



## **Possible impact of climate change on meningitis in northwest Nigeria: an assessment using CMIP5 climate model simulations**

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Meningitis remains a major health burden throughout Sahelian Africa, especially in heavily-populated northwest Nigeria. Cases exhibit strong sensitivity to intra- and inter-annual climate variability, peaking during the hot and dry boreal spring months, raising concern that future climate change may increase the incidence of meningitis in the region. The impact of future climate change on meningitis risk in northwest Nigeria is assessed by forcing an empirical model of meningitis with monthly simulations from an ensemble of thirteen statistically downscaled global climate model projections from the Coupled Model Intercomparison Experiment Phase 5 (CMIP5) for RCPs 2.6, 6.0 and 8.5 scenarios. The results suggest future temperature increases due to climate change has the potential to significantly increase meningitis cases in both the early and late 21st century, and to increase the length of the meningitis season in the late century. March cases may increase from 23 per 100,000 people for present day (1990-2005), to 29-30 per 100,000 ( $p < 0.01$ ) in the early century (2020-2035) and 31-42 per 100,000 ( $p < 0.01$ ) in the late century (2060-2075), the range being dependent on the emissions scenario. It is noteworthy that these results represent the climatological potential for increased cases due to climate change, as we assume current prevention and treatment strategies remain similar in the future.