

Animal Health in Earthquakes

After the 1964 earthquake in Anchorage, Alaska, a veterinarian reported that “veterinary services were not needed to any great degree.” Primary responsibilities for veterinarians after this earthquake were to ensure the safety of themselves and their families and those in the immediate surrounding area, to coordinate rescue teams to find and rescue people, and to organize professional groups.

After the Northridge earthquake veterinarians reported the following problems:

Extent of damage

Hospitals in the affected area numbered 150

About three dozen practices suffered minor to major damage.

Costs of structural damage ranged from a few hundred dollars to over \$120,000

Business interruptions

Distraction of veterinarians and staff from work because of damage to their homes
Intimidating security checkpoints, hindering client access to the practice, Lack of water and gas supply. Complete isolation for 24 to 48 hours
Business closure for up to a week
Need to relocate

In several cases insurance premiums for business disruptions specifically excluded disruption caused by earthquake damage.

Medical and surgical problems

Blunt trauma, such as bruises and fractures (legs and backs) from falling objects and furniture

Wing tip injuries to birds that had been in cages that toppled
Lacerations from broken glass

Prolonged hiding

No specifics were reported, but the number of animals needing treatment did not appear to be high.

Husbandry problems

Stray animals roaming because of knocked down fencing
Need for animal adoption programs

Again numbers were not reported, but they appeared to be small.

Injuries Resulting from Earthquakes

Frequency of Injuries

In the context of veterinary medical care we give attention to the expected number of cases that will occur and the resources required to deal with them. This is the type of information that is needed to plan realistically for an earthquake. The care of people always comes first, however, if a choice must be made between making medical services available to people or animals.

Specific veterinary medical attention to most types of injuries and medical conditions is omitted because this is adequately covered in other textbooks on critical patient care and would be an unnecessary repetition for most veterinary practitioners. Also, owners of injured animals should seek professional help from a veterinarian.

Considerable information is available on the injuries that humans suffer in earthquakes, and some of these data may be useful in anticipating the types of injuries that veterinarians may be expected to treat in animals following major earthquakes or in individual building collapses unrelated to earthquakes (e.g., after heavy snow).

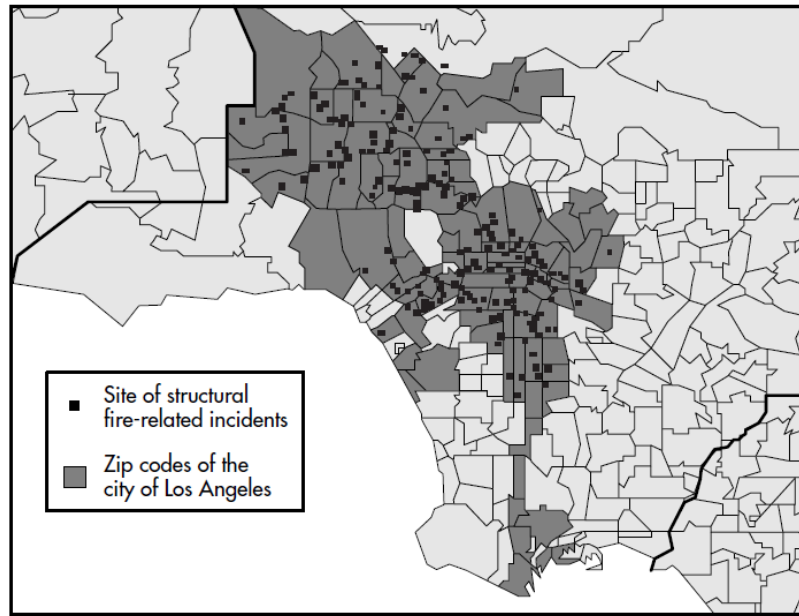


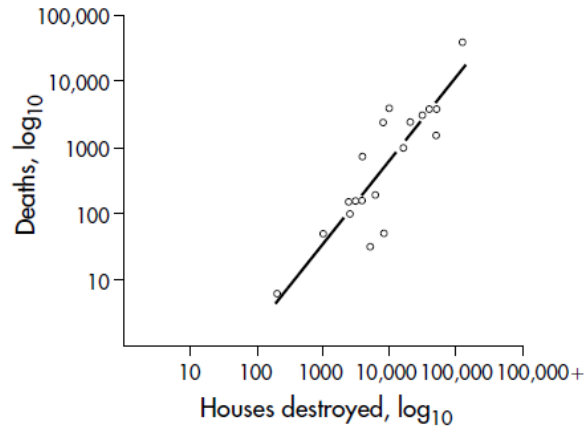
FIG. 8-8 Map of structural fire-related incidents reported to the Los Angeles Fire Department on the day of the Northridge earthquake. Five to 10 times the normal number of incidents occurred. (Courtesy EQE International.)

Although no research has been done on injuries that animals suffer in earthquakes, the management of injuries in humans and animals is likely to be similar. However, because of the smaller size and greater agility of animals, the number of injuries in animals probably always will be much smaller than in people.

The reports of animal injuries following earthquakes are only anecdotal. One practitioner claimed to have treated over 70 fractures after the Northridge earthquake. However, this could never be confirmed by review of the medical records and contrasts strongly with reports after the earthquake at Prince William Sound, which indicated that few animals needed veterinary medical attention.

Research on human earthquake victims indicates that the vast majority of injuries are treated by the victims themselves or as outpatient cases. Most injuries are minor and can be treated without a physician. Patients who do need treatment are treated as outpatients. For example, after the 1989 earthquake in Loma Prieta, California, over 60% of injuries were treated by the victims themselves. After the 1968 earthquake in Teheran, Iran, only 3.3% of all physician-treated injuries were treated as inpatients. Although more than 6000 people died after the Kobe, Japan, earthquake in 1995, they represented only 0.1% of the affected population. An additional 0.8% of the affected population received treatment in hospitals for injuries.

Admissions to hospitals are more or less immediate after an earthquake. In 1992 in Egypt, over 70% of all inpatient victims of the earthquake were admitted to a hospital within 36 hours. From these descriptions it should be clear that local preparedness for veterinary medical attention is likely to be the single most effective intervention for injured animals after an earthquake. By the time outside groups can be mobilized and arrive at an earthquake site, they are unlikely to have much impact on the care of injured animals after an earthquake.



Types of Injuries

The most common injuries result from falling and broken objects. Severe injuries appear to occur only at localized sites where buildings have collapsed. Injuries are often multiple in nature. One of the most critical medical emergencies is the crush syndrome. Crush syndrome occurs in earthquake victims who have been crushed under fallen heavy objects. When the pressure is released as the victim is freed, myoglobin and other intracellular components from crushed muscle are released into the bloodstream. These substances affect the kidney and frequently cause peracute renal failure.

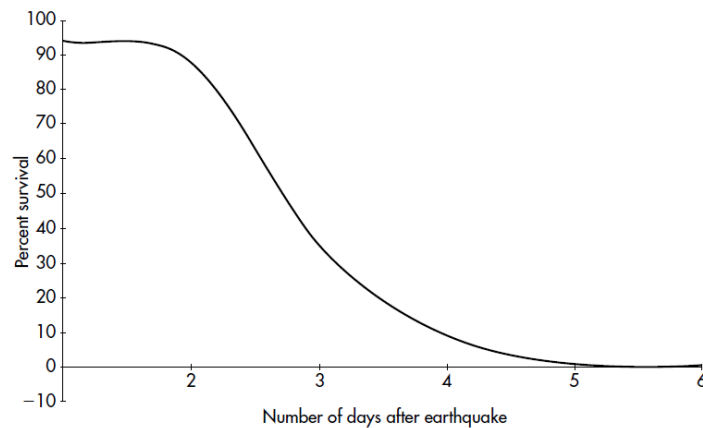


FIG. 8-10 Survival rates of trapped earthquake victims.

Crush syndrome was a large problem after the earthquake in Armenia in 1986, where acute renal failure resulting from crush syndrome developed in nearly 30% of trapped victims. Regrettably many victims died because rescuers were unaware of the need to treat the victims immediately with intensive intravenous fluids. After the 1995 earthquake in Kobe, Japan, 75% of the deaths were attributed to crushing syndrome and suffocation under debris, and 10% of the deaths were caused by fires.

In addition to primary injury, existing disease is exacerbated. In humans the most commonly reported disease conditions that are worsened in earthquakes are myocardial infarction, diabetes, hypertension, depression, and respiratory disease. The latter is associated with suspension of dust. It is probably safe to assume that animals that have the same or similar conditions suffer from exacerbation of their conditions after earthquakes too. Part of this exacerbation may be due

to changes in treatment schedule brought on by the disruption of normal life from the earthquake.

Almost all earthquake-related deaths (95%) occur while the victim is still trapped. Likelihood of survival of a trapped victim decreases rapidly with time. The vast majority of live victims are found and extricated within the first 24 hours of the primary earthquake. Several studies have shown that people on site rescued over 80% of trapped victims and that search and rescue teams have had only marginal impact. Although some trapped victims are saved many days after an earthquake, the majority of evidence indicates that survival rates decrease by 50% for every day a search is delayed or a trapped victim is not found. After 4 to 6 days it is only by chance that live victims are found.

The Impact of Earthquakes on Veterinary Practices and Animal Shelters

Additional complications arise for the care of earthquake victims if hospitals are affected. Damaged veterinary facilities, animal shelters, or other animal-related businesses may no longer have staff who can come to work. This greatly compromises the capability with which animal care can be provided. In anticipation of this problem, local emergency management agencies, veterinarians, and animal shelter operators should work together to designate “critical animal care facilities.” These designated facilities should be the primary sites from which to provide care for animals affected by an earthquake. These facilities should be built or retrofitted to the highest standards of current building codes to reduce the potential loss of animal care services in disasters. Animal care facilities should also enter into agreements with one another so that critical care cases can be referred and transported for appropriate level of care away from the affected area. It is not appropriate to provide emergency care to animals when there are functional veterinary hospitals in the vicinity, and there always are.

Much of the research that has been published about humans in earthquakes indicates clearly that local persons who are on site at the time of the earthquake are the major group of rescuers who find and attempt to save trapped victims. This probably applies to trapped animals as well. With this in mind, the emphasis on veterinary medical earthquake preparedness should be on teaching residents how to provide lifesaving human and veterinary First Aid and how to recognize and euthanize severely injured animals. Education of residents of earthquake-affected areas is likely to be the most important means to improve animals’ well-being in earthquakes.

With appropriate local preparedness, it is unlikely that outside teams will be needed to go to earthquake sites to save or care for animals. The likely role for outside consultants should be to help restore businesses, assist local teams in the care of healthy animals and their owners, and foster stray animals (under the supervision of the local animal control agency).



A veterinarian's truck was severely damaged when a slab of concrete fell on it. The truck had been parked overnight in the garage.



Treatment of animals under field conditions is necessary only under extreme conditions, when lifesaving procedures are indicated. In most cases owners can transport their animals to functional veterinary practices.