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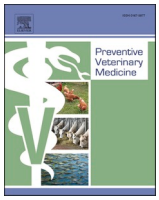

Swedish veterinarians' perspectives on the work with Emergency Animal Diseases – part 1: Workload, task demands, and decision-making

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ABSTRACT

Veterinarians play a central role in the identification and control of Emergency Animal Diseases (EADs), yet empirical knowledge of how they experience and manage this work in practice remains limited. Ultimately, outbreak management depends on how suspected and confirmed cases are handled in everyday veterinary settings. This study explores how Swedish veterinarians experience and manage suspected and confirmed EADs in production animals, with particular attention to workload, task demands, and decision-making. The study draws on semi-structured interviews with 19 livestock and slaughterhouse veterinarians who have managed suspected or confirmed EADs leading to state-mandated interventions such as testing, movement restrictions, and culling. Data were analysed using thematic analysis. The findings are presented through three main themes. First, *Organisational strain and competing demands* describes how emergency disease work intensifies workload, time pressure, and non-routine administrative and practical tasks, particularly when outbreak management is added to everyday clinical responsibilities. Second, *The burden of situated responsibility* captures how veterinarians' on-site judgements carry far-reaching consequences and require adaptation of formal protocols to local conditions. Third, *Distributing responsibility in the management of EADs* shows how collegial, expert, and institutional support helps distribute responsibility and make outbreak work manageable. Overall, the study highlights how EAD management amplifies the complexity of veterinary practice and underscores that strengthening disease preparedness requires attention to the organisational conditions and support structures that enable veterinarians to carry out this work without becoming overburdened.

1. Introduction

Veterinarians are crucial in the identification and control of Emergency Animal Diseases (EADs): infectious diseases in animals that are not normally present in a country and for which mandatory control measures are justified due to their societal implications, for example on public health or national economy and trade. Within broader scholarship on preparedness and biosecurity, effective outbreak response has been shown to depend not only on formal plans and regulations, but on how responsibilities and surveillance practices are organised and enacted in practice (Hinchliffe et al., 2016). However, limited empirical attention has been paid to how veterinarians themselves experience and manage these responsibilities in everyday settings.

In Sweden, EADs are regulated under the national Epizootic Act (SFS 1999:657), which implements and complements the EU Animal Health Law (European Parliament and Council of the European Union 2016, Regulation (EU) 2016/429). Approximately 200–300 potentially suspected cases of EADs are investigated in Sweden each year by laboratory analysis, but confirmed cases are very rare. In recent years there have been a few confirmed outbreaks of high pathogenicity avian influenza, HPAI, (with a peak in 2021), Newcastle disease, and atypical scrapie.[1] Unlike countries where the control of EADs is handled by specialised units, in Sweden the identification and initial management of EADs rests with veterinary practitioners, for whom such cases fall outside their routine everyday practice (Jordbruksverket, 2023, SJVFS 2023:15). All veterinarians in Sweden are obliged to immediately carry out an investigation when encountering a case of potential EAD in an animal/group of animals, to determine if it is a credible suspicion. If the disease cannot be completely ruled out, the case must immediately be reported to the authorities (SFS 1999:657). The veterinarian should put the farm or slaughterhouse where it is discovered under restrictions to minimize the risk of spreading the disease while conducting a thorough

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[1] Several cases of bluetongue were recorded in 2024, however the disease was removed from the Epizootic Act in the same year (SVA, 2024)

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investigation, including sending samples to the Swedish Veterinary Agency (SVA) for laboratory analysis. Veterinarians suspecting an EAD are encouraged to consult the experts at SVA, who provide around-the-clock support. SVA acts as a complementary institution to the Swedish Board of Agriculture (SBA): while the SBA is responsible for decision-making concerning testing and control measures, as well as approving costs and expenditures needed, SVA functions as the national expert authority in matters relating to animal health and infectious diseases. Confirmed cases are managed by field veterinarians appointed by the SBA. If the infection is confirmed, the farm will have to be depopulated and decontaminated. Loss of the animals and income from the production, as well as the cost for the cleaning and disinfection and other measures deemed necessary by the veterinarian, are compensated by the government (SFS 1999:657).

The management of suspected and confirmed EADs places veterinarians in a position of considerable responsibility, requiring them to execute state-mandated interventions such as putting restrictions on the farm or slaughterhouse, and, in some cases, the euthanasia and destruction of affected animals. Existing research on veterinarians' roles in animal disease control indicate that the veterinarian's role in managing EADs is challenging due to both workload and difficult decisions where conflicting interests need to be balanced (Elbers et al., 2010; Jewitt et al., 2024; Law, 2010; Makita et al., 2015; Purc-Stephenson et al., 2025; Spence et al., 2022). The present article draws on interviews with 19 Swedish veterinarians who have managed suspected or confirmed cases of EADs leading to state-mandated interventions, including for example testing, restrictions, and the culling of animals. The aim of this paper is to explore how veterinarians' experience and manage cases of suspected and confirmed EADs in production animals, with a focus on workload, type of task and decision-making. By examining how outbreak management is carried out in everyday veterinary practice, we seek to contribute to a better understanding of how disease preparedness depends on the working conditions and professional judgement of veterinarians. Such knowledge is essential for strengthening both disease control systems and the sustainability of the veterinary workforce.

2. Previous research

Decision-making in a complex and uncertain environment is central in veterinary work (Enticott, 2012; McKenzie, 2014; Vandeweerd et al., 2012). Veterinarians in agriculture need to balance multiple interests and responsibilities which are not always easily aligned: the health and welfare of the individual animal(s) receiving care, owner interests, as well as public and animal health in general (Bubeck, 2023; Deelen et al., 2022; Law, 2010; Meijboom, 2018; Scholz and Trede, 2023; Vogel, 2022). The need for considering different interests potentially puts the veterinarian in a difficult and morally stressful position (Schott et al., 2016; Vogel, 2022). The demanding nature of veterinary work is associated with a recognised risk of occupational stress. Workload, long working hours, client expectations and moral dilemmas are recurrently identified as significant stressors (Morris, 2018; Platt et al., 2012; Pohl et al., 2022; Steffey et al., 2023).

Even though veterinary work is governed by formal procedures, research shows that the circumstances often require pragmatic and creative solutions. Studies from different settings show that veterinarians frequently rely on pragmatic solutions and professional discretion when working under imperfect conditions (Enticott, 2012; Schott et al., 2016; Hunka et al., 2024; Vogel, 2022), and that collegial consultation and specialist advice form an important part of managing complex assessments (Vandeweerd et al., 2012; Morris, 2018). Enticott (2012) asserts that protocols and procedures still have value in veterinary work, but that there must be some leeway for adaptation to context for them to be of use.

The research on veterinarians' experiences in managing suspected or confirmed outbreaks of EAD is limited. Nevertheless, available studies indicate that outbreak situations tend to intensify many of the challenges already present in veterinary practice. Managing outbreaks often involves prolonged working hours, limited opportunities for rest, and the accumulation of administrative and practical tasks (Makita et al., 2015; Purc-Stephenson et al., 2025; Rutt and Møller, 2025). Rutt and Møller (2025) particularly show how extended availability to farmers during evenings and weekends contributes to the escalating workload in outbreak situations.

Existing studies moreover indicate that tensions between different interests are accentuated in this kind of veterinary work. Large-scale culling has been described as particularly challenging (Makita et al., 2015; Winter and Ward, 2002; Purc-Stephenson et al., 2025). Such situations may intensify tensions between animal welfare considerations, farmer interests and broader disease control objectives. Law (2010) explore how veterinarians who worked with the culling of cows in the foot-and-mouth epidemic in the UK needed to account for several "objects of care" which were sometimes hard to align. Thus, the veterinarians needed to care for the animals and to create a good death for them. They also needed to care for the farmer, for whom the mass culling of the farm's animals was often traumatic. In addition, the veterinarians needed to care for the "bigger picture", to prevent the spread of the disease. To manage all these objects of care required, according to Law, intricate and adaptive work of tinkering (cf. Vogel, 2022). Along these lines, Meijboom (2018:214) states that although veterinarians' actions in relation to severe infectious animal diseases are governed by various laws and regulations "there still is room for individual and professional assessment by veterinarians."

Studies examining the management of suspected EADs suggest that the stage of suspicion itself entails particular professional challenges. Research from Australia indicates that veterinarians may experience anxiety when confronted with atypical and potentially notifiable disease presentations, especially under time pressure in busy practices and in situations where access to timely technical or governmental support is limited (Steele et al., 2021). Concerns about overlooking potential EADs have similarly been described as significant sources of stress (Hayes et al., 2022).

Lack of prior experience has been identified as a barrier to reporting and managing suspected outbreaks. For example, limited familiarity with HPAI has been associated with reluctance or difficulty in reporting (Elbers et al., 2010), and studies have described insufficient species-specific knowledge—particularly regarding poultry—as a challenge in managing suspected avian influenza cases (Jewitt et al., 2024). In navigating such uncertainty, veterinarians often rely on more experienced colleagues or specialists before formally notifying authorities, suggesting that collegial communication frequently precedes official reporting (Spence et al., 2022; Hernandez-Jover et al., 2024).

3. Methodology

For this study we aimed to recruit veterinarians with experience of managing either suspicions of EADs or confirmed outbreaks of such diseases in production animals during the last five years. *Suspicion* is here defined as an official suspicion that involved contact with the authorities. As it proved challenging to recruit an adequate number of participants for the study, a combination of recruitment methods was employed. We advertised in several Facebook groups for veterinarians and emailed veterinary clinics within the DVO (Distriktsveterinärerna, a separate organization under the SBA that ensures year-round, 24 h/d national animal health services everywhere in the country). We also contacted the Swedish Food Agency and asked them to distribute the information to veterinarians working in slaughterhouses. In addition, the SBA provided us with a list of veterinarians who had managed disease outbreaks during 2021 and we contacted these veterinarians directly by email or phone.

We also used snowball sampling, asking participants if they knew of any colleagues with the relevant experience that might agree to be

interviewed. In the end, this was the most effective method for finding additional veterinarians to interview. None of the contacted veterinarians explicitly declined taking part in the study, but many of the emails remained unanswered. No incentives were offered for participation. Recruitment continued until additional interviews were deemed unlikely to generate substantially new insights related to the study's focus. The final sample provided a wide range of experiences with both confirmed and suspected cases of EAD.

Before data collection, the project was assessed by the university's legal office (certificate reference nSLUua.2022.2.2–4309) concluding that according to Swedish law, the study did not require ethical approval by the Swedish Ethical Review Authority (a national governmental authority responsible for ethical review of research) because no sensitive personal information was collected (SFS 2003:460) To protect confidentiality, all interviews were anonymised during transcription, and identifying details relating to individuals, workplaces or specific outbreak events were removed or altered. Audio files and transcripts were stored securely and were accessible only to the research team. Prior to each interview, informed consent was obtained from the participant. They were also given the opportunity to ask questions before the interview began.

The interviews were carried out digitally via video call (13 interviews), or by phone (4 interviews), and two were conducted face-to-face at the participant's request. The interviews lasted between 45 min and 1.5 h. The interviews were performed by the third author (HG, PhD in sociology) who has experience in qualitative interviewing and research on veterinary and animal health practices. A semi-structured interview guide was used to allow both consistency across interviews and flexibility to pursue issues introduced by participants, in line with established principles of in-depth qualitative interviewing (Kvale and Brinkmann, 2015).

In all of the interviews we initially asked the veterinarians to describe—as concretely and in as much detail as possible— their work with confirmed or suspected cases of EAD. For participants with experience of confirmed outbreaks, we first focused on those particular experiences before moving on to aspects of suspecting an EAD. We used follow-up questions throughout the interviews to explore topics that were not spontaneously mentioned such as communication with authorities, use of guidelines or other instructions, availability of protective clothing and sampling equipment. We were particularly interested in if the veterinarians experienced the work—or aspects of it—as challenging or involving tensions between different interests and factors facilitating their work.

The interviews were transcribed verbatim by the first author (VÖ) and imported into NVivo (Lumivero, 2023), to facilitate data management and qualitative data analysis. Theoretically, we draw on practice-based approaches and perspectives from Science and Technology Studies (STS), which emphasise how professional knowledge and decision-making are accomplished through situated everyday work, where biomedical, regulatory, and social dimensions of disease control are closely intertwined. From this perspective, the study does not aim to map veterinarians' attitudes or knowledge as separate individual attributes, but rather to examine how suspicion and outbreak management are enacted through everyday veterinary practices (Law, 2004; Mol, 2002; Schatzki, 2001).

The analysis followed an iterative and reflexive process consistent with reflexive thematic analysis (Braun and Clarke, 2006, 2019). Initially, the interview transcripts were read repeatedly by the first (VÖ) and third (HG) authors with a social science background, and initial ideas for codes were noted. This was followed by open, inductive coding that stayed close to participants' accounts. These codes were then compared, merged, and refined through multiple rounds of analytic discussions between the two authors. Themes were developed by identifying recurring patterns of meaning across the dataset. While the early stages of analysis were primarily inductive and data-driven, the later stages of theme development were informed by relevant previous literature on veterinarians' work with EADs (referred to in the section on previous research), which functioned as theoretical sensitisation rather than a deductive framework. Themes were continuously reviewed and refined to ensure internal coherence and clear distinctions. As a final analytic step, the themes and their associated extracts were revisited and more descriptive theme labels reworked into more abstract and analytically meaningful themes that captured shared patterns of meaning across the data. In this paper, the analysis focuses on themes related to workload, task distribution, and decision-making.

To enhance the credibility and trustworthiness of the analysis, the second author (SSL) with expertise in veterinary epidemiology, reviewed all transcripts and themes to ensure that interpretations remained grounded in veterinary practice and accurately reflected the professional context (Patton, 2015). Quotes were selected to represent each theme. As the interviews were conducted in Swedish, all excerpts used in the manuscript were translated into English by the authors and cross-checked against the original transcripts to ensure fidelity.

4. Results

Between 2022 and 2024, 19 veterinarians, five male and 14 female, were recruited, reflecting the predominance of women within the Swedish livestock veterinary workforce (Wlosinska, 2019). Four of the interviewed veterinarians worked as government inspectors in slaughterhouses and were employed by the Swedish Food Agency. 15 of the veterinarians worked in clinical practice (one privately employed, the others with DVO). The veterinarians were geographically spread from the southern to the northern parts of the country.

Eleven of the interviewed veterinarians (including all of the slaughterhouse veterinarians) had on one or more occasions during the last five years been in contact with the SVA in relation to suspicion of an EAD (for example anthrax, foot and mouth disease, bovine spongiform encephalopathy), but had not managed any confirmed case. They had all conducted testing, and established restrictions on the premises as part of investigating the suspected infection. The remaining eight participants had been responsible for managing one or more outbreaks of HPAI. Some of these veterinarians had been involved throughout the entire process—from initial suspicion, testing, and implementing control measures (e.g. establishing herd restriction borders)—while others became involved after testing had begun or the infection had been confirmed. The majority of these veterinarians also had experiences of contacting the SVA on other occasions, about suspicions of EADs which had later been dismissed.

The findings are presented through three main themes. First, *Organisational strain and competing demands* describes how emergency disease work intensifies workload, time pressure, and non-routine tasks, particularly when it collides with everyday clinical responsibilities. Second, *The burden of situated responsibility* (with the subthemes *Triggering consequences: the crucial assessment on site* and *When protocols meet reality – situated adjustments and discretion*) captures how veterinarians' on-site judgements carry far-reaching consequences and how formal authority depends on local decision-making. Third, *Distributing responsibility in the management of EAD* (subthemes *Redistributing workload and judgement among colleagues* and *Embedding decisions in institutional support structures)* shows how collegial, expert, and institutional support makes this work manageable by distributing judgement and buffering responsibility.

4.1. Organisational strain and competing demands

Cases of suspected or confirmed EADs are a high priority and by law veterinarians are obliged to handle them immediately. Several of the interviewed veterinarians working at DVO described how they sometimes accepted the assignment of managing a confirmed outbreak of HPAI only because "someone has to do it", and this was described by some veterinarians as challenging. One veterinarian explicitly stated

that she felt that she did not have a choice in accepting the task of managing an outbreak of HPAI, and that it was not the kind of work she had expected she would be doing when she decided to become a veterinarian. This veterinarian expressed that her experience from managing the outbreak had contributed to her decision to stop working as a livestock veterinarian. On the other hand, some veterinarians described the task as interesting, and even exciting, something extraordinary.

Throughout the interviews, the veterinarians described how work in relation to both suspected cases and confirmed outbreaks often competed with their regular duties.

> What do you do, those of us who have long distances, what do I do the day I'm out on something and I realise I won't be leaving here for x number of hours because this [the investigation and restrictions procedure] has to be finished before I can leave. But I have a district that needs help. What happens if there is a call on something? And that is one thing that can be stressful and difficult. (Interview 1)

As illustrated in the quote, several veterinarians at DVO clinics highlighted how work related to EADs may conflict with their routine clinical work. In particular, they described how it can be challenging to be on call outside regular working hours and be required to travel to a farm to manage a suspected or confirmed case. They also described how the work with suspected EADs sometimes clashes with previously booked clients. One interviewee described how she, when responsible for managing a confirmed case of HPAI, felt like she did not get any support from her superior in managing and distributing her regular work tasks, which she thought should be her superior's responsibility. She stated that this lack of organizational support made the work more demanding than it would have to be.

During the process of investigating and dealing with EADs, part of the veterinarians' work both at farms and slaughterhouses is to be available to answer questions and concerns from farmers and slaughterhouse personnel.

> Well, it's mostly about that. I usually say that it's like having constant on-call duty. […] we talked at least five, six times a day. And then there was email contact. And it was nights and evenings and, whether it was Saturday or not it didn't matter, right. And you sat there and typed up these decontamination plans, because you still have to take care of the ordinary work too. (Interview 2)

The account illustrates how the livestock veterinarians in particular described how they needed to be on hand for the farmers throughout the whole process of investigation and eradication. The concern for the affected farmer during outbreak management contributed to blurring the boundaries between work and non-work, thereby adding to the workload. Moreover, the practical work of handling the case on site can affect the working hours and need for overtime. One interviewee described how she had to work far into the night when managing an outbreak of HPAI, as a veterinarian had to be present for when the birds were killed and the gas-truck could not get to the farm until late.

The long working hours and the intensity of the work were described as straining by several of the interviewees and especially for the veterinarians who had managed outbreaks of HPAI at poultry farms. One of them depicted it as "more stressful than getting a driver's licence" and stated that it is not a situation that is sustainable over time, and another veterinarian described working 17–18 h every day in the first few days of an outbreak, calling it "inhumane".

The first time a veterinarian has to handle a suspected or confirmed case is described by all the interviewees as especially demanding, as it entails making sure all of their knowledge and information is up to date. They also stated that the more hands-on aspects of the work are difficult to learn except through experience. Some veterinarians at the DVO who had managed outbreaks of HPAI described how they had not only lacked experience in handling EADs, but that they had no previous experience working with the affected species or production system.

> I felt like I had no idea what I was doing. I found it really difficult. […] Like, of course we had training in this in school [the veterinary education program], and like lectures and stuff. But it's a completely different matter to put it into practice. […] I had no idea, I'd never worked with this before. I had never been to, I'd probably been to a laying hen farm at some point, but that's about it. I don't know anything about laying hens. At all. But I'm expected to be able to investigate an outbreak of bird flu and know exactly how to take care of everything and clean everything and put everything away and you have to find, well, come up with how to do it. (Interview 3)

Poultry is described as significantly different from other types of production animals with which the veterinarians work. As illustrated in the quote, being responsible for managing an outbreak in poultry when you have no experience with this species at all is described as challenging and stressful.

Moreover, in several interviews, the veterinarians described how managing outbreaks of HPAI involves tasks that are not typical veterinary work. For example, one veterinarian described how she became responsible for arranging a cabin on wheels for coffee breaks, as the normal break room ended up behind the infection control barriers. Some of the interviewees described the work with writing the eradication plan and filling out forms as taxing.

> I'm not a desk person, really, so it's taxing when it was several days and like, working intensively with something like that. Compared to being out and like examining horses all day. (Interview 4)

> There was a lot of administrative work and we are "doers" a lot of us DVO veterinarians […] And it was stressful to do something that you've never done before, of course. (Interview 5)

As shown in these quotes, outbreak management required veterinarians to engage in administrative work that contrasted with their everyday clinical practice, especially in relation to writing and revising eradication plans. During the management of a confirmed outbreak, the eradication plan is a work in progress throughout the whole process, encompassing every detail and expense. It can be challenging to write this plan, especially the first few times.

4.2. The burden of situated responsibility

Although the formal mandate to declare suspicions and impose control measures lies with the relevant authorities, the interviews show that veterinarians' situated assessments and decisions are central to how potential cases are interpreted and managed in practice. Across the data, decision-making emerges as a process shaped by uncertainty, responsibility, and the need to balance infection control with local conditions, material constraints, and everyday realities

4.2.1. Triggering consequences: the crucial assessment on site

This study reveals how investigating symptoms that might indicate a suspicion of an EAD puts the veterinarian in a potentially demanding position.

> The experts at SVA are really good to discuss with, and such. But there is no escaping the fact that I am the one on site, seeing the animals, and I can see the symptoms and determine whether I think it is a suspicion. I can get advice and I can discuss it with others, but they make their assessments and decisions based on what I tell them. And that, like, I know this as well, I know enough about these infections to know which words trigger like, if I were to say like, fever and blisters in the mouth and a limp in a cow, well, then I know they will press the big, red button. But if I say two of those, they might not. So I know what the consequences of my assessments are. Even if someone else is making the decision. […] At the same time it can be really difficult to dismiss a potential suspicion, as the consequences

of missing a case of epizootic disease are very serious. You definitely don't want to fail to discover it when you should have. (Interview 6)

The quote reflects the critical responsibility placed on the veterinarian on site. All the interviewed veterinarians had experience of discussing potential suspicions with experts at SVA, and trusted their assessment. However, some also emphasised how SVA's interpretation of the situation relied on the veterinarian's assessments and what the veterinarian communicate to SVA. The veterinarian neither wants to fail to identify an EAD, given the potentially catastrophic consequences of a missed case, nor to unnecessarily initiate the extensive process of managing a suspicion. The minute a case is defined as an actual suspicion, many people will have to get involved. If this is after hours or over the weekend, as is often the case, people will have to be ordered to work outside their ordinary hours. In addition, the farm or slaughterhouse will be affected by the implementation of restrictions. The veterinarian above explained how it took a long time for him to stop feeling uneasy every time he considered contacting the authorities regarding a suspicion. Similar accounts illustrating the crucial and potentially difficult position of veterinarians on site were identified in other interviews, both with slaughterhouse and livestock veterinarians.

4.2.2. When protocols meet reality – situated adjustments and discretion

Most veterinary clinics and slaughterhouses have a checklist on what to do in case of a potential suspicion and there are procedures dictated by laws, regulations and administrative formalities that state how things should be done. In addition, veterinarians are supported and guided by the authorities.

There is like a template, there is a running schedule, there is a basic plan […] but then you have to adjust it every time to what things look like here and now. And what the weather is like and stuff. […] You have to be inventive. What tools do we have available? What kind of production do the neighbouring farms have? Like, every case is unique, even if they are the same in broad terms. (Interview 7)

The account illustrates how, despite formal templates and regulatory frameworks, a lot of adjustments and adaptations have to be made based on the conditions on site. The need to be "inventive" reflects how veterinarians must interpret and adapt protocols in light of available tools, neighbouring production systems and environmental factors. In this sense, outbreak management appears less as a straightforward application of rules and more as a process of situated judgement. Along similar lines, one veterinarian described the maintenance of a hygiene barrier with a boot-bath and change of clothing:

That first disinfection should be done and you were supposed to set up a boot-bath and like go in and change and stuff. At that time it was like sub-zero temperatures and freezing wind, which means it's not that easy to have a hygiene barrier and like, do the work really well. And at the end when you have to undress and clean yourself, you kind of have no feeling in your fingers or feet. It's not that easy to be hygienic. […] It looks so easy in the videos [descriptive videos distributed by the veterinary authorities] when you watch them. It's not that easy in reality, it becomes, life comes in between with either ice-cold temperatures or… (Interview 8)

That "life comes between" the implementation of infection control, for example in terms of cold weather and environmental considerations, is telling for the veterinary practice in relation to EADs. While managing these diseases is potentially straightforward in theory, in practice various matters emerge locally that need to be managed, often in inventive ways.

The parts where flexibility and adaptations are most often needed on site, as identified in the interviews, are setting up the boundaries for hygiene controls and defining the restriction boundaries.

Someone who isn't on site can't make those decisions, because they can't like see how things are and can't get an overview. And I guess that is just how it is. I don't think it could be any other way. (Interview 6)

Actually, it's very systematic and it's a thing that in theory is very simple. […] Because then it's this, well, but if they're going to go home to their house they need to go through, like. I think we talked about that kind of thing during our education as well, so it's not that we don't talk about it, but it's still really just theory compared to practice. (Interview 3)

While the formal decision of enforcing restrictions is taken by the authorities, the quotations shows that the practical decisions regarding where boundaries should be drawn can only be made on site, once you have gained an understanding of the workflow and the specific needs of the farm in question. The veterinarians described how they need to consider various local aspects when drawing the boundaries: for example, there might be children living at the farm that need to be able to get to school without passing through the restricted zone. They also need to take animal welfare into account and for instance make sure that it is possible to get feed in and manure out from buildings where animals are still kept.

It also became like, "Well, how much adaptation can I do to allow the farmers to get out?" Because we still have to, like, we enforce a lockdown for a reason. (Interview 3)

As illustrated in this quote, the veterinarian's decision-making on site involves taking into account not only infection control but also other interests, and sometimes this is quite challenging. The veterinarian's reflection thus captures the tension between adhering to strict biosecurity measures and responding to the everyday realities of the farm. While the lockdown is imposed "for a reason", its practical implementation requires the veterinarian to continuously negotiate how far adaptation can go without undermining its purpose.

Another aspect posing distinct challenges and dictating adjustments described by the interviewees, is the actual physical space; the layout of the buildings and the conditions of the facilities. One interviewee working in a slaughterhouse described how those facilities are not designed for a thorough medical examination of the animals. Thus, it might not be possible to perform an ideal examination, and instead the investigation has to be adapted to what is doable. Interviewees also described the need to improvise with protective clothing, when those available were not suited to protect them from the suspected disease agent. Another obstacle mentioned was the availability of proper sampling equipment.

You can't refrain from doing the examination just because you have the wrong equipment. (Interview 6)

Occasionally, the veterinarians did not have the optimal tools for the necessary examinations and needed to improvise. During larger outbreaks affecting several farms, national resources might be limited and therefore difficult to obtain at short notice. The interviewees who had handled confirmed cases of HPAI on poultry farms during the large outbreak in Sweden 2021, described how they had had to wait longer than usual to get the necessary items. One example mentioned was how the gas for culling poultry was in high demand during that time and could take several days to procure. The extended waiting time caused animal welfare concerns as well as prolonged the whole process for the farmers. Some interviewees also described how the company in charge of handling the carcasses (there is only one such company in Sweden) was unable to send enough containers for the carcasses.

They don't have the capacity to handle this many animals at once. It had never happened before that things were like this [this large an outbreak]. So we couldn't get rid of the animals. […] We put them in large construction bags, that cubic-meter kind, right. And luckily it was really cold that winter. Because it was, they froze. So it could be managed that way. (Interview 7)

There were some containers that didn't arrive and the birds just lay there rotting in the coop and just kept getting nastier and nastier. (Interview 3)

The shortage of containers required the veterinarians to devise creative solutions concerning how the dead animals were to be stored on site until additional containers could be obtained. Some of the veterinarians also expressed that the lack of preparedness at the SBA for this kind of event increased their workload and created a constant need for inventive decisions. For example, one veterinarian described how, as it took too long to get answers from the authority, and as the work with EADs often is time-critical, she had to come up with many solutions herself. Another veterinarian described:

The SBA hadn't foreseen this […] It showed clearly. There was no preparedness for clothing and there was no preparedness for the carcasses, there was no preparedness for personnel. Everything had to be solved gradually. (Interview 9)

The account illustrates how gaps in national preparedness required veterinarians to translate policy into practice under constrained conditions, developing solutions as situations unfolded.

Importantly, however, the limitations of obtaining resources are not only an issue of crisis preparedness. For farms in remote areas, with limited infrastructure, like the remote rural areas in the northern part of Sweden or islands like Gotland, it can be difficult to access transportation and resources, even when there is no larger outbreak putting a limit on the availability.

4.3. Distributing responsibility in the management of EADs

Even if there are several aspects of the work of managing cases of suspected or confirmed EAD that are difficult by nature, the veterinarians in this study described how they navigate these aspects in ways that make them manageable.

4.3.1. Redistributing workload and judgement among colleagues

For veterinarians working at DVO, co-workers and the head of their veterinary clinic play an important role in alleviating the stress and workload when handling a suspected or confirmed outbreak. Several of the interviewees at DVO reported a spirit of cooperation and support.

If there is someone who is alone with children and has to pick them up at six o′clock, well then you don't go at half past three on a suspicion of foot-and-mouth disease. Instead we need to have someone else go there. (Interview 6)

The quote illustrates how the consideration is given to personal circumstances and individual capacity when deciding who is going to take on a suspected or confirmed case. The interviewees also described how co-workers often covered their regular assignments when needed. One veterinarian recounted how a colleague in another county had stepped in to cover the hotline and emergency clients, when no one was available at the clinic. Some interviewees further described having collaborated with, or been supported by, a more experienced colleague the first time they had managed an outbreak, which was highly valued. The veterinarians explained how discussing the case with co-workers functioned as a way to get moral support, even when colleagues could not provide concrete assistance in the specific situation. Interviewees working at slaughterhouses described being able to call co-workers at other slaughterhouses or consult workers with extensive experience of identifying different diseases in animal carcasses.

Some veterinarians with experience of visiting farms to investigate possible suspicions described how they try to plan as much as possible in advance, as a way to reduce the pressure on site.

We usually look at it as a group before you drive to the farm. Like you find a satellite image from Google Maps and look at the layout of the farm. And there you can note that here and here you'd want a boundary, and such. (Interview 10)

Because establishing the boundaries of the restricted area constitutes a substantial part of the initial stage of the process, this is something they begin working on even before leaving the office. This assistance and collaboration between co-workers continue, when needed, throughout the entire process of confirmed outbreaks.

I think we were four veterinarians in our office that were investigating and writing eradication plans for different farms, like, during the same period of time, so we could support each other. And the head of the clinic has a lot of experience as well, she was a good support. (Interview 10)

At least two of my co-workers had done this before. They had some more flesh on the bones and I could like, maybe not pass it on, but I could at least get some help and we did it more together, and that made it possible [to manage]. (Interview 3)

As writing the eradication plan is challenging, particularly the first few times it is undertaken, several interviewees described receiving both support and practical assistance from their co-workers in this task.

Veterinarians with previous experience from managing outbreaks of HPAI or salmonella in poultry—both of which require culling of animals as well as cleaning and disinfection of buildings—expressed that the work became easier after the first few times and that their need for assistance decreased. These more experienced veterinarians also expressed being willing to support co-workers dealing with EADs. In this way, part of the mental workload is shared between colleagues, which helps them cope with the associated stress.

4.3.2. Embedding decisions in institutional support structures

All veterinarians in this study were able recall the difficulties associated with being inexperienced in managing EADs. In several interviews, veterinarians described how they were reassured by the extensive range of resources available online and stated that they utilised them when needed. They also expressed taking comfort in the premade action plans and checklists provided both online—for example by SVA and the SBA—and in printed form at clinics or slaughterhouses.

You go to the website and read a bit, does it fit with this or that, and then I discuss it with a co-worker if necessary. (Interview 11)

The interviewees noted that these resources reduced the need to remember every procedural detail by heart and helped to alleviate the burden of decision-making in the moment. Moreover, the interviewees described receiving tangible support from the involved authorities. Most notably they emphasised the reassurance provided by the possibility of contacting the expert hotline at SVA.

I have talked to them several times when we have been able to dismiss it right away. […] And we dismissed it during the call, that it's nothing. But at least you're not alone with that decision then. […] There have been a lot of times when you think, that, "nah, this is probably nothing". But I still call and ask them. (Interview 1)

As illustrated in this quote, several interviewees described how they used the hotline as a tool to assess whether their observations might *become* a suspicion that should be formally reported. Thus, the hotline functioned as a mechanism for distributing responsibility. Even in cases where suspicion was dismissed, the act of consulting SVA transformed what could have been an individual judgement into a shared assessment, thereby reducing the sense of isolation associated with on-site decision-making.

The following account provides a further example of how the SVA hotline functioned as a source of support.

The problem is, in every case you get a bit stressed when you are standing in the middle of it. And it's quite nice at that point to have

someone who is sitting in the office, drinking coffee and just "well, but we did this last week as well, so now we are going to do it like this". And you can discuss with them and they can think in peace and quiet too, when you have ended the call. That, like, "I will look this up, we'll call back". (Interview 12)

As the situation on site often is stressful for veterinarians, the interviewees emphasised the reassurance of having someone sitting in an office at SVA—for whom these diseases are routine—who was able to remain calm and provide strategic input. Having someone to lean on who is more knowledgeable, and who can assist with decision-making and determining the appropriate steps to take, emerged throughout the interviews as an important factor in alleviating stress and pressure for the veterinarians in this study. Moreover, some interviewees expressed that they at times took great comfort in knowing that the formal, final decisions were made by the SBA and not by them.

I don't have any responsibility, really. Well, of course I do, my responsibility is to make sure everything is done right according to the conditions at the farm. But the larger responsibility is on those making the decisions, that is not on me, really. (Interview 7)

In this way, the decisions that must be made by the veterinarian on site become less onerous. Although it remains their responsibility to make these decisions, support from the authorities and the legislative framework appears to ease the burden.

5. Discussion

This article has explored Swedish veterinarians' experiences of managing suspected and confirmed cases of EADs in production animals, with particular attention to workload, the nature of the tasks involved, and on-site decision-making. The analysis shows how veterinarians' work with both suspected and confirmed cases involves a range of challenges related to workload, time pressure, lack of previous experience, as well as crucial action and decision-making on site. Our findings suggest that these cases intensify the complexity of veterinary work and decision-making. The study also shows how support from co-workers, superiors, experts and authorities facilitate this work by lessening the burden of heavy workloads and on-site decision-making.

The identification and management of EADs is a crucial task for the veterinary profession, however, studies of veterinarians' experiences of these tasks are limited. In Sweden, the responsibility for identifying and managing diseases that are controlled by law does not rely on a specific cadre of veterinarians who work only with this kind of tasks, but on veterinarians for whom this is just one of many responsibilities and who have other work as their regular duties. While the work with suspected and confirmed outbreaks was described in some interviews as interesting and even exciting due to its non-routine character (cf. Rutt and Møller, 2025), it is also evident from the current study that the non-routine character of the work involves challenges for the veterinarians. Knowledge of rare diseases might not always be up to date (Spence et al., 2022), and in line with previous research (Hayes et al., 2022) our study indicates that the responsibility for identifying unusual infections can be a source of anxiety for veterinarians.

The first time a veterinarian is responsible for managing a suspected or confirmed case of an EAD was described by the interviewees as particularly challenging. Veterinarians with experience from managing outbreaks of HPAI emphasised that the administrative tasks were difficult to manage, since this was not the kind of work they were used to. In addition, and in line with previous research (Jewitt et al., 2024), our study indicates that veterinarians might lack experience working with poultry, and that managing a disease outbreak in a species with which one has no prior experience makes the task especially demanding.

Previous research shows that potential stressors in veterinary work include long working hours, heavy workload, client expectations, and moral dilemmas (Morris, 2018; Platt et al., 2012; Pohl et al., 2022; Steffey et al., 2023). In our study, we can see that all these stressors are potentially intensified during the management of EADs. The interviewed veterinarians described how both suspected and confirmed outbreaks involved a high workload and long working hours. Some of the veterinarians with experience in managing outbreaks of HPAI described the workload as extreme during the most intensive phase. Our study thus confirms previous research (Makita et al., 2015; Purc-Stephenson et al., 2025; Rutt and Møller, 2025) showing how work with severe disease outbreaks tends to involve long hours, limited breaks and many consecutive days.

A specific challenge described by our interviewees was to investigate a suspected case of EAD when work with regular clients could not be postponed or redistributed to co-workers. This finding confirms Steele et al.'s (2021) study showing how time constraints associated with a busy practice created difficulties in investigating and managing complex cases of atypical disease.

Previous research shows how decision-making in a complex and uncertain environment is central to much of veterinary practice (Enticott, 2012; McKenzie, 2014; Vandeweerd et al., 2012). Various studies further show that veterinarians' everyday work involves finding workarounds and pragmatic solutions for problems at hand–even in contexts governed by legal regulations (Hunka et al., 2024; Schott et al., 2016). Although the management of EADs is regulated by law, and the decisions are formally made by the SBA, our findings show that suspected and confirmed outbreaks require on-site decision-making, involving local adjustments and inventiveness. Our study thus supports Meijboom's (2018) claim that although veterinary work in relation to severe animal disease is largely regulated by laws and regulations, veterinarians need to exercise their own professional discretion when putting these rules and legislation into practice. Importantly, our results indicate that EADs accentuate the complexities of veterinary decision-making. In relation to these diseases, the veterinarian needs to care not only for the animal/s at hand and the human client, but also for society at large (cf. Meijboom, 2018; Law, 2010), and to balance these different interests is potentially challenging.

In contrast to previous research (Purc-Stephenson et al., 2025; Winter and Ward, 2002) our respondents with experience of culling animals due to disease outbreaks, did not describe this part of the work as especially straining. This could possibly be explained by the way the act of culling is seen as a form of care for the animals, which limits their suffering from disease (cf. Rutt and Møller, 2025). The potential negative feelings associated with taking part in culling might be alleviated by the knowledge that one is performing a necessary service for society and public health, as well as by the satisfaction of doing one's duty (cf. Purc-Stephenson et al., 2025, Winter and Ward, 2002). Notably, all the veterinarians with experience of culling in our study had managed outbreaks of HPAI in poultry. As noted by Rutt and Møller (2025) veterinarians might perceive culling of birds as different from culling larger animals, as one might feel more attached to the latter (cf. Authors forthcoming). Importantly, poultry is culled 'en masse' by gas, and the veterinarian supervises the culling, but does not themselves perform the killing of the flock nor of individual animals.

Even though several aspects of managing suspected or confirmed outbreaks are inherently challenging, the veterinarians in this study also described factors that made the work manageable. Throughout our interviews, support from colleagues was described as very valuable. This support could take different forms: colleagues could be consulted, they could take over other tasks, and they could provide moral support. Some veterinarians managing an outbreak of HPAI for the first time had been supported by a colleague with previous experience of this, and this kind of support was described as very helpful and appreciated. Importantly, the interviewed veterinarians described the on-call support from the experts at the SVA as greatly appreciated and crucial in facilitating their work with managing suspected cases. This finding partly differs from previous research, showing that veterinarians lack proper support from governmental bodies when managing atypical diseases (Steele et al.,

2021). Importantly, the study shows that the interviewed veterinarians had a low threshold for contacting the SVA hotline and, for instance, contacted them to obtain confirmation that dismissing a suspicion was justified. In this way, the veterinarians were not left to decide on their own whether specific symptoms should be considered a suspected EAD or not. Despite some of the veterinarians who had worked with HPAI outbreaks during 2021, when there was an overwhelming number of infected holdings, expressing the view that the SBA was not prepared for this, there were also several references to online information and support as well as templates and instructions facilitating the work. This indicates that a substantial degree of contingency planning is in place, but that very large outbreaks will be challenging also for the veterinary authorities.

6. Implications

This study explores how disease preparedness is embedded in everyday veterinary work and, as such, has implications for how preparedness can be sustained and strengthened in practice. By foregrounding veterinarians' experiences of managing suspected and confirmed EADs, the study shows that preparedness cannot be reduced to formal regulations, contingency plans, or surveillance infrastructures alone. This does not mean that such structures are unimportant. However, the findings demonstrate that preparedness ultimately depends on how these frameworks are interpreted, enacted, and made workable in situated practice in relation to rare and high-stakes events which must be managed under conditions of uncertainty, time pressure and responsibility. Importantly, the situated decision-making in outbreak contexts presupposes a high level of professional competence. Preparedness thus relies on robust veterinary education and continued professional training that equip practitioners to interpret clinical signs, balance competing considerations and adapt formal protocols to local conditions. However, the study also underscores the need to strengthen the organisational and professional conditions under which veterinarians carry out this kind of work.

Because the identification and management of EADs form part of routine veterinary practice, this work is added to already demanding everyday duties. Veterinary practices may therefore benefit from establishing local routines that allow veterinarians handling suspected and confirmed EADs to be temporarily relieved from other tasks. Clear procedures for redistributing clinical duties can mitigate overload and support both effective disease control and sustainable working conditions.

Structured collegial and institutional support is equally important. Access to experienced colleagues, opportunities to discuss uncertain cases and low-threshold consultation with expert authorities help distribute responsibility and reduce pressure associated with feeling compelled to manage complex situations alone. Where local support is limited, broader professional networks may provide necessary guidance. Gradual introduction to outbreak management—through working alongside experienced colleagues—can further strengthen confidence and procedural familiarity, reducing the strain associated with first-time responsibility.

At both local and national levels, decision-support structures and logistical preparedness should be clearly established. Practical templates, accessible guidance and round-the-clock expert advice facilitate work under pressure. While this study does not evaluate specific authorities, it indicates that veterinarians' work becomes significantly more demanding when logistical arrangements and resource mobilisation are not in place. National preparedness planning during periods of relative calm should therefore include consideration for how personnel, equipment and transport capacity can be mobilised rapidly during large-scale outbreaks.

Although outbreak management in Sweden is largely embedded in routine practice, similar challenges—high workload, administrative demands and decision-making under uncertainty—are reported in more specialised systems. Specialisation alone is therefore unlikely to resolve these pressures. In large and sparsely populated countries, it may be necessary to involve geographically distributed general practitioners, making organisational support more important than structural specialisation. Supporting veterinarians in this work is therefore not only a matter of preparedness, but of maintaining a resilient and sustainable veterinary profession over time.

7. Limitations

There are some limitations to this study. Since we included veterinarians who had managed a suspected or confirmed EAD during the last five years, for some veterinarians the experience went quite far back in time, and sometimes they had difficulties recalling details. Moreover, the number of slaughterhouse veterinarians who took part in the study is limited, and much smaller than the number of livestock veterinarians. As the interviewed slaughterhouse veterinarians' experiences were similar to those of the livestock veterinarians, we have chosen to include these interviews in the study. The number of interviews is however too small for exploring the specific experiences of slaughterhouse veterinarians, and further studies are needed on this matter. This study focused on veterinarians working with production animals and no companion animal veterinarians were included. It is likely that the experiences of companion animal veterinarians, who for example might encounter a suspicion of rabies where the animal needs to be euthanised, is different due to the emotional bond between owner and animal as well as the immediate zoonotic risk. It is also important to note that the study is performed in a Swedish context where there is no dedicated cadre of veterinarians taking care of EADs, but where veterinarians who work clinically or in slaughterhouses also are responsible for identifying and managing these diseases. In countries where the responsibility for such diseases is organised in other ways, veterinarians' experiences of challenges and facilitators might be different. Moreover, we have focused this paper on the specific areas of workload, type of task and decision-making. Other aspects of veterinarians' work with EADs, such as communication and cooperation with agencies and animal owners is covered in another publication (Authors, forthcoming).

8. Conclusion

This study has examined how Swedish veterinarians experience and manage suspected as well as confirmed cases of EAD in production animals. The findings show that both the investigation of potential suspicions and the management of confirmed cases intensify workload, time pressure and complex decision-making under conditions of uncertainty. Even though EADs are formally regulated by law, their identification and control depend on veterinarians' situated assessments and professional discretion, exercised on site and often under considerable practical constraints.

By focusing on how suspicions are evaluated and how confirmed cases are handled in everyday veterinary settings, the study highlights a critical yet underexplored dimension of disease preparedness: its reliance on the judgement, competence and working conditions of practising veterinarians. Effective disease control begins with the recognition and assessment of potential cases and unfolds through context-sensitive implementation of formal measures. In this sense, preparedness is inseparable from the organisation of veterinary work.

The findings further demonstrate the importance of collegial, expert and institutional support in making this work manageable. Access to experienced peers and readily available expert guidance was described as central to distributing responsibility and alleviating the strain associated with high-stakes decisions. Strengthening such support structures may therefore enhance both the effectiveness of disease control and the sustainability of the veterinary profession.

Overall, the study underscores that managing EADs is not only a technical and regulatory task, but a demanding form of professional

practice. Ensuring that veterinarians are supported, trained and able to sustain this responsibility over time is essential for maintaining both robust disease preparedness as well as a resilient veterinary workforce.

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CRediT authorship contribution statement

Valentin Öckinger: Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Susanna Sternberg Lewerin:** Writing – review & editing, Validation, Methodology, Conceptualization. **Hedvig Gröndal:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization.

Declaration of Competing Interest

The authors declare they have no conflict of interest.

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