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## Study on Assessment Method of Earthquake Casualties Based on Spatial Reasoning of Similarly Historical Cases

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Earthquake is one of the most serious natural disasters for human survival. Once a destructive earthquake occurs, it often leads to huge losses. However, in the early days after the earthquake, it was difficult to quickly obtain disaster information due to the interruption of traffic, electricity, and communications. Therefore, damage assessment based on similarly historical cases rapidly in access to limited disaster data situation is effective support for analysis disaster and making disaster relief decision. In this study, earthquake disaster statistics with a magnitude of 4.0 or above and casualties in China from 2000 to 2013 were selected as historical cases. The number of earthquake casualties was used as an evaluation index, and the earthquake magnitude, focal depth and time of earthquake are selected as disaster indicators. A similarity assessment model based on Manhattan distance was used to evaluate the similarity of historical cases, and the collection of historical cases that participated in the assessment were screened. And then considering the spatial correlation between historical cases and current disasters, an earthquake disaster assessment model based on spatial reasoning of similarly historical cases would be established. Then the Yushu earthquake in Qinghai in 2010, the Lushan earthquake in Sichuan in 2013, and the Ludian earthquake in Yunnan in 2014 were selected as cases for accuracy verification by comparing the actual number of casualties. The result shows that: (1) For the three verification cases, the best evaluation accuracy of the model is above 95%, indicating that the method has certain feasibility and applicability in the assessment of earthquake casualties; (2) The accuracy of the disaster assessment is related to the number of participating cases. When there are more than two participating cases, the accuracy of the model assessment decreases steadily with the increase in the number of participating cases. When the number of participating cases is 3 ~ 4, the evaluation accuracy of the model is the best. The method of this study is low cost, high efficiency, timeliness strong, simple, less constraints and easy to implement. It has certain practical value and promotion prospects in disaster assessment.