Mathematics of imperfect vaccines

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The dynamics of vaccine-preventable diseases depend on the un- derlying disease process and the nature of the vaccine. I will present a general model of an imperfect vaccine and the dynamical consequences of different modes of vaccine failure. I will also discuss statistical inference methods (e.g. trajectory matching, sequential Monte Carlo methods) that can be used to estimate the parameters of these models. The methods used can be extended to study and parametrize mechanistic, stochastic models of complex systems beyond those in disease ecology.
