

2018. Van Kinh Nguyen and Esteban A. Hernandez-Vargas. Parameter estimation in mathematical models of viral infections using R. *Methods Mol Biol.* 1836: 531-549.

See <https://pubmed.ncbi.nlm.nih.gov/30151590/> . Accessed 15 March 2023.

**Abstract:** In recent years, mathematical modeling approaches have played a central role to understand and to quantify mechanisms in different viral infectious diseases. In this approach, biological-based hypotheses are expressed via mathematical relations and then tested based on empirical data. The simulation results can be used to either identify underlying mechanisms, provide predictions on infection outcomes, or evaluate the efficacy of a treatment.

Conducting parameter estimation for mathematical models is not an easy task. Here we detail an approach to conduct parameter estimation and to evaluate the results using the free software R. The method is applicable to influenza virus dynamics at different complexity levels, widening experimentalists capabilities in understanding their data. The parameter estimation approach presented here can be also applied to other viral infections or biological applications.

**Key Words:** viral infection, mathematical modeling, parameter estimation, influenza