

Coordination of Processes as a Starting Point for Simulation-Based Management of Biological Incidents

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Abstract: Biological incidents nowadays represent more often as well as more serious threat endangering important assets. Their management requires complex approach including high demands on technological support. This paper neither contributes with another simulation model or results, nor offers the application of specific technology. It utilises the literature analysis and interviews with experts to reveal the framework for potential options and scenarios for simulation employment in the realm of management of biological incidents. Conceptual issues related to the simulation of biological incidents together with process perspective are provided and advantages as well as prospective utilisation in modelling and simulation are discussed.

1 INTRODUCTION AND PROBLEM FORMULATION

Biological incidents can be defined as events when a biological agent harms or threatens humans, livestock or other important assets (UNODA, 2009). These problems represent a topical issue in several areas of our society regardless if these are caused by the biological weapons or if they occur unintentionally like the leakage of a dangerous substance from a factory or laboratory, or natural incidence of a disease. Whereas the former can be considered as more perilous, the latter is usually more easily manageable. It is especially because focal points can be typically identified quickly and localised more precisely. Therefore, the critical assets can be recognised faster and adequately protected. On the other hand, during these incidents it is hard to react promptly in the initial phase, because the first phase of the agent identification can last a significant time. Nevertheless, if appropriately managed, their consequences can be minimized (Bureš et al., 2012b). Coping with a biological incident involving a highly persistent agent (e.g. anthrax, Brucella, influenza or zoonosis) is a complex process. It requires extensive information

and both considerable and appropriate resources. Unfortunately, these are likely to be limited, particularly if multiple facilities, areas or groups of people are affected (Krauter et al., 2011). Therefore, any available tool for decision support and for the improvement of the effectiveness of the course of action should be employed. This paper firstly introduces the current state-of-the-art related to the modelling and simulation utilisation during the process of biological incidents. Afterwards, methods followed by results are discussed. Finally, the limitations, further research perspectives and implications of the mentioned research are provided.

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APPENDIX: Process View on the Influenza Incident (Authors' Research).

