



Impact of climate change upon vector born diseases in Europe and Africa using ENSEMBLES Regional Climate Models

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Climate variability is an important component in determining the incidence of a number of diseases with significant human/animal health and socioeconomic impacts. The most important diseases affecting health are vector-borne, such as malaria, Rift Valley Fever and including those that are tick borne, with over 3 billion of the world population at risk. Malaria alone is responsible for at least one million deaths annually, with 80% of malaria deaths occurring in sub-Saharan Africa. The climate has a large impact upon the incidence of vector-borne diseases; directly via the development rates and survival of both the pathogen and the vector, and indirectly through changes in the environmental conditions. A large ensemble of regional climate model simulations has been produced within the ENSEMBLES project framework for both the European and African continent. This work will present recent progress in human and animal disease modelling, based on high resolution climate observations and regional climate simulations. Preliminary results will be given as an illustration, including the impact of climate change upon bluetongue (disease affecting the cattle) over Europe and upon malaria and Rift Valley Fever over Africa. Malaria scenarios based on RCM ensemble simulations have been produced for West Africa. These simulations have been carried out using the Liverpool Malaria Model. Future projections highlight that the malaria incidence decreases at the northern edge of the Sahel and that the epidemic belt is shifted southward in autumn. This could lead to significant public health problems in the future as the demography is expected to dramatically rise over Africa for the 21st century.