

# The economic impact of a new animal disease: same effects in developed and developing countries?

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## Summary

Animal disease outbreaks generate a range of economic and non-economic impacts. While a significant number of research studies have estimated the effects of various diseases in a variety of contexts, examining the differential impacts and implications associated with the introduction of a novel disease into a developing country, as opposed to a developed one, is a rich area for further research. In this paper, the authors highlight some of the key dimensions and implications associated with the impacts of new diseases, how they differ in different contexts, and their implications for public policy.

## Keywords

Animal disease – Developed country – Developing country – Impact assessment – Incursion – Livestock.

## Introduction

Perceptions of an increase in new, animal-based pathogens have been on the rise in recent years. While many of these general perceptions stem from a combination of better detection and reporting, there have also been erratic, upward trends in the incidence of epidemic diseases, fuelled by a variety of drivers, including climate change, globalisation and movements of both goods and people, and ecosystem degradation. These effects are felt quite differently in developed and developing world contexts, with the latter providing a potential reservoir of disease but also disproportionately affected by the various drivers of disease (1).

The incursion of a new animal disease into a country or region creates a wide range of both economic and non-economic impacts on various actors. A large number of studies have measured both the *ex post* (actual) costs and economic impacts of a plethora of important diseases of international trade (2). These studies include:

- Knight-Jones and Rushton: global reviews of foot and mouth disease (FMD) (3, 4)
- Morgan and Prakash: a general review of important diseases of trade (5)

- Grace *et al.*: a general review of zoonoses (6)
- Otte *et al.*: a study of highly pathogenic avian influenza (HPAI) in developing countries (7)
- Pendell *et al.*: a review of Rift Valley fever (RVF) in the United States (8)
- Rich and Wanyoike: an impact assessment of RVF in Kenya (9)
- Bennett and Ijpelaar: a review of 34 diseases of production animals in the UK (10).

Complementing this strain of literature over the past 20 years has been the development of a variety of simulation techniques from the epidemiological literature to predict the impacts of different animal diseases *ex ante* (before the fact). Accompanying this has been an evolution of increasingly complex economic methods that can be used to measure impacts at different levels, scales and contexts (11, 12, 13, 14).

While the literature has documented the various types of economic and non-economic impacts associated with animal disease, as well as appropriate methodological platforms to compute these effects, two important research gaps remain. First, much of the current body of research is context-specific, with the impacts and dimensions of

disease reported for a *specific* disease in a *specific* setting. However, with respect to new, epidemic diseases, the economic and livelihood impacts associated with, for instance, epidemic avian influenza in the commercialised poultry sector of a developed country, such as the United States, are significantly different from the impacts of, say, epidemic RVF in pastoralist settings of East Africa. These differences further shape the means by which control strategies are implemented, as well as their effectiveness. Such differences arise partly from the different objectives and policies that are used to combat and control diseases.

Secondly, and perhaps more importantly, the literature has not sufficiently examined the economic impacts of animal disease in its broader socio-economic context. Estimates of such impacts, whether *ex ante* or *ex post*, provide some guidance to decision-makers on the magnitude or importance of one disease versus another. However, as an exercise in itself, this is akin to 'counting the number of angels on the head of a pin', in that there is very little precision in the estimates provided or examination of what they mean in 'the bigger picture'. Indeed, in many cases, the costs of disease are given without context, and with little use of appropriate denominators to express what such impacts 'mean', making the analysis somewhat superficial. Moreover, and following Rich and Perry (15) and Rich *et al.* (16), there is a pressing need to understand how 'impact' translates into or influences behaviour within the animal health system. This particularly matters for the entry of new diseases in different socio-economic settings. The incursion of a novel disease into a variety of settings could have significantly different effects and give rise to quite different reactions from those in the animal health system, depending on context, which in turn will influence how well or how poorly efforts to control or eradicate the disease evolve. These issues suggest a need to develop and adapt frameworks that highlight and synthesise categories of animal disease impact more generically, but which take into account the socio-economic differences found in developed and developing countries (15, 17, 18, 19).

In this paper, the remit of the authors is to assess how economic and non-economic impacts associated with animal disease might differ in developed versus developing countries. Their focus is on 'new' diseases, which they define generically as the entry of any pathogen or zoonosis that has never (or rarely) appeared in a country before, to understand the range of effects as well as reactions that may occur upon incursion. To guide their analysis, the authors first briefly review the impacts that animal diseases have had in previous settings, distinguishing between developed and developing countries and attempting to ground those results with more robust contextual denominators. Secondly, following Rich and Perry (15) and Rich, Roland-Holst and Otte (17), the authors provide a framework for looking at the generic dimensions of disease impacts and

the way in which these can vary across settings. From this, they examine the implications of the impacts of a 'new' disease, including its ramifications on the animal health system in general.

## Dimensions of economic impacts

Animal diseases have multi-faceted impacts on the livestock sector, the agricultural economy, and resource allocation in the public and private sectors alike. At the farm level, epidemic animal diseases can significantly increase costs for affected farmers, through disease-induced mortality and loss of production in animals, higher input costs (medicines, feed), and control measures such as vaccination or the mandatory culling of affected animals. For instance, Otte *et al.* (7) note that HPAI resulted in the depopulation (through natural or control-oriented mortality) of 25–30% of the poultry population in Thailand and Vietnam while, in Egypt, some 80% of the layer stock and 10% of the national poultry population was culled or died.

Concomitant with farm-level losses are the direct costs of disease control by the public and private sectors, in the form of vaccination and the mobilisation of a variety of veterinary services and logistics, as well as indirect costs associated with market losses in related and unrelated sectors. Epidemic FMD in Europe and Asia has had significant economic impacts over the past 20 years. Based on data from Knight-Jones and Rushton (3) and Morgan and Prakash (5), the combined total cost of FMD epidemics in the UK, Chinese Taipei, Uruguay, Japan and South Korea has exceeded US \$25 billion. In 2007, epidemic RVF in Kenya was estimated to have imposed economy-wide costs of US \$32 million and a variety of unquantifiable costs on the livestock sector and the livelihoods of ancillary service providers in regions largely devoid of alternative livelihood activities (9).

Rich and Perry (15) developed a framework to highlight some of the generic impacts of an animal disease. They identified five dimensions of disease impact:

- i) disease characteristics, which relate to the impacts associated with the biology or epidemiology of a given disease
- ii) production impacts, which refer to the characteristics of the livestock system in which a disease takes place, and the resulting impacts on that system
- iii) market impacts, which depend on the degree of commercialisation in the society concerned, socio-

economic development, and links between the livestock sector and other sectors

iv) livelihood impacts, which concern the importance of livestock in the economic and non-economic lives of stakeholders, and how disease influences them

v) control characteristics related to the resources allocated and technical capacity to combat disease incursions.

Rich, Roland-Holst and Otte (17) built upon this framework to examine the *ex post* impacts of rinderpest eradication, highlighting the different levels at which diseases can have an impact, ranging from the household or farm level, through to meso-level impacts at the species and livestock-sector level, to more macro impacts within the value chain, and indirect impacts on the local, regional, and global economy through spillover effects.

To understand the generic impacts of a 'new' disease, we can adapt these two previously developed approaches into a new framework, taking into account the differences that exist between developed and developing countries. The trajectories provided by Perry, Grace and Sones (1) are particularly salient in further delineating the nature of animal disease impacts. In their analysis, they distinguished between three focal trajectories of disease drivers. The first of these are the concerns of those consumers whom Perry, Grace and Sones (1) refer to as 'the intensified and worried well of the Western world' (p. 20874). Disease trajectories in this area are shaped by strong public awareness of disease, relatively high levels (though under increased budgetary pressure) of public and private expenditure on animal disease control and surveillance, and increased concerns about the effects of climate change, food safety and animal welfare, the latter three manifested through generally rising standards for food products (20). This bundle of concerns reflects many attributes which have become important in developed countries.

Their second and third trajectories distinguish between alternative paths taken in the developing world, contrasting regions which are becoming increasingly market-oriented against those which are more smallholder-dependent. In the former, there is an implicit tension between the demand drivers of livestock commercialisation (including urbanisation, income growth and growth in trading opportunities) and the animal health situation, which is often ill-equipped in capacity and resources to provide the support that this burgeoning sector needs to meet growing demand.

In the latter, disease trajectories are characterised by a general climate of disease endemicity, a smallholder base with limited incentives or capacity to deal with disease-related events, the absence of animal health support structures, and growing challenges associated with climate

change and ecosystem degradation that will potentially exacerbate disease occurrences in the future.

In Tables I and II, the authors summarise how impacts might differ in the context of these three disease trajectories. First, in Table I, they distinguish between the different dimensions of impact in each of the three different areas. In developed countries, during the generic incursion of a new disease, the authors would expect relatively short, infrequent outbreaks, due to high levels of institutional capacity, resource allocation, and the technologies used. While the costs of containment would potentially be high, as well as surveillance and regulatory costs after the outbreak, this is often justified by high levels of commercialisation and links between the livestock sector, its value chains, and other non-agricultural sectors. The more intensified nature of developed-country livestock sectors could lead to pockets of more severe outbreaks, but would also aid in control. For example, given the more intensive systems found in developed countries, new or newly established diseases can cause substantial losses, as diseases such as porcine epidemic diarrhoea and porcine reproductive and respiratory syndrome in intensive pig systems have demonstrated (21, 22).

In developing countries, by contrast, the impacts of disease vary considerably among those countries that are market-oriented and those that are smallholder-oriented. In the former, we see gradients of increased commercialisation and intensification that may or may not be supported by sufficient veterinary resources or capacity to control disease effectively. In many market-oriented developing countries, there is a mix of both commercialised and smallholder livestock that can complicate control efforts – these tensions were quite apparent during the HPAI outbreaks in Asia during the 2000s. The response by policy-makers in emerging market-oriented countries (Thailand, Vietnam) was to use the outbreak as a means of accelerating the restructuring of the livestock sector away from smallholder production towards private-sector, commercial operations, perceived as being more biosecure and modern in nature (7). This has important livelihood implications that the authors intend to explore later.

The emergence of disease in smallholder-oriented economies exacerbates an already complicated disease scenario. Initial epidemic diseases often become endemic, with little in the way of resources to support disease control, and few private incentives for producers and other participants in the value chain to coordinate their mitigation efforts. Long, dispersed value chains and extensive production systems further complicate control efforts, as do other non-market livelihood considerations associated with livestock (e.g. cattle as assets, poultry as pets or for other traditional uses). This reinforces the status quo – in the wake of continued disease, production decisions are directed at survival and risk mitigation rather

**Table I****Dimensions of animal disease impacts relevant to new, epidemic animal diseases: developed versus developing countries**

Source: adapted from Rich and Perry (15) and Perry, Grace, and Sones (1)

Relevant dimension of disease impact	Developed countries	Developing world – market-oriented impact	Developing world – smallholder-focused impact
<b>Disease characteristics</b>			
Severity	Intensive, but duration tends to be short	Greater incidence of endemic and epidemic diseases	Greater incidence of endemic and epidemic diseases
Frequency	Generally low	Sporadic but intense	Generally high
<b>Production characteristics</b>			
Production system	More intensive, commercially oriented	Becoming more intensive/commercialised	Generally extensive, smallholder-based
Production distribution	Herd demographics commercially driven	Herd demographics increasingly commercially driven	Herd demographics are risk and livelihood driven
Population size per farm	Tends to be high, high density	Varies	Varies by context, low density
Importance of related products/functions	Generally low	Varies	Generally high, especially for cattle
<b>Market characteristics</b>			
Level of commercialisation	Generally high	Becoming higher	Generally low
Level of market integration	Generally high	Becoming higher	Generally low
Length of value chain	Tends to be relatively short, consolidated	Increasingly consolidated and commercial-based	Tends to be long, with many intermediaries
Scope of value chains	High	Rising	Low
Non-livestock sector impacts	Generally high, particularly in non-livestock sectors	Vary	Generally low, confined to impacts in rural areas and livestock sector
Level of socio-economic development	Generally high	Rising	Generally low
<b>Livelihood characteristics</b>			
Role of livestock in livelihoods	Generally the main source of income for specialised producers	Generally the main source of income for specialised producers	Variable, depending on context
Cultural importance of livestock	Generally low	Varies	Can be quite high
<b>Control characteristics</b>			
Effectiveness of current control technologies	Generally high	Variable, depending on resource availability and degree of adoption	Variable, depending on resource availability and degree of adoption
Resource requirements for control	Generally adequate	Vary	Generally inadequate
Maintenance costs for control	Generally high	Variable, depending on resources	Variable, depending on resources
Regulatory costs	Generally high	Rising	Generally low
Externalities related to disease control	Generally low, but depends on the policy measures taken	Vary	Can be high, depending on institutional capacity
Institutional capacity	Generally high	Varies	Generally low

**Table II****Impacts of disease by level of sector aggregation: developed versus developing countries**

Source: adapted from Rich, Roland-Holst and Otte (17)

Level of sector aggregation	Developed countries	Developing world – market-oriented	Developing world – smallholder-focused
Level 1 – Farm	High	High	High
Level 2 – Species	High	High	High
Level 3 – Sector	High	Moderate – high	Low – moderate
Level 4 – Value chain	High	Moderate – high	Low – moderate
Level 5 – National/international	Moderate – high	Moderate – high	Low
Level 6 – Spillover effects	Low	Potentially high	Moderate – high

than capital accumulation, weakening the ability of livestock to be an appropriate pathway out of poverty (1, 17).

In Table II, the authors examine the impacts of disease at different levels of sector aggregation, from the farm to the global, following Rich, Roland-Holst and Otte (17). In developed countries, impacts tend to be most evident at the first four levels of aggregation (from farm to value chain), with specific impacts depending strongly on the particular disease and context. In developing countries, by contrast, while impacts from a new disease are high at the farm level, the more disparate nature of marketing and value chains will probably result in lower impacts downstream, with regard to more commercialised markets. At the same time, there are a potential range of more nuanced livelihood impacts within the value chain, as highlighted in the case of RVF in Kenya (9).

One important difference between developed and developing countries is the potential spillovers associated with disease. In developed countries, the most preferred response to an epidemic disease is to eradicate it as swiftly as possible to prevent it from taking hold. In developing countries, however, lower levels of institutional capacity and fewer resources allocated to veterinary services mean that the disease will probably become endemic, and consequently raise the probability of spillovers through trade or other means.

A final indicator of the severity of the impact is the dependence of developing countries on livestock. In Table III, the authors report the value of agricultural gross domestic product (GDP) and the share of agricultural GDP as a proportion of total GDP for major global regions. As illustrated in Table III, while the value of agricultural output in Europe, Latin America and sub-Saharan Africa is comparable, the importance of agriculture to Africa's GDP is several orders of magnitude greater than in Europe. Although comparable estimates of livestock's contribution to agricultural GDP are unavailable, various estimates in East Africa suggest that livestock can contribute between 30–50% of agricultural GDP. The implications of this are twofold. First, in developed countries, while livestock diseases can potentially have large impacts on the agricultural economy, the ability of such markets to draw resources towards control efforts is much greater than in the developing world. Indeed, FMD outbreaks in the UK and Chinese Taipei each had an economic impact of less than 0.7% of GDP, much of which was offset by public spending on control measures (5). By contrast, an emerging livestock disease takes considerably more resources, in proportional terms, in developing countries, making both disease control and recovery from outbreaks more difficult.

The control objectives of decision-makers further influence these dynamics. In developed countries, the objective of

**Table III**  
**Agriculture as a share of gross domestic product by major region, 2014**

Source: World Bank, World Development Indicators (<http://data.worldbank.org/products/wdi>)

Region	Agricultural GDP (US\$ billion)	Agricultural GDP as a percentage of total GDP at value added*
Europe	221	1.7%
Latin America and the Caribbean	236	4.9%
East Asia and the Pacific	1,054	8.4%
South Asia	477	18.4%
Sub-Saharan Africa	253	14.6%

GDP: gross domestic product

\* GDP at value added refers to the value of gross national production net of intermediate input costs

disease control is often eradication. This is particularly true for highly contagious diseases such as FMD that have significant market access implications. The aim of eradicating the disease is often driven by the serious threat that such diseases may pose to human or animal health, the economy, or the environment. Response in these contexts tends to be rapid and concentrated, and mitigates the overall economic and other damage associated with an outbreak. In addition to disease control, costly measures may be taken to mitigate deteriorating animal welfare during an outbreak or to retain access to certain markets. For diseases that are expected to cause milder damage, the response is often containment and proper control, or systematic prevention, should it be absent from the country, region or farm.

In developing countries, the response is more constrained by resource limits and thus tends to be oriented towards 'firefighting' pockets of outbreaks, while accepting an endemic level of disease that persists and adversely affects investment and development in the livestock sector. Although disease eradication may be an outcome preferred by developing countries, resource constraints, the more dispersed structure of the industry, and insufficient regulatory control of livestock may guide control decisions towards disease containment and asset protection.

## Implications of impacts – what does a new disease mean for stakeholders and how does this differ in differing contexts?

The previous section summarised the various types of impact that a new disease could cause. However, when

a new disease enters a country, there are several implied effects that this disease will have on livestock owners and other stakeholders in the animal health system. These adjustments or 'second-round' effects associated with an animal disease are no less important, and indeed can influence the resilience of a particular country or region to disease in the future.

One of the most important implications of a new disease is the way in which it may change production and value-chain structures (23). The incursion of a new disease may make existing production systems unviable or unattractive, and lead to a reorganisation of the existing value chains. HPAI is an excellent example of this, in that the incursion of disease led to a much stronger focus on reorganising the poultry sectors in Thailand and Vietnam away from smallholder production and towards commercial production, perceived to be more biosecure. Moreover, value chains were diverted from producing fresh chicken to less trade-vulnerable, more processed products (7). The persistence of endemic rinderpest in Africa induced pastoralists to organise their herd demographics to mitigate risk (e.g. by stocking a greater number of older animals), but this also reduced the commercial viability of such systems for formal markets (17).

These implications can further vary by type of disease. For instance, in developing-country contexts, Perry *et al.* (18) distinguish between those diseases that compound asset insecurity, those that limit market access, and those that limit intensification. Diseases in the first category are particularly challenging in smallholder settings, while the latter two prevent the expansion of the livestock sector in emerging economies. However, this varies significantly according to the context of the disease (24).

The variability of production and economic revenues due to disease can have important behavioural implications in both intensive and extensive settings. Besides exposing livestock owners to the risk of losing their assets and negatively affecting their food security, uncertainty also affects their investment decisions. For instance, in intensive systems farmers may not be willing to invest in new production capacity, while in extensive systems more and older animals may be kept to cope with the risk associated with maintaining younger stock. These effects may be found downstream in other stages of the supply chain, in which constant access to markets and stability in the flow of materials and revenue are essential. In many cases, livestock processors and retailers must be able to provide a stable, quality-assured flow of goods to their customers to remain commercially viable. If slaughterhouses, dairies and other livestock-processing companies are at risk of losing access to key markets, or face a volatile supply of animals for slaughter, milk, eggs and other products from the farming sector, they may refrain from entering or expanding the

business, since volatile revenues and unstable input supplies may reduce such incentives for investment.

Disease control strategies themselves can have important implications for the broader animal health system. Developed countries combat the most dangerous diseases through eradication, stamping out, and vaccination policies, and through a host of various other preventive control measures. These measures can comprise a major share of disease costs – e.g. as in the case of bluetongue, as noted by Velthuis *et al.* (25) – and cause disruptions in farming. When disease control practices are expensive, the ability to sustain efforts over time could be challenging. In developed countries, in particular, public-sector budgets are increasingly coming under stress, placing increasing pressure on veterinary services for more cost-effective service delivery (16). Conversely, the increased risk of disease incursion will force farmers to invest in preventive measures and subsequently decrease producer incentives to invest in new production. Over time, this can result in reduced livestock production and a probable increase in producer prices as the cost of elevated disease risk must be covered, further lowering incentives for adopting good animal health practices on-farm (26, 27, 28).

Concerned farmers may be willing to invest in insuring their production against disease (e.g. 29). However, in countries where safety nets are strong, farmers may show less interest in paying for the security of covering disease-related financial losses caused by highly contagious animal diseases. Better incentives may well be needed to encourage livestock owners to take relevant preventive measures as they may think that it is the responsibility of the government to combat the disease. Producers may also suffer from cognitive dissonance, and may underestimate the severity and likelihood of disease incursion, which decreases their efforts to combat diseases. In emerging developing countries, a crucial issue will be the co-existence of market-oriented producers, who wish to control disease, and smallholder producers who have little market incentive to do so. In these contexts, developing institutions that foster cooperation across the livestock sector as a whole will be key (30).

New diseases also have a host of dynamic implications for the economic well-being of stakeholders in markets, although these can be quite complex. In addition to directly affecting farm production, a new animal disease can either reduce or raise producer prices, which can also magnify changes to farm revenue. A new disease which occurs in a small proportion of farms, and which does not result in any restrictions on the trade of livestock or livestock products, is unlikely to have any major effects on the farming sector in general (although impacts on individual farms and regions can be severe). However, if the new disease becomes widespread and uncontrolled, as may be the case in very

intensive systems, or extensive systems with little disease control, market prices may gradually increase as farms either require higher prices to cover increased disease costs or they will exit from markets due to unprofitable production, further reducing supply and increasing prices. When trade in livestock or livestock products is affected, the disease may result in excess domestic supply and thus reduce producer prices (31, 32, 33). These effects may reverse after the epidemic as control measures are relaxed, causing greater fluctuations in prices for producers and consumers alike (26, 31). Given these dynamic effects, a challenge for policy-makers is that 'optimal' control strategies may have different impacts if one considers the short term versus the long term (33). In developing countries, policy choices can often be made for short-term political expediency rather than long-term economic development, limiting the effectiveness of a given strategy (34).

Another implication of disease is related to market changes caused by consumers changing their preferences. This implication is likely to be more important in developed countries, where consumers tend to pay more attention to the quality attributes of livestock products and where a zoonotic disease can be a disaster for a food-processing company. Once freedom from disease is lost, consumers may prefer to choose products that come from other regions or suppliers (35, 36, 37). This also applies to the live animal trade. At the same time, quality standards for agri-food products are rising in many parts of the developing world as well (20), suggesting that the importance of consumer sovereignty will only grow over time.

One final implication of a new disease is its effect on non-agricultural sectors. For instance, the 2001 FMD outbreak in the UK was estimated to have caused substantial economic welfare losses to tourism and some rural industries, although these impacts were often quite localised (38, 39). Impacts across sectors are multidimensional. Restrictions on the movement of people and goods and the use of services may have substantial economic consequences for non-agriculture sectors; in turn, the reduction in revenue for

both agricultural and non-agricultural sectors reduces the capacity of people to purchase services and goods supplied by rural businesses. The effects of restrictive control measures and food safety hazards are likely to be more important in developed countries and market-oriented systems, while, in less-developed countries, diseases can prevent the ability of inhabitants to use agriculture and livestock as a pathway out of poverty.

At present, the impacts and implications of a new animal disease differ significantly between developed and developing countries. However, in the wake of greater globalisation of the livestock trade, better coordination between developed and developing countries will be key to preventing the spread and persistence of such diseases over time (1, 15). Part of this coordination will need to take place at the global level, and defining the right level and appropriate areas of international cooperation will become essential (40).

## Conclusions

Animal diseases have a multitude of economic and non-economic impacts. The incursion of a novel, epidemic disease has differential impacts on developed and developing countries, given differences in capacity and incentives for control. While developed countries can typically prevent such diseases from becoming endemic, this often comes at such a high cost of eradication and future prevention that it may reduce future incentives for control. In developing countries, new diseases can often become endemic, serving as future global reservoirs of disease and exacerbating an already difficult disease-control setting that is compounded by a variety of drivers for disease, such as climate change and ecosystem degradation. Greater coordination between developed and developing countries will increasingly be needed to meet these global challenges in an integrated and effective way.



## L'impact économique d'une maladie animale émergente est-il le même dans les pays en développement et dans les pays développés ?

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### Résumé

La survenue de foyers de maladies animales entraîne des effets divers, de nature économique et non économique. Si l'estimation de l'impact de nombreuses maladies dans différents contextes a fait l'objet de très nombreuses études, l'évaluation différentielle de l'impact de l'introduction d'une maladie nouvelle

dans un pays en développement et de ses conséquences, par opposition à ce qu'ils seraient dans un pays développé, constitue un domaine de recherche au riche potentiel largement inexploré. Les auteurs mettent en avant les dimensions et conséquences majeures de l'impact des maladies nouvelles et en soulignent les spécificités selon les contextes ainsi que leurs conséquences en termes de politiques publiques.

#### Mots-clés

Animaux d'élevage – Évaluation d'impact – Incursion d'une maladie – Maladie animale – Pays en développement – Pays développé.



## Impacto económico de una nueva enfermedad animal. ¿Son sus efectos iguales en los países desarrollados y en los países en desarrollo?

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#### Resumen

Los brotes de enfermedades animales traen consigo una serie de consecuencias de orden económico y no económico. Si bien ha habido numerosas investigaciones destinadas a evaluar los efectos de varias enfermedades en distintos contextos, el estudio del impacto y las repercusiones diferenciales que se siguen de la introducción de una nueva enfermedad en un país en desarrollo, por oposición a un país desarrollado, constituye un prometedor ámbito de investigación para el futuro. Los autores destacan algunas de las principales dimensiones y repercusiones ligadas a las consecuencias de nuevas enfermedades y examinan cómo difieren en función del contexto y cómo repercuten en las políticas públicas.

#### Palabras clave

Enfermedad animal – Evaluación de impacto – Ganado – Incursión – País desarrollado – País en desarrollo.



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