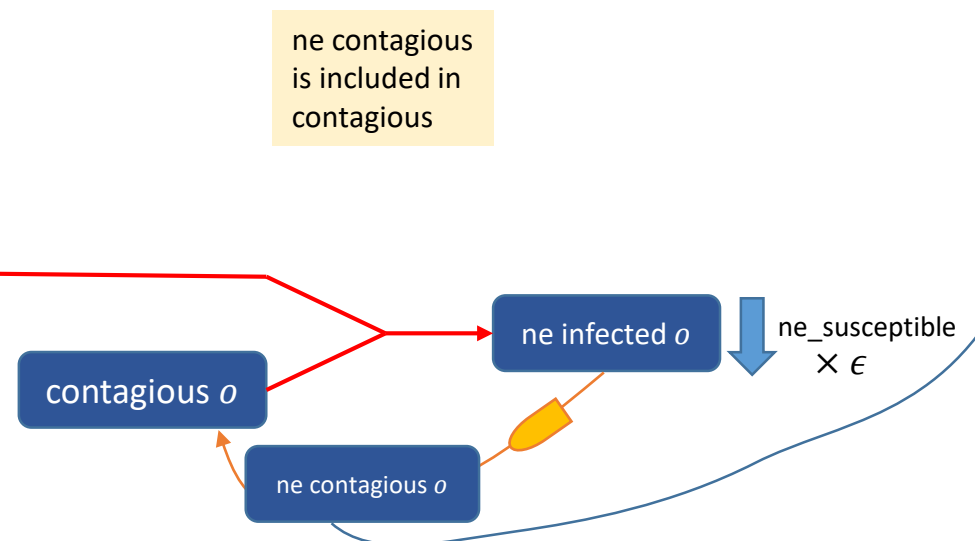


these populations are only ve

Infection cycles

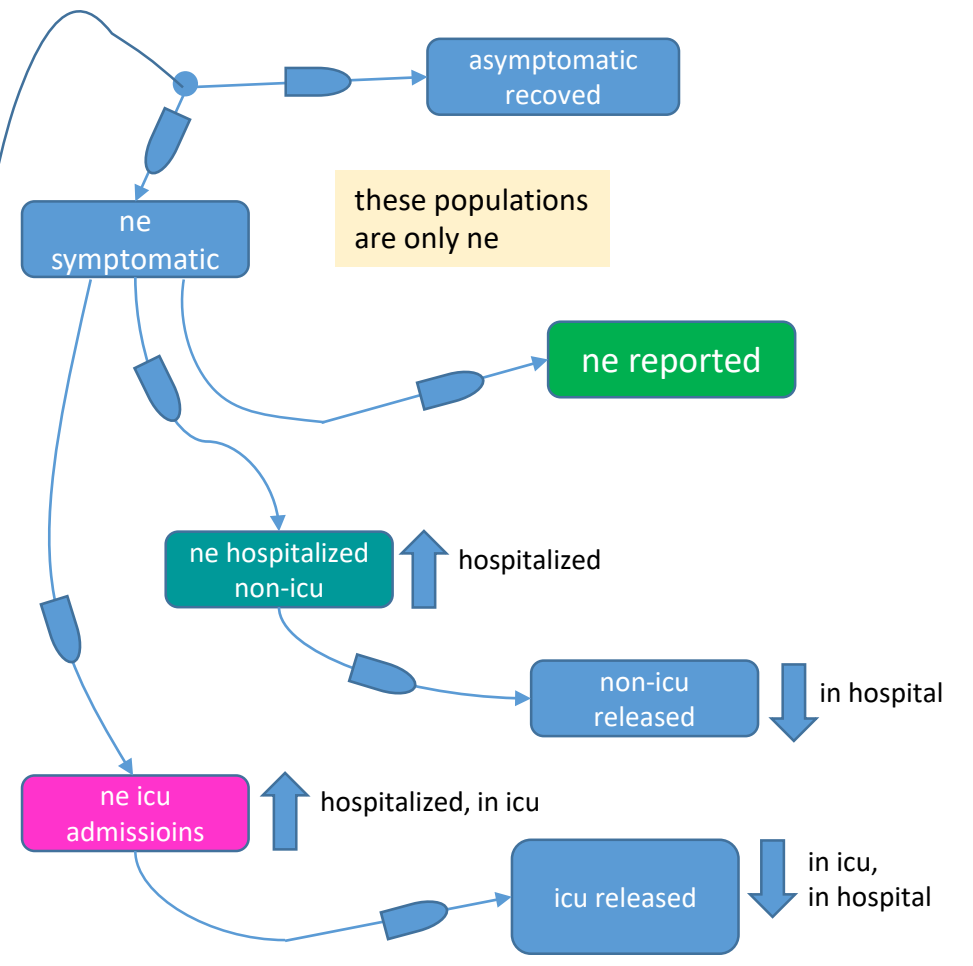


ne susceptible is separate from other susceptible populations

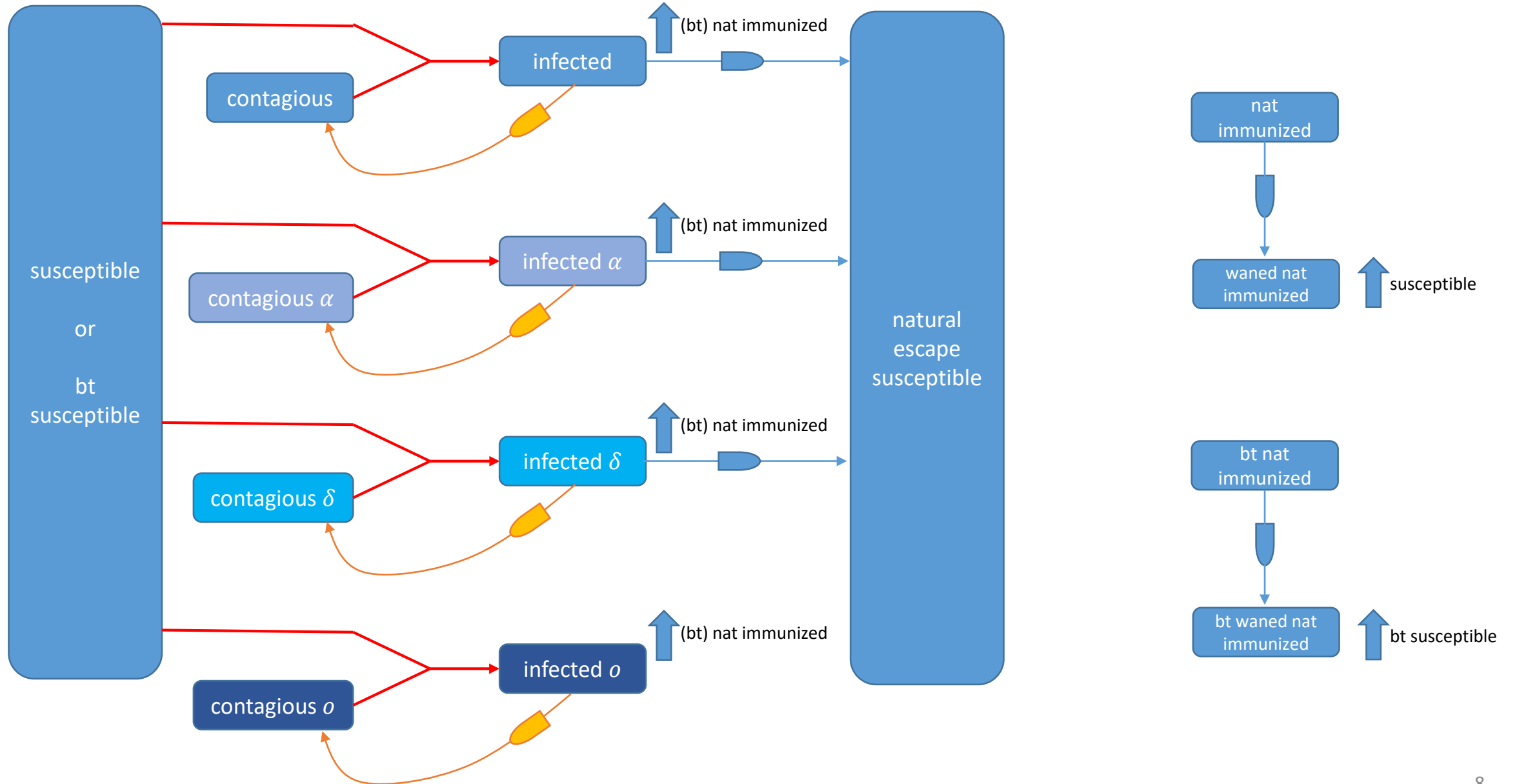


Natural escape in pyPM

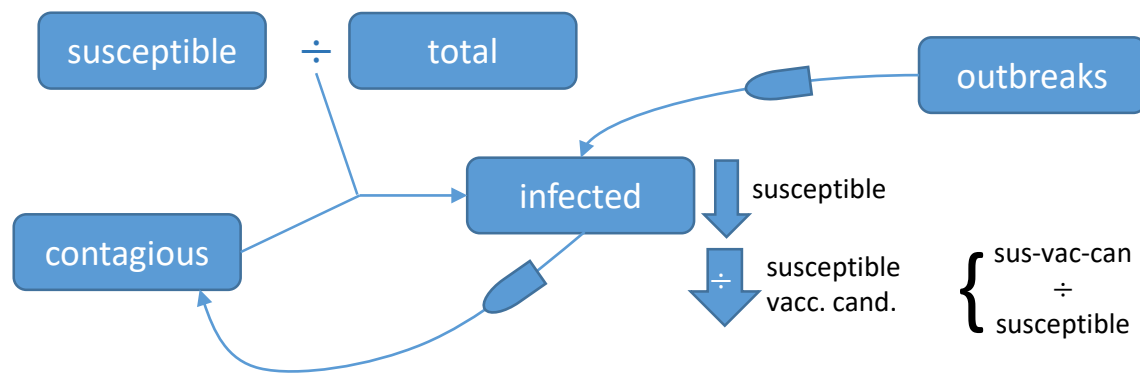
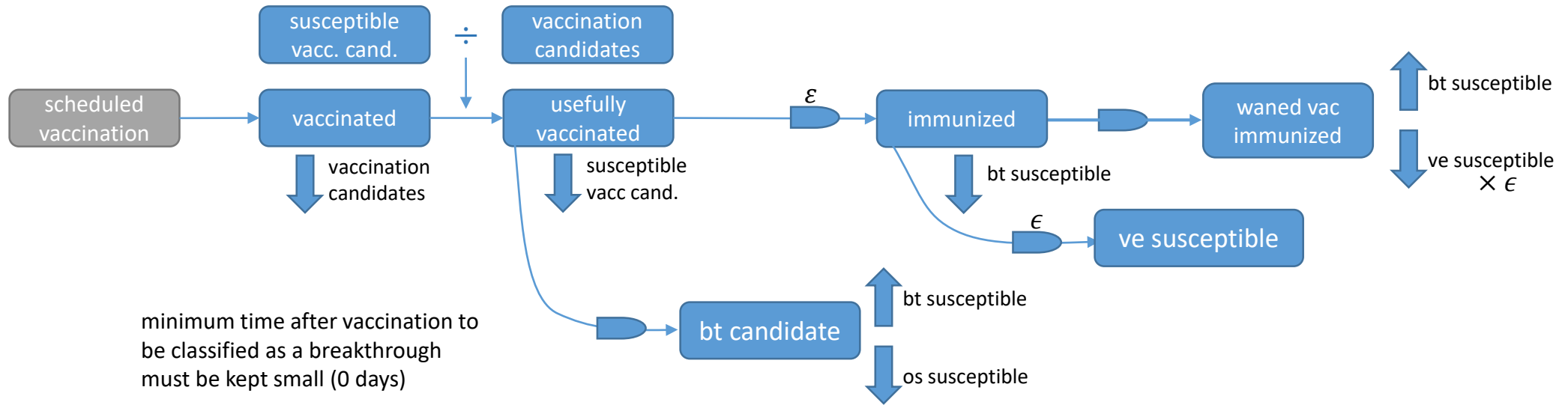
not to be confused with waning



Waning and escape of natural immunity



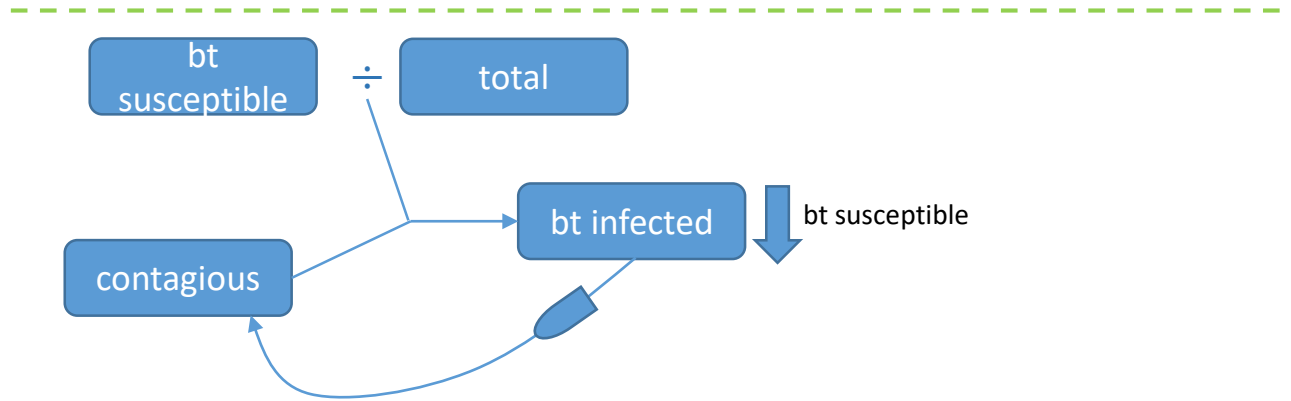
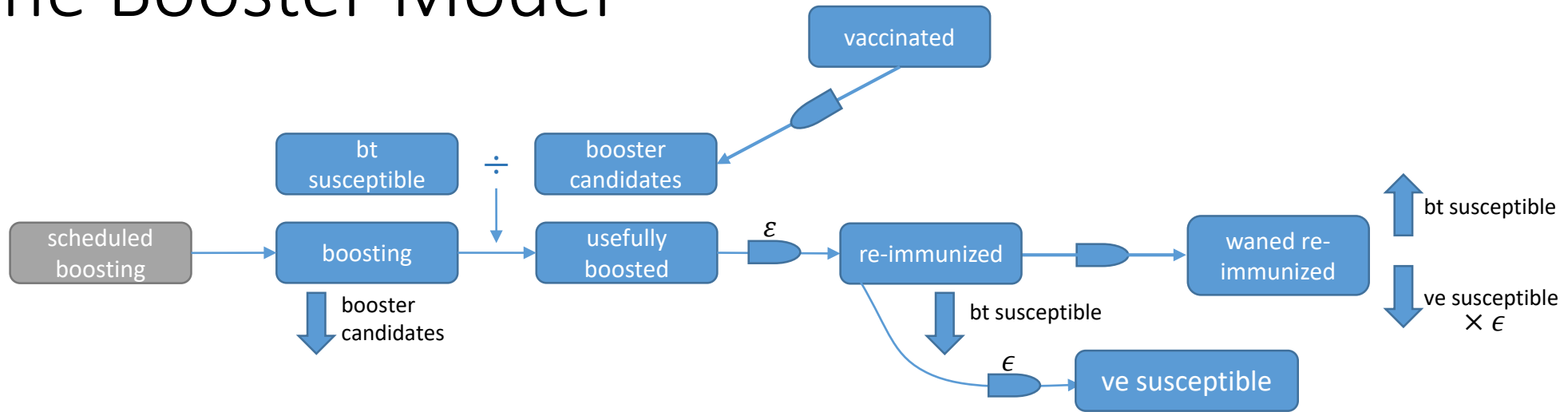
The Vaccination Model with Waning and Escape



reported (green box)

$\downarrow \div$ vaccination candidates $\left\{ (f - (1 - \epsilon)) \frac{\text{vac}}{\text{tot}} \right\}$

The Booster Model



Booster hesitancy assumed to be 0