

THE GEOGRAPHIC DISTRIBUTION OF DENGUE FEVER AND THE POTENTIAL INFLUENCE OF GLOBAL CLIMATE CHANGE

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Background and Aims: We aimed to describe the geographic distribution of dengue transmission (current and historical) and to estimate possible impacts on transmission from climate change.

Methods: We searched PubMed, digital books and archives for literature describing geographically defined outbreaks of dengue. We also searched PubMed and Scopus for studies modelling the potential effects of climate change on dengue transmission.

Results: One hundred and one articles met the eligibility criteria for the first review; there were some contradictions and ambiguities in the data. Current global distribution of dengue is generally less extensive than historical limits of dengue-like illness. In recent years, several countries have reported local transmission of dengue for the first time, but it is unclear whether this represents true geographic spread, rather than increased awareness and reporting. Six papers met the inclusion criteria for the second review. The findings of theoretical and statistical models of dengue and climate are broadly consistent: the transmission of dengue is highly sensitive to climate. Relatively small increases in temperature (around 1°C) can lead to substantial increases in transmission potential

Conclusions: The geographic distribution of dengue has generally contracted, despite increases in global average temperature in the past century. Theoretically, however, temperature trends have increased the risk of dengue in some areas. The independent effect of climate change on historical patterns of dengue transmission cannot be quantified based on current evidence, as existing models of disease transmission provide limited, incomplete, projections of disease risk. The geographic limits of dengue result from a complex interaction between physical, ecological and social factors which have not been included in current climate change models. Keeping this limitation in mind, models estimating changes to geographic boundaries of transmission suggest an increase in the future population at risk of dengue.

References: Nathan M, Dayal-Drager R, Guzman M (2009). Dengue: guidelines for diagnosis, treatment and control. Geneva, World Health Organization.