Livestock Disease Production Burdens

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Does disease cause the preventable death of one in four young ruminants and one in ten mature ruminants each year?

Photo courtesy of Supporting Evidence Based Interventions (SEBI)

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Animal disease can impact the livestock sector both directly (for instance production losses, increased mortality and lost traction power for cropping) and indirectly (for instance market and trade disruptions, livelihood risks, zoonotic disease and food-borne illnesses)[1,2]. Experts suggest that these impacts are significant, particularly in low and middle income countries (LMICs), where income and nutrition from livestock is critical for development, and thus deserve greater attention from the global community[3]. In particular, current understanding does not allow us to effectively answer questions such as[4]:

How much less milk do infected cows produce? How much less do infected goats weigh? How many chickens die due to disease?

Verifying reported global figures
Advocates for increased investment into animal health do make impact claims, for instance

"one in four young ruminants, and one in ten adult ruminants, die from preventable causes", and "one quarter of the animals owned by poor livestock keepers die from preventable and treatable diseases"[5, 6]. However, such statements are commonly made with no source citation. We suggest these numbers were derived from mortality risk percentages presented in a systematic review (of over 400 studies) of ruminant production systems in Sub-Saharan Africa[7]. The review presented mortality risks for different ruminant species in different production systems; the variation between these is lost when they are grouped into such high level ruminant figures. In addition, the advocacy claims suggest that the mortality risks are preventable, whilst the systematic review does not make this claim. While it could be assumed that some portion of mortality risk is preventable through intervention, however, it would be wrong to suggest mortality could be reduced to 0% under any scenario.

Why do we need to know?

It is important to understand how much diseases limit production from livestock (e.g. reduced milk yields, growth rates or egg production). Accurate quantifications are vital for economic assessments, effective decision-making, and prioritisation and implementation of animal health resources[8-10]. For instance it is suggested that the significant environmental impact of livestock production (namely greenhouse gas emissions) can be reduced by improving efficiency of livestock production[11]. Removing the production burden of disease is one option, and being able to quantify the burdens is vital in deciding which animal health options have the greatest and most economical mitigation potentials[12, 13].

What do we know?

Typical studies that evaluate livestock diseases according to impact on production rely on asking experts and farmers[10, 14]. Subsequently, lists of key diseases can be composed[15].

The symptoms and mechanisms by which these diseases limit production are fairly well understood[16, 17], whereas the quantification of the global production burden is not[10]. There are case studies for particular diseases in particular production systems, which give some detail to associated production burdens[18,19]. These case studies are often the basis for broader quantifications of disease burdens[9, 20, 21].

Future efforts

Case study assessments have shown disease to be a barrier to improved productivity from livestock systems in LMICs, but quantifying a global impact is a challenge. A lack of detail of disease incidence and prevalence contributes significantly towards this limitation[10,22]. An increasing ability to detect and report livestock disease, offers prospects for improved quantification.

References

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