

benefits of using VR simulation. Participants commented that compared to table-top exercises, a VR simulation compels the interaction and coordination of different stakeholders on site, and is beneficial in situations where communication between different parties is necessary, such as towards the wider public.

Conclusion: VR simulation can be a beneficial method for training for command and coordination in case of emergencies in mass gatherings.

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Enhancing Disaster Preparedness Exercises with Virtual Reality Simulations

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Study/Objective: The National Library of Medicine (NLM) is studying virtual reality simulations as tools to improve the Incident Command System proficiency of professionals playing emergency management roles through scenario-based exercises. Medical facilities identified a number of deficiencies in traditional methods. The NLMs approach aims to improve instructional outcomes by: increasing trainee engagement, promoting more frequent exercising, providing enhanced scenario realism, allowing for objective exercise assessments, reducing the impact of exercises on facilities' day-to-day activities, and improving exercises' cost-benefit ratio. The NLMs approach makes use of computer gaming and instructional design techniques to develop tools that others can use freely to implement scenario-based exercises.

Background: Since 2008, NLM collaborates with the Bethesda Hospital's Emergency Preparedness Partnership (BHEPP) in Maryland to enhance the preparedness of this coalition to respond to a crisis that may affect the National Capital Region. Hospital Incident Command System training was identified as an important preparedness component. NLM applies a variety of information, library, and computer science disciplines to support the goals of this coalition.

Methods: NLM developed application prototypes and instructional materials, prepared and conducted virtual ICS exercises in a local hospital, and collected participant's input through interviews, limited surveys, and during post-exercise "hot wash" meetings. The outcomes from these field tests guided the development of enhanced prototypes that were tested via additional exercises, some with other entities, including a county and a city Emergency Operations Center.

Results: Virtual exercise participants reported benefits in all the intended objectives. Over 90% of participants envision this type of training as a regular part of their preparedness training.

Conclusion: Preliminary results suggest that NLMs virtual ICS training can enhance ICS training. Creating the simulation software can be costly, but NLM is developing tools that can reduce adoption costs for organizations that want to try this training method, and the resource can be reused repeatedly at no significant cost.

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Simulation Exercises as Training and Evaluation Tool in an Ebola Preparedness Project

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Study/Objective: Designing a simulation exercise to evaluate a project that aims to prepare Health Care Workers (HCW) to identify and manage patients with highly contagious diseases.

Background: HCW were the most vulnerable persons by consulting and treating patients without sufficient protection during the Ebola outbreak in West Africa. In order to strengthen these key persons, the European Forum for OS-9 (EFFO) project with a train-the-trainer-program was initiated in 2014 by the Robert Koch Institute, STAKOB (German permanent working group for highly contagious and life-threatening diseases). The project is financed by the German Federal Ministry of Health. Evaluation and quality control play a crucial role in the train-the-trainer program.

Methods: Key aspects for the exercise with a single simulated patient were modified from previous projects for biological event preparedness evaluation. Certain aspects were highlighted as a result of the formative evaluation during the training program. The simulation directions were adapted for the local health care facility in Senegal. The general design, principles, and exact data were discussed with the responsible personnel. A precise debriefing similar to a tabletop exercise was conducted.

Results: This simulation exercise allows the identification of strengths and weaknesses. Eg, while the use of Personal Protective Equipment (PPE) was professional, the waste management remained a challenge. The method was highly accepted by the health care facility. The results were used to improve the train-the-trainer program.

Conclusion: Simulation exercises play a key role in biological events to prevent nosocomial infection. Training in PPE is essential, as well as practicing the context to achieve a transfer of training knowledge to a real suspected case. In this project, the simulation exercises will be used to evaluate and further adapt the train-the-trainer-program, to improve the preparedness of health care facilities, and to strengthen the network within the project.

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Pilot Study: Utilization of Simulated Exercises to Teach Healthcare Students the Potential Benefits of Unmanned Aerial Vehicles to Respond to Environmental Health Issues Associated with Disasters

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Study/Objective: To develop a simulated disaster scenario to demonstrate the potential benefits of UAVs.