Public Abstract

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Title:Modeling the Spread of the 1918 Influenza Pandemic in a Newfoundland Community

Infectious disease epidemics have played and continue to play important roles in human populations. At different geographical levels, the spread of epidemics are affected by multiple demographic, social, cultural, political, economic, and other factors. Variation in these factors often produces different local or regional outcomes, so it is important for researchers to understand how individual behaviors and interactions can produce and explain larger patterns of disease spread. In small, traditional communities, important factors include settlement and household organization, daily behaviors, and relationships among residents. This research uses two computer simulation models to test the relative impact of these factors on disease spread in a small study community in Newfoundland and Labrador in the early 20th century, using data from the 1918 flu pandemic and other archival sources. In the agent-based model, which emphasizes movement to important social spaces, schoolchildren drive the size and timing of epidemics. In the social network model, which reflects important relationships among community residents, epidemics begun by adult women tend to be slower and smaller than epidemics begun by other types of individuals. These results demonstrate that, based on their roles in the community, members of different age and sex groups can strongly affect epidemic outcomes. Further, because simulation models are often used to develop or recommend public health policies or intervention strategies, the different results of the two models indicate the importance of selecting appropriate design features to ensure the best possible recommendations.