

Some challenges in modeling imperfect vaccines

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Abstract

The dynamics of vaccine-preventable diseases depend on the underlying disease process and the nature of the vaccine. I will present a general model of an imperfect vaccine and the epidemiological consequences of different modes of vaccine failure. I will also discuss likelihood-based statistical inference methods that can be used to estimate the parameters of the model even in the presence of incomplete covariate information (such as vaccine coverage). The methods used can be extended to study and fit mechanistic models of complex phenomenon beyond those in disease ecology.