

Quantitative analysis of socially amplified zoonotic risks

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Food scares can be caused by government statements on food safety, albeit unintentionally. The social amplification of risk framework (Kasperson et al., 1988) attempts to explain such unexpected public reactions to risk announcements. This study aims to bring a new focus, of quantitative analysis, to the study of this risk framework. Our focus is on a zoonotic food scare: UK poultry consumption following the 2007 outbreaks of highly pathogenic avian influenza (HPAI) in two separate domestic poultry flocks.

This research was motivated by a similarity between the social amplification of risk framework and epidemic models: the framework uses a metaphor of risk signals broadcast over a communications network which we conjecture are analogous to infectious diseases spreading through a population. In this example the 'infectious' condition would be the public's perception of a zoonotic risk.

To parameterise our models it is necessary to verify the spread of risk perception through the UK population. We propose using a panel of 1.2 million supermarket shoppers, with risk perception being measured through changes in purchases of products and their substitutes in response to HPAI outbreaks. The data is aggregated geographically, demographically and into similar product groups. Our initial investigation was into the number of stores selling poultry. This was selected as consumer purchases are underpinned by the availability of the product. There is a further advantage in that it may be possible to assess the supermarket's reaction to the zoonotic outbreak.

A generalized linear model with a Poisson response was fitted to the data. Explanatory variables representing seasonality and the two separate HPAI outbreaks in the UK were used. Our early results indicate people could use geographic distance as a heuristic to assess health risks. The number of stores selling selected turkey products in distant regions recovers more quickly than more local regions following the second outbreak, in November 2007. Future work will include analysis of customer reaction, measured by sales value.

Amplifications and attenuations of risk can lead to job losses and stresses in the supply chain of replacement food products. We believe that this makes our results of value to decision makers in local and national government and to veterinary practitioners in poultry and farm animal practice.

Kasperson, R.E., Renn, O., Slovic, P., Brown, H.S., Emel, J., Goble, R., Kasperson, J.X., Ratick, S., 1988. The Social Amplification of Risk: A Conceptual Framework. *Risk Anal.* 8, 177-187.