models, we are better able to conceptualize performance under pressure and to propose pathways for evaluating and optimizing performance in dynamic and complex scenarios.

Prehosp Disaster Med 2017;32(Suppl. 1):s109–s110
doi:10.1017/S1049023X17003156

Arctic Disaster Risk Reduction and Response: Community-Based Approaches in the Face of Wicked Problems and Cascading Disasters

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Study/Objective: To examine community-based Disaster Risk Reduction and Response (DRRR) approaches to wicked problems (Rittel and Webber 1973) and cascading disasters (Little 2012; Pescaroli 2015) in the Arctic; and to understand how these approaches do or do not change in correlation with the degree/type of the wicked problem and related circumstances, such as the degree of interconnectedness of critical infrastructure.
Background: Communities across the Arctic have been subjects to climate stressors, impacts and other natural-hazard induced or man-made crises and disasters. These range from violent ocean and winter storms, landslides, floods, erosion, earthquakes, tsunamis, nuclear, maritime and aviation incidents, etc. In some cases, the response is governmentally aided, such as in the case of planned relocations of entire communities to other, safer locations (see Alaska or Norway). However, when facing disasters of a more complex nature - ie. cascading disasters, wicked problems, interconnected infrastructures across functional and national boundaries - emergency and disaster response institutions have often been slow to adapt and react. Consequently, many communities across the Arctic feel left to their own devices in dealing with DRRR.
Methods: Following an extensive literature review of the theoretical framework, this qualitative study examines and analyses case study data from around the Arctic, to shed light on community-based approaches to vulnerability and risk reduction and response to cascading disasters and wicked problems.
Results: Initial results indicate valuable insights into a novel topic, and shows the challenges and barriers faced by communities when responding to these complex events. We recognize adoption of innovative, self-help approaches such as the use of Para diplomacy and knowledge transfer with other communities around the Arctic who face similar challenges.
Conclusion: Final conclusions including, diplomatic implications, future research directions and where possible, policy recommendations, will be presented at the WADEM Toronto conference in April 2017.

Prehosp Disaster Med 2017;32(Suppl. 1):s110
doi:10.1017/S1049023X17003168

Doctor-Heli Fleet Operations During the 2016 Kumamoto Earthquake in Japan

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Study/Objective: This study described and analyzed the operations of the Doctor-Heli (DH) fleet, comprising of 14 DHs and a headquarters in Kumamoto prefecture.
Background: The "physician-on-board" helicopter system, called Doctor-Heli (DH) in Japan, is crucial in the event of a widespread disaster. During the 2011 Great East Japan Earthquake, the DH fleet carried out effective operations during a real disaster for the first time in Japan. After the earthquake, a new command and control system of the DH fleet, and headquarters at the prefectural government level, were instituted. In April 2016, the Kumamoto region of Kyushu Island, southern Japan, was hit by a major earthquake.
Methods: An air medical transport record of Kumamoto earthquake has been analyzed.
Results: In total, the 14 DHs transported 75 patients in the first five days (April 16-20, 2016). Most of the patients were transported to neighboring prefectures that were not damaged by the earthquake. The headquarters of the DH fleet in Kumamoto Prefecture, requested assistance from other organizations to use their helicopters for medical transportation. Thereafter, five helicopters from the Japan Self-Defense Forces, eight from Fire departments, and one from the Coast Guard were used for medical transportation. Of the 89 transported patients in total, 30 (34%) sustained traumatic injuries due to the earthquake, and three (3%) suffered pulmonary embolism while asleep in vehicles at the disaster site. Furthermore, dynamic satellite monitoring, which was developed after the 2011 Great East Japan Earthquake, was used for all DHs, as well as helicopters from the fire departments, and was effective for information sharing, efficient operations, and safety.
Conclusion: The command and control of the DH fleet, the headquarters at the prefectural government level, and dynamic monitoring developed after the 2011 Great East Japan Earthquake were usefully employed. More efficient coordination of the DH fleet, and cooperation with other organizations, are ongoing challenges.

Prehosp Disaster Med 2017;32(Suppl. 1):s110
doi:10.1017/S1049023X1700317X

The Experience of the Ecuadorian Red Cross in the Joint Deployment of an Emergency Medical Unit Post, April 2016 Earthquake

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