

Evacuation of Pets During Disasters: A Public Health Intervention to Increase Resilience

During a disaster, many pet owners want to evacuate their pets with them, only to find that evacuation and sheltering options are limited or nonexistent. This disregard for companion animal welfare during a disaster can have public health consequences.

Pet owners may be stranded at home, unwilling to leave their pets behind. Others refuse evacuation orders or attempt to reenter evacuation sites illegally to rescue their animals. Psychopathologies such as grief, depression, and posttraumatic stress disorder are associated with pet abandonment during an evacuation. Health care workers may refuse to work if their animals are in danger, leaving medical facilities understaffed during crises. Zoonotic disease risk increases when pets are abandoned or left to roam, where they are more likely to encounter infected wildlife or unowned animals than they would if they were safely sheltered with their owners. These sequelae are not unique to the United States, nor to wealthy countries.

Emergency planning for companion animals during disasters is a global need in communities with a significant pet population, and will increase resilience and improve public health. (*Am J Public Health*. 2017;107:1413–1417. doi: 10.2105/AJPH.2017.303877)

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Companion animals are an integral part of human society. But when disaster strikes, evacuation and sheltering of companion animals are often overlooked.^{1,2} This disregard can lead to public health consequences. This article will give an overview of some of the documented public health sequelae in communities that did not have an adequate companion animal evacuation and sheltering plan in place. Many of these are physical risks to pet owners, including stranding, not complying with evacuation orders, and attempting dangerous or illegal reentry of evacuation sites.^{2–7} In the latter 2 instances, physical risk is also a concern for first responders. In addition, psychological trauma may occur when people are forced to evacuate without their pets, which may be one of the most well-documented and recognized consequences of pet loss associated with a disaster.^{2,6,8–16} Another area of discussion is the finding that many pet-owning health care workers may refuse to work unless their pets are safe, which can endanger availability of medical care.^{10,17–20} Finally, I will examine the mostly unrecognized idea that the risk of zoonotic disease spread is higher in animals that are not evacuated.^{21–23} I will present planning considerations and resources available to help develop animal disaster response programs. The aim of this article is to identify the public health need for emergency management

groups to incorporate animal welfare into disaster relief protocols in countries and communities that have a significant population of pet animals.

A GLOBAL NEED

During an evacuation, many people want to take their pets with them. This is true in the United States and around the world, regardless of a country's socioeconomic status.^{3–5,10,24–26} During a 2008 volcanic eruption in Chile, dogs were not permitted to be evacuated with their owners.^{10,25,27} Eventually, concern expressed by owners and international media coverage led to the government deploying the army to recover the abandoned dogs, but not before there was considerable negative media attention on the subject.^{10,25,27} After the 2011 tsunami and earthquake in Japan, the World Society for the Protection of Animals estimated that approximately 30 000 animals were being housed in evacuation shelters alongside 350 000 people.²⁴ A 2012 survey of pet owners in Colombia, Costa Rica, and Mexico approximated that 75% of respondents would take their pets with them during

a disaster evacuation, even at the risk of their own safety.²⁶

In the United States, the Pets Evacuation and Transportation Standards Act of 2006 requires that states receiving Federal Emergency Management Agency assistance include pets in their evacuation and sheltering plans, but finding an emergency shelter that accommodates pets is difficult, if not impossible.^{6,28} According to the American Red Cross Web site, their shelters do not allow pets for “health and safety concerns, among other considerations,” although no details about these concerns are specified.²⁹ The Web site recommends that owners look for a hotel that accepts pets or ask friends and family to shelter them. In addition, first responders are often unable to provide any information on where to house pets during a crisis and may explicitly instruct owners to leave their pets behind; emergency management groups frequently do not include companion animals in their evacuation plans; and animal welfare groups that try to address this need are often unable to reach the evacuees in time to provide help.^{1–6,10,12,14–16,25,28}

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EVACUATION NONCOMPLIANCE

An evacuation plan that includes pets can contribute to community safety and evacuation compliance. In a 2007 study of elderly, primarily low-income adults in Georgia, United States, 16.2% of participants said that they would not evacuate without their pets and 8.1% would stay at home with their pets during an evacuation.⁷ Heath et al. found that the most significant risk factor for evacuation failure is pet ownership, particularly in people who do not have children.^{1,4} They also found that the more pets someone owns, the higher the risk of evacuation failure.⁴ This was evident during Hurricane Katrina, when pet owners in New Orleans, Louisiana, refused to leave without their animals.⁶ Because the Superdome and other emergency shelters would not allow animals inside, pet owners were reluctant to leave their homes unless forced to do so.^{6,13} Some 44% of people who refused to evacuate did so in part because they refused to leave their pets behind.¹⁰ Some pet owners were threatened with arrest before they were convinced to evacuate their flooded homes without their animals.² Evacuation noncompliance put not only civilians in danger, but also first responders who tried to help evacuate those who refused to leave.

Premature return to evacuation sites because of missing pets is another problem that occurs during evacuations. It is estimated that up to 80% of people who prematurely reenter an evacuation site do so to rescue a pet.^{3,4,12} One extreme example occurred in the 2009 Victoria, Australia, bush fires, when a dog owner jumped out of a police rescue

helicopter to return to her dog.¹⁶ Animal welfare groups or well-meaning volunteers may take it upon themselves to try to rescue as many animals as possible, resulting in a chaotic mix of unauthorized or untrained people prematurely entering evacuation sites, taking animals from evacuated homes or the streets, and sheltering them anywhere they can.^{1,6,28} Strangers handling stressed, abandoned animals are at risk for being bitten or scratched, and the animal may escape or be too scared to allow catching or handling.³⁰ Owners' reunification with their pets can be particularly difficult when there are multiple rescue groups involved, and unclaimed pets may be adopted by other families or euthanized.^{1,28} There are also cases in which public outcry has resulted in large-scale reentry by first responders and pet owners in an attempt to rescue abandoned animals.^{3,5,25} The ability to promptly evacuate and shelter companion animals during an evacuation is an important issue to many pet owners, and forced abandonment of pets during disaster evacuations should be avoided.

MENTAL HEALTH SEQUELAE

The significance of the human-animal bond is broadly recognized, and its importance should be taken into account during disaster planning. Barker and Barker determined that owners may feel as close to their dogs as to their partner, children, or parents, with more than one third of dog owners feeling closer to their dogs than to any of their human family members.⁹ Children have lower stress levels during times

of anxiety if a companion animal is present, and many adults report that their pets are important for coping with stress as well.^{6,10,12,13} Children living in Croatian war zones showed lower levels of posttraumatic stress disorder (PTSD) and better coping strategies if they owned a pet.⁸

Furthermore, losing a pet can significantly alter mental well-being, leading to stress, grief, and depression.¹²⁻¹⁵ This may be especially true when owners are forced to abandon their pets in an emergency and are later overcome with guilt and grief. Lowe et al. determined that pet loss is a significant predictor of post-disaster distress.^{14,15} Hunt et al. established that pet loss because of forced abandonment significantly adds to acute trauma and peritraumatic dissociation, increases the risk of PTSD, and intensifies depressive symptom severity.¹³ In fact, this study found that pet loss resulted in higher levels of PTSD and depression than home loss.¹³ Similarly in Japan, people who lost a pet following a volcanic disaster reported significantly higher depressive symptoms than those who did not.¹¹ Allowing pet owners to safely evacuate their animals with them during an emergency evacuation may prevent significant acute and long-term psychological trauma, and can strengthen the emotional resiliency of potentially vulnerable evacuees.¹⁶

HEALTH CARE WORKERS

The basic needs of health care workers should be considered during a disaster, or hospitals and medical facilities risk being understaffed. For some health care personnel, a foremost concern is

the safety and welfare of their pets.^{17-20,31} Studies have indicated that up to one third of health care workers may be unable to work during a disaster if they do not have suitable arrangements for their animals.¹⁸⁻²⁰ Davidson et al. found that some health care workers consider their pets to be particularly vulnerable during natural disasters.¹⁸ French et al. determined that family safety, personal safety, and pet care are seen as primary needs more important than food, water, sleep, and shelter to health care personnel working during a disaster.¹⁹

After Hurricane Katrina, Tulane University Hospital and Clinic in New Orleans created a pet care center in the hospital's parking lot for employee pets.¹⁷ The CEO of the hospital was quoted as saying, "don't underestimate [health care workers'] unwillingness to leave [their pets] behind."¹⁷

ZOOZOSES

The risk of zoonotic disease outbreak is a common reason cited for not allowing pets to be evacuated and sheltered with their owners.²⁹ Although the risks of contracting serious zoonotic diseases should not be trivialized, especially in countries where a disease is endemic, the risk of infection contracted from owned companion animals during a disaster seems to be small and mostly related to animal bites.^{21,30,32,33} Furthermore, evacuating and sheltering companion animals can help protect the public from zoonotic diseases through mitigation of loose animals and preventative veterinary medicine, such as providing rabies vaccines in rabies-endemic countries and ectoparasiticides in areas where

vector-borne disease transmission is a risk.^{21,22} There is a paucity of data concerning specific cases of zoonotic disease transmission from companion animals evacuated during natural disasters, likely demonstrating the rarity of occurrence, but there is evidence that allowing companion animals to roam free after forced abandonment may present a risk for them contracting zoonotic diseases that they would not be exposed to in an evacuation shelter.

The most likely means of direct disease transmission from companion animals to humans is via contact with urine, feces, or saliva.²² *Giardia* is a common parasite that can infect both dogs and humans through fecal-oral contact.²² A more common means of disease transmission is through vectors that are associated with pets, such as fleas, ticks, mosquitoes, and endoparasites.^{21,34} The risk of many diarrheal and vector-borne diseases is more prevalent after floods, tsunamis, or hurricanes, particularly in developing countries.^{23,34} This is likely attributable to contaminated water sources and thriving populations of vermin and insect vectors after a disaster.^{23,33,34} Leptospirosis can be spread by pets that have ingested contaminated water.^{21,22} Leptospirosis is a disease of particular concern in Central and South America, because of a reported increase in disease incidence in recent years, and exposure to infected pets is a known risk factor for developing leptospirosis.^{21,22} *Echinococcus granulosus*, another parasite of importance in South America and also Asia, can be transmitted to dogs that eat contaminated livestock carcasses, a scenario that is common after a natural disaster kills livestock and leaves

abandoned pets hungry.²¹ Infected dogs that are reunited with their families can then transmit the disease to their owners.²¹

Practices such as providing clean sources of water for both humans and pets, prompt disposal of feces and carcasses, animal bite prevention, and access to veterinary vaccinations and parasiticides dramatically reduce the risk of zoonotic disease prevalence and transmission.²³ Animals in a shelter will be safe from exposure to contaminated water, carcasses, and feral or free-roaming animals that are more likely to harbor disease. In addition, these animals can easily be screened for diseases of concern and given vaccinations and parasiticides when they are sheltered. It has been shown that owners who are less bonded to their pets are less likely to evacuate them, and this also coincides with findings that these same animals are less likely to have visited a veterinarian in the previous year.^{1,3,5} Companion animals with owners who are bonded enough to evacuate them are more likely to have been to a veterinarian in the previous year, and thus are more likely to be up to date on preventative vaccinations and medications and less likely to be harboring zoonotic diseases than are neglected or free-roaming animals.^{1,3,5,21,34}

ANIMAL BITES

The risk of animal bites after disasters has been well-documented. Animal bite wounds can cause severe and even fatal infections if not appropriately treated.^{30,32,33} However, the most dangerous time to handle an animal appears to be after the disaster has already occurred, in the case of severe weather. After

the nuclear disaster at Fukushima, Japan, there was a 30-fold increase in dog bite wounds.³² In this case, 40% (8/20) of the injuries were caused by neglected dogs 6 weeks after the evacuation was initiated. The authors postulate that these bites occurred because the dogs were highly stressed and starving. After Hurricane Floyd hit North Carolina in 1999, there was a 246% increase in dog bites within the first week of evacuation, and most of these were also attributed to displaced, frightened pets.³⁰ A similar conclusion was reached after multiple reports of bites by misplaced dogs and cats were received after Hurricane Katrina.³⁰ Dog and cat bites comprised 22% of all trauma complaints following Hurricane Ike in 2008.³⁰ Warner questioned these dog bite victims and found that all the people who were bitten were familiar with the animals that bit them, and most of the bites occurred within 72 hours after the hurricane had struck. This reinforces the importance of evacuating before a severe weather event, if possible, to minimize animal stress and fear-based biting. It is also crucial for owners to curtail handling of frightened pets unless necessary. Once at a shelter, having experienced animal handlers work directly with the animals will decrease the risk of bites and scratches to people.

In regions where rabies is endemic, it is especially important to be cautious when handling dogs during an evacuation. Although rabies does remain a prominent cause of death in many developing countries, most dogs that are unvaccinated and, therefore, are at risk for rabies exposure, are free-roaming and may not be highly bonded to their owners, making it less likely

that they will be evacuated.^{1,3-5,35} It is also unlikely that owners would be able to catch a free-roaming dog that is in the infective stage during the chaos of a disaster evacuation, because of the behavior changes exhibited in the prodromal stage. If a bite does occur, a sheltered dog can be observed for symptoms of rabies, something that would not be possible if the animal was not evacuated. Furthermore, mandatory rabies vaccination upon intake into an evacuation shelter is easily instituted and is an advantage that should be taken in rabies-endemic regions. This may even help instigate widespread rabies vaccination campaigns, such as occurred in Haiti after a January 2010 earthquake.³⁶ Although the risk of animal bites is a public health concern, it can be avoided by cautioning owners to limit handling and to evacuate early, which is a safer alternative to leaving animals roaming and at risk for contracting and transmitting zoonotic diseases.

PLANNING AND RESOURCES

Creating an emergency response plan for pets is not a new concept. The same 5 phases of the emergency management lifecycle—planning, preparedness, mitigation, response, and recovery—apply, just as in human disaster management.^{1,37,38} There are different types of pet-friendly shelters that can be created, depending on the existing infrastructure and available space.^{39,40} In general, it is not advisable to house animals in the same physical space as the rest of the human population.^{37,40} This is because the logistics of

animal care and sanitation become impractical, and it is difficult to control interactions with other animals or people.³⁷ A space designated specifically for animals (by species) that is within the human shelter can function as the emergency animal shelter, or an off-site location can be used.^{38–40} A building or space adjacent to the human shelter is ideal, but, if necessary, animals can be sheltered at distant locations.³⁷ In the latter case, the human shelter should have a pet staging area where owners can fill out necessary paperwork, confirm vaccination status, ensure that their pet has correct visible identification, and communicate medical needs to staff and volunteers of the pet-friendly shelter.^{38,39} Most pet owners prefer to have their pets sheltered close by so that they can have regular contact with their animal, which reduces stress among both owners and pets.³⁷ Another practical benefit of this is that pet owners can be assigned care duties for their animals, such as feeding, walking, and cleaning.^{38,39} This reduces the number of staff and volunteers that is needed.

Because the needs of different communities and shelter types vary, it is difficult to give a blanket estimate of the cost associated with sheltering animals. There are multiple agencies and non-profit organizations that provide financial assistance and grants for animal disaster relief, and there are often ample opportunities to raise funds through donations specifically for animal care after a disaster occurs.^{37,39,40}

There is a multitude of resources to help a community, state, or country develop emergency plans for animals. Some comprehensive resources include, but are not limited to, the *Emergency Response and*

Preparedness manual by the American Veterinary Medical Association; the *Emergency Animal Sheltering Best Practices* white paper written by the National Alliance of State Animal and Agricultural Emergency Programs; the Federal Emergency Management Association Web site, which includes both animal sheltering manuals and online training modules in the Incident Command System and disaster management for animals; and *Developing a Local All Disaster Animal Evacuation and Sheltering Plan*, developed by the Regional Institute for Community Policing, Springfield, Illinois.^{37–40}

Groups that have extensive experience successfully assisting in emergency animal sheltering in the United States and internationally include, but are not limited to, the American Society for the Prevention of Cruelty to Animals; Humane Society International; International Animal Welfare Training Institute at University of California, Davis; International Fund for Animal Welfare; United Animal Nations; World Animal Protection; and World Vets.^{37,38} The availability of numerous high-quality resources for assistance in planning, preparation, and execution of emergency animal evacuation and sheltering counters claims that lack of information prevents the development of appropriate protocols.

CONCLUSION

Companion animal welfare is important to pet owners, especially during times of stress. Pet-friendly sheltering has benefits to public health, and increases resilience in a potentially vulnerable subset of the population. In the United States, the Pets Evacuation and

Transportation Standards Act was created specifically as a reaction to the trauma and danger that pet owners faced in Hurricane Katrina. More than 10 years later, development and implementation of animal evacuation and sheltering plans during disasters is widely overlooked, both in the United States and internationally. Recognizing the importance of pets to their owners and their role in public health is an important first step in ameliorating a public health problem that has been seen repeatedly in the past and is unlikely to change in the future. Sheltering companion animals during disasters is an attainable objective when there is appropriate planning. Emergency management groups should seek the expertise of the many animal welfare groups and resources available to help create and implement their animal emergency preparedness protocols, and ensure that the health and welfare of the companion animals in their community are met. By protecting and improving the welfare of companion animals during disasters, public health of owners is also improved. **AJPH**

HUMAN PARTICIPANT PROTECTION

Institutional review board approval was not required for this article because no human participants were involved.

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