

Proposal for a veterinary presidium to support public authority in responding to catastrophic events in the Italian context

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Summary

The ultimate goal of any disaster response, or a natural or a man-made event, is to get the best outcome for the highest number of people. From a veterinary point of view, the best outcome includes either the protection of animals (conventional and unconventional pets) or the safeguarding the wholesomeness of food supplies in the "One Health" perspective. The evolution of the Italian veterinary role in disaster management has changed across the last 35 years and has grown with the awareness that animals and human beings share the same vulnerability to disasters. The University of Teramo, following its experiences in different disaster scenarios, proposes a veterinary presidium to support Public Authority in responding to catastrophic events in the Italian context, in order to rescue small, large and unconventional animals. The proposed veterinary presidium is made up of 3 skilled people certified to react to different population needs. Indeed we propose different teams to rescue small, large or non-conventional animal, trained to work together in a stress situation and under coordination of the Civil Protection Function 2. This presidium with its 3 different skilled teams under the supervision of the advanced veterinary medical center (AVMC) and by reporting to it will provide the best competences based on the needs of the population and the authorities, in view of the "One Health" perspective.

Introduction

Several geographical, demographic and socio-economic variables make Italy more exposed than other countries to natural, technological or anthropic disasters. Within these scenarios veterinary services might indeed play a fundamental role (Table I).

According to Ministry for Environment, Land and Sea Protection, 9.8% of the Italian territory has a high hydrogeological risk (Ministero dell'Ambiente 2013). According to the seismic classification of the Italian Municipalities updated to 2010, 731 Municipalities are in the high-risk zone, 1,909 in the medium risk zone and at least 2 million people live in areas exposed to volcanic risk (Vesuvius, Campi Flegrei, Etna, Aeolian Islands)¹. With regard to technological risks, at April 30, 2012, 1,152 plants

classified as incident-related risks under the D.Lgs. n. 334 of 1999 were registered (D.Lgs. 334, 1999). Even if in Italy nuclear power reactors are no longer operational, there are plants in France, Switzerland and Slovenia that are less than 200 km away from the national border².

In this environmental context, laws on national risks had already been issued by pre-EU states, especially in relation to seismic risk. Specific actions were implemented by the Veterinary Services after the disasters of Seveso, Chernobyl and Dioxins in the 'Fires land' (Campania), as well as after the floods that struck Liguria, Piedmont, Emilia-Romagna and

¹ <http://www.protezionecivile.gov.it/jcms/it/classificazione.wp>.

² http://www.protezionecivile.gov.it/jcms/it/attivita_nucleare.wp.

Table 1. Description of the different types of disaster (Mantovani et al. 1998b).

Natural disasters	Technological disasters
Earthquake	Leaks and chemical contamination
Flood	Joints of radioactive materials
Avalanches and landslides	Large-scale intoxication
Exceptional snowfall	Explosions
Fires	Massive accidents
Volcanic eruptions	Collapse of dams
Storms and tidal waves	Massive movements of populations and refugees
Hurricanes	
Typhoons	
Massive invasions of wild and / or synanthropic animals	
Drought and famine	

Tuscany, the earthquakes which occurred in Abruzzo and Emilia Romagna and the massive landslides that hit Campania. It was, however, after the earthquake of Campania and Basilicata in November 23, 1980, that it was proved first the importance of the veterinary interventions during emergency. It was the first step towards a modern system of Civil Protection and the practical application of veterinary emergency management (Mantovani et al. 1998a). This pioneering experience has promoted a cultural movement that has led to an increasing attention and preparation of local veterinary services for the response to non-epidemic emergencies. Ministry of Health had established the activities during both the preparatory phase and the intervention one (Circolare Ministero della Salute 1992). In 1998 the Department of Civil Protection has drawn up the guidelines about the management of non-epidemic emergencies, that has been updated in 2002 (D.P.C. 1998). The evolution of non-epidemic emergencies management in Italy is not linked to scientific acquisitions but to socio-cultural factors, legislative production and to the change of the country's institutional framework. This paper proposes, through an excursus on the veterinary approaches in the different Countries, to identify intervention guidelines for the management of animals during natural catastrophe. In some areas of the Italian territory, especially in small isolated areas and in difficult environments, the National Veterinary Services need support to fully guarantee all the required activities, as in the case of the L'Aquila and Central Italy earthquake, in 2009 and 2016, respectively.

From these observations it becomes evident that in the area affected by the disaster a veterinary presidium, coordinated by the Health Function together with the Civil Protection system and/or

local authorities capable to respond to catastrophic events should be established. This presidium could support National Veterinary Services in all the disaster phases: in prediction and in prevention, in disaster preparedness, first answer and in the emergency overcoming.

Veterinary medicine and disaster: guaranteed activities

Animals and humans share the same vulnerability during disaster. Massive deaths of animals due to catastrophic events have led to severe famines in the past centuries. In addition, as a result of natural disasters, an increase in epidemic risks is recognized. Given the huge damage resulting from the disasters, since the last decades of the last century Western countries have developed and organized a civil protection system. It was based on the coordination and integration of the various bodies involved in disaster recovery and on the principles of humanity, neutrality and impartiality, enshrined in the Oslo guidelines (Oslo Guidelines 2007). The organizational models vary according to the political and administrative characteristics in the different countries. For example, in USA the veterinary response to disasters was mainly developed by veterinary associations, in particular by the American Veterinary Medical Association (AVMA). Thanks to the efforts to create a systematic approach to disasters, it was able, in May 1993, to include veterinary services in the National Response Plan for disaster recovery, getting them into the National Disaster Medical System (NDMS) (Lundin 1994). Under the direction of the Department of Agriculture, in 1994 the Veterinary Medical Assistance Teams (VMAT) became operative in the control, treatment and eradication of animal disease outbreaks, evolving in 2007 into National Veterinary Response Team (NVRT) (Wingfield and Palmer 2009). Its responsibilities include assessing the veterinary medical needs of the community, caring for medical treatment and stabilization of animals implementing animal and zoonotic disease surveillance. As official responders to a disaster or emergency³, NVRT should also gather information about hazardous substances and provide technical assistance to assure food safety and water quality, hazard mitigation and care and support of animals. In France, the response to emergencies is articulated in different levels: municipal (mayor), departmental (prefect), zonal (interregional) and central (national). At each level, a veterinarian is in charge of coordinating all activities related to animal

³ http://eeda.cfsph.iastate.edu/11Jan/L_Role/vetrole0080.php?frames=frameless.

health and food hygiene, within the organization of relief efforts. Most of the operational responses are under the responsibility of the Fire Department, which includes both a medical and health service (SSSM) and well-organized veterinary bodies (Vétérinaires Sapeur Pompier, VPS⁴). The fields of action of the VSPs are: prevention and response to technological and biological risks, inspection and control of live animals and foodstuffs of animal origin, veterinary support in recovery operations, training and follow-up of rescue teams with dogs, management of animals and materials for veterinary actions, health and hygiene education, sampling and advice on deceased animals, advice to the Fire Brigade Command about the risks of food and environmental damage during disasters and advice to the Fire Brigade Command about the expected risks and their prevention⁵.

In Italy, the veterinary services fall under the remit of the Ministry of Health. The organization of health services is commissioned to the regional administration and is divided into local health units. In accordance with D.Lgs. 502/1992, the veterinary services, together with the services of Public Hygiene, Food Hygiene and Nutrition and Occupational Medicine, report to the Prevention Department (D.Lgs. 502 1992). The Law 225/1992 established that the Italian Civil Protection (L. 225 1992) and veterinary services, as members of the national health system, are activated in emergency situations by the local Civil Protection authority (L. 225 1992). Nowadays, this law was repealed and replaced by the D.L. 1/2018 in which the Civil Protection code that gives new definition and purpose of the National Civil Protection Service, was introduced. In particular, this law defines the National Civil Protection Service as the system that exercises the civil protection function consisting of the set of skills and activities aimed at protecting life, physical integrity, property settlements, animals and the environment from damage or the danger of damage resulting from natural disasters or from human activity. The response to disasters is managed by coordination centers at municipal, provincial and national level. In each of these centers, all public and private bodies are represented according to their functions. The veterinary activities are coordinated within Function 02 - Health, social and veterinary assistance, at the head of which a first-aid officer is usually placed. However, the flexibility of the system allows organizational structures to be modulated according to need.

⁴ https://www.veterinaire.fr/fileadmin/cru-1616430119/user_upload/documents/profession/code-de-deontologie/1890_CODE_DEONTO-07-04-BD.pdf; <http://www.veterinairespompiers.fr/>.

⁵ http://www.recrut.com/metier/V%C3%A9t%C3%A9rinaire-sapeur-pompier_553.

Although the focus of the veterinary disaster response is the veterinary services of local health authorities, other veterinary institutions may be involved in disaster management, i.e. Istituti Zooprofilattici Sperimentali, Regional Veterinary Offices, local practitioners and groups of experts from other Regions or from other public veterinary institution (i.e. Army, University) as well as non-governative organizations (NGO) that, if coordinated by the veterinary services, could give their support in taking care of the rescued animals, as regulated by the memorandum between Civil Protection Department and the NGOs (Protocollo d'intesa 2018). The veterinary actions that have to be guaranteed during non-epidemic emergencies according to the Italian model are illustrated in Table II.

Veterinary response presidium to catastrophic events: intervention guidelines

In 2016, the World Organisation for Animal Health (OIE) has developed these guidelines for disaster management and risk reduction in relation to animal health, animal welfare and veterinary public health with the goal of strengthening

Table II. Activities provided by the Veterinary Services according to the Italian organization (DPC 1998, Mantovani et al. 1998b).

Natural disasters	
Immediate actions	Subsequent actions
Identification of every possible food resource available and determine if the products are still edible and safe	Restore normal slaughtering activities, meat inspections, milk collection and storage;
Organization of treatment or slaughter of injured animals and identification of those still destined for human consumption	Supply medicines, vaccines, disinfectants and pesticides;
Destruction or containment of carcasses or animal waste	Disinfection of areas and companies at risk;
Providing shelter, food and water to the dispersed animals	Establish epidemiological surveillance;
Control of zoonosis	Evacuate animals from areas at risk (in case of repeatable events)
Pest control	
Food security	
Technological disasters	
Recognize the origins of contaminants at risk	
Remove or shelter animals from polluted areas	
Prevent animals from feeding on contaminated fodder or pasture	
Monitor contaminants in meat, milk and other animal products	
Ensure toxicological surveillance among the animal population	

the capacity of Veterinary Services in Member Countries. The document does not prescribe how Veterinary Services should act, but leaves it to each OIE Member Country to adapt to local needs based on their context. It identifies inter-sectoral and multi-disciplinary approaches as essential principles in disaster management and stresses that the plans of Veterinary Services should be included in the National Disaster Management and Risk Reduction Plans for non-epidemic emergencies, in issues related to climate change (floods, hurricanes, droughts, famines, etc.), earthquakes, nuclear and industrial accidents and accidental or intentional epidemics caused by man (OIE, 2016). The different experiences in Italy and in other countries suggest that the veterinary services should be active in the different phases of a disaster:

- mitigation and prevention; these activities aim at early warning of epidemic and / or environmental risks, monitoring events and defining prevention measures whenever possible:
 - epidemiological surveillance of zoonosis and animal diseases in general;
 - control of the entire chain of meat production, dairy products and other food products of animal origin;
 - environmental epidemiology;
- disaster preparedness:
 - “Local preparedness plan” organised by the Local Veterinary Services as an integral part of the national response system to a catastrophic event;
 - integration of veterinary services in a general prevention plan at different levels (local, regional, national);
 - training of veterinarians and other figures involved in the Civil Protection system (firefighters, volunteers, rescue teams with canine support);
- first respond:
 - advanced veterinary support in the operating areas to ensure assistance to rescuers and save and search animals;
 - advice on the “health” risk of first responders in relation to animals and food of animal origin;
 - animals as psychological support to the survivor;
- recovery-overcoming the emergency:
 - ‘reconstruction’ of routine veterinary assistance and veterinary public health;
 - contribution in verifying the onset of

epidemics or environmental emergencies by monitoring animals, feeding stuff and foodstuffs of animal origin.

The mentioned objectives are in line with the concept of Italian Civil Protection and with the government's desire to integrate veterinary services into the public health system (Leonardi *et al.* 2006, D.P.C. 2001). According to some Authors, these different phases should not be considered in a strictly chronological order but recovery activities, planning and risk assessment could be developed simultaneously but, for a better quality of the interventions following the disaster, preparation and planning of risks and coordination and recovery activities are necessary. In this regard, the Authors suggest the realization of a veterinary presidium for response to catastrophic events that could support the national response system in the preparation and approach to disasters and other emergencies, acting as primary intervention and guaranteeing high quality assistance for all small, non-conventional and large animals with different skilled teams.

In order to optimize actions on the disaster scene, the veterinary presidium must consider a basic operative team composed by a veterinary surgeon (qualified either in small, large or unconventional animal), a veterinary technician and an epidemiologist, trained to work together in situations of strong emotional stress, in a non-permissive environment and in highly critical conditions. The recovery and advisory team for either small, large or unconventional animals is included both in the first phase of rapid response and in the deferred one (about 72 hours after the catastrophic event) and, in the latter case, it appears to support the advanced veterinary medical center (AVMC). The AVMC is a modular self-erecting structure with telescopic opening, easy to identify in the tent field tent and with high internal brightness. The AVMC guarantees treatment, hospitalization of the rescued small and unconventional animals and of those of the guests of the tent emergency area, a diagnostic screening by images (ultrasound) and/or laboratory (blood-biochemical, chemical-physical urine tests), behaving as provided for the 2nd level advanced medical position (AMP). For large animals, paddocks or shelters should be set up to monitor rescued animals pending a second long-term placement, in cooperation and/or coordination the local health units. This presidium will work in symbiosis with the coordination and control line of medical and veterinary area at the municipal, provincial, regional and national level. This model, which in some respects follows the French model, includes, in addition to the Operating Teams, also figures of coordination at the level, in the first instance, of

Function 2 of the Mixed Operating Center (COM). The head of the Health Department is responsible for human health, veterinary and social assistance. It must therefore have a veterinary referent who, based on the knowledge of the livestock heritage of the area involved in the event, will coordinate the interventions carried out by the teams and will request, if necessary, additional personnel, emergency vehicles and equipment. All these professional figures always act under the guidance of the Civil Protection system and/or local authorities in the area struck by the disaster and in complete communion of intents. They should:

- assess the medical and veterinary needs of the affected community;
- provide treatment and stabilization of injured animals;
- implement epidemiological surveillance of animal diseases and zoonoses and assess risks to public health;
- provide technical assistance to ensure the quality of food and water;
- apply measures to reduce of hazards;
- provide care and support for animals, guaranteed by a qualified expert in disaster and emergency response.

It is a modular presidium in which to channel specialized resources with specific skills, as well as ready-to-use emergency facilities in response to critical and emergency medical situations connected to the veterinary emergency.

This disaster veterinary presidium must necessarily meet different needs on the disaster scene and must have:

1. recovery and consulting team for small animals;
2. recovery and consulting team for large animals;
3. recovery and consulting team for unconventional animals.

The current international geopolitical conditions have opened up a new emergency front in which the health security of the migrant population coincides with the public health needs of the host population. In this condition of continuous emergency and persistent epidemic risk, it is necessary to have clear guidelines and tested effective operational plans but also health/veterinary presidia that respond to specific needs of 'self protection' and 'force protection'.

The activities that are set up in an emergency scenario, are carried out by authorities responsible for the response to the territorial emergency and by the health manager of the Function 2 in the coordination centres. However, it should always be considered that every disaster event shows a

biphasic consequential response to the needs of health aid (D.M. 2001), that are:

1. a rapid response, given by the territorial organization on the basis of immediately available local resources;
2. a deferred response, which will be articulated in the hours following the event with the contribution from the outside (D.M. 2001).

Both answers include:

- an alarm phase, during which we will try to acquire all those elements that can be useful to size the event both in terms of quality and quantity. This phase can be preceded by the Attention and Early Warning phases (in this succession) when you are faced with a predictable event;
- an emergency phase in which all the operations necessary for rescue will be carried out (D.M. 2001).

As described above, the AVMC is designed to be used in emergencies that go beyond the possibilities of response of local structures (D.Lgs. 1/2018). This structure must:

- be ready for use as soon as possible after the alarm (3-4 hours);
- be able to treat 50 patients with a red-yellow code within 24 hours and for three days;
- have 72 h of operational autonomy;
- be able to treat at least 50 yellow/red codes per day.

In order to be sure of the suitability of drugs and consumables concerning conservation, validity and price, the supply of the 2nd level AMP is entrusted to a hospital pharmacy identified from every single Region. This choice must take into account the logistic aspects for the good functioning of the AMP, and the territorial and forecast elements of the risks (P.C.M. 2003).

The presidium pursues the following essential tasks that may slightly change depending on the catastrophic scenario: each team skilled either for small, unconventional or large animals rescues animals using the triage system and in shortest possible time, in respect of the "golden hour" rule.

The Veterinary Triage begins by verifying:

- the patient's medical needs
- the available medical resources.

When compared to the emergency triage of human medicine, evaluations and treatment decisions are different, due to the difference between the two medicines. Factors responsible for these differences are:

- the euthanasia option;
- the little margin of evaluation between the favourable and prolonged course of animal patients, considering long-term or permanent disabilities or recourse to intensive care;
- the difficulty of transport for large numbers of animals and some kind of species, as the non-conventional ones;
- limited veterinary medical resources (structures, materials, spare parts, and personnel, varying assistance capacity in the 24 hours);
- recognizing that the care given to animals still depends on the owner's disposable income, the "medical resources" do not only include facilities, materials, spare parts, personnel and time but also money. In a catastrophe, all the animals will receive the first courses, independently of the economic possibility of the owner (Wingfield and Palmer 2009, Wingfield et al. 2009).

This system requires a color code (red, yellow, green, orange, blue and black) that is well coded internationally to recognize the timeliness of the intervention (Wingfield and Palmer 2009, Wingfield et al. 2009):

- admission to the AVMC, feeding and eventual treatment of the animals affected by the catastrophe that need it;
- medical support for SAR K9 dogs, for research and recovery;
- medical screening for each animal that arrives or leaves the disaster site;
- transfer of animals to a safe area;
- control of any euthanasia, in order to guarantee the least possible suffering to the animal;
- removal and disposal of carcasses with the organization of collection points that are easily accessible to the vehicles, taking into account the advisability of not creating excessive difficulties for the road traffic of rescue vehicles;
- capture and identification of wandering animals and consequent control of stray dogs;
- organization of shelters and animal care, as follows:
 - evacuation shelter for animals: animals kept in structures near the reception area of the owners, to facilitate the evacuation and care of them;
 - response shelter: a kennel in which the animals are identified and can be found by their owners;
 - pet friendly shelter: organization in which animals and people are housed together;

- identification of the sources of food supply for the animals remaining available;
- identification of the facilities that remained active and usable. Of particular importance is the availability of places for the shelter of live animals, areas for the collection of carcasses, plants for their destruction (incinerators) and landfills;
- identification of mobile shelter structures (prefabricated, tents) and fencing nets, in order to create a shelter for small animals owned by the displaced within the tent camp;
- control of synanthropic animals;
- control and recovery of unconventional and possibly dangerous animals, e.g. snakes, spiders;
- epidemiological surveillance and possible prophylaxis;
- epidemiological surveillance of transmissible animal diseases, and in particular of zoonoses;
- epidemiological surveillance of toxicity and chemical and radioactive contamination phenomena;
- control of vectors of infectious diseases.

A schematic overview of veterinary interventions based on the type of disaster is resumed in Table III.

To ensure the feasibility of these activities, the recommended equipment of the veterinary teams is as follows:

- vehicles: veterinary teams must also be able to make available refrigerated transport vehicles for any requests that may come from legal institutions following catastrophes;
- orientation systems: local maps, GPS, compass;
- material for sampling and field analysis;

Table III. Schematic overview of veterinary interventions based on the type of disaster.

	Recovery	Evacuation	Rescue	Removal	Safety	Euthanasia
Earthquake	*	*	*	*	*	*
Volcanic eruptions	*	*	*	*	*	*
Avalanches and landslides	*	*	*	*		
Flood	*	*	*	*		
Exceptional weather events	*	*	*	*		
Fires	*	*	*	*		
Nuclear, radiological, biological and/or chemical event	*	*		*	*	*
Humanitarian emergencies	*	*	*	*	*	*

- protective gear, clothing and footwear;
- writing tools;
- work tools;
- media and radio communication;
- lighting;
- disinfection;
- documentation through pictures;
- tools for the capture and euthanasia of animals;
- triage tools, according to law (D.P.C.M. 2007);
- first aid set.

UNITE experiences on disaster scenario

L'Aquila Earthquake - 2009 (Sconza and Paradiso Galatioto 2015)

Following the earthquake that struck L'Aquila on April 6th 2009 at 03.32 am, the Faculty of Veterinary Medicine of Teramo (UNITE) expressed its willingness to the President of the Veterinary Order of L'Aquila, as early as 7 April, and sent some volunteers to Piazza d'Armi for veterinary assistance interventions. Thanks to the availability and collaboration of the Italian Red Cross, Teramo Provincial Committee, in the figure of the President Dr. Valentino Ferrante, on April 14th, the UNITE veterinary tent was activated at the base camp of Piazza d'Armi, clearly visible and integrated into the AMP. As proposed in this work for the AVMA, the tent was equipped with:

- examination tables;
- ultrasound machine;
- surgical basic set;
- cage shelters;
- infusion pumps;
- drug closet;
- equipped laboratory for emergencies including:
 - blood cell counter;
 - blood Chemical and electrolytes analyser;
 - urine test;
 - centrifuge;
- microscope;
- material storage area;
- food storage area.

The tent was active 7 days a week from 8.30 am to 6.00 pm and included the use of veterinary surgeons at UNITE (22 figures), some practitioners

of the L'Aquila, students, veterinary technicians and voluntaries. The reception area of Piazza d'Armi has proved to be an Aquila example of "Pet Friendly Shelter", counting the following population:

- > 2,500 people;
- 46 dogs;
- 21 cats;
- 1 parrot;
- 10 canaries.

During its activity, which ended June 8, 2009, the UNITE tent provided the following services:

- veterinary assistance activities in the L'Aquila area;
- integrated health action in the context of AMP;
- prevention, control and management of the problems inherent to forced human or animal cohabitation:
 - education of the owners (leash, excrement collection, muzzle);
 - health care;
 - behavioral assistance (Dr. Gentile - AQ);
 - zoonosis prevention and control;
- census of all the animals present in the field;
- control of:
 - ticks;
 - fleas;
 - intestinal parasites;
 - rats (deratting);
 - vaccination (Leptospirosis);
- reporting and/or checking of 'dangerous' or problematic animals within the reception area;
- management of 'problematic' or problematic dogs of human/animal cohabitation;
- preparation of external cages for the sheltering of 'problematic' animals;
- reporting of wandering animals;
- reporting to the Coordination of Lost/Abandoned Animals;
- participation in the reunion of animals/owners;
- distribution of food and animal support material (collars, leashes, dog beds, cat litters, carriers/cages, plastic bags for collecting excrements);
- reporting the presence of rats or mice;
- practical training for veterinary medicine students;
- distribution of medicines and health consumables for small and large animals

donated by companies in the veterinary sector to veterinary practitioners of L'Aquila;

- admission and adoption at the Chiareto Teaching Farm (UNITE);
- 'psychological' assistance and support to owners of pets;
- guaranteed zoological assistance for:
 - animals owned by people evacuated in the various tent camps;
 - animals left near home with evacuated owners;
 - stray or lost animals;
 - reference center for all other veterinary care facilities.

From April 14th to June 8th, the report of the zooiatric activity carried out on small animals counted the assistance of about 1,200 animals, with transport and hospitalization of 78 subjects at UNITE. This activity was daily reported to Civil Protection - Veterinary Crisis Unit in order to monitor medical and veterinary actions.

Abruzzo exceptional snowfall - 2017

In January 2017, the Abruzzo region was hit by several weeks of heavy snowfall and earthquakes. This disaster combination has caused several deaths in people and a lot of damages to livestock and their farms.

UNITE was called to the authorities working table as integral part of the command group and has made available 15 vets and vehicles in order to give practical support to the local public health veterinary service.

In particular, these vet teams coordinated by the civil protection authorities and local public health veterinary service was sent to the territory, in order to:

- search animal stuck in the rubble;
- check their health status and eventually perform euthanasia;
- verify and complete damages check lists;
- make a detailed census of live animals and of those which died because of snowfall and/or provide a list of the damages caused by the earthquakes to their farmstead;
- report local livestock needs to the authorities.

In this contest, the UNITE vets collaborate with other teams to guarantee population support.

Conclusions

From the historical excursus of the Veterinary Medicine on emergencies and from the UNITE field experiences it emerges that, as for the human medicine, even veterinary medicine should consider these 4 general principles:

1. Mitigation phase: mitigation is the most cost-efficient method for reducing the impact of hazards. A precursor activity to mitigation is the identification of risk;
2. Preparedness phase: this phase is a continuous cycle of planning, organizing, training, equipping, exercising, evaluation, and improvement activities that allows the Nation to ensure effective coordination and the enhancement of capabilities to prevent, protect against, respond to, recover from, and mitigate against disaster events. It includes resources identification, development of a local emergency plan, exercises (round tables and practical exercises), database of animals identification and emergency teams at the local level;
3. Response phase: it occurs during an emergency and includes the mobilization of the identified emergency staff, including first responders, to a disaster. Response procedures should be pre-determined by the university and hospital, and are detailed in disaster plans during the Preparedness phase;
4. Recovery phase: this phase comprises the actions taken to return to the 'status quo'. The recovery phase occurs after an emergency is over. Typically, this involves rebuilding and making sure that the business have the possibility to be restored.

Veterinary plans to respond to disasters must be locally organized according to the attitudes and vocations of the territory but must never neglect the basic needs of the animals (Wingfield 2015):

- rapid assessment of needs;
- animal shelter;
- animal evacuation and transport;
- control and capture of animals;
- animal-owner reunification;
- research and recovery of animals;
- admission to the site and feed the animals;
- critical infrastructure support;
- veterinary assistance;
- animal decontamination;
- management of wild animals;
- management of unconventional animals;
- management of animal mortality.

The significantly negative impact on the communities affected by disasters due to the absence of a veterinary plan is supported by an extensive bibliography (Heath *et al.* 2001, Levy *et al.* 2011, Zottarelli and Bronken 2010, Hunt *et al.* 2008, Ivers and Ryan 2006, Ketai *et al.* 2006, Wang *et al.* 2010, Garde *et al.* 2013a, Garde *et al.* 2013b, Pasquali *et al.* 2006, Garde *et al.* 2013c), few legislative acts (L.R. Emilia-Romagna 1 2005) indicate that veterinary activity must be guaranteed within 24 hours of the disaster.

From this work, emerges that a first-respond

intervention must be guaranteed from the first hours, especially as first aid teams, previously organized, prepared and trained. In particular, trained professional figures able to work with unconventional pet must be involved in the disaster support (Quarta and Leonardi 2015). These first aid teams can contribute to multidisciplinary collaboration (Busani *et al.* 2006, Calicchia *et al.* 1992), and to the integration between the various 'knowledge' to pursue a single final purpose: the reduction of the damage caused by disasters in view of the uniqueness of public health.

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