

## Executive summary

Management of livestock diseases has become increasingly important given the concentration of livestock production, large volumes of cross-border trade, and international travel. Many diseases pose threats to humans and wildlife. Farmers are the primary decision-makers in livestock disease management. How can government policy align farmer incentives with public objectives related to livestock disease risks? This report examines various aspects of this broad question and provides recommendations for more effective government policy.

Farmers have clear incentives to prevent livestock disease, but as rational entrepreneurs they trade marginal benefits of efforts against the marginal costs. Farmers may also weigh long-term gains from investments in farm biosecurity against returns to investment in other areas. For their decisions on disease management, farmers need to understand the options which depend on disease biology, prevention techniques, tests for infection and their costs, treatments available, market reactions and other factors. The role of policy then is to:

- *Enable farmers to make better informed decisions on disease management:* facilitate their access to necessary knowledge, skills and information, including the information that could be tailored to particular farm situations, as well as decision-support tools.
- *Encourage the development of technologies and services that decrease the costs to prevent and control disease,* so that private solutions on disease management result in lower disease occurrence and lower public costs.
- *Communicate the potential for economies of scope in biosecurity practices:* when farmers understand that certain practices can prevent multiple diseases, farmer incentives to undertake those practices are strengthened.

Uncertainties and risks add complexity as farmers do not have perfect information when making disease management decisions. Risk perception is an important factor: if a farmer believes there is negligible risk that a disease will be contracted on his farm, he will be unlikely to invest in its prevention. There are biases and risk perception issues that must be addressed in order for farm managers to make adequate livestock disease management decisions. Governments should therefore:

- *Ensure sufficient communication and education on animal disease risks,* so that farmers better understand the risks they are facing and their potential effects beyond the farm.
- *Increase government's own understanding of risk awareness and risk preferences of the farming community* as a necessary input into livestock policy design.

Infection on one farm may cause damage to neighbouring farms, affect the whole sector, or even threaten human health. This is the principal rationale for government involvement in animal biosecurity. However, government policies need to address potential information problems, in particular when it comes to very harmful diseases and compensation for related losses. One problem is moral hazard, where a farmer who expects to receive compensation in the event of a disease outbreak has weaker incentives to avoid risk during “peace time”. Another problem is that if a farmer reports a disease, there may be costs incurred related to that reporting, and thus a budget-constrained farmer may be inclined to wait and see without alerting authorities. Compensation schemes for epidemics can address these information problems if they:

- *Induce sufficient effort by farmers to prevent disease*; for example, by shifting part of the risk to farmers through less-than-full compensation of losses, or differentiation of payments according to individual risk profiles; by making payments conditional on farmers exercising certain biosecurity practices, or implementing farm biosecurity plans, or participating in disease programmes.
- *Provide incentives for early reporting of disease*; for example, by denying compensation where there is a failure to report, or applying no or reduced payment for diseased animals.

Whether livestock holders run commercial production or farm for subsistence or as a hobby, changes their incentives to manage disease. Policies designed for commercial farms will likely be a poor fit for non-commercial animal operations and hobby farms. Incentives may also depend on geographical location which affects vulnerability to disease risk and farmer's ability to free-ride on the biosecurity efforts of others.

- *Allowing flexibility in policy design to account for specific characteristics of farms* may improve the alignment of incentives.

Economic motivation is essential, but only partially explains farmer behaviour. The broader values of farmers and their ability to process information and gain knowledge, their habits and social connections also influence disease management decisions. Policy needs to act along the whole spectrum of these behavioural drivers to engage different notions – psychological, social, as well as economic – to have a more broadly shared response within the farming community. Information services, education, advice and communication activate such drivers. Thus, policy makers need to:

- *Build evidence on behavioural aspects to understand the complexity of drivers behind farmer disease management* and integrate that knowledge into policy design.
- *Encourage communication and social connectivity amongst farmers*, understand who the opinion leaders are and the farmer's principal sources of reference in disease management in order to exploit effective communication pathways to deliver policy.
- *Use gentle nudges*, rather than coercive measures, by appealing to preferred values.

Farmers are at once individuals who make individual choices and members of communities having a common interest. Collective action can provide responses to shared concerns in disease risk management, by generating economies of scale and scope that reduce the private cost of management. Collective action can strengthen compliance with norms, develop and enforce industry standards, and support best practices. It can also improve the division of responsibilities between government and private actors. The role of policy should therefore be to:

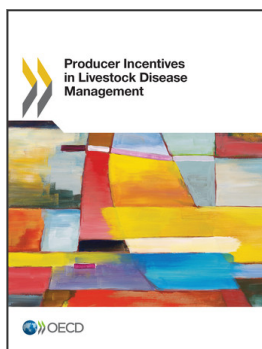
- *Provide evidence of the benefits of collective action, external facilitation, and information through existing networks.*
- *Foster institutional and financial soundness of producer institutions* through legislation, and address the “free-rider” problem that constrains collective action.
- *Develop the potential for collective action* in areas such as farmer capacity building, risk insurance, surveillance, and responses to livestock epidemics.

Farmers and agri-food industries co-operate to ensure food quality and verification of production practices to consumers, and to maintain market access. These programmes may provide a framework to foster farm biosecurity practices or create positive spill-overs to prevent disease.

Finally, wildlife as a reservoir and vector of disease complicates management. Farmers might be able to manage sporadic risks through biosecurity actions, but continuous disease pressure from a disease reservoir in local wildlife is not manageable at the farm level. Government agencies charged with disease control in livestock and wildlife populations should co-ordinate and complement their efforts.

Country-case studies for Australia, Chile, and Korea conclude this report. They all focus on three topics: i) government's awareness of producer behaviour; (ii) information, education and training for producers; and (iii) epidemic compensation policy. Some of the cross-cutting findings are:

- The degree to which these countries integrate knowledge about farmer behaviour into their policy design is uneven, with Australia being the most advanced in this respect.
- While there is strong communication with farmers on veterinary and sanitary issues, there seems to be less emphasis on the economics of disease management. Such considerations are nevertheless shown to be significant drivers of farmer disease management decisions.
- Approaches to compensation related to epidemic diseases differ across countries: Australia has established effective cost-sharing between industry and government, Korea presents an instructive example of tailoring government compensation to particular farmer profiles, while Chilean regulations do not foresee indemnities to producers in the case of disease outbreaks.
- Small livestock holders are an important constituency that should be targeted by animal disease policy, although designing a policy mix to reach out to this producer group is challenging.



**From:**  
**Producer Incentives in Livestock Disease Management**

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264279483-en>

**Please cite this chapter as:**

OECD (2017), "Executive summary", in *Producer Incentives in Livestock Disease Management*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264279483-3-en>

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