

Taxonomy of compartmental models

CONTINUOUS TREATMENT OF INDIVIDUALS
(averages, proportions, or population densities)

DISCRETE TREATMENT OF INDIVIDUALS

DETERMINISTIC

CONTINUOUS TIME

- Ordinary differential equations
- Partial differential equations

DISCRETE TIME

- Difference equations
(eg, Reed-Frost type models)

STOCHASTIC

CONTINUOUS TIME

- Stochastic differential equations

DISCRETE TIME

- Stochastic difference equations

CONTINUOUS TIME

- Gillespie algorithm

DISCRETE TIME

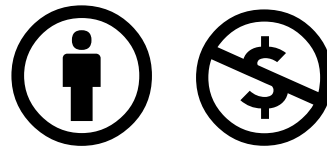
- Chain binomial type models
(eg, Stochastic Reed-Frost models)

Model Worlds

- A **model world** is an abstraction of the world that is simple and fully specified, which we construct to help us understand particular aspects of the real world
- A **mathematical model** is formal description of the assumptions that define a model world
 - We know exactly what assumptions we've made, and we can follow those assumptions to their logical conclusions to address research questions



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