MODELING THE IMPACT OF CLIMATE CHANGE ON VECTOR-BORNE DISEASE IN BANGLADESH

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In recent years, infectious diseases have become increasingly alarming global public health concerns. This is because new infectious diseases have emerged and some existing diseases have re-emerged and these diseases are spreading into new regions due to the global climate change [2]. It is assumed that global warming might lead to an increase of infectious disease outbreaks due to increased temperature and the environmental changes.

Bangladesh is one of the most vulnerable countries not only in the South East Asia but also in the world. It is already vulnerable to many gradual change phenomena of climate change as well as climate change related extreme events. In many cases, multiple threats of increasing extreme heat waves, sea-level rise, more severe storms, droughts and floods will have severe negative implications for the most vulnerable like Bangladesh. Based on the above issues, Bangladesh is suspected to be a home of several vector-borne, water-borne and food-borne infectious diseases [1].

In this paper, we first discuss some potential impacts of increased temperature due to climate change in Bangladesh and its aftermath on the ecosystems and human infectious diseases. We then study a mathematical model of vector-born infectious disease in terms of nonlinear ordinary differential equations (ODEs). Optimal control techniques have been applied to investigate the better control strategy [3] [4]. We analyze the model numerically and the results are illustrated with numerical simulations.

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