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Companion Animals Welfare in Non-Epidemic Emergencies: The Case of Central Italy, Post-Earthquake 2016/2017

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Abstract

Among the several factors affecting animal welfare, non-epidemic emergencies are very stressful events. In the aftermath of earthquakes or during flooding, snowstorms and wildfires, companion animals are subject to injuries and deep stress, abandonment or loss resulting in the overcrowding of animal shelters, or in emergent free-roaming populations representing a potential public health threat to the affected communities. The loss of animals often also results in significant psychological trauma for their guardians. For these reasons in all phases of calamities, the care of companion

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animals becomes essential. This paper describes the activities that were carried out for the veterinary care of dogs and cats affected by the earthquakes that occurred in central Italy from August 2016 to January 2017. These disasters provided an opportunity to test an integrated emergency management system in which several actors participated to aid, assist and accommodate the companion animals, whether owned or strays, affected by the catastrophic events.

Keywords

companion animals – non-epidemic emergencies – earthquake – natural disasters – stray dogs – stray cats

1 Introduction

In recent years, the companion animal population in the European Union (EU) has steadily grown, with the number of dogs significantly rising by six million from 2012 to 2014 (www.statista.com). To date, it is estimated, there are more than 60 million dogs and 74 million cats (FEDIAF, 2016). Many of these animals are now part of families—similar to children, friends, protectors and sentinels—as sources of support (Mouer et al., 2016), forming a bond with humans, and thus rooted in symbiotic benefit (Wyngfield et al., 2009). Our society has shifted toward a deeper respect for animal life and has also made significant progress as regards the legal status of companion animals, now recognized as sentient beings deserving respect and compassion, as stated in the Article 13 of the Treaty on the Functioning of the European Union (Sykes, 2011). As a matter of fact, people today wish to see those who work with the animals fulfilling their ethical and professional obligation towards them, as animal can be harmed or helped by their attitudes, decisions and actions. In many countries (Germany, Switzerland, Austria, Czechia, France, UK, Italy) a strong societal concern with regards to "animal welfare" has led to the adoption of specific legislation and codes of practice (Duarte Cardoso et al., 2017). This intrinsic property of animals—their sentience, their capacity to suffer as well as experience pleasure and happiness—is a morally salient fact, and it must be considered in our deliberations and actions (Singer, 1975). According to the last Eurobarometer on the attitudes of Europeans towards animal welfare, the absolute majority of respondents believe that the welfare of companion animals should be better protected than it is now (http://ec.europa.eu). In

Italy, companion animals are protected by Law n. 281/1991, which makes it illegal to euthanize dogs and cats unless recognized "seriously or incurably ill, or proven to be dangerous"; further, this law promotes birth control as a basic measure for the protection and assistance of free-roaming animals (Slater, 2001). Moreover, the Criminal Law foresees punishment in the case of animal abandonment or mistreatment (Passantino et al., 2006), therefore obliging humans to respect animals.

During non-epidemic emergencies—such as earthquakes, floods, volcanic eruptions, chemical and nuclear disasters, as well as in other situations like economic impoverishment, war or civil conflicts, migration and urban decay—animals can be lost, abandoned or left unsupervised (Turner et al., 2000; Garde et al., 2013a, b). This often results in the presence of a high number of free roaming dogs, either stray or owned (OIE, 2011), with major risks to their health and welfare since they can be injured, killed or subjected to dangers and stress. Free roaming dogs might also represent a danger for public health and security (Chadwin, 2017). Several authors reported risks of the emergence of zoonotic and other infectious diseases in dogs and cats following disasters due to the consequences of highly stressful events, resulting in decreased immunity and other negative social behaviors (Levy et al., 2011; Ivers & Ryan, 2006; Ketai et al. 2006; Wang et al. 2010; Garde et al., 2013a, b; Pasquali et al. 2006). Dog fighting (Jackman et al., 2007), human-directed bites (Garde et al., 2013a; Mori et al., 2013; Warner et al., 2010) and attacks are also important public health sequelae to be prevented during disasters.

Animals are not often a priority during preparation or response to a disaster, however animal rescue has a high moral, ethical and spiritual significance in a society that is becoming more humane, that feels a sense of obligation towards animals and is increasingly concerned for animal treatment, health and welfare (Wyngfield et al., 2009). The assumption that human life is of paramount importance and that the plight of animals is of secondary concern (Potts & Gadenne, 2014) has resulted in the needs of companion animals often being poorly catered for, both in planning for and response to disasters (Austing, 2013). Nevertheless, it remains paramount to save, protect and improve animal welfare during emergencies in consideration of the mutual and profound interdependence, on both social and emotional levels, existing between humans and animals (Darroch & Adamson, 2016; Chadwin, 2017). Moreover, the massive level of natural disasters are in many cases direct consequences of human-activity induced global warming and climate change (IPCC, 2013). From this point of view, because we have enlisted dogs, cats, and other species to be our companions, we have also made them vulnerable and dependent on us when

they are in danger (Burgess-Jackson, 1998). It is the fact of vulnerability, therefore, conjoined with causal responsibility for that condition, that generates moral and ethical responsibility (Burgess-Jackson, 1998).

Non-epidemic emergencies may induce a societal collapse and the loss of animals. These circumstances often result in significant psychological trauma for humans (Hunt et al., 2008; Lowe et al., 2009; Zottarelli et al., 2010) due to deep emotional involvement and substantial financial damages (Hall et al., 2004). In many cases owners experience deep distress when forced to abandon their animals (Hunt et al., 2008), and as a consequence (Lowe et al., 2009) their resilience is diminished. In the case of animals that are emotionally connected to human beings, their salvation and reintegration into social life is a significant element for the recovery of living conditions prior to the event. The need to maintain a strong human-animal bond during emergencies remains essential in order to motivate actions that improve survival and increase disaster resilience (Thompson et al., 2014).

People often refuse to evacuate without their animals, and they can even put themselves and the rescue teams' safety at risk by trying to retrieve or save them (Wyngfield et al., 2009; Trigg et al., 2017). Recent studies indicate that 20–30 percent of human evacuation failures are related to companion animal ownership (Ricketts, 2017). The refusal of animal owners to leave places also put rescue personnel under stress, hampering evacuation activities. Besides owners, those who regularly work with animals in emergency situations (veterinarians, veterinary technicians, animal shelter workers, animal control officers, and volunteers) may also be affected by psychological stress (Taylor et al., 2015) seeing animals suffer, feeling hopeless over the enormity of the task, and suppressing their emotions (Wyngfield et al., 2009). It should also be considered that some caregivers could refuse or be unable to work if their pets are in danger, or if there are not suitable arrangements for them, as was demonstrated for health care workers (French et al., 2002; Chaffee, 2009; Davidson et al., 2009; Ogedegbe et al., 2012). Canine units used in search and rescue operations, can also experience profound stress from overwork, given the difficult conditions in which they operate (CBS, 2017).

In a society with a strong concern for animals, media attention to animal rescue efforts after a disaster increases the prominence of companion animal welfare. A lack of media coverage could be the result of the failure to deal with animal issues of public concern.

The needs of animals in general, and companion animals in particular, in all phases of calamities should be taken into consideration, instead of being underestimated or being inadequately addressed (Garde et al., 2013a). At the same time, it is fundamental to address people's concerns and take into

account their emotional involvement in these situations (Hall et al., 2004; Lowe et al., 2009).

Italy is one of the European countries at greater risk for natural disasters, and the territory around the central-southern Apennines in particular is the most earthquake-prone area (Amendola et al., 2000; Xu et al., 2017). Over the last 2,000 years, more than 400 destructive earthquakes have been documented (RMS, 2008). This paper describes the activities carried out to assist companion animals affected by the earthquakes that occurred in central Italy from August 2016 to January 2017. This unprecedented sequence of catastrophic events provided an opportunity to test an integrated emergency management response system in which several actors participated to aid, treat, assist and accommodate the dogs, cats and other companion animals, whether owned or strays, affected by the disaster.

2 An Integrated Approach to Emergency Management

To date, at least 44% of Italian territory is exposed to high seismic activity resulting from the convergence of the African and the Eurasian plates. (Allegretti, 2017; USGS, 2017). The most susceptible regions are focused in and around the chain of Apennines, that that runs across the Italian peninsula (Allegretti, 2017; Xu et al., 2017). Moreover, hydro-geological phenomena represent one of the major and widespread risks according to the peculiar morphological nature of the territory (Allegretti, 2017). Hence, for the time being, seismic and hydro-geological hazards can be considered the greatest and constant threats to Italy (ANCE/CRESME, 2012; Bignami, 2010). On August the 24th 2016, a 6.0 magnitude earthquake struck a large mountainous area including 4 Apennine regions of central Italy: Lazio, Abruzzo, Umbria and Marche (Dalla Villa et al., 2016; Xu et al., 2017). A total of 300 people were killed, the city of Amatrice in the Province of Rieti (Lazio) was devastated and approximately 1,300 inhabitants were displaced, with immediate, significant consequences and potential risks for the health and welfare of farm and companion animals, as well as for the sustainability of the local economy; a community that is strongly linked to traditional small-scale farming systems and high value, typical food production. On 30 October, an even more powerful 6.5 magnitude earthquake affected the same areas (Xu et al., 2017). This was the strongest tremor to hit the country in more than three decades. Finally, in January 2017, a new series of tremors took place in a vast part of the Abruzzo territory that were simultaneously affected by freezing weather conditions, buffeted by snowstorms, and triggered avalanches in some areas (Dalla Villa et al., 2017).

The Italian Civil Protection Service (CPS) aims at safeguarding life, physical integrity, property, settlements, animals and the environment from the risk of damage caused by natural disasters, catastrophes and other events resulting from human activities (art. 1 of D. Lgs. n. 1 of 23 January 2018 on Code of civil protection). This system is based on a totality of functions and structures involved in the different stages of the emergency management cycle, and it relies on an integrated and coordinated set of measures and interventions, procedures and communication activities. The F2—"Health, social and veterinary assistance" support function is entrusted with the organization of interventions in the field of animal welfare, animal health, food and feed safety, and veterinary public health. These activities are primarily guaranteed by the structures of the National Health Service, including central, regional and local Veterinary Services.

In the aftermath of the first tragic event that occurred in the Province of Rieti, the need for reinforced, effective coordination and communication between the different agencies and authorities involved in the response phase became immediately apparent, given the highly destructive impact of the event and the number of sectors and people involved. Hence, following the first phase of the relief efforts, which were concerned with the recovery and rescue of people, an Interregional Technical Committee (CTI) was established in agreement between the Ministry of Health (MOH), the National Civil Protection Department and the Ministry of Agriculture, Food and Forestry Policies. The Directorate General for animal health and veterinary drugs was pivotal in the coordination of animal health and welfare, food safety and public veterinary health activities, along with the Directorate General for hygiene, food safety and nutrition, and in close cooperation with the Regional Veterinary Services of the 4 regions. The Istituti Zooprofilattici Sperimentali of Umbria-Marche and Lazio-Tuscany were permanently represented in the CTI and provided technical an operational assistance, along with the Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale", Teramo (IZSAM), that operated as National Reference Centre for Urban Hygiene and Non-Epidemic Emergencies (IUVENE). Fundamental support was also ensured by the Carabinieri Health Protection Unit (NAS), the Carabinieri Command for the Protection of Forestry and the National Fire Corps. Despite severe personal and logistical difficulties, Local Health Units (LHU) Veterinary Services played an essential role in the rescuing and assistance activities at the farm level, strengthening epidemiological surveillance measures and offering help to restore the productive functions at farms, as well as in slaughter and food production and their processing and distribution level. In addition,

breeders and farmers associations, veterinarian boards, veterinary medicine, and national and local NGOs put professional and logistical resources at their disposal. All of these actors contributed in a significant manner to guarantee the efficiency and continuity of the assistance in the emergency response and recovery phases.

Within this system, the CTI operated as a centralized emergency management centre, guaranteeing efficient vertical and horizontal coordination and timely communication between the different actors involved in the response phase at regional and local levels, the systematic identification of potential operational or overlapping gaps, and a constant assessment of the main criticalities flagged by citizens, farmers and food business operators. This evidence-based decisional mechanism allowed for a speedy prioritization of interventions, rapidly prepared an inventory, planned the best use of the available resources, identified possible new needs and organized the activation or acquisition of additional necessary resources. At the same time it was extremely important to address the concerns of citizens and tourists who were in search of their lost or missing pets, and to assist companion animals that were hosted with their owners in camps for internally displaced persons (IDPs). Prompt veterinary assistance and care were also provided to stray, sheltered or free roaming dogs, as well as stray or "colony cats".

The protection of companion animals and the prevention of stray dogs and cats in Lazio is regulated by the Regional Law no. 30 of 30/10/1997 on "Protection of pets and prevention of stray animals", implementing the National Framework Law no. 281 of 14/08/1991 on "Companion animals and the prevention of strays". The main legislative measures include individual dog identification by electronic transponder (microchip) and registration on a regional dog register, birth control programs and the promotion of the responsible ownership principle. Stray and free-roaming dogs, once collected in the territory, must be temporarily sheltered in health kennels managed by the LHU Veterinary Services, and eventually kept in public long-term shelters at the expense of the municipalities, unless re-homed or adopted. Some of these animals can be recognized as "community dogs", and released in the territory under the responsibility of the mayors after being captured, registered and identified, spayed/neutered and submitted to standard health and behavioral checks by the LHU Veterinary Services. According to this legislation, the systematic update of the regional dog register is the main instrument providing real-time data on the local canine population and, even in an emergency, it allows the ability to:

– trace ownership, in the case of damages caused by abandoned animals, theft or illegal trade;
– return free roaming animals to their owners;
– trace animal movements and changes of ownership;
– develop and implement stray dog population control programs and zoonotic diseases surveillance plans.

The legislation also promotes the protection of free-roaming cats in so-called "feline colonies", whose healthcare must be guaranteed by the LHU Veterinary Services, while their daily needs are entrusted to the municipalities, through voluntary staff. If belonging to "cat colonies" they must be identified and registered, along with the ones involved in non-commercial movements, according to Regulation (EU) No 576/2013. Cats can be euthanized only if seriously, incurably ill.

Today, these norms reflect the highest international standards for the protection of companion animals; furthermore, they clearly indicate the fundamental principles for an integrated management of veterinary public health issues in this field. Italian dogs and cats, owned or stray, are recognized as sentient beings and deserve to be treated in a responsible manner by institutions, individuals and society.

3 Veterinary Activities in the Earthquake Areas

The towns of Amatrice and Accumoli, home to about 3000 people in the province of Rieti (Lazio), were the worst hit municipalities, being at the epicenter of the earthquake. Many dogs and cats were missing, separated from their families or lost. In such situations, fulfilling the needs of companion animals is not just a moral and professional obligation for the rescuers but also has to be promoted as a sign of attention and tangible support to the community. In particular, veterinarians are expected to "restore and/or ensure the welfare and health of the animals they are caring for, no matter which branch of the veterinary profession they work in" and "give emergency first aid and pain relief to any animal according to their skills and the specific situation" (FVE, 2008). Within this context, the Veterinary Service of the Lazio region and the LHU Veterinary Services of the Province of Rieti, operating under the coordination of the CTI, were active from the very first hours of the emergency, in order to provide assistance and encourage the reunification of dispersed animals with their owners. In addition, the civil society represented by local, national and international animal protection organizations—Italian Animalist Associations (AI), Antivivisection League (LAV), the Dog National Defense

League (LNDC), The Guardian of the Shadow, the International Animal Protection Organization (OIPA) and the World Wildlife Fund (WWF)—as well as the Board of Veterinarians of the Province of Rieti immediately made their professional and logistic resources available on a voluntary basis. Close collaboration between these actors allowed rapid on-site inspections for the purpose of collecting detailed information, plan and perform targeted interventions to provide veterinary assistance and to ensure the full traceability of all rescued animals. All actions were based on the principle that no companion animals should be removed from their familiar habitat and should remain as close as possible to the local community. Following an agreement with the animal protection associations, the LHU Veterinary Services of the Province of Rieti established operational protocols reflecting legislation and common ethical standards, to be applied by the animal rescue teams for stray cats and dogs. The Amatrice and Accumoli territory was divided into 76 sectors, in order to guarantee an efficient planning of the interventions, and to avoid possible overlapping or leaving some areas unassisted by the animal rescue teams. On the basis of these protocols, operators were asked to collect the characteristics and pictures of any individual animal, to check their identification (either by microchip or tattoo) and to record the bearings of the location where the animal was found. This approach was fundamental with respect to the regional legislative provisions, which makes it illegal to remove dogs and cats from their habitat without informing the relevant authorities. If not identified, dogs or cats were microchipped and registered in the Regional database as either privately owned, belonging to the Municipality or temporarily adopted by citizens or animal protection organizations. This made it possible to quickly reunite lost or missing animals, or promote their adoption. Whenever feasible, animals were assisted in the field, provided they were far from risk areas and were regularly cared for by locals or volunteers. Only the youngest and most debilitated subjects were removed and sheltered. These animals were caught/collected (noose) using harmless methods by the Local Veterinary Services, animal protection associations or qualified personnel.

In any case, no animals were relocated without the consent of local people. In order to increase an animal's chances of being reunited with their owners, the Veterinary Service of the Lazio region and the LHU Veterinary Services of the Province of Rieti also implemented a centralized website where photos and descriptions of lost and found animals were posted (http://www.asl.rieti.it/dipartimenti/prevenzione/ssa/animali-dispersi/; http://www.regione.lazio.it/rl/animali). A section of this website was dedicated to the animals that were rescued, assisted and temporarily accommodated in special facilities (LHU Sanitary Kennel, veterinary clinics and private shelters). Citizens were allowed

to post pictures of their lost or missing animals. Particular attention was given to relinquished animals, once their owners declared they were unable to take care of them anymore, due to the consequences of the disasters. In this case, dogs and cats were entrusted to animal protection organizations and eventually given into temporary guardianship to private individuals who had provided sufficient guarantees of good treatment. A specific operative protocol was also developed in order to manage lost or injured cats, either owned or stray, according to the legislative measures in place. In the first instance, these animals were assisted on site, identified by microchip and spayed/neutered. Whenever possible they were reunited with their owners, or fostered by volunteers or animal protection associations. Alternatively they were introduced into preexisting or new "feline colonies".

After the seismic event, the local canine population was estimated to be more than 500, including the animals belonging to tourists visiting the area at the time of disaster. According to the regional database, only 64 dogs were identified and registered in Amatrice and Accumoli before the earthquake. In order to guarantee optimal on-site assistance, a permanent "Veterinary Point" was set up in Amatrice as an outpost of the LHU Veterinary Services of the Province of Rieti, and private practitioners were authorized, by way of derogation from the regional legislation, to sterilize animals in mobile veterinary ambulances/surgeries/units. In the period from 24 August 2016 to 31 March 2017, 183 dogs were identified and registered, 78 were rescued, 24 sterilized, 47 adopted and 75 were reunited with their owners. While 230 cats were rescued, 51 were identified, and 18 new "feline colonies" were established.

At the same time, in order to prevent the increase of the local feline population, LAV decided to launch a free sterilization program for stray and owned cats in the earthquake areas. The program, funded thanks to donations received from its members and supporters, was implemented by LAV in collaboration with the Lazio region, the LHU Veterinary Services of the Province of Rieti, the Board of Veterinarians of the Province of Rieti and the Municipality of Cittareale (Rieti). Several animal protection organizations—Animalisti Italiani, Lega Nazionale Difesa del Cane, OIPA, Il Guardiano dell'Ombra, WWF Terni participated in the program—and Guardia Zoofila Ambientale-Circolo Provincia di Frosinone made a veterinary ambulance available for the entire period. A camp equipped with two tensile structures, a mobile veterinary ambulance and a container for postoperative assistance was set up in Cittareale. A total of 9 veterinarians, including 2 from the international association Vier Pfoten, 12 LAV volunteers and a project coordinator were involved in the program. Veterinarians and operators, including LHU veterinarians and managers

of animal health, were selected on the basis of specific competencies on non-epidemic emergencies management.

From 20 February to 5 March and from 10 to 17 March 2017, a total of 222 cats living in the territories of Accumoli, Amatrice, Borbona and Cittareale were included in the program; 217 were sterilized (122 females and 95 males), while 5 of them were found to be already spayed/neutered. Among these, 55 animals (20 males and 35 females) were presented by citizens who took advantage of this opportunity. All of the animals were identified with microchips and tested for Feline Immunodeficiency Virus (FIV) and Feline Leukemia Virus (FeLV). 15 of them were FIV positive while only one was FeLV positive. Free roaming cats were registered in the municipality where they were found and released in their territory. Those that could not be released were registered in the animal protection associations, which cared for them in shelters or listed them for adoption. The Program counted on the precious collaboration of two specialized firemen that was essential for the delicate rescue of animals in the "red zones" and exposed to the risk of further structural collapses. Thanks to this support, 12 cats were rescued in Amatrice and Accumoli, eight of which were returned to the loving care of the families that lost them during the aftershocks. These actions also made it possible to assist cat owners who found themselves in difficult situations after the earthquake, and to improve feline health and welfare by reducing the risk of diseases and sexually transmitted infections. Unfortunately, in these areas there was no culture of animal birth control, probably due to a low social understanding of neutering as a responsible part of cat ownership. Many litters and four/five month old kittens were found, large groups of free cats were unsterilized, just like many family cats. This was verified through direct interviews carried out by volunteers with people in the camps for IDPs and with local citizens who did not leave their homes. Furthermore, starting in August 2017 LAV, in collaboration with the Rieti Municipality and the LHU Veterinary Services of the Province of Rieti, developed a project for the renewal of the municipal health kennel . LAV donated 11 insulated dog houses, to provide dogs with comfortable all-weather outdoor space. This ensured an increase in the number of available places in the health kennel and improved the quality of life of dogs that benefit from the new dog homes and cozy shelters. Training courses were organized to ensure that staff and volunteers working with the animals were sufficiently skilled (Barnard et al., 2014) and to encourage correct interaction with the animals in view of their adoption.

3.1 *IUVENE Contribution to the Veterinary Activities*

The Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale" (IZSAM) is a public health body belonging to the Italian National Health System, which has operated as an OIE Collaborating Centre on Veterinary Training, Epidemiology, Food Safety and Animal Welfare since 2004. As a result of its role in coordinating and managing the veterinary emergency activities during the L'Aquila earthquake in 2009—a disaster that sadly resulted in the loss of 308 lives, and which brought havoc to an extensive area of the Abruzzo region—IZSAM was appointed in 2013 as the National Reference Centre for Urban Hygiene and Non-Epidemic Emergencies (IUVENE). The tasks of the Centre are twofold: firstly, to draw up contingency plans and related operative procedures in relation to non-epidemic emergencies, and to put in place any other useful activity in the field of urban hygiene and non-epidemic emergencies. This involves creating a structured and permanent network of reference persons placed in each Istituto Zooprofilattico Sperimentale. Secondly the Centre supports and assists the Italian Ministry of Health in planning and implementing surveillance, monitoring and controlling programs on stray dog and cat populations, including developing protocols and operating procedures. After 24 August 2016, IUVENE made operational and informative tools available, which were quickly utilized to identify the main needs, and to prioritize and plan specific veterinary interventions in the areas of animal health, welfare, and food safety. A Help Desk was activated at the IZSAM headquarters in Teramo, advertised and managed by IUVENE, enabling citizens to flag any human and animal health problems and needs for veterinary interventions in the affected area. This action prevented the overload of the telephone lines dedicated to managing the emergency, enabled requests for intervention, classified according to priority, and transferal in real time to the personnel operating in the field. A tailor-made information system was updated and adapted to the situation, allowing the Local Veterinary Services of Rieti LHU to plan, prioritize and save information on their activities, and to monitor and verify their effectiveness. In this regard, it was essential to establish the number of cats and dogs present in the area affected by the earthquake. From 1 to 3 September IUVENE staff conducted a census of companion animals which followed owners who has been temporarily displaced, to obtain a holistic picture of the situation. In particular, it was fundamental to evaluate the status of the application of the canine registry, in order to prevent stray dogs and abandonment and to encourage the reunification of the owners with their animals. The census was carried out by administering a specific questionnaire (Table 1) to the persons in charge of the reception areas in 16 camps for IDPs set up in the territory of Amatrice and Accumoli (Table 2). The answers to the questionnaire

were persons subjective. This action was also intended to protect the integrity of the human-animal bond, as a factor of relief and social comfort in what was a very critical moment for the affected community. Information on the health and welfare status of owned and stray animals and on possible problems of coexistence between people and animals were collected.

Data analysis shows that owners prefer to maintain direct contact with their animals, sharing their living space with them as much as possible, even if restricted. All citizens had the right to bring their animals with them into the tent camp. In many cases, when they had a great number of companion animals, it was the owners themselves who decided to keep them out to the camp. In this latter case and when possible, the owners took care of their animals at the home they had remained in or decided to give them in temporary custody. A total of 38 dogs and 4 cats were recorded to be accommodated with their owners (Table 2), while 44 dogs (53.66% of cases) and 5 cats (Table 1, part 1) were kept outside the camps, largely due to difficulties in managing them, or because there were too many (hunting dogs and truffle dogs) to be accommodated in these temporary premises. Animals hosted in camp pens were managed by theirs owners under the control of Veterinary Services and the personnel operating in the camps. In 56.25% of cases the presence of animals was given to the person in charge of the reception area and in 66.6% of cases dog or cat owners asked for the permission to keep their animals (Table 1, part 1). In 75% of cases owners were reported to walk their dogs (Table 1, part 1). All of the owned animals were reported to be in good health and in 93.75% of cases to be in good welfare conditions (Table 1, part 4). Animals were considered in good welfare conditions both on the basis of a previous clinical-veterinary evaluation and on their behavioral status. More precise and detailed welfare parameters were not established in determining how much effort had been made to give priority in helping as many dogs as possible during this emergency situation. The most frequent problem highlighted by the respondents was a lack of dedicated facilities to host animals within the camps. Indeed, pens to host dogs were available only in 12.5% of cases and in all cases were used regularly (Table 1, part 1). Based on the indications of the camp personnel, pens to host animals in the camp were located perimetrically to the tent camps in order have areas for dog walking and to not disturb the public peace at the same time. There were not a significant number of free-roaming cats (25%) and dogs (25%) reported (Table 1, part 5). All free-roaming dogs were found not wearing a collar and their presence was on a regular basis (Table 1, part 5). In only 25% of cases, free-roaming dogs were reported to be sick and malnourished, while the general condition of free-roaming cats resulted mainly good, with a good state of heath in 75% of cases (Table 1, part 5). During the

TABLE 1 Questionnaire administered in 16 camps for IDPs

Date_____

Nr of people housed in the camp

PART A
Operator data

Operator 1

Affiliation

Operator 2

Affiliation

Tent City data (information available in the database)

Municipality

COM

Camp ID Telephone/fax/mail

Location of the camp Sports facility parking area other

Name of the person in charge of the reception area of the camp

Affiliation

Telephone

TABLE 1 Questionnaire administered in 16 camps for IDPs (*cont.*)

PART B

Tent City data (update only the information that does not correspond with the information in the database and reported in the Part A)

Municipality	
COM	
Camp ID	Camp Number
Name of the person in charge of the reception area of the camp	
Affiliation	
Telephone	
Nr of people housed in the camp	
Nr of dogs housed in the camp	
Nr of tents	
Nr of animal housing units	
Nr of cats housed in the camp	
Is the camp fenced?	Yes/ No
Nr of other animals*	

TABLE 1 Questionnaire administered in 16 camps for IDPs (*cont.*)

Location of the camp	urban	peri urban	rural
Is there any census of the animals housed in the camp?	Y/N		
How many dogs are identified and registered?			
How many dogs are NOT identified and registered?			
If present, please acquire the last census			

TODAY INTEGRATIVE CENSUS

Name of the owner	Surname of the owner	Telephone number	Dog/cat description (size, sex)	Microchip	Location (with the owner, kennel/ shelter/ board, animal protection associations, veterinary clinics)

N	Requisite	Y/N/NA	Comments
Part 1: Facilities and Staff			
Staff			
1	Has a contact person been identified for animal related issues?	YES	37.5%
2	The leaflets "Your 4-paws friend" were distributed in the camp?	YES	93.75%
3	The leaflets "Your 4-paws friend" were posted in the camp?	YES	93.75%

TABLE 1 Questionnaire administered in 16 camps for IDPs (*cont.*)

N	Requisite	Y/N/NA	Comments
4	The presence of dogs and cats has been notified to the person in charge of the reception area of the camp? (Indicate the evidence)	YES	56.25%
5	Were other people in the tent city asked for permission to keep the animals?(indicate the evidences)	YES	66.6%
Identification of the areas for temporary housing			
6	Are there pens available for owned dogs? (if yes, indicate how many animals can be housed)	YES	12.5%
7	Are they used regularly? (If yes, indicate who is in charge for the cleaning)	YES	100%
8	Are the dogs walked by their owners?	YES	75%
9	Are there people who hold dogs outside the facility? (if yes, indicate how many people)	YES	53.66%
10	Are there dogs held outside the facility? (If yes, indicate how many dogs)	YES	44 dogs, 5 cats
Part 2: Food Management			
11	Is food stored in closed environments?	YES	100%
12	Are kitchen leftovers given to owned animals?	NO	100%
13	Do people feed their own animals with canteen leftovers?	YES	6.25%
14	Are kitchen leftovers given to stray animals?	NO	100%
15	Do people feed stray animals with canteen leftovers?	NO	100%
Part 3: Food Waste			
16	Is the waste collection area protected?	YES	68.75%
17	Is waste stored in plastic bags and suitable containers?	YES	93.75%
18	Is waste removed regularly and transferred to protected waste collection areas?	YES	93.75%
19	Is waste disposed daily?	YES	87.5%

TABLE 1 Questionnaire administered in 16 camps for IDPs (*cont.*)

N	Requisite	Y/N/NA	Comments
Part 4: Cleaning And Disinfection			
20	Are animal feces removed regularly?	YES	87.5%
21	Are the temporary pens for dogs regularly cleaned and disinfected?	YES	50%
22	Is feces collection material available (brooms and bags)?	YES	25%
23	Do the animals appear in good state of health?	YES	100%
24	Do the animals appear sociable and non-aggressive?	YES	100%
25	Are the animals kept in sufficient welfare conditions?	YES	93.75%
PART 5: STRAY AND FERAL ANIMALS			
26	Are there any free-roaming dogs reported?	YES	25%
27	Is their presence occasional?	YES	0%
28	Is their presence regular?	YES	100%
29	Are they present during daylight?	NA	NA
30	Are they present at night?	NA	NA
31	Are they alone? (If in group, indicate how many)	NA	NA
32	Did they look diseased?	YES	25%
33	Did they look malnourished?	YES	25%
34	Are they aggressive towards humans?	NO	100%
35	Are they aggressive towards other animals?	NO	100%
36	Are they wearing a collar?	NO	100%
37	Have free-roaming cats been reported?	YES	25%
38	Is their presence occasional?	NA	NA
39	Is their presence regular?	NA	NA
40	Are free-roaming cats cared by people hosted in the camp?	NA	NA
41	Do free-roaming cats appear in a good state of health?	YES	75%
42	Cleaning conditions of the areas where animals are kept	Sufficient Insufficient	

TABLE 1 Questionnaire administered in 16 camps for IDPs (*cont.*)

Notes

Critical Issues

Requirement	**Description**

Advice Provided to the Operator

Requirement	**Description**

Compilation date _____/_____/_____
The inspection has been carried out from (a.m./p.m.) to (a.m./p.m.)

Operator 1 Signature:

Operator 2 Signature:

Legend: NA = no answer

The camp manager

_____

TABLE 2 Data recorded in 16 camps for IDPs set up in the territory of Amatrice and Accumoli

Territory	Camps visited	Number of tents	Assisted human population	Assisted animal population	Number of dogs	Number of cats	Dogs assisted outside the camps	Cats assisted outside the camps
Amatrice	12	156	818	71	27	2	37	5
Accumoli	4	44	244	20	11	2	7	0
TOTAL	16	200	1062	91	38	4	44	5

aforementioned period, aggression towards people and other animals was neither severe nor common, since both owned and stray dogs were reported to be unaggressive (100%) (Table 1, parts 4 and 5). Non-aggressive animals were defined as those animals which, in that context, showed no discomfort or aggression towards other people or other animals. A qualitative assessment of the aggressive behavior based on subjective observations was performed by the personnel involved in the questionnaire administration. No answers were provided about the occasional or regular presence of free-roaming cats and if they were cared for by people hosted in the camps. Also, no data were provided on the presence of free-roaming dogs during the daytime or nighttime and if they were seen alone or in groups (Table 1, part 5). Specific personnel dedicated to animal-related issues was found in only 37.5% of cases (Table 1, part 1), and the inability to refer to a single contact point over time was considered one of the main factors that potentially limited the efficiency of the veterinary assistance system. This data revealed a general lack of preparation by the camp personnel with respect to information regarding companion animals. With respect to the management of foodstuffs in the camps' canteens, in 100% of cases food was kept in closed environments, and canteen leftovers were fed to animals by their owners only in 6.25% of cases (Table 1, part 2).Waste management, a particularly critical aspect offering a potential source of food to both stray animals and pests, was found to be a minimal cause for concern, with storage and protection found to be sufficient. The frequency of waste collection was adequate (93.75%) and waste was stored in suitable containers (93.75%) and disposed of on a daily basis (87.5%) (Table 1, part 3). The waste disposal area was deemed protected in 68.75% of cases and kitchen leftovers were never given to owned or stray animals (Table 1, part 2). Temporary pens for dogs

FIGURE 1 Leaflets distributed in the camps

were found to be cleaned and disinfected regularly in 50% of cases (Table 1, part 4). Animal feces were regularly removed in 87.5% of cases, even though brooms and disposable bags were only found in 25% of the inspections (Table 1, part 4). Data collected with the questionnaire were uploaded in the IUVENEinformation system and were made available to the LHU Veterinary Services of the Province of Rieti. In addition, leaflets on how to keep animals in camps for IDPs was provided to citizens during questionnaire administration (Fig. 1), and they were correctly distributed and displayed in 93.75% of cases (Table 1, part 1). This in-field activity enabled the critical points to be identified and prioritized, and the experience gained will be useful to manage similar situations in possible future scenarios.

4 Conclusions

In order to respond effectively during disasters it is important to engage in considerable planning and preparation. This paper has sought to highlight how natural disasters represent a learning experience to better respond to animals' (and their owners') needs in critical times. This experience highlighted how important it is to build a disaster plan and to count on emergency management groups. Plans to mitigate natural disasters should include the preparation and training of human resources in topics related to natural disasters in order to ensure rapid and effective responses and that interventions are carried out safely. At the same time we have learned that is paramount to establish a climate of trust and collaboration with the population, the institutions and the associations. Moreover, the division of the territory into sectors, in order to guarantee an efficient planning of the interventions by the animal rescue teams, turned out to be a good operating choice and recommendable in such situation. The punctual data management as well as timely and accurate reports were also essential for the rationalization of resources and the organization of interventions. Systematic collection and analysis of the data provides invaluable information to governments and agencies responsible for relief and recovery activities. The descriptions of the animals sorted through databases helped reunite the companion animals with their owners in some cases. This represented a psychological support for those who had suffered human and/or material losses and the Veterinary Services, as part of a public health context, will have to consider this aspect in similar situations

The key to effective disaster preparedness and response is the active participation of all relevant individuals and organizations at every level of the community. Greater communication and cooperation among institutions, animal organizations and citizens is particularly valuable in the prevention of and response to the impact of disasters. This multi-sectorial approach means that many actors accept clearly defined responsibilities and the need to coordinate their efforts. Without such involvement and commitment, disaster preparedness and response become fragmented, inefficient and poorly coordinated.

These catastrophic events provided an opportunity to test an integrated emergency management response system in which public and private veterinarians, public health operators, volunteers and the community itself acted alongside the human rescue services to evacuate, take to safety, aid, treat, assist and accommodate dogs and cats, whether owned or strays, that were affected by the disaster. With respect to the stray dogs problem and that of the total census of companion animals, it is necessary to address this unresolved problem in a decisive way. Humane control and management of stray dogs in the

absence of crisis is a critical step toward reducing the welfare risks following disasters. In our opinion, the registration of all pet breeders (who should be the only ones authorized to hold breeding stock) is essential, limiting the trade to only sterilized and identified animals.

The need to help and assist companion animals, both during the emergency and the recovery phase, conveys an important message of respect and makes it clear that animals deserve moral consideration and obligation. During our animal rescue activities we had to cope with difficult ethical choices due to the dangerousness of the location of the feline colonies. Even knowing that the cat is a very territorial animal, in some particular situations we had to look for alternative accommodations to help them.

After the Amatrice and Accumuli earthquake the relationship between companion animals and their owners positively changed. Many cat owners have sensitized and came to understand the importance of cats sterilization and identification by microchip to contain new births, ensure their traceability and counteract the problem of stray cats. At the same time, many feline colonies care-takers understood the importance of feline colonies census, registration and sterilization to protect cats and to avoid continuous new litters destined to be decimating from illnesses or accidents. Also, the local authorities in turn took responsibility for their role with respect to free-roaming pets on the affected territory.

However, much work is still needed for the integration of companion animals into disaster preparedness and emergency management. The development of specific contingency plans and operational procedures remains essential in order to face the challenges of adapting to the continued changes in veterinary public health issues. This includes the full integration of the civil society into the civil protection system, the adoption of new technologies and the implementation of new administrative rules. Following these developments, it will be necessary to define specific training and continuing education activities that include the use of innovative training tools such as e-learning, in order to ensure an adequate level of veterinary assistance and to guarantee the correct functioning of the proposed system.

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