



Exploring the social context of risk perception and behaviour: Farmers' response to bovine tuberculosis



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ABSTRACT

While agricultural risk and risk perception has received significant attention in the literature, few studies have explored the factors that influence the way farmers respond to particular risks. This paper uses the case of bovine tuberculosis (bTB), one of the most significant risks currently facing the English cattle farming industry, to explore these factors, with a particular focus on the role of social networks. A large scale postal survey distributed to beef and dairy farmers in the south west of England provides representative data which are subjected to factor and cluster analysis in order to explore farmer views towards and responses to disease risk. Two groups of farmers are identified which can be distinguished from each other based on their attitudes towards bTB and the nature of their social networks. Farmers with wider, more externally focussed social networks are found to be more resilient than those whose social networks are restricted to family members and other farmers. However, while differences between the two groups are found in terms of their attitudes towards bTB, no differences are found in relation to their risk management behaviour, with few farmers taking clear action to reduce the risk of their herds contracting the disease. In order to address the identified disconnection between attitudes and behaviour, a number of potential interventions are put forward and discussed.

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Introduction

Farmers continually make business decisions in a risky environment caused by significant uncertainty in relation to production (for example weather or disease), market anomalies and price fluctuations. Over the last twenty years, a diversity of strategies have been developed ranging from conversion to organic agriculture to nature conservation and agro-tourism in order to reduce the financial risks that are inherent in the industry (Oerlemans and Assouline, 2004). In order to develop appropriate policy interventions, it is essential that the factors influencing the ways in which farmers approach risk and the choices they make in relation to their response strategies, are understood. While there is a large body of literature on agricultural risk (see for example Hardaker et al., 2004; Cobel and Barnett, 2008), very few studies provide an in-depth discussion of the factors that influence how such risks are perceived and the factors that influence response to them. This paper aims to address this important research gap with a particular emphasis on the role of social networks. Building on an earlier

paper (reference excluded to maintain anonymity) which presented an in-depth qualitative assessment of the relationship between social capital and farmer response capacity, this paper provides a quantitative analysis of a representative sample of farmers. The case study of bovine tuberculosis, one of the principle risks facing the cattle industry in England, is used to explore farmers' risk behaviour.

Bovine tuberculosis (bTB) is a bacterial disease found in cattle and other mammals throughout much of the world (Ayele et al., 2004; Schmitt et al., 2002). Its eradication is an international priority and has been successfully achieved in some countries, while others are making significant steps towards controlling the disease (such as New Zealand). However, in the United Kingdom (UK) the disease has spread significantly in recent years and the implementation of a range of control measures has not been successful in bringing the disease under control. Under European Union law, the UK is required to have a plan for the eradication of the disease (Council Directives 77/391/EEC and 78/52/EEC) and failure to meet minimum criteria poses a risk of infraction proceedings, financial penalties and trade sanctions. This study is therefore of international relevance in terms of exploring the issues and constraints associated with controlling bTB as well as disease control more generally.

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The disease is currently having a major impact on cattle farms in England, particularly in the South West and West Midlands, and is now costing England over £100 million a year in compensation and costs associated with bTB testing. Since 2008, 30,000 cattle have been slaughtered annually due to the disease (Defra, 2014). In cattle, bTB causes reduced productivity and premature death (Krebs et al., 1997), both of which have implications for wider farm productivity and the overall viability of the dairy and beef industries in the UK. Sustained disease outbreaks in livestock can also lead to problems associated with international trade agreements, should herds testing positive to bTB reach a critical level (Cousins, 2001).

Although the risk posed by bTB to farmers is well documented (Defra, 2013; Butler et al., 2010; Johnston et al., 2005) there has been limited research into how farmers respond to it. In fact, very little social science research has been conducted in relation to bTB in general. The social science studies that do exist generally focus on farmers' attitudes towards disease control measures, particularly biosecurity (Enticott and Franklin, 2009; Enticott, 2008a; Bennett and Cooke, 2005). However, farmers' response to bTB is key to the implementation of successful disease control policies, particularly at a time when the government is emphasising cooperation and partnership working across government and the farming industry (Defra, 2013).

Due to the limited social science literature on bTB it is useful to draw on the wider literature around risk perception and farmer behaviour, focusing specifically on social networks, within which this study is usefully situated. This is provided in the following section. The methodology is then presented followed by the results of an in-depth multivariate analysis of data collected through a large postal survey. The findings are then presented and the implications for understanding farmer disease response behaviour are discussed. A conclusion is provided in the final section.

The social context of farmer risk perception and behaviour

Farmers' responses to bTB are likely to be influenced by their perception of the level of risk that the disease poses. Risk is a complex concept which has received considerable interest from academics (see for example Beck, 1992; Hardaker et al., 2004; Botterill and Mazur, 2004). The reaction of individuals to a particular risk can vary substantially depending on the type of risk that is present (Beck, 1992). For example, Beck (1992) describes how people react differently towards risks posed by natural disasters when compared to those related to 'manufactured' or 'man-made' risks. Additionally, Maye et al. (2012) suggest that 'new' risks are likely to evoke different reactions to risks that may be familiar. For example, they suggest that a wheat farmer may perceive risks associated with 'known' diseases as relatively low when compared to risks related to 'alien' diseases about which they are less knowledgeable. Maye et al. (2012) also argue that it is often difficult to change a person's perception of a risk once a value judgment is made, particularly if the individual is knowledgeable about the subject. It is therefore likely that a farmer will be more easily persuaded about the best ways to avert the risk of a 'new' disease of which they have little or no knowledge.

There are a number of factors which influence perceptions of, and responses to, risk. According to Botterill and Mazur (2004), these include the characteristics of the individual facing the risk, the characteristics of the risk itself, as well as the social and environmental context in which the risk is placed. The importance of knowledge has also been highlighted. For example, a study of Australian farmers found that a range of situational factors as well as knowledge, beliefs and attitudes influence perceived risk and consequently impact upon levels of innovation adoption (Wyatt and

Henwood, 2006). Risk perception and response is clearly influenced by a wide variety of factors, many of which are likely to be socially situated. This discussion therefore now turns to the social context of farmers' risk behaviour.

Positive response to a particular risk is likely to involve a certain type of behaviour and understanding the factors that influence farmers' behaviour is essential. In reality, decisions are rarely made with full knowledge of all costs, benefits or risks. Behaviour and decision making is often influenced by group dynamics and social norms especially when decisions relate to commonly owned resources or community interests such as in the case of climate change, water abstraction or disease prevention, when individuals are unlikely to act unless others do so as well (Pike, 2008). The benefits of local, horizontal social networks in addressing risk and building resilience have been noted in the literature. Such networks take account of local contexts, knowledge and resources (Ilbery et al., 2005; Adger et al., 2005; Bernier and Meizen-Dick, 2014). The geographical nature of social networks is also noted by Bryant and Johnston's (1992) farmer decision-making model which recognises a range of factors that can influence farmer adaptations, many of which are spatially focussed: attributes of the farm operation, such as existence of an heir or the skill set of the farm operator; attributes of the local community, including the availability of farmland or community concerns about particular farm practices; and off-farm factors, such as commodity market prices. The model goes on to identify three types of farmer adaptations: positive adaptations, such as adding non-traditional enterprises or intensifying production on the existing land base; normal or managerial adjustments characteristic of the entire agricultural sector, such as the adoption of a standard agricultural technology (e.g. hybrid seeds); and negative adaptations, such as exit from farming or a reduction in production intensity in anticipation of the future sale of farmland to developers. Further emphasising the spatial elements of social networks, Sharp and Smith (2003) argue that the adaptations missing from this model are those which are influenced by the local social setting. This type of adaptation involves a farmer building trust and understanding about potential offensive farm practices with neighbours in order to prevent future misunderstanding or conflict. Sharp and Smith (2003) draw on the social capital literature to justify their claim that 'neighbouring' should be considered a valid adaptive strategy. They conclude, in agreement with many social capital researchers, that "people who know and trust one another are more likely to be able to work together to find a solution to problems that are mutually acceptable to everyone." They suggest that social capital among farmers and non-farmers is likely to provide several benefits for both the farmer and the wider community, including benefits relating to increased resilience. When faced with risk, farmers have a number of options in terms of their response and it is at this point that the various mechanisms influencing farmer behaviour are important, as discussed below.

Throughout the literature the importance of the wider social context has emerged as being central to our understanding of why individuals respond to risk in the way that they do. While the importance of the social context has been emphasised by social scientists exploring farmers' attitudes towards bTB and its control (Fisher, 2013; Enticott and Vanclay, 2011; Enticott and Franklin, 2009), no quantitative exploration of farmers' social networks in relation to their response to bTB has been undertaken. This paper therefore draws on understandings of farmer behaviour, which is explored further in the following section, in order to provide representative data to address this important gap in the literature.

Interpreting farmer behaviour is key to understanding risk perception and the reasons why farmers choose to respond to risk in certain ways. In order to further understand farmer behaviour countless 'theories of behaviour' have been developed within the

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