MEETING ABSTRACTS

Predicting the Demand for Medical Care in Disaster-Affected Areas using the Minimum Data Set and Machine Learning

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Background/Introduction: The Minimum Data Set (MDS) has allowed governments of disaster-affected countries to collect, examine, and evaluate standardized medical data from Emergency Medical Teams in real-time. However, little study has been conducted on the use of MDS data to predict health care needs.

Objectives: This research proposes an outlook on the use of machine learning and MDS data to predict the need for medical care in disaster-affected areas.

Method/Description: The characteristics of the data collected by MDS and the optimal machine learning model were discussed.

Results/Outcomes: The primary causes of disease after disasters are trauma (MDS Nos. 4–8), which frequently occurs immediately after a disaster, and infectious diseases (MDS Nos. 9–18), which can increase due to decreasing hygiene conditions. Furthermore, certain infectious diseases can spread quickly because of living in congested evacuation centers, and early detection is crucial.

Therefore, predicting the need for medical care in a disaster area is complicated and requires a combination of many machine-learning models. Data-driven methods are mostly linear approaches and cannot capture the dynamics of infectious disease transmission. Additionally, statistical models depend heavily on assumptions, making real-time infection prediction challenging. Thus, deep learning is employed to model without losing the temporal component.

Conclusion: Real-time prediction of health care needs using machine learning and MDS can be useful to policymakers by enabling them to better deploy and allocate health care resources, which is useful to patients and front-line health care providers. More detailed predictions for regions and diseases are also anticipated.

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