

Strategic Planning for Acute Adverse Multi-Site Events: An Info-Gap Analysis

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Abstract Acute adverse events such as fires, floods, earthquakes, or terror attacks, can occur in distinct circumstances: residential, industrial, natural, etc. Severity of events range from minor to extreme, and events can occur in parallel at multiple locations. Response to an event is necessary in two domains: overcoming or ameliorating the event itself, and providing sociological and psychological support to effected individuals. Response to adverse events is a governmental responsibility that requires infrastructure of equipment, trained personnel, and operational procedures. Long-range planning is fraught with deep uncertainties about the locations, circumstances, severities, and multiplicity of adverse events. We use info-gap decision theory to develop a methodology for formulating and evaluating long-range plans for response to acute adverse multi-site events. We demonstrate generic properties of info-gap robust satisficing, especially the quantified trade off between robustness against uncertainty and quality of the outcome: better outcome entails lower robustness. We also discuss the concept of model-free policy analysis. Application to multi-site fires is developed.