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Assessing the potential impact and uncertainty of climate, land use change and demographic trends on malaria transmission in Africa by 2050.

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Previous analyses of data has shown that in addition to variability and longer term trends in climate variables, both land use change (LUC) and population mobility and urbanisation trends can impact malaria transmission intensities and socio-economic burden. With the new regional VECTRI dynamical malaria model it is now possible to examine these in an integrated modelling framework. Using 5 global climate models which were bias corrected using the WATCH data for the recent ISIMIP project, the four Representative Concentration Pathways (RCP), population projections disaggregated from the Shared Socioeconomic Pathways (SSP) and Land use change from the HYDE model output used in the CMIP5 process, we construct a multi-member ensemble of malaria transmission intensity projections for 2050. The ensemble integrations indicate that climate has the leading impact on malaria changes, but that population growth and urbanisation can offset the effect of climate locally. LUC impacts can also be significant on the local scale but their assessment is highly uncertain and only indicative in this study. It is argued that the study should be repeated with a range of malaria models or VECTRI configurations in order to assess the additional uncertainty due to the malaria model assumptions.