promoting public health and relieving animal suffering. Public safety is enhanced when animal health is addressed in disaster management. Obstacles to functional disaster responses that include animals may be due to limited 1) evacuation/sheltering plans; 2) integration of professionals 3) training opportunities.
Methods: A general review of legislature, literature, training reports, incident debriefings, community group meetings and agency consultations was conducted to assess the availability and effectiveness of veterinarians in disaster response. A veterinary student survey (Davis) was used to assess disaster response understanding, skill set and interest for training.
Results: Recent fires illuminate the need for local veterinary involvement in response. Community organizers report difficulty in securing veterinary services in disasters. A veterinary student survey showed the majority are interested in training as part of their medical education. Fire services report gaps in animal handling. Law enforcement reports public safety concerns. These professionals don't regularly interact, and time is lost when faced with an incident involving animals. England and France have models for integrating veterinarians into fire service. A working group of veterinarians, consultants and community organizers developed a 10 module lecture and lab disaster curriculum that covers all hazards-all species animal handling, evacuation, sheltering, biosecurity, triage, and Incident Command System.
Conclusion: Veterinarians are skilled in animal movement/capture, husbandry, and triage; first responders have skills in technical rescue; law enforcement is charged with public safety and traffic control. Training veterinary students in disaster response, aligns with the veterinary oath and creates the next generation of professionals capable of participating in disaster response. Trainings that include first responders foster a seamless response further maximizing positive outcomes.

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Co-Location and Close Proximity Facilities for Animal and Human Sheltering as Part of a Community Disaster Preparedness Plan: Application of GIS

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Study/Objective: The objective of this study is to establish a Geographic Information System (GIS) report for animal shelter facilities that are co-located or in close proximity to human shelter locations for Yolo County, California.
Background: The inclusion of animals in emergency management is gaining more attention from the general public, government agencies and academic institutions worldwide. Addressing the needs of animals during disasters is crucial, not only for the welfare of animals, but also safety for people. Animals that are abandoned experience starvation, injury and death. People's concern for animals puts their own physical and psychological well being in danger, because of their reluctance to comply with evacuation orders. Animal owner non-compliance in turn, jeopardizes first responder safety. Shelter location is critical to the development and implementation of emergency planning. In the US, jurisdictions that have variable plans in place, are likely to exclude animals in paper documents only. GIS data management and analysis can facilitate efficacious emergency planning for human and animal sheltering needs.
Methods: Base maps were obtained from county websites. Facility locations were acquired from Red Cross, Office of Emergency Services and Google, and stored in attribute tables. All data was downloaded into ArcGIS. Multiple ring buffers identified animal facilities within 500, 1,000 and 1,500 meters (.31 mi., .62 mi., .93 mi.) of human facilities. A proximity analysis was performed to determine the nearest shelter sites for people and pets and was reported in near tables.
Results: Red Cross shelters, veterinary clinics, pet-friendly hotels, outdoor sites and county animal shelters were identified. The majority of Red Cross shelters were not within 1500 meters of animal housing. Less than 10% of Red Cross shelters were within 500 meters of veterinary clinics.
Conclusion: The GIS reports provide quick visual assessments of relative locations of human and animal facilities for pre-disaster planning. Utilizing GIS analysis can identify gaps and be instrumental in emergency preparedness community planning for animals and people.

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Epidemiological Evaluation of Cat Health at a First-response Animal Shelter in Fukushima, following the Great East Japan Earthquakes of 2011

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Study/Objective: The purpose of this study was to retrospectively evaluate the incidence of Upper Respiratory Infection (URI) and diarrhea in cats at the first response animal shelter in Fukushima, and investigate factors affecting the duration of disease and determinants of treatments performed.
Background: Unplanned animal rescue, in addition to unregulated and/or unstandardized sheltering of affected animals during disaster, caused secondary damage to animals such as disease epidemics. Stress-related disease such as URI and diarrhea were extremely common in cats at the first response shelter in Fukushima, imposing not only animal welfare and cat health issue, but also public health concern.
Methods: A retrospective cohort study was performed at a first response temporary disaster shelter in Ihno, Fukushima Prefecture, Japan. Between April 27, 2011 to December 31, 2012 there were 189 cats brought in by animal control officers from the restricted area to the temporary disaster shelter as part of an animal rescue operation. The incidences of URI and diarrhea were compared between the first and second years, and related to factors predictive of disease duration and frequency, including choice of treatment options.

Results: Of the impounded cats, 80% and 59% developed URI, 71% and 54% of cats developed diarrhea, and 91% and 83% of cats had at least one disease in 2011 and 2012, respectively. Uses of multiple drug administration (more than five drugs) was associated with prolonged URI and diarrhea. Multiple antibiotics, antihistamines, interferon, and steroids were associated with relapse of and prolonged URI.
Conclusion: The incidence of disease in cats at the shelter was high. Developing a standardized treatment protocol for commonly observed diseases at Japanese animal shelters to prevent and control diseases, to promote animal welfare, and to protect public health in the face of future disasters is overdue.
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Disaster Preparedness for Pets

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Study/Objective: The objectives of this study were to perform pet-owners' attitude survey to evaluate disaster preparedness for pets, and to perform questionnaires to investigate the effect of pets on the recovery of disaster.
Background: Almost all disasters involve people, animals and the environment in the affected area. People will evacuate from hazardous locations and the pets owned by people may be an issue in the evacuation process, if there was no planning for pets. Recent change in human-animal-bond, pet-owners see their pets as family members and risk themselves for the sake of their pets. Animals affected by disasters are also gaining more public attention, and the need for pet preparedness should be addressed and incorporated in the community emergency planning.
Methods: The pet-owner's attitude survey was conducted at pet shops and rabies vaccination sites (only for dogs), and the pet-owners were randomly assigned to answer 47 questions regarding on the perceptions toward pet disaster preparedness. Questionnaires to investigate the effect of pets were performed in the City of Sendai at a City Festival. Pet-owners and non-pet owners were randomly assigned, and the posttraumatic stress disorder (PTSD) by the earthquakes in 2011 were scored. Questions regarding the perception for pet evacuation were also recorded.
Results: Thus, 95% of the pet-owners wanted to evacuate with the pets, but only 26% of them knew the location of a pet-friendly shelter. Then, 20% had identification for their pets, and 96% of pet-owners and 88% of non-pet owners thought pets should be evacuated with people. Pet-owners had higher PTSD scores than non-pet owners within 1 month from the earthquakes, but the score was lower for the pet-owners after 5 years.
Conclusion: Addressing pet disaster preparedness is important for not only animal welfare but also for people's safety and mental health. Pets can be a risk factor during disasters but could act as profactor for recovery.
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Epidemiological Evaluation of Dogs Rescued in the Fukushima Prefecture Following the Great East Japan Earthquakes of 2011

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Study/Objective: The objectives of this study are to report characteristics, disposition, and health status of dogs rescued in the Fukushima Prefecture, and to perform a retrospective epidemiological evaluation of factors associated with disposition and disease incidence.
Background: Rescued dogs from the restricted area by the nuclear accident were initially housed at a temporary shelter in Ihno, Fukushima Prefecture. This first shelter operated under chaotic conditions: dogs were kept in individual cages proximate to each other, poor husbandry was maintained by unfamiliar/untrained staff, and lack of exercise was associated with deterioration of the mental and physical health of the impounded dogs. Secondary shelter was newly built in Miharu with better housing and trained staff, and all the remaining dogs at Ihno shelter were transferred.
Methods: All dogs rescued from the Fukushima Prefecture from March 2011 to July 2015 were included. The data including medical records, intake data and disposition (adopted, reclaimed by owners, or died in shelter), were retrieved and evaluated for the factors associated with disease and disposition.
Results: Five hundred and twenty-nine dogs were admitted to the Ihno and Miharu shelters, including 179 that had detailed medical records. Seventy-six percent of dogs admitted to the shelters were mixed breed. Twenty-six percent of dogs had verified ownership, and almost 16% of dogs were reclaimed by their owners. Sixty-six percent of dogs developed diarrhea, and 17 different antibiotics were used to treat it. Using three or more different antibiotics was associated with prolonged signs of diarrhea.
Conclusion: To improve the welfare of dogs in disasters, responsible owner education, a well-organized registered volunteer training program for care of animals at shelters, proper disease management protocols, and enrichment strategies to prevent stress in shelter setting are essential.
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