

Modelling the effect of vaccines on cholera transmission

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Cholera is a diarrhoeal disease that is caused by an intestinal bacterium, *Vibrio cholerae*. Recently an outbreak of cholera in Haiti brought public attention to this deadly disease. In this work, the goal of our differential equation model is to find an effective optimal vaccination strategy to minimize the disease related mortality and to reduce the associated costs. The effect of seasonality in pathogen transmission on vaccination strategies was investigated under several types of disease scenarios, including an endemic case and a new outbreak case. This model is an extension of a general water-borne pathogen model. This work involves the optimal control problem formulation, analysis and numerical simulations.

What optimal [vaccination strategies](#) should be used during a cholera outbreak? The effect of seasonality in pathogen transmission on vaccination strategies was investigated under several types of disease scenarios, including an endemic case and a new outbreak case. The model is an extension of a general water-borne pathogen model. This work involves optimal control problem formulation, analysis and [numerical simulations](#).

More information: Urmi Ghosh-Dastidar, Suzanne Lenhart, *J. Biol. Syst.* 23, 323 (2015). [DOI: 10.1142/S0218339015500175](https://doi.org/10.1142/S0218339015500175)

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