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The role of climate and socioeconomic factors on the spatiotemporal variability of cholera in Nigeria

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Nigeria has a number of climate-sensitive infectious diseases; one of the most important of these diseases that remains a threat to public health is cholera. This study investigates the influences of both meteorological and socioeconomic factors on the spatiotemporal variability of cholera in Nigeria. A stepwise multiple regression models are used to estimate the influence of the year-to-year variations of cholera cases and deaths for individual states in the country and as well for three groups of states that are classified based on annual rainfall amount. Specifically, seasonal mean maximum and minimum temperatures and annual rainfall totals were analysed with annual aggregate count of cholera cases and deaths, taking into account of the socioeconomic factors that are potentially enhancing vulnerability such as: absolute poverty, adult literacy, access to pipe borne water and population density. Result reveals that the most important explanatory meteorological and socioeconomic variables in explaining the spatiotemporal variability of the disease are rainfall totals, seasonal mean maximum temperature, absolute poverty, and accessibility to pipe borne water. The influences of socioeconomic factors appeared to be more pronounced in the northern part of the country, and vice-versa in the case of meteorological factors. Also, cross validated models output suggests a strong possibility of disease prediction, which will help authorities to put effective control measures in place which depend on prevention, and or efficient response.