Introduction: Because messages are broadcast on social media timelessly and efficiently, it is a critical disaster management survey tool. Taiwan's Regional Emergency Medical Operation Center (REMOC) has responded to nationwide disaster messages in real time since 2005. To construct an early warning system to reduce the delay between the outbreak of accidents and messages received by REMOC.
Methods: Timely data, often from first responders and social media, is critical. A system was developed to collect disaster related posts from social media platforms, focusing on keywords like typhoon, flooding, and traffic accidents. Given the mix of topics, informal language, and frequent errors, text analytics and the SVM-based tool LibShortText were used to classify relevant messages. REMOC's system identified 3,022 disaster-related messages out of 66,588 total posts. We calculated event frequency in 2019, response speed, and engagement rate (ER) to assess the responsiveness of traditional media and individual users.
Results: Most messages collected were related to earthquakes (23%), followed by traffic accidents (17%), fires (12%), and floods (3%). Of 702 earthquake-related messages (142 episodes), social media users shared 35 messages about 18 earthquakes, while traditional media posted 667 messages about 124 earthquakes. Social media consistently posted 100% of earthquake messages faster than traditional media ("early dissemination efficacy": 124/124). For 251 fires (367 messages), social media shared 122 messages on 82 fires, with an early dissemination efficacy of 0.57 hours. For 32 flood events (117 messages), social media posted 55 messages on 16 floods, achieving an early dissemination efficacy of 0.65 hours.
Conclusion: Results show that social media users responded faster than traditional media to disaster news, especially for earthquakes, fires, and floods. Earthquakes and floods had the highest response rates from social media. Integrating REMOCs and social media information systems can greatly enhance preparedness and response, particularly for earthquakes and floods.

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Construction of a System for Retrieving Notification Documents Issued When There Is a Disaster Using Multimodal AI

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Introduction: Information management for large-scale disasters is at the heart of logistics. When there is a disaster, the MHLW issues a notification document regarding the measures to be taken by the MHLW and the relevant local governments, depending on the damage situation. However, it takes time to summarize and understand the notification documents. Therefore, we developed a system using Gemini to search for notification documents issued in the event of a disaster.
Methods: Gemini is a multimodal AI that can make advanced decisions by combining various types of information and can quickly summarize and search information from Google Drive. Notification documents were stored in Google Drive, and questions were created from keywords such as "dispatch of medical professionals" and "handling of insurance treatment," and the search results were verified.
Results: As a result of searching for the question, "I want to know about the dispatch of medical personnel when there is a disaster," three materials were matched. In addition, the search results included a summary of the materials and links to all related materials stored in Google Drive.
Conclusion: The advantages of the notification document retrieval system are as follows: it is possible to check the notifications that are common to multiple disasters at once, anyone can use it free of charge by sharing an account, and it is possible to summarize the contents of the materials as well as extract related materials. Conversely, as an improvement, it was mentioned that since it is not an exact match, documents that are not necessary are extracted, and only a part of the required documents is extracted. Although it is necessary to devise ways to share accounts and update data, a notification document retrieval system using multimodal AI can be expected to manage information in the event of a disaster.

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Computer Simulation Comparison for the Different Evacuation Strategies of Patients in Mass Casualty Incidents

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Introduction: The evacuation of patients in mass casualty incidents is an important part of emergency management. The appropriateness of evacuation strategies determines whether the patients can receive adequate treatment in time. Real-world evacuation cannot be re-performed, but models of evacuation can be constructed through computer simulation. Thus, the different evacuation strategies can be compared in simulations.
Methods: There are some important factors in the evacuation strategy: the number and distance of hospitals, the capacity of hospitals, and the number of vehicles. In this study, past mass casualty incidents are used as reference sources for the patient data. The evacuation processes are simulated with well-established software, and the rules are modified according to different strategies. Several strategies with different settings are compared in the results of the patient treatment, and the influence and the weight of different parameters are analyzed.
Results: From the comparison of different strategies, the strategy with the shortest time from the scene to the hospital has the larger number of hospitals, a higher hospital capacity, and vehicles for transportation are sufficient. In addition, adding faraway hospitals as evacuation options when vehicles are limited will not reduce the time it takes for patients to arrive at the hospitals.
Conclusion: The appropriate decision of evacuation strategy can help patients get proper treatment as soon as possible.

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