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The application of epidemic dynamics on the prediction and prevention of hand-foot-and-mouth disease (HFMD) induced by EV71 virus

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Objective: The study aimed to develop an epidemic dynamics model for the transmission and prevention of hand-foot and-mouth disease {HFMD}induced by EV71 virus.

Methods: A SEIR model for susceptible, exposed, infected and recovered HFMD patients was created based on research results and actual incidences of HFMD in China using mathematical and epidemic dynamical methods. Time-fitted curves determined by the relevant parameters were adopted to simulate the epidemic process and the effectiveness of the model with and without an intervention was evaluated.

Results: Comparison of the results of data fitting to the model for HFMD cases occurred in China from 2009 to 2015 with the actual incidence showed that the model fitted well to the maximum number of infected HFMD patients and that the simulated trend of epidemic process was identical to that of the actual situation. Implementation of intervention measures was demonstrated to effectively delay the onset of HFMD epidemic peaks and reduce the number of incidence during peak seasons. Finally, we make use of the parameter values of the year 2013 and 2014 to simulate and forecast the number of patients of 2015, and the predictive results inosculate well with the real-world situations.

Conclusion: The model created in this study is suitable for simulating the spread of HFMD in China and may be used to evaluate the effectiveness of relevant intervention and preventive measures.

Biography

Li Luo has her expertise in research design and statistical analysis of vaccines and drug clinical trials. She has conducted in-depth research in the past few years in the epidemic dynamics model and its application on the clinical trials, and the calculation of the sample size of cluster randomization trails.

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