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Modelling transmission dynamics of Lassa fever transmission with environmental pathway transmission

Lassa Fever, caused by the Lassa virus, is an animal-borne disease endemic in some regions of Africa with a rodent called a natal multimammate rat as a natural reservior. It occurs more during the dry season when the bushes are dry and burned in preparation for the farming season, making the rodents move into human habitats for food to survive. The rodents excrete their faeces and contaminate the environment making environmental transmission vital in Lassa fever transmission dynamics. Therefore, studying the contaminated environment's impact on Lassa fever is essential. This study used a deterministic model to examine the situation of Lassa fever transmission incorporating two environmental pathway transmissions. First, the model's stability is established regarding the model's basic reproduction number, R_0. Further, the model implements the sensitivity analysis to identify the parameters that fuel the Lassa fever spread using the Partial Rank Correlation Coefficient technique based on the Latin hypercube sampling.