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# So who is responsible for disease?

Who owns disease? Thursday November 24, 11.10am, Friesian

AT one level, the question of who is responsible for disease may seem simple or even one that doesn't need asking. If you have a cold, you are expected to take care of yourself and if a cow has mastitis then the farmer needs to undertake effective treatment. If it is one of the notifiable diseases in your livestock, such as foot-and-mouth, then the Government veterinary services take over control. So, why the question – and why the debate?

Possibly we, as veterinarians, should be asking the question for a number of important reasons. In this article, let me suggest a few. I appreciate it can be irritating to have all questions and no answers; possibly, we need a wider debate to find worthwhile answers.

Some diseases can be highly transmissible. For diseases that are not infectious, for example, metabolic, genetic or endocrine, the correction is usually local – such as nutritional, breeding or replacement therapy. More importantly, there is no risk to either neighbouring farms or during the marketing of animals.

Infectious diseases are different – they continually challenge other livestock enterprises and our companion animals. They travel in the wind, they ride on clothing, vehicles, equipment and vaccines, they cross fences at the end of an extended muzzle and they can even hijack lovemaking/mating. In exceptional cases, they hide away in unborn foetuses. For all these reasons, disease transmission becomes a silent assassin, with the potential for damage and death. The difficult question is who is responsible – the neighbour for transmitting disease or the farmer for failing to protect his stock by foolproof biosecurity?

A bull, full of raging passion, destroys an adequate fence to enter a neighbouring farm, but brings with it a virus that infects the new and naive herd, thereby severely crippling its production and welfare. Far-fetched? Not at all – I have been involved in legal cases dealing with just this

"So, what is one of the major risks to food security? We come back to both endemic and exotic diseases. If this true, it would appear that responsibility for food security and better productivity moves away from the individual primary producer to a more collective one."

legal situation. The case rested on providing adequate proof (by DNA fingerprinting) that the viruses on both farms were identical.

Infectious diseases are a risk to all and not (usually) confined to a single individual or premises. In the context of veterinary practice, all clients are vulnerable to their neighbour's diseases or, if they trade more widely, then all diseases further afield.

Do new diseases emerge?

The Government's Foresight project on detection and identification of infectious disease (2006) was directed by Prof Sir David King (King et al, 2006; Brownlie et al, 2006) and reported new and emerging infections were a major threat to the health of humans and animals, with a new human disease being reported every eight months. To predict what the new disease might be and how severe it might be has not been possible, what we can say, with some authority, is that new diseases will continue to emerge. Are we, as veterinarians, well placed to deal with such new infections? Do we know what we need and are we ensuring we have the strategy to deal with the unexpected disease?

Are a high proportion of animal diseases, including the newly emerging ones, zoonotic?

We know that possibly 80 per cent of emerging diseases have zoonotic potential, as well as a number of the endemic animal infections that we encounter daily. Does this make any difference to our thinking and our responsibility? There is now a greater awareness of a One Health approach to infectious disease, but are the medical and veterinary practitioners joined at the hip – or joined anywhere? Our research, our science and our pathogens are remarkably similar, but, when it comes to controlling diseases, are there strong links?

Is there professional responsibility for the control, if not eradication, of infectious diseases?

To detect and identify an infection, a number of events need to happen. In fact, they need to happen sequentially and rapidly, particularly if we want to control a disease from becoming widespread. The sequence is first, the livestock keeper must recognise there is a problem needing veterinary diagnosis; secondly, the veterinary practitioner needs to make a diagnosis or take samples for laboratory diagnosis and thirdly, the laboratory has to undertake rapid tests, both specific and sensitive, to confirm or reveal the causal pathogen. The sequence then needs to work quickly in reverse – laboratory to veterinarian to stockkeeper. Any failure in this chain is a prelude to failure of control. The point I want to make here



Cattle in a Devon lane. Endemic diseases are a constraint on small, family farms and a bigger vision is needed to help them.

Cattle, such as these in sub-Saharan Africa, are crucially important for food and cultural reasons. Disease pandemics can cause widespread famine in rural populations.



is that the veterinarian, as the professional diagnostician, is a critical and central player. So, do we have a responsibility?

Are all stockkeepers committed and competent to recognise infectious diseases?

If we look at the aforementioned diagnostic chain and ask about the commitment and competency of stockkeepers, we all know their range of expertise is considerable. This has an impact on welfare and on disease control.

If the disease is highly transmissible, then it becomes a crucial issue. The failure of a farmer to recognise and report foot-and-mouth disease in his pigs in 2001 held the country to ransom. Such a failure of the stockkeeper thereafter invalidates any expertise provided by the veterinarian and the laboratory.

Do farmers/stockkeepers consider their veterinarians important for the control of infectious diseases?

In a survey carried out by the national bovine viral diarrhoea (BVD) control group in 2006, more than 80 per cent of farmers considered their veterinarian to be the most important source of information about the risks of infectious disease and the means of disease control for their stock. This privileged position has been won by the hard work and professionalism of private practitioners over many years; it is not a provision gifted of the state

veterinary services. It is a private arrangement and not orchestrated within a national framework.

Do UK veterinary laboratories provide the service required to control infectious diseases?

In the past, we had one major state veterinary laboratory service that had a number of interlinked laboratories strategically located around the country. Today, the situation is different, with a number of private and competing laboratories with a diminished state veterinary laboratory service.

This may provide better, and possibly more appropriate, use of government funds, but loses the coherence of an integrated system to manage control of many infectious diseases. When one considers the essential foundation for disease control, particularly if one analyses past successes in the UK and present successful programmes overseas, a cornerstone is a single integrated laboratory for the provision of diagnosis.

Is there still a need to conduct relevant research underpinning the control of present and future disease?

It is surely self-evident that without a research capacity and suitable funding to undertake appropriate and often quite applied research (how long does virus X remain infectious in stock or in pasture?), then we become more vulnerable to the risks from

new, emerging or even mutated pathogens. The responsibility for this type of applied research is less clear. Funding for endemic infectious diseases has been considerably reduced in recent years, although it can be argued that important questions still remain (for example, the herd transmission of John's disease).

However, funders have a responsibility to understand, and hopefully accept, that this type of research is still in the public interest whether the funders are government or industry.

Disease control at the community, regional and national level requires a bigger vision and infrastructure than for individual animal/farm control.

Moving from controlling infectious disease on individual farms to the regional or national level is a huge step. Important lessons can be learned from the control on individual farms, possibly the most important is that control is possible. The move to a community-based system, however, no longer becomes one of just disease control. The need now is for the community to buy into the scheme. For this to happen, a sense of community is needed so total commitment to undertake disease control will be accepted.

This is all the more essential if the control scheme is to be voluntary. From my research, few, if any, such schemes have succeeded purely on a voluntary basis in the UK. A possible reason for failure is that insufficient thought is given to the essential infrastructure needed for disease control – such infrastructure needs to be both functional and properly supported. More interestingly, some social aspects, even cultural aspects, become central to success – do we, in the UK, have a culture in agriculture for cooperating for the community good? This is placed in very sharp focus when dealing with infectious diseases, where a single focus of disease can reinforce the community and lay waste several years of diligent control.

It would appear we are losing sight of the lessons we have learned from the past about disease control.

A sensible way to examine the critical issues involved with disease control is to consider those schemes that have been successful in the past and, possibly more instructive, those that have not. Several themes emerge, but paramount is the commitment of all to the scheme – and a clear understanding of who is responsible for what.

In the future, will food security be a problem only for developing nations?

Some developed countries, including the UK, appear to be complacent about food



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security. Global statistics clearly show that animal protein will be in short supply by 2020 and that governments of both the developed and developing world need to understand better productivity within livestock farming will become an issue.

If ensuring adequate food for the nation is a governmental responsibility (which it surely is), then investing in agricultural programmes that ensure improved productivity makes sense. If you couple food security with sustainability, it is not difficult to understand that more efficient animal production, particularly ruminant productivity, will also help reduce agricultural greenhouse gas emissions, which have been heavily implicated in climate change.

So, what is one of the major risks to food security? We come back to both endemic and exotic diseases. If this is true, it would appear that responsibility for food security and better productivity moves away from the individual primary producer to a more collective one.

Is the need to clarify who is in charge critically important?

If we can accept control of infectious diseases is not just a matter for the individual farmer and his veterinarian (although they have an intimate involvement with it), then we need to know where responsibility lies and who is in charge. This is behind the Government's recent "Responsibility and cost sharing" review – possibly more a question of cost sharing than responsibility. However, it really comes back to the bigger question – "who owns disease?" Until we really understand this and have a commitment to it, we will not



The dairy industry in New Zealand is highly developed and aware of all aspects of productivity, including endemic diseases. There is a nascent national bovine viral diarrhoea virus control programme.

control infectious disease. We will not be able to identify who is in charge. I don't see industry taking up the challenge. I do, however, see Government trying to hand it over. My own view is that we need to accept we all have some responsibility and need to find some answers to fundamental questions about ownership, leadership and whether we want to control and, better still, eradicate infectious diseases.

#### References

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