# Taxonomy of **compartmental** models

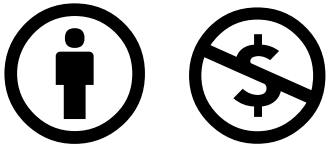
| | CONTINUOUS TREATMENT OF INDIVIDUALS (averages, proportions, or population densities) | DISCRETE TREATMENT OF INDIVIDUALS |
|---|---|---|
| DETERMINISTIC | CONTINUOUS TIME<br>• Ordinary differential equations<br>• Partial differential equations<br>DISCRETE TIME<br>• Difference equations (eg, Reed-Frost type models) | |
| STOCHASTIC | CONTINUOUS TIME<br>• Stochastic differential equations<br>DISCRETE TIME<br>• Stochastic difference equations | CONTINUOUS TIME<br>• Gillespie algorithm<br>DISCRETE TIME<br>• 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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