

Original Research

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World Organisation for Animal Health Members' Capacity to Deal With Animal Welfare Emergencies During Natural Disasters in Europe

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Abstract

Objective: Little is known about individual European countries or regional capacity to respond to animal welfare emergencies during natural disasters; therefore, it is important to establish baseline information (eg, types of disasters, training) to enable more focused and data-driven actionable support for future disasters.

Methods: A 55-question survey was distributed by an email link to the 53 World Organisation for Animal Health (WOAH) European Region Members plus 1 observer country.

Results: Forty-nine countries (91%, n = 54) responded to the survey. Fifty-one percent (25/49) indicated they incorporated animal welfare into their national disaster regulatory framework, whereas 59% (29/49) indicated animal welfare was incorporated in the Veterinary Service National Disaster Management and Risk Reduction Plan. Thirty-nine percent (19/49) indicated they had “no” or “limited” legal authority to manage animal emergencies in natural disasters. Floods, forest fires, and snowstorm/extreme cold were the 3 most commonly reported disasters over the last 10 years with 79% (27/34) reporting Veterinary Services was involved in managing these disasters.

Conclusion: The survey results indicated a wide range in the capacity of WOA European Member Countries to respond to animal welfare in natural disasters, highlighting the gaps and potential areas of improvement in this arena.

Disasters have had significant impacts on human health along with animal health, economies, trade, environment, and societies, which have resulted in animals and animal-related issues becoming an increasingly important part of disaster management and risk reduction planning. The United Nations Office for Disaster Risk Reduction Annual Report 2019¹ estimated the global economic losses from natural hazards at US \$232 billion in 2019, highlighting the animal component of disasters by citing Australia's October 2019 to March 2020 bushfires that killed an estimated 1.25 billion animals. In recognizing the critical importance of resilience in agriculture, the Food and Agriculture Organization of the United Nations (FAO) analyzed the post-disaster needs assessments undertaken in the aftermath of medium-to-large-scale disasters in Africa, Asia, and Latin America over the decade from 2003–2013. Livestock were the second most affected subsector after crops, accounting for US \$11 billion, or 36% of all damage and losses.² In 2021, the Center for Research on the Epidemiology of Disasters (CRED) reported a total of US \$40 billion in economic costs caused by the 2012 Germany flood.³

World Organisation for Animal Health (WOAH), founded as The Office International des Epizooties (OIE), has maintained its basic mission of “protecting animals, preserving our future” since its founding in 1924. It is the primary international agency addressing animal and animal-related issues. Both the government and the public have the expectation that the national Veterinary Services of each country will be prepared for and able to respond to a wide range of disaster scenarios, at the regional, national, and local levels while addressing animal welfare concerns. The focus on animal welfare has multiple benefits, including the promotion of the physical and behavioral health of animals; supporting the humane values of compassion and caring across stakeholder domains; safeguarding the physical health of human survivors and responders; supporting disaster response effectiveness; supporting effective recovery on a physical, social, economic, environmental, and emotional basis; and maintaining public confidence and support of the government.⁴

Additionally, animal health is inextricably linked with human health under the One Health umbrella. In disasters, there are many links between the two components. Protecting the safety

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of food throughout the food chain and encouraging evacuation of people by providing for evacuation and sheltering of companion animals are just 2 examples. Animal welfare in disasters has multiple aspects that impact the public as well as the government entities responding. Scientific and ethical reasoning should be incorporated in a One Health perspective into disaster preparedness and management strategies, to address the challenges posed to people, animals, and the environment⁵ by natural or man-made catastrophic events. The coronavirus disease (COVID-19) pandemic has affected animal welfare in unexpected ways.⁶ Examples include the depopulation of mink in infected farms in Europe⁷ and the culling of animals on farms due to lack of humane slaughter capacity with sick personnel unable to work.⁸

According to the international Sendai Framework for Disaster Risk Reduction, the result of the United Nations sponsored conference on disaster risk reduction (2015/2030), countries should enhance their disaster preparedness and recovery efforts, strengthen governance, and invest in disaster risk reduction measures aiming at strengthening and promoting collaboration and capacity-building for the protection of productive assets, including livestock and working animals.⁹ In 2014, the WOAAH established an *ad hoc* group focusing on veterinary emergencies. This *ad hoc* group developed the first WOAAH guidelines on disaster preparedness and response, the OIE Guidelines on Disaster Management and Risk Reduction in relation to Animal Health, and Welfare and Veterinary Public Health.¹⁰ Since 2014, the OIE Platform on Animal Welfare for Europe (<https://awp.oie.int>) has been assisting the 53 WOAAH Country Members from the European region, with a particular focus on Eastern European countries, to progressively improve compliance with WOAAH intergovernmental standards on animal welfare. WOAAH has subsequently established an *ad hoc* committee on Veterinary Emergencies and has published 2 additional guidelines for National Veterinary Services, the Investigation of Suspicious Biological Events,¹¹ and Disaster Simulation Exercises¹² to be used for the implementation of disaster management and disaster risk reduction programs. WOAAH also recently adopted a technical item, “WOAH, Veterinary Services and Aquatic Animal Health Services Engagement in Global, Regional, and National Animal Emergency Management Systems” at the 2022 89th General Assembly in Paris.¹³ This technical item included a comprehensive review of the animal emergency activities and programs as well as a pathway to strengthen national Veterinary Services capabilities in the disaster preparedness and response arena.

The 2017–2019 WOAAH Platform on Animal Welfare for Europe’s second action plan included the welfare of animals in disasters among its priority topics with a 3-year pilot project launched in 2018 to promote knowledge transfer and capacity building in veterinary emergency management. The first 2 workshops consisted of groups working on exercises designed to help participants draft contingency plans to address animal welfare emergencies during floods, how they should be structured, which organizations and agencies should be involved, and what activities and management processes should be implemented to approach, handle, and assist livestock and companion and wild animals affected by natural disasters.¹⁴ The project was concluded in 2021 with the organization of an online tabletop simulation exercise where participants were asked to identify gaps, propose elements for improvements of the model contingency plans developed over time, and how to embed lessons learned during earlier emergencies when revising protocols and operating procedures employed in managing catastrophic events.

Based upon WOAAH experiences and the expertise of the authors, this survey was developed to answer the question of how prepared the European Region WOAAH Veterinary Services in Member Countries are to effectively respond to animal welfare issues in natural disasters. Specifically, the survey sought to determine and quantify the level of capacity of WOAAH Members to respond to natural disasters in general and animal welfare by (1) determining the types of disasters encountered over time; (2) categorizing the Member’s level of education, training, and exercising; and (3) identifying gaps in capacity and specific needs of WOAAH Members. This project hopes to provide detailed information on specific member countries and general information on the European region to develop data-driven actionable activities to support and strengthen member countries disaster management capabilities. The information and data presented in this paper will be used in combination with the results of previous workshops and the outcomes of an ongoing regional needs assessment exercise focusing on Veterinary Services preparedness and capacity levels to develop new initiatives in this area within the context of the 2021–2023 Action Plan of the OIE Platform on Animal Welfare for Europe.¹⁵

Methods

A web-based Qualtrics® XM (Qualtrics, Provo, UT) survey on Animal Welfare in Natural Disasters was developed by Lincoln Memorial University College of Veterinary Medicine (LMU-CVM) in conjunction with the WOAAH Platform on Animal Welfare for Europe. For the purposes of this survey, animal welfare was defined as “the physical and mental state of an animal in relation to the conditions in which it lives and dies,” as stated in WOAAH Terrestrial Animal Health Code.¹⁶ Questions included an agreement to participate (N = 2); country representative and position (N = 3); animal welfare incorporation into disaster planning (N = 7); Veterinary Services capacities (N = 15); familiarity and use of international guidelines and standards (N = 3); disaster types and scope (N = 15); compensation for producer losses (N = 3); disaster organization, needs, technology (N = 6); and a free-text comments section at the end. The survey responses included drop-down lists of likely responses, Likert scales, and free-text entries. The full list of questions is included as supplemental material (S1).

The 55-question survey, which included an introduction as well as a definition of natural disasters, was distributed by an email link to a point of contact provided by WOAAH for each European Member Country plus 1 observer member. The respondents were advised that the survey was voluntary, and the responding individual could quit taking the survey at any point. WOAAH respects the anonymity of the responses provided by member countries.

The survey was open for 5 months (September 2021–January 2022) with an initial email followed by general reminders and specific follow-up requests to points of contact to complete the survey. Due to the sensitivity of individual member countries’ disaster preparedness and response capabilities and gaps, only aggregate data are presented. No statistical analysis was performed as the survey was designed to collect basic information related to preparedness, and many of the questions allowed respondents to select “All that apply,” which violates the assumption of independence needed to perform many statistical tests. There was no external funding for this project and no conflicts of interest. The Lincoln Memorial University Institutional Review Board determined there was no personal information collected that would be published; therefore, no additional ethics review was required.

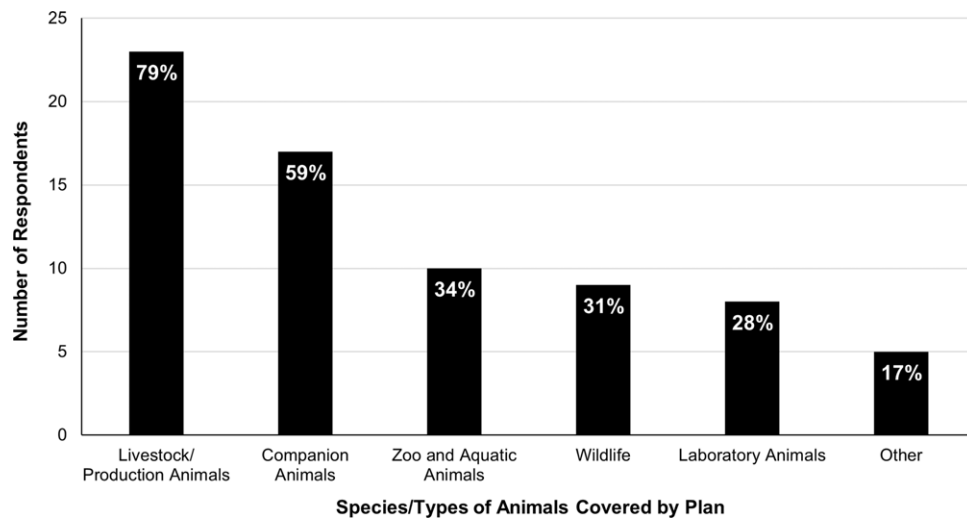


Figure 1. Species/types of animals covered by National Disaster Risk Reduction and Management Plan. Number of respondents and percentages reflect answers provided by the 29 member countries that included animal welfare in their plans. Three countries indicated that “Other” included all species. Respondents were allowed to select “All that apply.”

Results

The survey was completed by 49 out of 54 invited member countries for an overall response rate of 91%. The responses are mainly broken down according to the different question sections.

Animal Welfare in Disaster Planning

Almost half (24/49) of the member countries responding did not have animal welfare in disaster events incorporated into national, regional, and local regulatory frameworks, but 88% (43/49) did have a Competent Authority. The Competent Authority has the responsibility and competence for ensuring or supervising the implementation of animal health and welfare measures, international veterinary certification, and other standards and recommendations in the WOAHA *Terrestrial Animal Health Code* and *Aquatic Animal Health Code* in the whole territory with responsibility for animals in disasters.^{16,17} The Competent Authority was varied among the respondents and included Veterinary Services and/or food ministry/agency, civil protection/emergency services ranking, followed by a range of other varied entities. In a follow-up question for only member countries where the Competent Authority was not the Veterinary Services, the level of collaboration between the named Competent Authority and Veterinary Services was ranked at a mean of 5.5 on a 1–10 Likert scale with 1 being the lowest level of collaboration and 10 being the highest level.

Almost 60% (29/49) of the member countries reported having animal welfare in their Veterinary Service National Disaster Management and Risk Reduction Plan, which is slightly higher than responses given for overall national regulatory frameworks (25/49, 51%). These plans covered a range of species, including livestock/production animals and companion animals (Figure 1). Several respondents listed in the comments section that “All species” were covered in their plans.

Natural Disaster Experience

Many of the member countries (34/49, 69%) indicated having experience with a variety of natural disasters within the last 10 years, including floods and extreme weather events (Figure 2). The majority of the member countries reporting a natural disaster event

(27/34, 79%) declared that Veterinary Services at the national, regional, or local level were involved in the management of the disaster and that animal welfare was incorporated into the disaster response (21/27, 78%). Despite the number of member countries experiencing natural disasters and the number of member countries involving Veterinary Services in events, less than one-third (16/49) indicated that natural disasters were included in Veterinary Services specific contingency plans.

The self-reported effectiveness of the animal welfare response was rated at a mean of 7.39 on a Likert scale of 1–10 with 1 being the lowest level, or least effective, and 10 being the highest level, or most effective. Respondents indicated that After-Action Reports or a Lessons Learned analysis to help establish best practices was compiled in many of the disaster events (11/20, 55%) with 7 of the respondents indicating the documents were not publicly available.

Veterinary Services Operations, Training, and Exercising for Natural Disasters

Twenty-two (N = 47, 47%) of the member countries reported having at least partial standard operating procedures (SOP) to prepare and respond to animal welfare tasks in natural disasters. Multiple respondents (36/49, 73%) indicated that Veterinary Services did not train for animal welfare emergencies in natural disasters and or conduct any simulation exercises (42/49, 86%); however, those reporting training had a high percentage (10/13, 77%) of joint training with other organizations. Joint training was conducted with a variety of governmental organizations and non-governmental organizations, including veterinary clinics, hospital services, and defense agencies. Most respondents (41/49, 84%) also reported having well-established contacts with organizations that could be of assistance in managing animal emergencies in a natural disaster situation as well as having a system in place to facilitate coordination between all responders and aid in the management of resources during a natural disaster response (31/49, 63%). Forty-one (84%) member countries reported having well-established contacts that Veterinary Services could access to aid in managing natural disasters. The top 3 categories for assistance included expertise in carcass disposal, expertise in disaster management, and expertise in welfare and care of companion animals (Table 1).

Table 1. Types of assistance in managing a natural disaster that could be provided by Veterinary Services well-established contacts

Types of assistance provided by Veterinary Services contacts	Number responding (n = 41)*	Percentage reporting
Expertise in carcass disposal	26	63%
Expertise in disaster management	25	61%
Expertise in welfare and care of companion animals (eg, dogs, cats)	25	61%
Access to emergency shelters for companion animals (eg, dogs, cats)	23	56%
Access to vehicles suitable for animal transport on roads	22	54%
Expertise in welfare and care of food-producing animals (eg, cattle, pigs, poultry)	21	51%
Field equipment suitable for culling food-producing animals	20	49%
Systems for emergency feeding of displaced animals	19	46%
Data on and traceability of companion animals, including equids	19	46%
Plans/agreements on how to coordinate their actions with Veterinary Services in an emergency	19	46%
Expertise in welfare and care of equids	17	41%
Expertise in humane euthanasia	16	39%
Expertise in welfare and care of wildlife and zoo animals	13	32%
Systems for milking displaced dairy cows, goats, sheep	13	32%
Access to emergency shelter for equids	12	29%
Data and traceability of genetically valuable food-producing animals	12	29%
Access to emergency shelters for other small ruminants	11	27%
Access to means for air-lifting animals	10	24%
Access to vehicles suitable for animal transport on water	8	20%

*Responses provided by the 41 (84%) member countries that indicated “yes” to question asking whether Veterinary Services have well-established contacts with any organizations that would/could be of assistance in managing a natural disaster situation. Respondents were allowed to select “All that apply.”

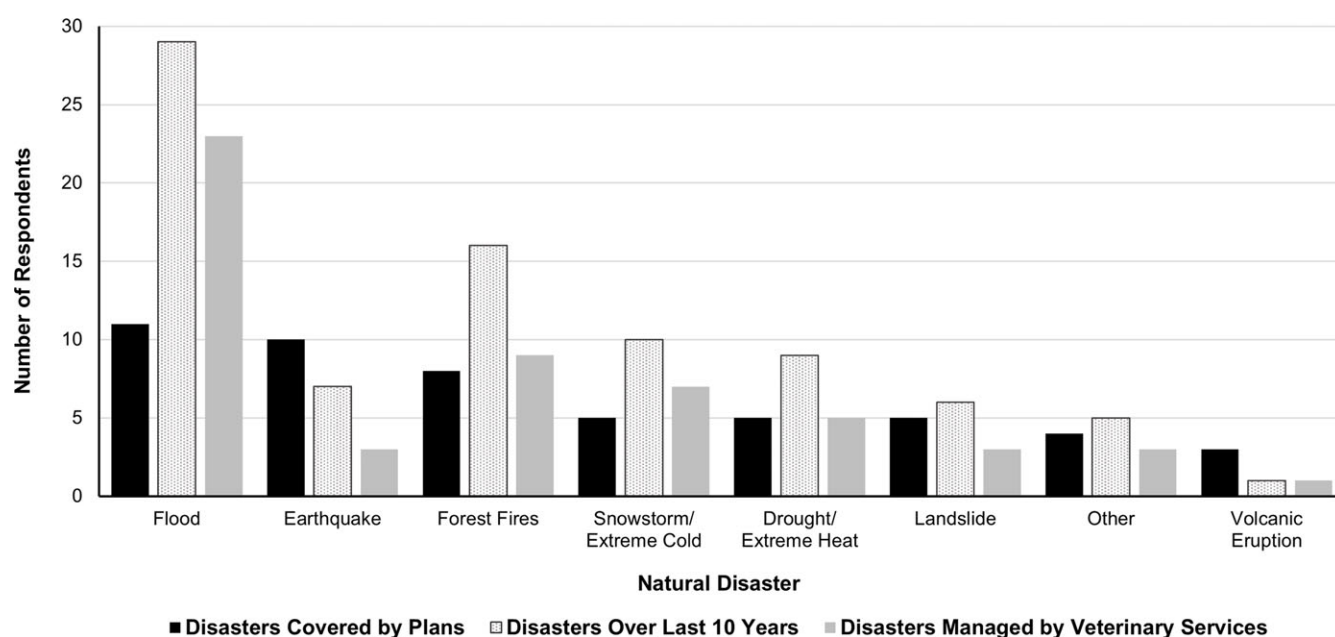


Figure 2. Bar chart displaying number of respondents' answers to 3 separate questions regarding natural disasters. Respondents were asked 3 separate questions about disasters and were allowed to select “All that apply” for each question. “N” reflects total number of respondents by disaster for each question: (1) types of disasters covered by Veterinary Services and their specific contingency plans (N = 16/49, “Disasters Covered by Plans”) with 16 identifying having specific contingency plans for natural disasters; (2) types of disasters encountered over the last 10 years (N = 34/49, “Disasters Over Last 10 Years”); and (3) types of disasters that Veterinary Services got involved with managing (N = 27/49, “Disasters Managed by Veterinary Services”).

To date, there are multiple international guidelines for disasters. Member countries were asked questions regarding both awareness and the incorporation of guidelines into operational planning, training, or exercises. The OIE Guidelines for Disaster Management

and Risk Reduction in Relation to Animal Health and Welfare and Veterinary Public Health was listed the most for awareness followed by the OIE Guidelines for Simulation Exercises (Figure 3).^{10,12} The Livestock Emergency Guideline Standards and United Nations Food

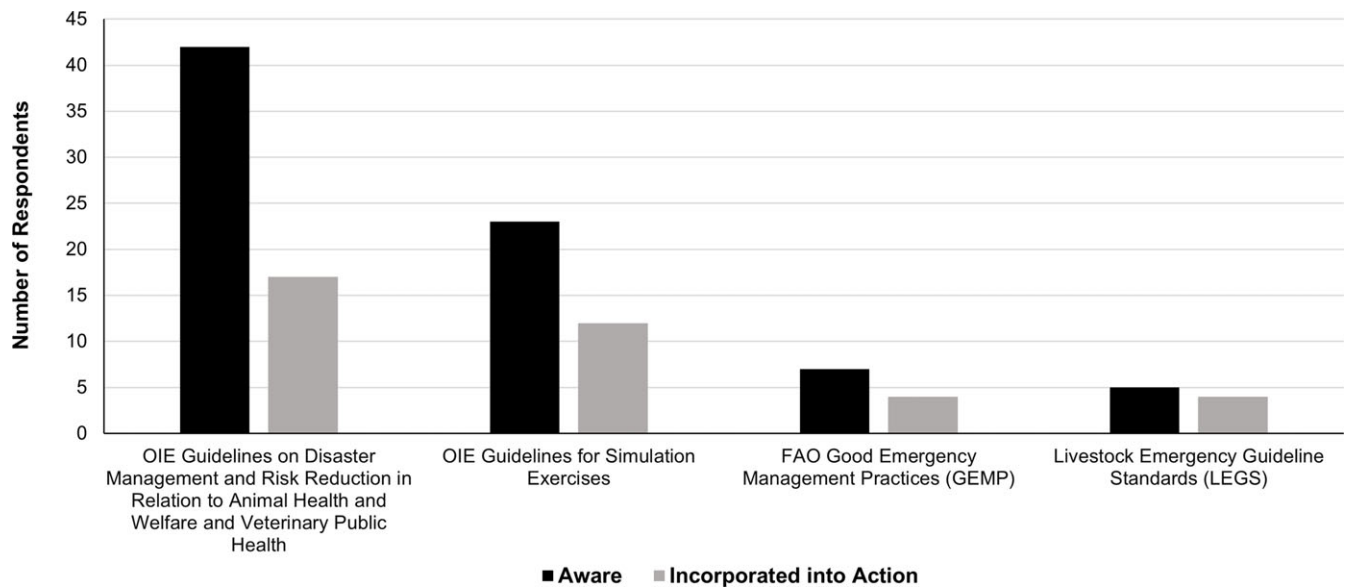


Figure 3. Respondents’ answers regarding awareness and incorporation of international guidelines on animal welfare. Survey asked participants 2 questions regarding awareness of 4 international guidelines pertaining to animal welfare and natural disasters (Aware) as well as which ones were incorporated into animal welfare and natural disaster operational planning, training, and exercises (Incorporated into Action).

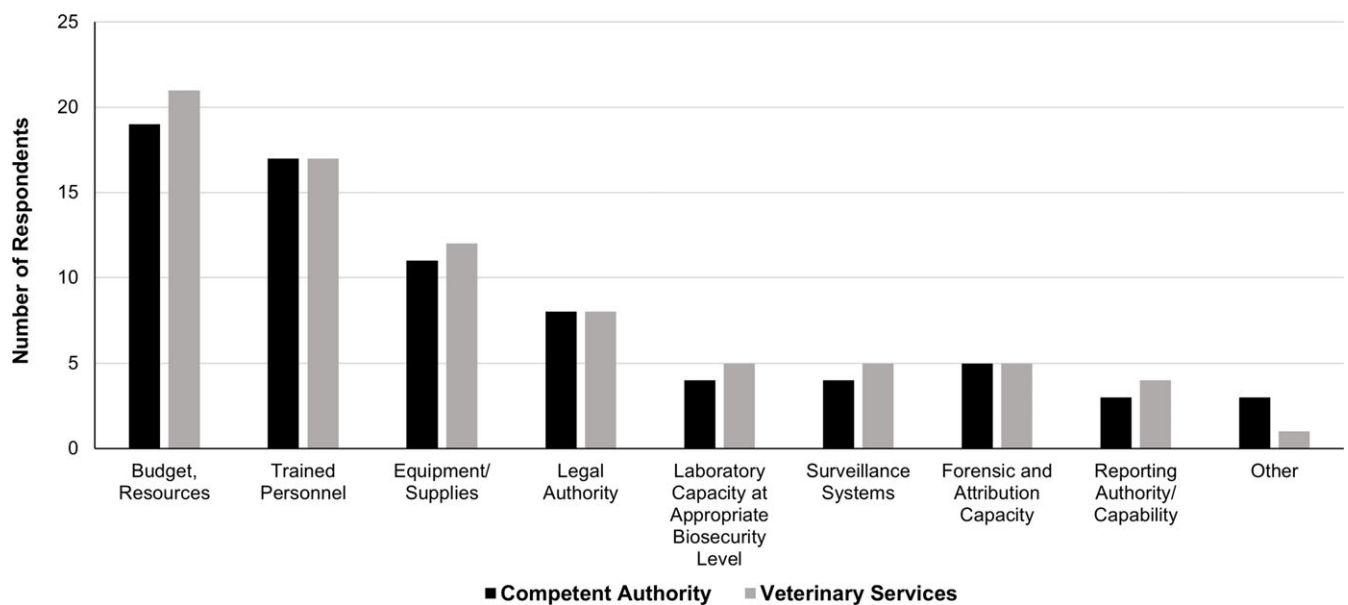


Figure 4. Gaps/shortages identified by respondents in management of disasters by the Competent Authority. Gaps and shortages reported by the 29 (59%) member countries that thought the Competent Authority did not have sufficient capacity to respond to animal welfare emergencies during natural disasters and the 26 (53%) member countries that indicated that Veterinary Services did not have sufficient capacity to respond to animal welfare emergencies during natural disasters. Respondents were allowed to select “All that apply.”

and Agriculture Organization Good Emergency Management Practices were not widely known by respondents.^{18,19} None of the guidelines had widespread usage by member countries.

Capacity and Gaps for Natural Disaster Response

Separate questions asked the member countries whether Veterinary Services and the Competent Authority had sufficient capacity to respond to animal welfare emergencies during natural disasters. A slightly lower number (26/49, 53%) responded that Veterinary Services had insufficient capacity compared to that of the Competent Authority (29/49, 59%), but similar gaps and

shortcomings in response capabilities were identified in both groups (Figure 4). The categories “Budget, Resources”; “Trained Personnel”; and “Equipment/Supplies” had the highest number of responses, whereas “Reporting Authority/Capability” had one of the lowest number of responses.

Responsibility and Funding in Natural Disasters

The tasks and responsibilities for Veterinary Services in the management of disasters were in order of responses: (1) carcass disposal (N = 35); (2) euthanasia (N = 31); (3) decontamination (N = 30); (4) treatment (N = 29); (5) transport (N = 16); (6)

Table 2. Actions or activities that could be taken by the OIE Platform on Animal Welfare for Europe to plan and respond to animal health and welfare

Actions or activities by OIE Platform on Animal Welfare for Europe that could assist with planning and responding to animal health and welfare in natural disasters	Number responding (n = 34)*	Percentage responding
Training courses	29	85%
Provide animal disaster simulation exercises	21	62%
Provide guidance through standards in the Terrestrial Code	20	59%
Develop online training programs on the management of animal welfare emergencies during natural disasters	20	59%
Develop regional workshop/programs on the management of animal welfare emergencies during natural disasters	17	50%
Visit countries with experience and well-functioning systems on the management of animal welfare emergencies during natural disasters	16	47%
Disaster management experts brought to your country for exchange of views and experiences	15	44%
Provide animal disaster planning and simulation exercise templates and examples	14	41%
Facilitate mutual support agreements between countries in the event of natural disasters	12	35%
Provide animal disaster planning assistance teams	8	24%
Support expanding OIE Collaboration Centres on the management of animal welfare emergencies during natural disasters	8	24%
Recommend embedding animal disasters and assessment into PVS*	7	21%
Promote the development of twinning projects under PVS**	7	21%
Provide after-action templates and development training	7	21%
Convene an OIE European Summit on the management of animal welfare emergencies during natural disasters	6	18%
Provide assistance for drafting specific legislation	5	15%
Facilitate incorporation of disaster management into veterinary curriculum	5	15%

*Actions or activities indicated by 34 member countries (69%). Respondents were allowed to select "All that apply."; **PVS, WOAHP Performance of Veterinary Services Pathway assessment tool.

sheltering (N = 16); and (7) other (N = 7). Respondents were allowed to select "All that apply" and listed *coordination, feed, and repopulation* as some of the "other" tasks.

Several questions were asked to gain information regarding financial aspects of natural disaster response. When asked about the source of funding for the emergency, respondents listed *government funding, private entities, or insurance* in their free-text answers. Most of the respondents (37/49, 76%) reported that farmers and other food business operators can receive compensation from the state budget for losses and/or costs related to natural disasters. Compensation for the commercial value of animals (28/37, 76%) was the most common type of loss compensated, followed by carcass disposal (18/37, 49%) and permanent structure repair or replacement (12/37, 32%). Only 11 (N = 49, 22%) member countries selected "yes" when asked whether operators were obligated to have insurance for losses incurred by natural disasters, and 2 member countries said insurance companies with such products existed.

WOAH Platform on Animal Welfare for Europe Assistance for Disaster Management

Many member countries (34/49, 69%) felt that there were actions or activities by the WOAHP Platform on Animal Welfare for Europe that would assist the Competent Authority or the delegated body in their country/territory to plan and respond to animal health and welfare in natural disasters. Many of the top answers pertained to training in some form (Table 2). "Including disaster medicine in veterinary curriculum" and "drafting specific legislation" had the lowest number of responses.

Discussion

The high response rate to the survey reflects the interest among the WOAHP European Region Members regarding this subject. The

overall survey results identified both specific country capabilities and gaps as well as regional trends. This information will be used by the WOAHP Platform on Animal Welfare for Europe to develop data-driven actions to strengthen Member Countries Veterinary Services capacity for disaster preparedness and response. The results highlight the potential for governmental, intergovernmental, donor organizations, and others to support these activities.

The responses demonstrate that many national Veterinary Services as well as Competent Authorities have major gaps in their planning and preparedness in responding to animal welfare emergencies in natural disasters. Part of the lack of incorporation may be due to many of the Competent Authorities and Veterinary Services lacking the legal authority or regulatory responsibility for response in these events. One respondent wrote, *We have no clear legal obligations regarding animal welfare in disaster management.* In addition, there were significant shortages or gaps reported in disaster operation, budget, training, exercising, and other areas.

The respondents indicated multiple areas where the WOAHP Platform on Animal Welfare for Europe could assist in strengthening their capacity to respond to natural disasters (see Table 2). Many of these are ongoing or part of future activities. For example, WOAHP has initiated the development of on-line training for veterinary emergencies as part of the WOAHP Competence-based Training Platform as 1 of the 16 competency packages.²⁰ WOAHP delivered a multinational simulation exercise in 2023 in collaboration with FAO and The International Criminal Police Organization (INTERPOL) with a biological threat focus. Veterinary Services can also benefit from other training opportunities such as the World Animal Protection (WAP) initiated Veterinary Emergency Response Unit training for veterinary students that has been delivered in multiple countries.²¹ WOAHP has delivered workshops to develop contingency plans and SOP that was piloted with 10 Balkan countries followed by a simulation exercise.¹⁴ This type of program can be

tailored to the needs of the European Member Countries as well as other member countries.

Many Veterinary Services indicated they had well-established contact with multiple organizations that could provide a wide range of support. This reflects a whole of society focus as well as One Health interaction. The range of assistance available from well-established contacts provides an opportunity to create or expand the capability of Veterinary Services to respond to animal welfare emergencies (see Table 1). There are numerous organizations such as the International Fund for Animal Welfare (IFAW), Four Paws, and World Animal Protection (WAP) as well as local and national animal-focused groups that have experience and resources to support and supplement Veterinary Services in disaster preparedness and response. Examples of the types of responses these organizations can provide and case studies to provide lessons learned are well documented in multiple resources, including the books, *Animal Management and Welfare in Natural Disasters* and *Animals in Disasters*.^{22,23}

One example of collaboration is the response required for transboundary disease control. The tasks that Veterinary Services complete on a routine basis are widely varied. At least 3 of these (euthanasia, carcass disposal, and protection of responders' health safety and welfare) may be outside of daily non-emergency operations and deserve special attention. Euthanasia of animals may be required, and this must be considered from not only the legal and moral obligations to perform this correctly, but also to consider the health, safety, and welfare (including mental health) of those involved.²⁴ Carcass disposal is a complex issue that crosses multiple authority lines. National and local laws must be followed, the environmental and public perception issues must be properly addressed, special equipment may be required, training personnel on policy and procedures is required, and pre-established contracting for work may be necessary. Some of these same considerations would also apply with decontamination tasks.

One member country wrote, *According to the level of the natural disaster we could face on it, but if we are talking about a huge disaster, we are a tiny country with limited resources*. This would be an area in which WOAHEurope could assist in crafting and executing mutual aid agreements and provide training on the process of requesting help through the European Civil Protection and Humanitarian Aid Operations, Emergency Response Coordination Centre (ERCC) or North Atlantic Treaty Organization Euro-Atlantic Disaster Response Coordination Centre. The assistance areas identified could cover a wide range of these required tasks (see Table 1).

There are multiple resources for Veterinary Services to draw upon in framing and developing their own plans. One example is the in-depth study done in relation to the Australian animals in disasters assessment.²⁵ In the Australian assessment, there were 16 recommendations, 3 of which stand out as critical for Veterinary Services. The first recommendation highlighted was to acknowledge the impact of the human-animal bond on owner decision making and behavior in emergencies. It is important to develop and deliver effective risk communications, as individuals will often refuse to evacuate a dangerous area if they are not confident their animals will be cared for. Additionally, owners may try to enter a danger or restricted area to rescue animals, putting themselves and responders at risk. The second recommendation was to promote a consistent and optimized approach to disaster planning. Consultation with animal welfare organizations and other stakeholders should be guided by a centralized or coordinated source and a common set of best available resources. Engaging

stakeholders in the planning process will help build trust, identify personnel and material resources that can be provided by other entities, and develop risk mitigation and response strategies. Finally, the third recommendation that could be incorporated by Veterinary Services was to support consistent integration of animal-related issues in disaster planning. The plan for animal disasters should emphasize the need to maintain knowledge of emergency systems and resources available to support animal welfare in disasters, which is extremely important for planners and responders to know. Often, responders do not know the response processes and authorities, resources available, and/or how to request them. The roles and responsibilities are often not clearly understood. These issues can lead to delays or failure in effective response.

Limitations

Various limitations, several of which pertained to the survey itself, were encountered during the completion of the project. The survey was written in English, the working language for the WOAHE Platform on Animal Welfare for Europe, but some of the responses were not in English. The survey consisted of 55 questions, including open-ended questions, which resulted in a long survey to complete. This length of survey can cause non-response bias due to the time and effort required to complete due to some information that may require research to adequately respond. Additionally, some information required by multiple questions were phrased similarly to ask for information pertaining to the Competent Authority or Veterinary Services, which may have caused some confusion since some responsibilities overlap or may be the same entity in member countries. Self-assessments can also bias surveys in that organizations and individuals may overestimate or underestimate capabilities and performance. Another consideration is that terminology and knowledge regarding response may differ among the points of contact, depending on who was tasked with filling out the survey. Even though the survey had an overall high response rate, some individual questions had low response rates, which limited our ability to extract trends for those questions. In many cases where a "yes/no" question was asked and there were only a few "yes" answers, the follow-up question did not provide enough information to make generalizations.

Conclusion

This survey provides detailed information regarding the individual and aggregate capabilities and gaps of WOAHE Members in the European Region for animal welfare in natural disasters. There are significant gaps in authorities, resources, and capabilities to prepare for and respond to animal welfare issues in natural disasters. In addition, the number of requests for assistance by member countries indicates the desire to strengthen their capacities in disaster management and disaster risk reduction. The survey allowed for specific country needs to be assessed and to identify focused actions and activities that can be addressed by the WOAHE Platform on Animal Welfare for Europe to strengthen the capabilities of national Veterinary Services to provide an efficient and effective response during natural disasters. The information presented here can also be used to guide the discussion and development of animal welfare plans and response in other member countries that face natural disasters.

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- Visualization
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