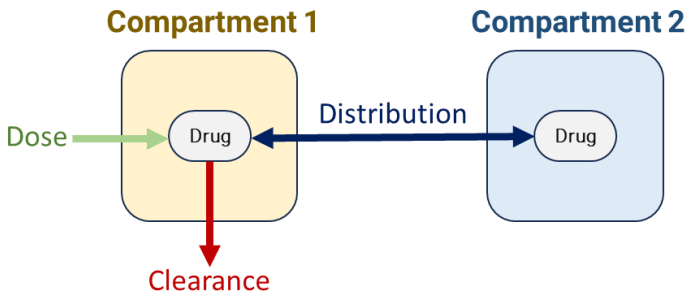
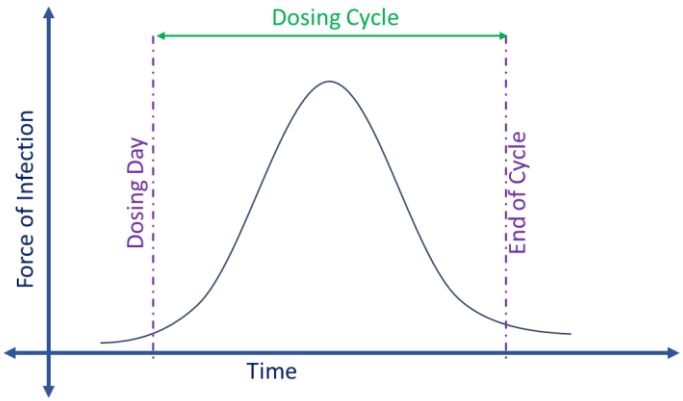
PK Modelling

The pharmacokinetic parameters of the identified molecule (clearance rate, distribution rate, volumes) provide insights into how the molecule moves through the body. These parameters are fundamental for determining how frequently the molecule needs to be administered to maintain an effective concentration. Mathematical models, such as compartmental models, can help simulate the behaviour of the molecule in the body and inform dosing strategies.



Incorporation of seasonality of Infection

The problem statement presents a Gaussian distribution curve to model the seasonality of infection rates. This type of distribution is commonly used to represent natural phenomena with a peak and variability. Understanding the parameters and how they relate to the infection rates is crucial for creating a realistic model of the disease's behaviour over time.



Population-Level Modelling

To determine the effective treatment population and ensure that at least 75% of the populace can be effectively treated, a population-level model is needed. This model should integrate the infection rate distribution, dosing strategy, treatment duration, and treatment coverage to estimate the percentage of the population that can be protected over time.

Including inter-individual variability at the population level is an important consideration when tackling complex problems like determining the First-in-Human (FIH) dose for a viral infection. Inter-individual variability acknowledges that different people may respond differently to treatments and have varying characteristics that can impact treatment outcomes.

Instead of assuming fixed values for parameters for pharmacokinetic parameters, consider using probability distributions to describe these parameters. This allows you to capture the range of possible values that individuals in the population might exhibit.