

基于广义随机Petri网的重大传染病传播演化模型研究

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Spread Model of Major Infectious Disease Based on Generalized

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- 摘要
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摘要 本文采用多案例分析方法提取重大传染病疫情事件的属性,从"事件类型、关键属性、从属性、环境属性和危害评估属性"进行结构化描述。在此基础上,分析重大传染病疫情发展演化事件链中关联事件的相关属性,利用基于广义随机Petri网的建模方法,根据广义随机Petri网与马尔科夫链的同构关系,得到重大传染病传播演化的广义Petri网模型和等价马尔科夫链模型。通过马尔科夫链及相关数学方法分析其中的均衡状态及其变动规律,并对系统评估和改进提出建议,可为有效监控和应对疫情提供有力决策支持。

关键词: 突发事件 重大传染病 广义随机Petri网 马尔科夫链

Abstract: Major infectious disease attributes are extracted in this paper by the approach of multi-case analysis. On the basis of the structural description, properties of related events in the events chain are analyzed for the process of major infectious disease, the Generalized Stochastic Petri Nets (GSPN) is applied to model the diffusion of major infectious disease, and the corresponding Markov chain is established based on isomorphic relation between GSPN and Markov chain. Finally, the equilibrium state and fluctuation pattern of the system are studied for evaluating the system with Markov chain and corresponding mathematics method, which provides decision-support for monitoring and responding to the major infectious disease.

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








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