Study/Objective: To study the lessons learned from the joint deployment.

Background: On April 16th 2016, at 6:58 pm. an earthquake of 7.8 Richter scale, hit west of Ecuador. As a result 673 people died, 4,859 injured, 8,000 displaced, 51 health care facilities damaged, and 593,000 persons had reduced access to health care services. The Canadian Red Cross together with the Ecuadorian Red Cross deployed (on April 20th) Emergency Medical units to support the affected population. The units were deployed in Jama and El Matal, and later moved to Pedernales, where they stayed until September 30th when the services were taken over by the Ministry of Health (MoH).

Methods: Data was collected from the unit's statistics, as well as from the operation's debriefing.

Results: A total of 46,356 patients have been treated in the fixed facilities and the mobile clinic. There were 31,821 (68.6%) patients for internal medicine, 3,039 patients with GOB (mass or lump) needs (6.5 %), and Odontology needs became an issue with 3,137 (6.7 %).

Conclusion: Successful joint deployment of an International and National team. Hand-over of the EMU from the Canadian RC to the Ecuadorian RC serves as crucial local capacity building for the ERC for future disasters. The Ecuadorian Red Cross High Technological Institute, the biggest training school for paramedics in the country, served as a major resource in the response (initial and long term) allowing the deployment of more than 2,000 persons to the affected areas. This earthquake has been the only large scale disaster the country has faced in 10 years. The response capacities have been increased significantly post disaster.

2013 Colorado Floods, Boulder's Emergency Animal Air Rescues; A Military and Animal Control Collaboration

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Study/Objective: I. Introduction of the 2013 Colorado Floods II. Preparedness for potential county-wide emergency events III. The response; Emergency Operations Center (EOC), ground rescue, and animal sheltering IV. Helicopter Evacuations; collaboration between military and animal control V. Lessons Learned and concluding remarks reinforcing the necessity and value of collaboration

Background: In September 2013 the State of Colorado suffered a major flood event affecting 17 counties. Boulder County was the most devastated county in terms of lives lost, homes destroyed, and families displaced. The Colorado National Guard and the Army were requested for assistance with human evacuations from the ground as well as the air. When the Military responded to evacuate flood victims and were faced the challenge of air-evacuating pets, their compassion for the evacuees led them to the decision to air evacuate pets as well, setting the precedent for this emergency. The Boulder Police Animal Control Unit responded to manage and supervise the staging area for incoming rescued evacuees and their animals.

Officers had key roles during this event; training military personnel on animal handling and equipment, handling a variety of animals to ensure the safety of emergency responders, evacuees, and animals; evaluation for veterinary treatment; and provided care for the animals. The use of resources, improvisation, and collaboration during this event lead to the successful evacuation of over 1,500 evacuees and their pets.

Methods: Provided in Background.

Results: The 2013 Colorado Floods led to the second largest helicopter rescue for humans to date, and the largest helicopter evacuation of animals. This disaster tested both the ability and capability of aerial evacuations for varied species of animals. In the midst of disaster, the US military and animal control collaborated to successfully evacuate over 1,500 people and their pets (estimated 800-1200 animals).

Conclusion: To provide audience with capabilities, suggestions, and practical application for aerial evacuations of animals during disasters.

Monitoring the Well-being of AusMAT Members Deployed to Fiji following Tropical Cyclone (TC) Winston

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Study/Objective: To monitor the well-being of Australian Medical Assistance Team (AusMAT) members deployed to Fiji following Tropical Cyclone (TC) Winston.

Background: The AusMAT response to TC Winston resulted in small teams across a variety of locations. Due to the limited day to day visibility and communication with individual team members, oversight of team welfare was likely to be challenging.

Methods: An anonymous electronic survey, the AusMAT well-being questionnaire[1], was completed by team members following each work shift during deployment. The questionnaire assessed perceptions of physical workload, weather conditions, body temperature, symptoms of heat stress, access to food and fluids, fatigue and sleep factors. Responses were compiled by the National Critical Care and Trauma Response Center, ensuring anonymity of responses. A brief report consisting of two paragraphs, overall trends and recommended actions, was compiled for the mission lead on a daily basis.

Results: An example of the overall trends summary from day 3 is provided.

- ~35% of the team reported hot working conditions.
- ~50% of the team reported feeling moderately to severely hot during shift.
- ~15% of the team reported severe to extreme fatigue post shift.
- ~30% of the team aren't able to get out of the warm/hot conditions during their down time.
- ~40% of the team reported warm sleeping conditions but overall sleep data is acceptable.

Conclusion: The daily team leader report was considered critical to understanding how each team member was responding to the environment during the TC Winston response. It prompted strategies to manage heat and hydration prior to the manifestation of serious symptoms. Such information also contributed to our knowledge of the AusMAT member workloads, assisting to prepare teams for future deployments. [1] Brearley M, Ruskie S. Development of a Disaster Nurse Well-being Instrument. Prehospital and Disaster Medicine 30(1): s116

Canada Task Force 2 Medical Team Deployment to the Fort McMurray Wildfire

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Study/Objective: To provide a review of the Canada Task Force 2 (CAN-TF2) medical team deployment to the 2016 Fort McMurray wildfire (FMMW).

Background: The FMMW displaced over 80,000 citizens and destroyed over 1,600 structures, making it the most economically devastating natural disaster in Canadian history, with a cost of over 9 billion CDN (6,834 billion US). CAN-TF2, an all-hazards disaster response team, was deployed to this disaster. Since its inception in 2002, the team has deployed in Alberta during the Slave Lake wildfires (2011), and the Calgary/High River floods (2013). The medical unit of CAN-FT2 engaged in its first active deployment during the FMMW. This team was designed to provide medical care for CAN-FT2 members and was comprised of paramedics, nurses, and physicians. During this event the teams scope was expanded, as it developed the only medical facility in the FMM vicinity.

Methods: A narrative review of the FMMW deployment that focused on lessons learned from the medical team standpoint, along with descriptive epidemiology of the patient encounters.

Results: Themes discussed included: (1) the development of a field hospital to support those beyond the CAN-FT2 team, which encompassed first-responders and critical infrastructure employees; (2) undertaking chronic disease management; (3) the fostering of relationships with other provincial agencies that allowed access to medical transport and critical medical supplies; (4) the integration of a critical incident stress-management team that addressed the mental health needs of first-responders; (5) the monitoring of public health markers and advocacy for actions within the incident command structure, that ensured the safety of the first-responders and self-deployed volunteers; (6) the transition from a CAN-TF2 field hospital back to a government facility run by the local medical community in FMM.

Conclusion: The medical team capacity within CAN-FT2 continues to evolve, and the FMMW deployment has highlighted a number of strengths and areas requiring further development.

Fit for Duty? The Case for Disaster Responder Fitness Standards

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Study/Objective: To mitigate the risk of disaster responders suffering heat illness through physical fitness standards.

Background: Recent Australian Medical Assistance Team (AusMAT) deployments have encountered challenging environmental conditions, heightening the risk of heat stress impacting responders. Two intrinsic factors increasing the risk of heat related illness are inadequate heat acclimatisation and lower levels of physical fitness. Pre-deployment heat acclimatization guidelines have been developed for disaster responders [1], yet commensurate standards are not available for fitness. Furthermore, the physiological impost of responding to disasters in hot and humid conditions are poorly characterized, limiting the development of evidence based standards.

Methods: A literature review of emergency responder fitness standards was conducted. Assessment of disaster responders was undertaken according to Brearley et al. (2013)[2] during construction of an EMT2 facility in hot and humid conditions to determine physiological and perceptual responses.

Results: Fitness standards are common among law enforcement and civilian protection agencies, generally incorporating running to volitional exhaustion. There were no reports of fitness standards for medical disaster responders in the peer-reviewed literature. Establishing an EMT2 facility in hot and humid conditions resulted in prolonged elevation of heart rate, core temperature, and physiological strain accompanied by body temperature perceptions of warm to very hot.

Conclusion: Based upon the physiological responses of disaster responders establishing an EMT2 facility in hot and humid conditions, assessment of disaster responder fitness is warranted. Reflecting the lower physical demands compared to law enforcement and civilian protection agencies, and age range of potential disaster responders, submaximal fitness tests should be prioritized.

References
1. Brearley M. Pre-deployment heat acclimatization guidelines for disaster responders. *Prehospital and Disaster Medicine* 31(1):85-89, 2016.
2. Brearley M, Heaney M, Norton I. Physiological responses of medical team members to a simulated emergency in tropical field conditions. *Prehospital and Disaster Medicine* 8(2):139-144, 2013.

Earthquake in Amatrice (Italy), August 24, 2016: The Role of the Medical Teams of the National Alpine Rescue Corp (CNSAS)

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Study/Objective: The Mountain and Speleological Alpine Rescue Corp (CNSAS) is a voluntary corps diffused in all of Italy, expert in hostile environment rescue missions. The study is a report of the first medical teams deployed in Amatrice.