

A methodology to assess indirect economic impacts of animal disease outbreaks

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Abstract

Indirect costs of animal disease outbreaks often significantly exceed the direct costs. Despite their importance, indirect costs remain poorly characterised due to their complexity. In this study, we developed a framework to assess the indirect costs of a hypothetical African Swine Fever outbreak in Switzerland. We collected data through international and national stakeholder interviews, analysis of national disease control regulations and industry data. We developed a framework to capture the resulting qualitative and quantitative data, categorise the impacts of these regulations, and rank the impacts in order of importance. We then developed a spreadsheet model to calculate the indirect costs of one category of control measure for an individual group of stakeholders. We developed a decision tree model to guide the most economically favourable implementation plan for a given control measure category, under different outbreak scenarios. Our results suggest that the most important measure/impact categories were 'Transport logistics', 'Consumer demand', 'Prevention of wild boar and domestic pig contact' and 'Slaughter logistics'. In our hypothetical scenario, the greatest costs associated with 'Prevention of wild boar and domestic pig contact' were due to assumed partial or total depopulation of pig farms in order to reduce herd size to comply with the simulated control regulations. The model also provides suggestions on the most economically favourable strategy to reduce contact between wild boar and domestic pigs in control areas depending on the duration of the outbreak. Our approach provides a new framework to integrate qualitative and quantitative data to guide disease control strategy. This method could be useful in other countries and for other diseases, including in data- and resource-poor settings, or areas with limited experience of animal disease outbreaks.

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