Network View of Lassa fever Spreading through Population West Africa

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Abstract. Infectious disease expansion among the population has attracted many researches trying to know who gets sick, how best to prevent a large outbreak. For many years, mathematicians used models to approximate answers to these questions. However, these older models used simplifying assumptions about the host population that drastically reduced the accuracy of the model's predictions. Recently, researchers have introduced graph theory to simulate the spread of disease and results reflect more the reality. This study considers the sample population as a network in which each person represents a node and the edges represent social relations. To simulate the propagation of an epidemic, each new infected node becomes the center of the network and communities representing family members, workplace members, friends, traditions and hospital treatment body and others are formed around it. The spreading rate is evaluated using the visit probability from each community based on the strength of the relation he may have with them. The model is evaluated using the characteristics and data from Lassa fever in west Africa. The accuracy of simulation results with real expansion of the epidemic disease demonstrates the model's efficiency.

Keywords: Infectious Disease, Network, Visit Probability, Simulation, Spread.