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COLLOQUIUM

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Mathematical modelling tools for vector borne diseases

Abstract

Many well known diseases such as malaria, dengue, Zika, and West Nile Virus are transmitted to humans via an insect vector and are collectively referred to as vector borne diseases. All these diseases pose major public health concerns. The insect vectors can carry the disease and pass the infection to new human or animal hosts via an insect bite. Climate change has been proposed as a likely driver of past and future geographical expansion of these diseases, however the complex ecology of insect populations makes understanding the likely impacts of climate change on vector borne diseases challenging. Tools that can predict when insect vector numbers will be high can allow us to plan management strategies to mitigate against future disease outbreaks. In this talk I will show how differential equations can be used to describe how insect abundance and disease risk change in time. I will show how we can use these mathematical models to make predictions about the threat of West Nile Virus in the UK.