The costs and benefits of rinderpest eradication

In addition to health risk, animal diseases inflict a broad spectrum of direct and indirect economic costs on society, many of which are neither well-understood nor rigorously analysed. Various methods exist to evaluate economic impacts, but many of these focus only on specific aspects or stakeholder interests and how they are affected by a disease, and do not capture the totality of impacts across the economy. However, these economy-wide considerations are essential to comprehensive ex-post evaluation of disease control or eradication programmes. Direct disease incidence and control costs may be focused on particular stakeholder groupings, but spill-over costs and benefits are dispersed more widely, traversing agricultural supply chains and associated households and enterprises. These extensive indirect effects often outweigh the direct ones. For this reason, cost-benefit analysis of animal disease and policy response must include a broad spectrum of both direct and indirect impacts in the assessment.

Rinderpest was once one of the world’s most feared livestock diseases, but concerted international control campaigns have now eradicated the disease globally. Despite this success, a major gap remains in the history of rinderpest eradication, namely a comprehensive assessment of the socio-economic costs and benefits of its control and eventual eradication. Such an assessment would make an important additional contribution, offering policy-makers an instrument for assessing the risk, cost and reward of enhanced investment in the control of other (present and future) animal diseases. Although it may be desirable to eradicate any health threat, cost-effectiveness is an important consideration, especially in developing countries, where public resources have many high priorities, and sustained expenditures require clearly discernable benefits for large segments of society. While much has been documented on the epidemiological, technical and institutional lessons resulting from rinderpest eradication, little has been written on the socio-economic impacts – what eradication means for society at the local, national, regional and global levels. What exists at present are fragmented national and international analyses, utilizing disparate and sometimes arbitrary methodologies, and not attempting to get at the “big picture” or to deliver general conclusions for guiding policy in diverse circumstances. What is lacking is a unifying framework that can bridge and synthesize the lessons from the past of rinderpest eradication and effectively inform future campaigns designed to control and eradicate other animal diseases.

To address this gap, FAO and partners are developing a more rigorous and comprehensive methodological approach to evaluate the global impact of rinderpest eradication. An important element lies in highlighting the different levels of costs and benefits associated with different stakeholder groups. Disease impacts take place at six levels of aggregation: i) household- or farm-level impacts, which can include impacts on non-farm-related livelihoods; ii) cattle sector impacts; iii) general livestock sector impacts, including substitution effects at the production and
consumption levels; iv) national-level value chain impacts based on the forward and backward linkages of livestock with other sectors of the economy; v) indirect impacts at the national level, based on local externalities such as effects on the environment, wildlife and human well-being, including health, educational and employment development and other socio-economic conditions; and vi) indirect impacts at the global or subregional level, based on externality effects, such as the savings other countries receive because they no longer have to worry about disease incursion. In all of these, the cost of a disease is the sum of reduced economic activity/returns and control expenditures. While the latter can be valued directly in terms of the cash costs associated with the control of disease, the costs related to the former can also result from adaptive behaviour, such as keeping an excess of old female cattle as a risk mitigation strategy.

So far, for the purpose of developing the approach, it has been applied at a national level to estimate the impact of rinderpest eradication for Chad, by assessing the impacts on producers, sectors, and national and regional economies (within West Africa) and combining a variety of standard economic tools. This analysis suggests that there are large benefits to rinderpest eradication in Chad. At the sector level, by extrapolating the benefits associated with rinderpest control through its effects on herd demographics, the benefit-cost ratio for the totality of control programmes (JP15, PARC and PACE) over the period 1963 to 2002 is estimated at 16:45. These benefits exclude the macroeconomic and regional ones attributed to the programme. Analyses utilizing social accounting matrices (SAMs) and computable general equilibrium models yield additional insights. For instance, in 2000 (the latest year for which a complete SAM has been estimated for Chad), SAM multiplier analysis reveals that Chad’s gross domestic product would have been more than 3 percent lower in a “no-eradication” scenario.

Household-level impacts from the SAM reveal that rural households, the group that was most vulnerable to outbreaks of rinderpest, would have had incomes 8.5 percent lower in the absence of rinderpest control. Breaking down these results further, it is found that shocks to livestock production have knock-on effects on rural households, through impacts on marketing and processing activities, suggesting that producers have more complex interactions within the value chain than simple intuition might suggest. This finding confirms that these households diversify into a variety of activities within the chain, so the total benefits of rinderpest eradication will include a multiplicity of non-livestock-related benefits as well.

Although these analyses must be considered preliminary, there can be little doubt that the benefits of rinderpest eradication far outweighed the costs and, from a socio-economic point of view, few investments would have yielded higher returns, particularly in countries with rural poor majorities.