Challenges and Solutions in Selecting Locations for Medical Container Deployment during the Noto Peninsula Earthquake in Japan

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Introduction: On January 1, 2024, a magnitude 7.6 earthquake struck the Noto region in Ishikawa Prefecture, Japan. The earthquake recorded a maximum seismic intensity of 7 and a tsunami height of 5 meters, causing extensive damage across various areas. In response, the government, through relevant agencies, arranged and deployed mobile medical containers for medical support. However, determining the locations for these containers proved to be extremely challenging. This study identifies the factors and challenges in the location selection process and examines a pre-designated site selection system as a solution.
Methods: To organize and examine the "Report on the Deployment and Operation Status of Medical Containers during the 2024 Noto Peninsula Earthquake" by the Ministry of Health, Labour and Welfare's Koido Research Group and the National Resilience Promotion Office, and field survey results.
Results: During the Noto Peninsula earthquake, selecting locations for medical containers required understanding the medical needs of the affected areas, identifying candidate sites, and meeting installation conditions, including area, ground strength, ground conditions, access routes, and road conditions. These tasks were not only extremely challenging but also time-consuming, leading to discrepancies with the actual needs, which became a significant issue.
Conclusion: Based on this experience, it is desirable to preselect and database potential sites and transport routes for mobile medical containers during normal times, utilizing GIS to visualize this information, in preparation for large-scale disasters such as the anticipated Nankai Trough megaquake.

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Development of a Disaster Welfare Simulation to Enable Policy Consideration

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Introduction: Japan faces a high risk of disasters, and its aging population has led to an increase in vulnerable individuals, such as the elderly and people with disabilities. During disasters, these individuals often fail to receive adequate support, leading to deteriorating health and functional decline. Furthermore, many welfare facilities supporting them are privately operated, making it difficult to sustain services due to facility damage or caregivers' inability to work. This situation exacerbates the health risks for vulnerable populations who require welfare services but are unable to receive sufficient support. To address these issues, it is crucial to examine policies that ensure efficient and sustainable welfare service provision. This study aimed to develop a simulation model for systematically planning disaster welfare support for vulnerable populations, enhancing the accuracy of policy consideration.
Methods: This study developed an agent-based model (ABM) to simulate individualized care plans, coordination among welfare facilities, and collaboration with medical institutions. The model incorporated human resource allocation, shelter operations, and the timing of supply provision across multiple scenarios designed to support vulnerable populations during disasters. Regional characteristics and policy implementation timing were considered to evaluate the scenarios' effectiveness from multiple perspectives. This approach enabled a comprehensive evaluation of broad support activities, including coordination between welfare facilities and medical institutions, efficient resource allocation, supply provision, and shelter management.
Results: The simulation model evaluated multiple scenarios for human resource allocation and shelter coordination, quantitatively assessing the impact of geographical conditions and policy timing on vulnerable populations. By applying statistical and optimization methods, the study identified optimal parameters for the simulation, enabling the design of effective disaster welfare policies.
Conclusion: The developed simulation model is a valid tool for evaluating the effectiveness and validity of disaster welfare policy considerations. It is also applicable for education and training, offering broad utility in practical settings.

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Augmented Reality–Virtual Reality Wartime Training of Reserve Prehospital Teams

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Introduction: In the realm of trauma response preparation for prehospital teams, the combination of Augmented Reality (AR) and Virtual Reality (VR) with manikin technologies is growing in importance for creating training scenarios that closely mirror potential real-life situations. The study focused on training in airway management and intubation for trauma incidents, based on a Trauma AR-VR simulator involving reserve paramedics of the National EMS service (Magen David Adom) who had not practiced for up to six years, activated during the Israel-Gaza conflict (October 2023). The trauma simulator merges the physical and virtual realms by utilizing a real manikin and instruments outfitted with sensors. This integration enables a precise one-to-one correspondence between the physical and virtual environments.
Methods: A quantitative questionnaire was utilized to gauge the influence of AR-VR training on specific psychological and skill-based metrics, including self-efficacy, resilience, medical knowledge, professional competency, confidence in performing intubations, and the perceived quality of the

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