New Agent-Based Model for an Influenza Epidemic Spreading in Cities

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Keywords: Agent-Based Model, Influenza Epidemic Spreading.

It is well known that evaluation of parameters for any mathematical model is always an important and difficult problem. This is especially true for agents-based models (ABMs) because as a rule the evaluation of an agents parameters can be made only based on available information from the higher levels of the complex system under consideration. Such problems can be ill-posed ones that can have a non-unique solution or do not have it at all. That is why there is no general algorithm for solving these problems and a researcher has to search for it for every specific model type.

In this talk I will tell about new approach to creation of ABM for an influenza epidemic spreading in cities. In this ABM evaluation of transmission probabilities for different age groups during the influenza epidemic/pandemic in a city is carried out with help of the regularization procedure that based on illness attack rates for several age groups (i. e. cumulated numbers of infected residents as functions of time).

The proposed ABM can be used for past epidemics to estimate the efficiency or inefficiency of undertaken interventions, to propose new ones and to reveal its advantages and shortcomings.Under some conditions it can be used to model the possible dynamics of coming epidemics and pandemics.