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IMPACT STORIES

Interactive tool for assessing and modelling crisis vulnerability

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The novel crisis vulnerability assessment and modelling tool will give crisis management a human face. While most of European disaster risk analyses and emergency solutions have mainly focused on the continuity of institutions and infrastructure, our new tool brings people in need into the picture. The tool allows us to keep pace with the compounded and cascading nature of modern crises, identify the people affected in emergency situations, and assess their need for help, thereby potentially saving thousands of individuals from harm to their lives or wellbeing.

In the project, AI is employed to predict social vulnerability in all kinds of emergencies, from natural disasters and pandemics to cyberattacks and wars. A digital tool is created to facilitate crisis managers' identification of people affected by emergency situations and their need for help. This assessment can be done based on a specific hazard situation at hand (crisis response and recovery phases) or scenario (as part of risk analysis and crisis preparedness planning). The tool enables experts to assign weights on vulnerability predictors including individual (e.g. impairments, limited communication skills), socio-structural (e.g. shortage of emergency personnel), and crisis-situation-specific factors (e.g. proliferation of harmful rumours). Later on public databases on various social and environmental conditions will be used and machine learning techniques to model vulnerabilities (e.g. the need for evacuation) will be applied. The whole design process of the vulnerability assessment and modelling tool has been user-centred and participatory, following the co-creative approach. From prototyping over testing to training.

The tool promotes the implementation of the principles set forth by the EU Civil Protection Mechanism and in the United Nations Sendai Framework for Disaster Risk Reduction. The tool is applicable to the needs of crisis management agencies (e.g. Police and Border Guard Board, Defense Police Board, Health Board, and local governments) and companies that provide vital services such as electricity and water. The tool could also benefit the Estonian Reserves Center as the central coordinator of national reserves and the Government Office as a policy maker for crisis management and national security.

> *"By reaching out to broader academic and practitioner networks, we hope to inspire future practically targeted research projects that are founded on solid science and co-design with stakeholders. We will also encourage broader academic debate on crisis preparedness and novel solutions to emerging hazards arising from, for instance, climate extremes and technological failures."*

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