

Validating Disaster Medicine Experts' Feedback Outcome Using Artificial Intelligence Computing Techniques

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Background. In disaster medicine, expert feedback is vital for refining response strategies. Traditional analysis, however, may overlook nuanced insights. Employing AI-powered text analytics was suggested as an in-depth, powerful tool to analyze open-ended feedback.

Objective. This study aimed to use artificial intelligence (AI) computing techniques to determine if they can validate the findings of a previously published thematic analysis article focusing on disaster medicine experts' open-ended feedback about Middle East and North African countries (MENA) for chemical, biological, radiological, and nuclear (CBRN) threats [1].

Methods. Automated text analytics techniques were employed to explore and visualize the semantic essence of the experts' feedback through word vector transformation and Principal Component Analysis (PCA) for dimensionality reduction. The t-distributed Stochastic Neighbor Embedding (t-SNE) is another more advanced dimensionality reduction technique that enhanced the capturing of the determined components.

Results. Two prominent clusters emerged from the full textual data set representing word similarities groups in the original data set, denoting a thematic group of ideas that experts have emphasized in their responses. Upon deep reading the text feedback, the themes linked preparedness with different training types, such as tabletop exercises and policies/legislation. The findings are in line with currently adopted practices [2].

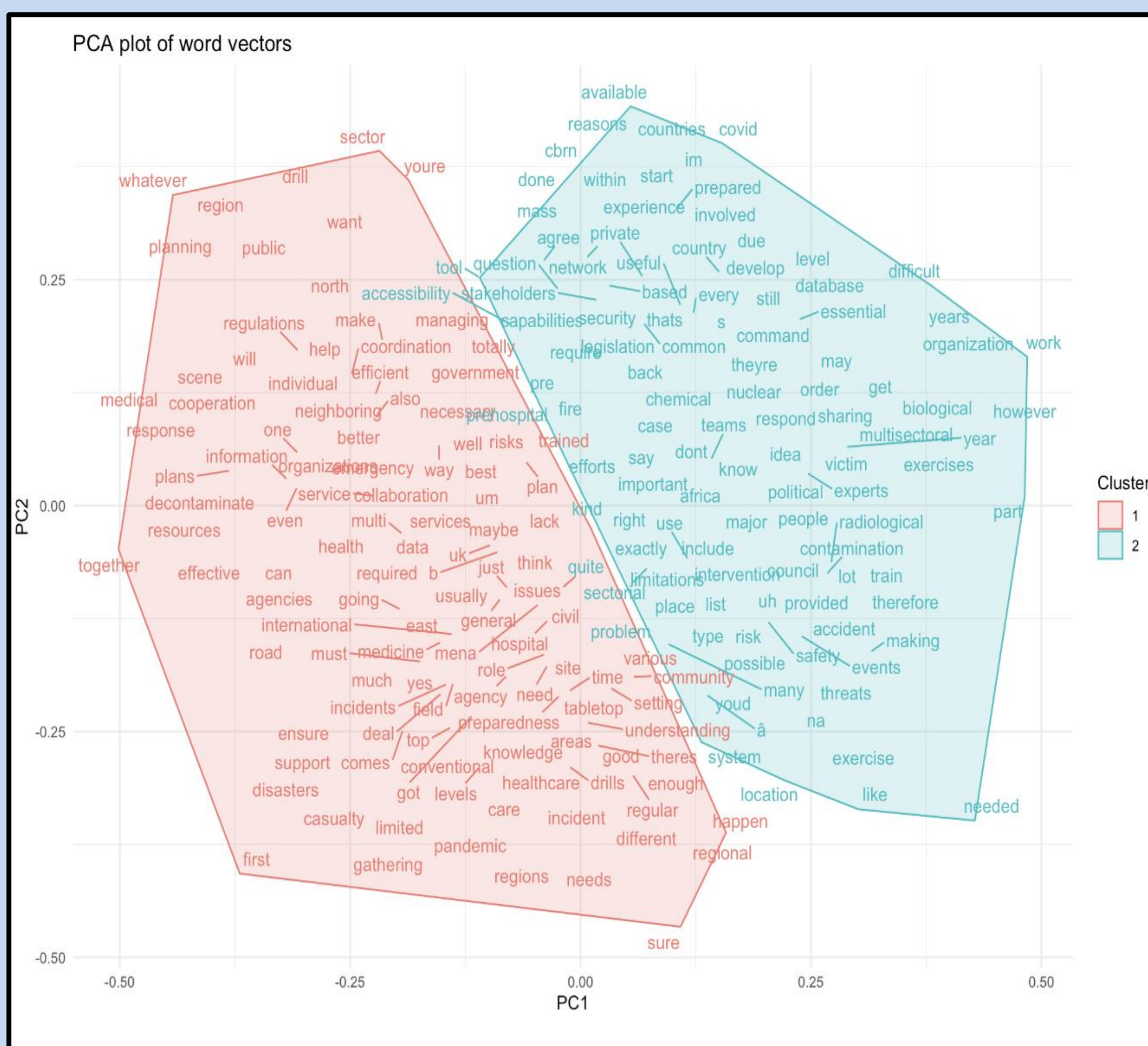


Figure 1: Principal Components Analysis of Word Vectors

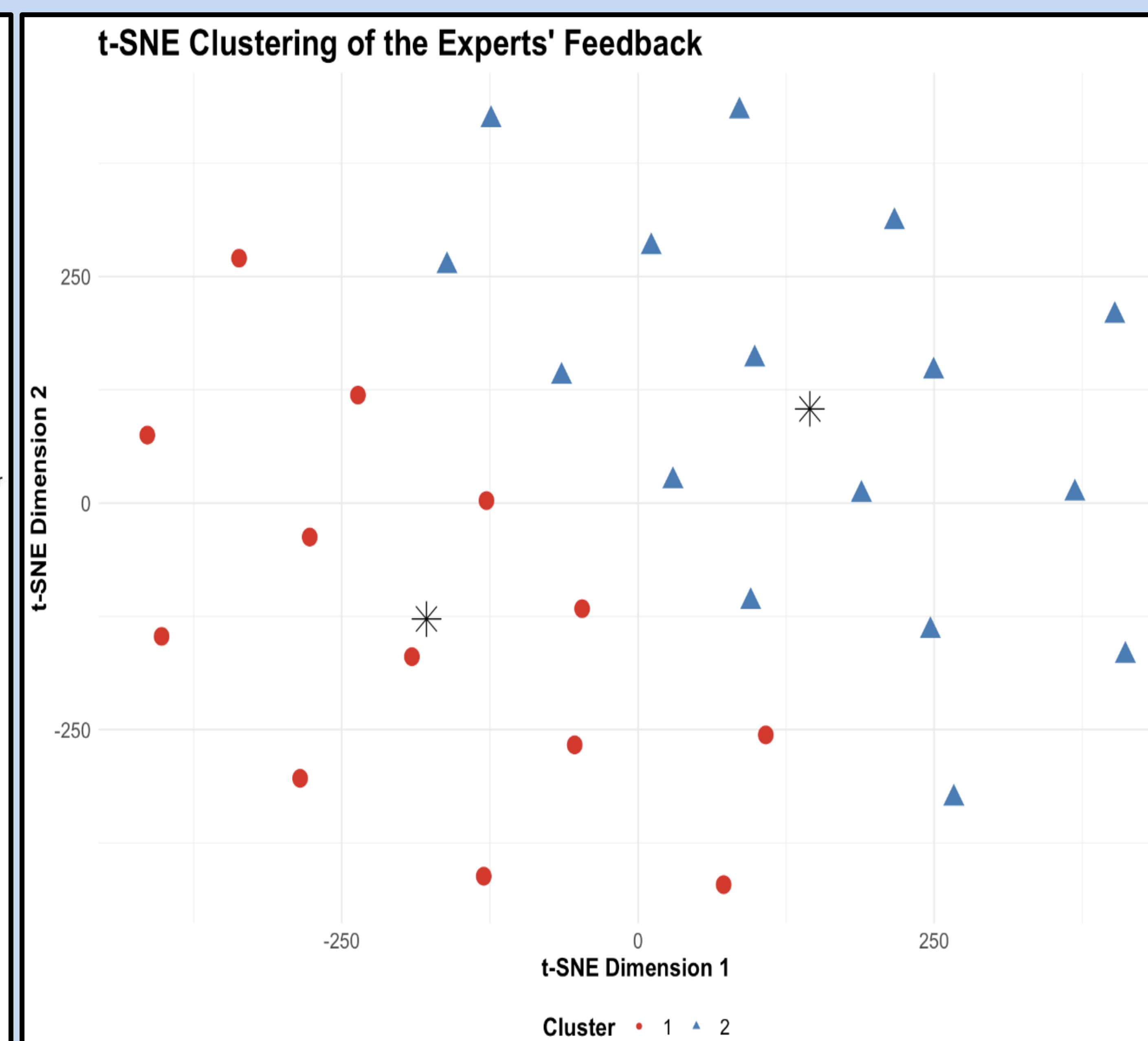


Figure 3: t-distributed Stochastic Neighbor Embedding Clustering of Experts' Feedback

Conclusion. While AI methods demonstrated their valuable application in disaster medicine and helped validate the experts' recommendations objectively, they should be approached cautiously, as they can be complex and challenging to comprehend fully.

[1] H. Farhat et al., "Exploring attitudes towards health preparedness in the Middle East and North Africa against chemical, biological, radiological, and nuclear threats: A qualitative study," *J. Contingencies Crisis Manag.*, vol. n/a, no. n/a, doi: 10.1111/1468-5973.12509.

[2] G. Alinier, G. Dacey, M. A. Segni, S. McCabe, and D. R. Dungan, "Planning a large-scale tabletop exercise to test Qatar's healthcare system readiness to respond to a major incident during the 2022 FIFA World Cup," *J. Contingencies Crisis Manag.*, vol. n/a, no. n/a, doi: 10.1111/1468-5973.12485.