diversities in mass-casualty incident and disaster preparedness and training curricula.

Methods: Extensive literature review, quantitative data analysis of the feedback of 50 trainees (medical professionals (55%), paramedics (25%), social scientists (20%)) in two phases, before and after their participation in the simulation exercises; and qualitative analysis of 2 focus group discussions composed by facilitators and 7 expert external evaluators.

Results: Expressed concerns and challenges before the simulation exercises were afterwards, characterized as acquired skills and knowledge (increased awareness regarding disaster preparedness, enhancement of non-technical skills such as decision-making, communication, conflict resolution, teamwork and coordination among stakeholders, improvement of technical skills such as identification of critically patients and triage). Furthermore, all parties involved in the study recognized the following innovating elements: -the involvement of public medical professionals, and civil protection officers and their direct interaction with the trainees, -the active contribution of trainees in the simulation scenarios design (ie roles allocation independently their professional background) -the use of fully functional public spaces as training locations for the simulation exercises (hospitals, airport, port, hotels).

Overall, participants described feeling more prepared and confident for disaster response compared to prior the training.

Conclusion: Learning by doing, facilitating cross-sectoral and transdisciplinary collaboration, transposing real events into educational processes, enabling actual challenges, are proposed as a remedy to the apparent disconnect between theory and methodology used in disaster preparedness drilling.

High Fidelity Simulation With the Use of 360-degree Virtual Reality for Aeromedical Training in Search and Rescue

Tiffany Yeung[1], Benny Cheng[2], Carmen Lam[2], Eva Lam[1]
1. Hong Kong Jockey Club Disaster Preparedness And Response Institute, Hong Kong Academy of Medicine, Aberdeen/Hong Kong Prc
2. The Hong Kong College of Anaesthesiologists, Hong Kong/Hong Kong Prc

Study/Objective: Recent experience has demonstrated the benefits of virtual and hybrid simulation training. A successful simulation model should provide customized environments to facilitate skill training and enhance complex contextual learning, especially for disaster scenarios, which may be infrequently met by an individual.

Background: The Government Flying Service (GFS) of Hong Kong is responsible for providing 24/7 emergency helicopter and fixed-wing flying support. The GSF and the Hong Kong College of Anaesthesiologists collaborated to organize the Air Crew Resuscitation Simulation Refresher Course for the Aircrew Officers, to enhance their medical skills for search and rescue missions. In order to enhance learning outcomes, this training made use of high fidelity simulation search and rescue scenarios.

Methods: The training includes topics such as triage process, pre-hospital and helicopter resuscitation in trauma, amongst other emergency clinical skills. With the support of the Hong Kong Jockey Club Disaster Preparedness and Response Institute, Virtual Reality (VR) aeromedical incident films were produced, which will be displayed using 360 degree goggles and a dome-shaped projection platform. To enhance fidelity of the simulation, sound effects and a mock-up cockpit will be produced. The hybrid training will be established by requiring the participants to carry out first aid and resuscitation procedures on mannequins. A self-administered questionnaire will be distributed to participants for process evaluation.

Results: Regular trainings will be conducted throughout two years, reaching a total of 50 participants. The first training is on December 3, 2016. Results of the process evaluation will be ready after data collection and analysis.

Conclusion: It is anticipated that the use of VR in search and rescue training will add a more realistic aspect to this area of training, and allow for consistency in trainings and for the ease of evaluation, yet keeping the training in a safe environment and at a low-cost.

Use of Virtual Reality in Motorsports Emergency Training

Tiffany Yeung[1], Jacky C. Chan[2]
1. Hong Kong Jockey Club Disaster Preparedness And Response Institute, Hong Kong Academy of Medicine, Aberdeen/Hong Kong Prc
2. Hospital Authority, Hong Kong/Hong Kong Prc

Study/Objective: To explore the benefits of using VR simulation in motorsports medical incidents training.

Background: With the increasing popularity of using Virtual Reality (VR) in training, there has been a paucity of studies showing that content retention in memory is better, and compared to other simulations, VR bridges the gap of inconsistency of trainings while allowing participants to be trained in a realistic yet safe environment. In view of the first electric motor race in Hong Kong, the Federation Internationale d'Automobile (FIA) Formula E Hong Kong ePrix held in October 2016, a training for the medical community for such events was thus organized by the Hong Kong Jockey Club Disaster Preparedness and Response Institute. The aim of the course was to enhance command and coordination with different parties, including the marshal team, chief medical officer, first aid team, extrication team, and fire services. In the scene coordination session, participants were immersed in interactive simulated motor accident scenes, created by a VR game-based tool to interact with each other to communicate.

Methods: Two levels of assessments were done, including a self-administered course process evaluation questionnaire and a video analysis of performance assessment, which assesses the fidelity of the simulation to the real situation.

Results: A total of 80 emergency first responders, who would be on the ground during the event as emergency medical teams, were trained. The evaluation (72 questionnaires returned) showed the

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.

Enhancing Disaster Preparedness Exercises with Virtual Reality Simulations

Victor Cid
Stacey Arnesen Disaster Information Management Research Center, National Library of Medicine, Bethesda/United States of America

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.

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

Luzie Verbeek[1], Regina Ellwanger[1], Michel Mendy[2], Madeleine Ndour[2], Sabine Gies[3]
1. Robert Koch Institute, Berlin/Germany
2. Association Nationale des Postes de Santé Catholique du Sénégal, Dakar/Senegal
3. Medical Mission Institute Würzburg, Würzburg/Germany

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.

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

Theodore Rader, April Ames, Michael Valigosky, Paul P. Rega, Brian N. Fink
School Of Population Health, University of Toledo, Toledo/OH/ United States of America

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