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Compensation and exotic livestock disease management: The views of animal keepers and veterinarians in England

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Abstract

Relatively little is known about the perceived influence of different compensation systems on animal keepers' management of exotic livestock disease. This paper aims to address this research gap by drawing on interviews with 61 animal keepers and 21 veterinarians, as well as a series of nine animal keeper focus groups across five different livestock sectors in England. The perceived influence of current compensation systems on disease control behaviour was explored and alternative compensation systems that respectively reward positive practices and penalise poor practices were presented in the form of scenarios, alongside a third system that considered the option of a cost sharing levy system between industry and government. The results indicate that animal keepers consider themselves to be influenced by a range of non-financial factors e.g. feelings of responsibility, reputation, and animal welfare concerns, in the context of their exotic disease management practices. The majority of animal keepers were unaware of the current compensation systems in place for exotic diseases, and were therefore not consciously influenced by financial recompense. Concerns were raised about linking compensation to disease management behaviour due to auditing difficulties. A cost sharing levy system would likely raise awareness of exotic disease and compensation among animal keepers, but differentiation of payments based upon individual farm-level risk assessments was called for by participants as a strategy to promote positive disease management practices.

Key words

Exotic livestock disease management, compensation systems, scenarios, farmer and veterinarian perceptions

Introduction

Outbreaks of exotic disease present a significant threat to farming, rural communities, animal keepers and the economy as a whole, and can represent a major public health risk in the case of zoonotic diseases (Defra 2015a). An exotic livestock disease is a disease not normally present in a country. In England, for instance, Foot and Mouth Disease (FMD), Bluetongue, Avian influenza (AI), African Swine Fever, African Horse Sickness, and Anthrax are examples of exotic livestock diseases. This study defines exotic livestock disease management as practices implemented at the farm level to prevent the incidence and spread of exotic disease, such as through the uptake of biosecurity measures and the prompt identification and reporting of disease suspicion. Whilst an effective response to livestock disease involves many levels of activity and responsibility across organisations and Government, there is a legal duty incumbent upon any person who suspects that an animal may have an exotic notifiable disease to report that suspicion to the appropriate authorities. In England, the first point of contact is the local Animal and Plant Health Agency (APHA) duty veterinarian who will assess the situation and arrange appropriate investigation (Defra 2015a). Thus, to limit the spread of exotic disease before controls are applied, it is imperative that animal keepers have an understanding of the clinical signs of exotic disease to ensure early detection and prompt reporting of suspicion. Where disease is detected at premises, it can often be eradicated through culling of susceptible animals, and animals identified as 'dangerous contacts.' Animal keepers are generally compensated for the culled animals, although levels of compensation vary across the pig, poultry, cattle, sheep, and equine sectors and depend also on the type of disease. For example, animals culled due to FMD will generally result in full valuation based compensation, while keepers of horses culled to control exotic disease may only receive £1 in compensation per animal (up to £2,500 in the case of African Horse Sickness) (see Defra 2011 for FMD, Defra 2012 for African Horse Sickness, and Defra 2015b for Avian Influenza).

The availability of compensation may encourage animal keepers to report disease quickly and adhere to legal requirements for cleaning and disinfecting their premises. However, Enticott and Lee (2015) suggest that the existence of compensation does not necessarily provide a strong incentive for animal keepers to implement biosecurity measures to reduce the risk of disease spread. Nevertheless, under the principle of 'prevention rather than cure', animal keepers are expected to practice certain

biosecurity measures (such as limiting and controlling farm visitors, appropriate sourcing of livestock and isolation practices) within their normal routine to help reduce the risk of disease incidence and spread. It is advised that biosecurity practices be maintained and enhanced during a disease outbreak. The non-compensation orientated influences on biosecurity uptake amongst farmers in England are relatively well established (see for example, Bennett and Cooke 2005, Gunn *et al.* 2008, Enticott and Franklin 2009, Floyd 2011, Fisher 2013, Naylor *et al.* 2016). However, little is known about how animal keepers and veterinarians view the role of current compensation systems in promoting the implementation of biosecurity and the speed of reporting suspicion, in relation to exotic disease management behaviour.

This paper reports on the findings from a recent qualitative study designed to understand how compensation systems might influence exotic disease management. Prior to the research being conducted, a separate rapid evidence assessment was undertaken to inform Defra's review of the way it pays compensation for exotic livestock disease. This assessment involved a review of existing evidence and the identification of research gaps (see Barnes *et al.* 2015), and concluded that thus far, there has been a focus on economical modelling (see for example Boni *et al.* 2013, Hennessy and Wang 2013) and a relative lack of investigation into compensation and behavioural change. Acknowledging this need to consider farmer behaviour from qualitative social science perspectives, Defra commissioned research to form part of the wider interdisciplinary evidence base, and this paper directly addresses this knowledge gap. It draws on findings from a study undertaken with animal keepers and veterinarians between January and April 2015 which aimed to elicit views on how different hypothetical compensation systems may influence animal keeper exotic disease management behaviour in England. Specifically, animal keepers and veterinarians' views were sought on the influence of three different compensation systems. After a brief review and justification of the research methods employed in this study, the main section of the paper examines animal keeper and veterinarian responses to the different compensation system scenarios. The final section of the paper discusses the implications of the findings in terms of exotic livestock disease management.

Research methods

A qualitative approach was adopted for this study, involving a total of 82 face-to-face interviews and nine sector specific focus groups. In total, 61 interviews were carried out with animal keepers across key livestock sectors (poultry, sheep, cattle, pigs, equine, backyard/hobby) and further data were collected via interviews with 11 APHA veterinarians and 10 private veterinarians. Of the 61 animal keepers interviewed, 50 (across the sectors) had prior experience of exotic livestock disease in terms of suspected or confirmed cases, as did all of the veterinarians. The interview sample was drawn from data held by APHA. For certain livestock sectors, such as equine, due to low incidence of exotic disease in the past, it was necessary to also interview animal keepers without past experience. The nine sector specific focus groups (two per sector for cattle, sheep, pig and poultry and one for equine) were held in a range of geographical locations across England[1] and were each attended by 8-12 animal keepers, selected through existing contacts and industry gatekeepers. The focus groups lasted between two and three hours, whilst interviews lasted approximately one hour, and all discussions were recorded and transcribed verbatim.

Interviewees with past disease experience were asked to recount in detail how they felt compensation available at the time had influenced their exotic disease management, including the speed of reporting suspicion. All animal keepers were asked to discuss their past and current approach to biosecurity both in terms of routine practice and during disease outbreaks (if applicable). In the process, the factors which were perceived to influence their disease management practices (including and in addition to compensation) were identified and explored. Discussions revolved around their perception of the role that compensation played in their practices at the time of disease outbreak (where applicable) and the potential influence that both the current and alternative compensation systems may have on keepers' responses to future outbreaks. Interview and focus group discussions yielded in-depth and contextualised accounts of participants' views towards the role of compensation and enabled the exploration of other factors that may influence decision making during an outbreak.

[1] Animal health is a devolved issues in the UK so the research was commissioned to apply to England only

This social data is a valuable addition to the evidence base, offering opportunities to triangulate these accounts with existing quantitative datasets and economic modelling.

To explore the perceived influence of alternative compensation systems on animal keeper disease management behaviour, interviewees and focus group participants were presented with a series of compensation scenarios. Scenarios have been widely used in the social sciences for their ability to represent a realistic decision-making situation and a range of intervention mechanisms (Soleri and Cleveland 2005, Naylor *et al.* 2014, Quine *et al.* 2011). The three compensation systems presented to participants were as follow: (a) the current system of compensation, (b) a system based on bonuses for good behaviour or a system based on penalties for poor behaviour, and (c) a levy system representing government and industry cost-sharing. For the bonus-based and penalty-based systems, the scenarios were designed to represent different framings of a single system; one with positive connotations and one with negative connotations. The fact that the impact of a message can be manipulated by emphasising the benefits or costs associated with a particular behaviour is well recognised across behavioural studies (Rothman and Salovey 1997, Tversky and Kahneman 1981). Furthermore, a case study formed the third scenario, describing details of a system based on cost-sharing in the form of levy payments. The scenarios were co-developed in collaboration with Defra and were also informed by the research objectives and early findings of the rapid evidence assessment process. They were adapted to ensure applicability to each livestock sector, and are outlined in detail in the results section of the paper. Each scenario was presented to participants simultaneously during interviews and focus group discussions. Participants were asked to give their initial reactions to each scenario and to consider what they would do in each situation; what factors would likely influence what they decided to do; and what they believed other animal keepers would do in terms of their exotic disease management practices. Veterinarians were presented with the same scenarios and asked for their opinion on how animal keepers might respond. The reactions to each scenario were recorded and key differences between animal keepers and veterinarians were identified. While scenarios have been shown to be a useful method to ascertain realistic insights into how individuals would respond to particular situation, it is important to note that the results reported here are based on participants' opinions on what they would do rather than a reflection of actual behaviour.

All interviews and focus group discussions were facilitated by experienced social science researchers. This was important given the sensitive nature of the research. Participants were made aware of the purpose of the research and were assured of confidentiality, and all signed a form to give their consent for participation. Data collected from both the interviews and focus group discussions were analysed using the qualitative analysis software, NVivo. Following an initial reading of transcripts and multiple meetings with all members of the research team, a coding framework (identifying key themes) was devised and reviewed prior to analysis, in order to ensure validity. During coding and analysis, further themes emerged from the data, and an iterative approach to the analysis was taken (see Welsh 2002 for further detail).

Results

Views on the influence of current and past compensation systems

Surveyed animal keepers across sectors were generally unaware of current compensation systems for exotic diseases, beyond the general recognition that some form of recompense existed. There were incorrect assumptions made amongst surveyed animal keepers that full compensation would always be received and would also cover consequential losses, such as loss of production. The compensation system concerning reductions in payment based on disease status of animals at the time of culling (in the case of Swine Fever and Avian Influenza, for example) were unknown to the pig and poultry sector interviewees, and thus the idea of compensation was rarely considered to have an influence on the speed of reporting at the time. Instead, in retrospect, animal welfare, feelings of responsibility to other animal keepers and the wider industry, and risk perception were perceived to be the most significant factors driving early reporting, as demonstrated by the following quotes:

"I don't think [compensation is] relevant really. I think when you're faced with something

like [African Horse Sickness] that the first thing you want to do is eradicate the disease." (Horse keeper)

"The compensation never entered my head really. I mean once we had fought from our end to try and stop the disease getting onto our farm, our main concern after that was to try and help other local farmers." (Sheep keeper with experience of FMD)

Despite the limited perceived influence of compensation, concerns were raised over the negative impact on disease reporting if compensation was reduced. Participants suggested that if animal keepers were made fully aware of reductions or lack of compensation available, perverse impacts may result, such as hiding suspicious cases, and delayed reporting. This view was shared by animal keepers and veterinarians. The following quotes reflect this:

"We want to control it and this is a very good reason why we [the Government] pay compensation… the amount of people that won't declare their suspicions if we didn't pay compensation, lots of people wouldn't report [it]" (APHA veterinarian)

"If I knew that there was no compensation and I was going to lose my herd 171 then I would try and keep it under wraps to survive. Blow everybody else, at the end of the day I want to try and stay in business … If I could still market animals without being noticed, although I might be the black sheep amongst pig producers, I would still be in business because I still have something to sell." (Pig keeper)

Views on the influence of a penalty or bonus compensation system

All study participants were presented with a penalty and bonus system scenario (see below) and asked for their views on how these alternative compensation systems may influence disease management response, including the implementation of recommended biosecurity practices, the speed of reporting and the speed of secondary cleansing and disinfecting (C&D). Scenario 1 represents a penalty system whereby compensation for exotic disease is only paid in full to keepers who have a regularly audited biosecurity plan in place; in other words, individuals are penalised if found to be demonstrating 'poor disease management practice'. Scenario 2 represents a bonus system, whereby keepers must demonstrate 'good disease management practice' to qualify for a bonus payment, thereby topping up their payment to full compensation.

Scenario 1: There has not been an outbreak of [exotic disease] in the UK for 20 years. The Government announces that it has changed the way that compensation will be paid. Instead of receiving compensation for all animals culled to control the, disease, you will only get compensated for culled animals if you have a regularly audited biosecurity plan in place.

Scenario 2: You hear that the government is planning to change the way that they pay compensation for [exotic disease]. They will pay 25% of the costs in compensation, plus bonuses for good practice including prompt reporting, the presence of a regularly audited biosecurity plan and prompt implementation of secondary cleansing and disinfecting (C&D) (where relevant). Animal keepers could therefore receive full compensation if they are eligible for all available bonus payments.

Whilst animal keepers and veterinarians felt that a compensation system based on either penalties or bonuses would encourage animal keepers to draw up a biosecurity plan, significant concerns were shared about the feasibility of linking compensation to disease management practices; with animal keepers emphasising that biosecurity requirements would need to be realistic and tailored to their situation, and balanced against financial losses and perceived exotic disease risk. The main area of concern raised by participants was the limited ability to monitor and audit biosecurity plans, and the potential complications of evidencing eligibility for payment.

In relation to reporting disease suspicion (e.g. suspicion of a potential exotic disease would be required to be reported within 24 hours to avoid penalties or to be eligible for bonus payments),

participants felt that a bonus or penalty system may increase the speed of reporting. However, concerns were raised about how the speed of reporting could be accurately assessed. Unease was also expressed over the idea that animal keepers may report all disease concerns on a precautionary basis, which may impact upon veterinary capacity. This concern was particularly evident from discussions with veterinarians. Alternatively, it was suggested that if keepers knew that they would not receive full compensation (due to penalties for poor biosecurity management practices), they would not report disease suspicion promptly and thus such a system may potentially discourage good exotic disease management practice:

> *"The compensation was put there for [keepers] to come forward in good time and report anything that's a bit suspicious or you're a bit worried about. If you remove that we're not going to be quite so keen to open the door" (Cattle keeper)*

> *"If [a keeper] is only going to get 25% of their cost, they're not going to report it." (Pig keeper)*

Animal keepers favoured a system based on bonuses due to the positive connotations and emphasised the importance of rewarding good behaviour, but tailored interventions or systems may be required. The concept of earned recognition was noted as preferable, whereby those with a strong track record of adherence to standards should avoid additional auditing and inspections. Despite the general consensus among animal keepers that a bonus system would be a more popular approach, there were mixed reactions in terms of whether such a system might actually influence behaviour, especially from animal keepers who are already engaged in good practice**:**

> *"I'd always go bonuses first, definitely. Your carrots are much more likely to see good behaviour than sticks… you need to come at it in a positive way in order for people to see it as a positive thing, rather than the government just dictating what we need to do."* (Pig keeper)

Surveyed veterinarians felt that a system based on penalties, would be more likely to influence animal keeper behaviour; in this regard, veterinarians noted the success of Cross-Compliance penalties (particularly relating to non-compliance with bovine tuberculosis testing) in encouraging compliant behaviour:

> *"You can get farmers to do whatever you want, if you make the financial penalties hard enough, there are many examples of that…"* (Private cattle vet)

> *"I think unfortunately there's a part of our human population that will only react to being punished and that the carrot doesn't work so it has to be a stick."* (Private equine vet)

The idea of a tailored approach was discussed by veterinarians and animal keepers as a means of influencing a variety of individuals:

> *"It depends on the farmer. The progressive ones, I think probably would go for the bonuses. The ones that were not quite so business orientated, I think they would wait and get penalised fairly heavily before it would make any difference with them."* (APHA vet)

Furthermore, it was suggested that some keepers undertaking particularly poor practice would not be influenced by either system. The preference for a bonus system by animal keepers and the preference for a penalty system by veterinarians is the most significant difference between the two groups.

<u>Views on the influence of a levy compensation system (cost sharing)</u>

Study participants were asked to discuss how the source of compensation may influence the likely disease management behaviour of animal keepers. Participants were presented with a case study based on a system of industry levies. Animal keepers are required to pay levies to industry boards, in the form of annual payments, but payments do not reflect individual livestock keeper risk nor risks

associated with particular production systems. Economic sanctions are used where there is proof that the cause of an outbreak is the fault of a producer, or where hygiene and prevention standards have not been met.

The levy approach was cautiously welcomed by interviewees and, if made voluntary, participants felt that most animal keepers would pay the levy if it was affordable and in line with levies that have been paid in the past in certain sectors. To have the potential to influence animal keepers who are less engaged in the industry and likely to pose highest risk (e.g. lifestyle keepers or those with poor animal husbandry), it was argued that the system would have to be made compulsory. The source of compensation was not considered to be an influential factor; with keepers suggesting that they would generally be no more likely to adopt higher biosecurity standards or report disease quicker if the costs were covered fully or partly by the industry, than if compensation payments were met fully by the state. The main way that a levy system was thought to have the ability to lead to more positive disease management responses was through having the potential to increase industry engagement and raise awareness of the compensation system among animal keepers. At the same time, the issue of fairness was consistently raised by animal keepers throughout the interviews and focus groups, whereby any cost sharing scheme would need to reflect shared responsibility, with government being seen to be 'playing their part' in disease risk control.

The findings suggest that feelings of fairness concerning compensation are likely to influence industry support, which in turn may have an impact on individual keeper buy-in to such a scheme. For the levy system scenario to be attractive, animal keepers argued that payments would need to be differentiated by individual risk, rather than at the sector, system, or geographical level, for example. Such a system was perceived to be more likely to lead to positive behavioural outcomes due to the immediate, visible financial impacts on individuals.

Discussion

This paper provides qualitative insight into the perceived influence of compensation on exotic disease management. Surveyed animal keepers felt that their actions were being influenced by a range of factors, including animal welfare, responsibility, risk perception, and reputation. In line with the conclusions of Enticott and Lee (2015) the findings reported here suggest that current compensation systems have a limited perceived influence and impact on the disease management behaviour of animal keepers due to a lack of awareness. This may have prompted keepers to more readily cite other non-financial factors as more important in their decision making around exotic disease management. Animal keepers did, however, consider compensation to be important in guarding against adverse impacts such as hiding of disease and lack of or delayed reporting. The potential for negative consequences should be incorporated into any assessments of the costs and benefits associated with potential changes to compensation systems. This is particularly the case in light of Gramig *et al.'s* (2009) assertion that compensation should be less than 100% to ensure farmers have a stronger financial interest in preventing an outbreak.

Veterinarians perceived a penalty approach to most likely be more effective. This supports the conclusion reached by Bocqueho *et al.'s* (2014) study of farmers in Eastern France, which suggested farmers are more inclined to act out of fear of losing something (e.g. financial loss/penalty) (Weiner 1980, Davis 1995); hence suggesting that framing the outcome of a system as a 'potential loss' might promote risk aversion amongst animal keepers in the case of practicing appropriate exotic disease management. In contrast to veterinarians, animal keepers in this study expressed preference for a bonus system due to its positive connotations. Previous work by Burton, Kuczera and Schwarz (2008) has identified the tendency for farmers to support schemes that enable demonstration of one's own ability i.e. earned recognition.. The general concept of earned recognition and its potential benefits on behaviour have already been touched upon (see Angus *et al.* 2013, Defra 2013, Jones and Gosling 2013) and are supported by animal keepers in this study. In general, participants frequently distinguished between animal keepers with 'good' or 'bad practice' (see Naylor *et al.* 2016); and based on the qualitative findings reported here, these groups may respond differently to different compensation systems. A bonus system encompassing allowing some form of earned recognition may

be more likely to influence the 'good' animal keepers, while the penalty approach which utilises a 'loss' frame may be more likely to influence the keepers who were considered to have poorer disease management practices, for example.

In the case of the cost-sharing compensation system, consistent with the economic literature outlined by Barnes *et al.* (2015), the source of compensation was felt to have a limited influence on disease control behaviour. However, a system of levy payments may increase levels of knowledge relating to exotic disease risk and control. It is important to note that a compensation policy not supported by industry may lead to perverse behavioural responses. This was a consistent theme throughout the data, and it was felt to be particularly important for animal keepers to feel satisfied that the government is visibly 'playing their part' in preventing the spread of exotic disease, such as through effective border control (as previously suggested by Gunn et al 2008, Garforth, Bailey and Tranter 2013).

Conclusion

A major conclusion of this study is that animal keepers do not consciously consider their exotic disease management behaviour to be influenced by compensation. This may be due to a lack of awareness of the compensation system for exotic livestock diseases, and thus other factors were considered more prominent in guiding their disease management decisions, such as animal welfare concerns, responsibility, reputation, and perceived risk. These other factors should be considered during an outbreak or in designing responses to exotic livestock diseases and animal keepers must be made aware of the system of compensation that would affect them in order to achieve any potential desired behavioural response. One way that awareness of exotic disease and associated compensation available to the livestock sector could be increased is through a levy-based cost-sharing compensation system. For the system to be considered fair by animal keepers, it would need to allow for individual animal keeper payments to be differentiated at the farm level and be based on risk, to encourage animal keepers to reduce risk levels in order to pay lower premiums.

The findings suggest that reductions in compensation payments may potentially lead to adverse impacts, such as hiding of disease and a lack of or delayed reporting. Linking compensation to the speed of disease reporting may have some positive impacts on exotic disease management practices, but based on the contrasting views of veterinarians (who favoured a penalty approach) and animal keepers (who favoured a bonus approach), it is likely some form of a tailored approach, with different interventions may influence different groups of animal keepers more effectively.

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