

Understanding decision makers and their needs: framing GBADs offerings to enhance relevance and increase impact

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Summary

In a world characterised by data deserts and data swamps, translating evidence to actionable policies and practices is not easy. This paper addresses this challenge through the lens of evidence emerging from the Global Burden of Animal Diseases (GBADs) initiative. The article emphasises the need for an intentional approach that connects research information with the specific needs of decision-makers and identifies specific impact pathways associated with different groups of decision-makers.

The GBADs programme aims to support animal health decisions and we outline the diverse landscape of decision-makers in this field, encompassing public and private sectors, livestock keepers, civil society, and international development agencies. Key issues such as disease prioritisation and lobbying are also discussed.

We propose an 'evidence ecosystem' approach, that understands data users and their interactions, for analysing decision maker needs and framing GBADs offerings according

to these. Two case studies, a recently concluded global case study of disease prioritisation decision making and an ongoing policy analysis and needs assessment for GBADs in Indonesia, are presented to demonstrate how evidence ecosystem analysis and audience segmentation could be used to tailor GBADs information offerings for different decision-making groups.

The paper concludes by recommending that GBADs future applications should prioritise information offerings, adapt them to decision-makers' needs, and consider how different segments of decision-makers will utilise the information to achieve real-world impacts.

Keywords

Animal health – Decision-making – Disease – Evidence-informed – GBADs – Global Burden of Animal Diseases – Impact pathway-policy.

Introduction

However relevant, applicable or timely a piece of evidence seems to be in addressing the needs of decision-makers, it almost never automatically results in significant policy and practice change and real-world impact [1]. This is especially the case in high-income countries (HICs) where decision-makers have increasing access to large amounts of information (data swamps) [2,3]. In contrast, low- and middle-income countries (LMICs), often lack even the most basic information (data deserts). In particular, there is massive under-reporting of animal disease: it is estimated that in sub-Saharan Africa, 99.9% of brucellosis cases (a notifiable disease) do not appear in official reports [4]. But while decision-makers in LMICs suffer from more data scarcity than those in HICs, they also have greater challenges in actioning evidence.

In this context, generating yet more data, even in such an important area as the burden of animal disease, might not have any significant impact on decision-makers [5,6]. As an example of lack of information uptake [1], highlighted a 2014 study which found that more than 30% of policy reports produced by the World Bank had never been downloaded from the Bank site, and around 87% of the reports had never been cited in any other research or policy documents, let alone resulted in concrete impacts [7]. Most peer-reviewed papers are never cited or cited only once or twice in the scientific literature [8].

This implies that translating evidence into decisions, actions and impact cannot be taken for granted but needs an intentional approach linking research evidence development and dissemination to the issues faced by, and information needs of, decision makers [9].

This also implies that pathways to impact will be different for each type of decision maker, with each type of decision maker using evidence to inform their own data needs and to improve their own decision-making processes.

This evidence-informed decision making [10] takes place within an evidence ecosystem – ‘a system reflecting the formal and informal linkages and interactions between different actors... involved in the production, translation, and use of evidence’ [11]. The formulation and adoption of effective decisions depends on decision makers working within a well-functioning and understood evidence ecosystem [1]. An understanding of the evidence ecosystem needs an understanding of decision makers, the types of decisions they need to make, differing perspectives and power dynamics [12] (Figure 1).

The aim of this paper is to present a proposed method for applying an evidence ecosystem approach to understand decision-making characteristics related to animal health and to enhance the translation of Global Burden of Animal Diseases (GBADs) information offerings into effective decision-making through various impact pathways.

One approach to grouping decision-makers within an evidence ecosystem is based on an analysis of decision-makers’ interactions with evidence. For example, Purtle *et al.* [13] identifies four key dimensions of decision-makers interactions with evidence from psychological science: a) awareness of sources and effectiveness of information; b) adoption of solutions informed by evidence; c) changes in attitudes towards the use of information to support decision making; and d) preferences in terms of contents, form and timeliness of information to support decision making.

Decision-makers can also be grouped using audience segmentation techniques [14]. Demographic separation [15] can be undertaken on the basis of work functions. A recent survey of potential users of GBADs data, characterised decision-makers according to five functions (public, private, academia, inter-governmental or other) [16]. Because animal diseases and control resources vary greatly by income category, it is often useful to distinguish between HIC and LMIC decision-makers. Segmentation based on the characteristics of decision-makers can be very effective in developing information framing [17-19] strategies to disseminate information to decision-makers [20,21].

The public sector is key to the control of animal diseases with externalities, including those capable of transboundary spread, and those with public health or poverty implications. Policy development in the public sector is influenced by various factors. In LMICs, development banks and aid agencies in HICs often have a predominate role, and

often prioritise the diseases which threaten HICs because of potential for global spread. For example, there is much greater donor investment in control of transboundary animal diseases (TADs) in LMICs than endemic livestock disease, yet evidence for the importance of TADs to the poor is conflicting and mainly theoretical [22]. In HICs, public concern and media attention often influence the diseases prioritised for control. For example, the estimated cost-effectiveness of bovine spongiform encephalopathy in the Netherlands was €18 million per life saved in 2005, exceeding by more than two orders of magnitudes Dutch economic thresholds for health interventions, an excess largely driven by public outrage [23].

The remainder of this paper is structured as follows. First, we give an overview of the GBADs context, including the key decision makers it targets, the types of problems that they face and the GBADs offerings that could support their decision making. Second, we discuss key steps in the proposed method of applying evidence ecosystem thinking to the GBADs context. Third, we outline two GBADs case studies (one recently completed and one ongoing at the time of writing) which apply the proposed method in analysis of the potential role of GBADs in the evidence ecosystems around: i) disease prioritisation globally and ii) development of animal health policy in Indonesia. Finally, we will draw some conclusions on future applications of this method in the GBADs context.

GBADs context

Recognising the gaps in systematically capturing and measuring animal disease losses and estimating disease mitigation expenditures, a GBADs programme was initiated in 2018, hosted by the World Organisation for Animal Health, for data collection, analysis and information generation on disease classification and losses, animal health expenditure and ensuring sustainability and equitability [24]. Since its launch, GBADs has progressed in 'developing a comprehensive framework for characterising livestock populations and assessing the value invested in livestock, as well as a system to capture net losses in production and societal expenditure on animal health issues' [25].

As is the case with the well-established human Global Burden of Disease programme [26], the Foodborne Disease Burden Epidemiology Reference Group [27], the Child Health Epidemiology Reference Group [28] and the Global Health Epidemiology Research Group the key challenge for GBADs is to ensure results have relevance to decision-makers and hence to positively impact on people's livelihoods. This is especially the case at the national and sub-national levels, where key decisions on livestock development and animal health are made.

The aim of GBADs is 'By gathering available data and using new methodologies... to determine the economic, social and environmental burden of animal diseases. The findings will support evidence-based decision-making by governmental and non-governmental organisations to respond to animal health issues'. As there are numerous types of decision makers facing numerous problems, this implies that there are also numerous pathways to impact between the provision of evidence to improved decision making to enhanced livelihoods.

An understanding of the GBADs context includes understanding the livestock and animal health decision makers, understanding the types of decisions that they need to make and an understanding of the types of GBADs offerings that could support their decision-making processes.

Livestock and animal health decision makers

Decision makers in livestock and animal health include public and private sector actors. Even within each sector the decision-makers are non-homogenous. [Table I](#) outlines some different decision maker types and their characteristics.

Key decision types in livestock and animal health

A recent scoping review of approaches for disease prioritisation and decision-making in animal health [4] showed that almost 40% of analyses reported were for disease targeting and a further 23% were to aid in the identification of priority diseases to inform general organisational strategy. Well-designed evidence informed investments in animal health systems can form the basis for a productive livestock sector contributing to enhanced livelihoods [29].

Disease targeting

Considering finite resource availability, there is a constant challenge of ensuring resources are being allocated to priority diseases. As disease can have economic, social and environmental impacts, disease prioritisation needs to be rationalised based on potential disease impacts and how control inputs can achieve maximum benefit in improving and maintaining animal health [30]. However, disease prioritisation is a complex decision problem because priority is influenced by many factors such as uncertainty and variability associated with disease impacts, lack of cross-comparability of diseases, as well as heterogeneity in decision-makers' interests and their valuation of disease impacts. In addition to problem impact, amenability to solution (tractability) and

neglectedness are important criteria used by many resource allocators (including Bill and Melinda Gates Foundation). Human health is seen as an important end in itself, so it is rational to prioritise according to health burden, but animal diseases have multiple burdens beyond productivity losses (e.g. zoonotic potential), so health itself is not a meaningful category and multiple, weighted criteria are often used in prioritisation [4].

Prioritisation of diseases in organisational strategy

Public servants need to lobby legislators or senior decision makers to allocate funds and resources to, or influence policies for, certain diseases. The priorities of elected legislators and policy makers may not always align with the bureaucrats and service providers, a challenge for disease mitigation and/or management. For example, the state or provincial government may allocate significant resources and attention to a particular disease whereas the bureaucrats or the service providers may want the resources to be spent on another disease. Availability of information can make or break lobbying efforts aimed at securing resources or shifting policy focus towards certain diseases. As the saying goes 'In Washington, good numbers beat bad numbers and bad numbers beat no numbers at all.' [31].

Investments

Public and private sector agencies invest significant funds in animal health. Public sector agencies make investments in terms of staffing levels and infrastructure for animal health and livestock production support. Philanthropic foundations and multi-lateral and bilateral development agencies invest in programmes and projects to support animal health across the developing world.

Development agencies may invest in the priorities of HICs rather than LMICs. For example, many countries in Africa were largely unaffected by the highly pathogenic avian influenza pandemic of the 2000s, yet because of large donor-funded projects this occupied much of veterinary service scarce manpower [D. Grace, personal communication].

The private sector (including large pharmaceutical and animal feed companies, commercial farms and smallholder farmers) also invests significantly in animal health, either through public-private partnership arrangements with governments [32] or as purely private investment. All of these investment decisions could be better informed through provision of accurate information on animal disease burdens.

GBADs offerings

The GBADs approach includes several interrelated outputs around the burden of animal disease. These can be presented in various forms, including online dashboards (see <https://gbadske.org/dashboards> for an interactive 'Knowledge Engine Dashboard'). Varying combinations of these offerings could be utilised by different decision makers in relation to the issues and problems they face in livestock and animal health. **Table II** outlines the GBADs information offerings and some potential applications to decision making.

A proposed method of applying evidence ecosystem thinking to GBADs

Our proposed method of applying evidence ecosystem thinking in the GBADs context includes three main steps:

- 1) understanding the evidence ecosystem surrounding GBADs;
- 2) understanding the needs of the clients within that ecosystem and identifying different client segments; and
- 3) framing the GBADs offerings to meet the needs of the different client segments to enhance uptake and impact.

Understanding the evidence ecosystem

Understanding the GBADs evidence ecosystem involves first understanding which key decision makers are involved in livestock and animal health. Each location will have a different sub-set of decision makers drawn from the comprehensive list presented earlier. Second, it is important to understand the roles of each of the decision makers in relation to livestock and animal health. Finally, an understanding of the connections between the decision makers and the influence that they have on one another should be gained.

Understanding the clients

In the case of GBADs analysis at a national level, there is generally a relatively small number of relevant decision makers in the public and private sector. If cross-country analysis is being done then a larger sample could be obtained and techniques such as empirical clustering could be used to segment decision makers.

We would propose a 'demographic separation+' approach to segmentation of decision makers, with groups being defined both by their job function and also by the issues and

problems they face and the characteristics of information that they require to address those issues and problems.

Framing the information offering

Based on the segments of decision-makers a set of proposed pathways to impact for different decision makers could be developed. Based on this, a prioritisation of which information offerings to develop at what stage of the programme could be made. To achieve greater effectiveness in information use and enhance evidence-informed decision making, framing of the offerings could involve specific online offerings through the GBADs dashboard system, or more targeted offline materials responding to decision-maker preferences.

Illustrative case studies

This section presents two illustrative case studies, a recently concluded global case study of disease prioritisation decision making and an ongoing policy analysis and needs assessment for GBADs in Indonesia. These case studies demonstrate the potential for evidence ecosystem analysis and audience segmentation to be used to tailor GBADs information offerings for different decision-making groups.

Survey of Burden of Animal Disease data users

To understand the demand for Burden of Animal Disease (BAD) data and how end-users might benefit from this, GBADs first reviewed the literature on animal diseases prioritisation processes (ADPP) and then conducted a two-part global survey of leading BAD information users, consisting of an online questionnaire followed by in-depth interviews with selected experts. The survey focused on their current use of data and prioritisations as well as their felt and unmet needs for different, more, and better information. Of the six ADPPs commonly featured in literature, only three were recognised by more than 40% of experts. Respondents identified 15 different uses of BAD data. The most common use was presenting evidence (publications, official reports, followed by disease management, policy development and proposal writing). Few used disease data for prioritisation or resource allocation, fewer routinely used economic data for decision making, and less than half were aware of the use of decision support tools. Nearly all respondents considered current BAD metrics inadequate, most considered animal health information insufficiently available and not evidence-based, and most opine that animal health decision making was non-transparent and not fair.

Indonesian policy analysis and needs assessment

One of the first GBADs country level case studies is being undertaken in Indonesia [36]. The key outputs are expected to be improved knowledge of livestock population, biomass, social and economic value of livestock, and an estimation of the animal health loss envelope for selected livestock production systems. The case study will include an in-depth concentration on three production systems – cattle in East Java, pigs in Nusa Tenggara Timur and poultry in West Java.

Given limited time and resources available for the case study there was a need to prioritise case study activities and outputs to match the needs of decision-makers in Indonesia. To support the prioritisation process, one of the activities of the case study is a policy analysis and an assessment of decision-makers needs for GBADs offerings – this is still ongoing at the time of writing.

Developing an understanding of the decision-makers has two main steps. The first step was a policy analysis, which developed understanding of the GBADs evidence ecosystem, including identifying different relevant groups of public sector decision-makers at central, provincial and local level; understanding the roles of those decision-makers and the linkages between them. The second step was based on key informant interviews of decision-makers to identify the key problems and issues they face and the awareness, adoption, attitude and preference dimensions relating to existing sources of information used to support decision making.

Audience segmentation was also based on key informant interview results and focused on the job function of the respondent and their perceptions of the relevance and adoptability of different GBADs offerings, how much influence they felt that these offerings would have on their decision-making processes and what their preferences were in terms of form and timeliness of GBADs information delivery.

When available, the results of this analysis will be used to identify proposed pathways to impact on smallholder livelihoods through prioritising and framing GBADs information offerings for different groups of decision makers in Indonesia.

Conclusions

Preliminary results from our case studies indicate that it is valuable to conduct policy analysis and needs assessment as part of an evidence ecosystem approach to GBADs case studies. There are two main reasons: First, all case studies will have limited

resources at this stage, and it will be many years before complete GBADs information offerings will be available, therefore there is a need to prioritise which information offerings are developed during the case study. Second, conducting evidence ecosystem research up-front enables an understanding of pathways to impact and the development of tailored information offerings for different decision-making groups, leading to increased awareness and adoption of information to support the decision-making process.

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Table I**Characteristics of decision makers in livestock and animal health**

Decision maker types	Characteristics
Public sector decision makers	Can be at regional, national, sub-national or local levels. These actors can be involved in policy development, decisions around how policy should be implemented or be involved directly in service provision
Private sector service providers	Private veterinarians, pharmaceutical companies, livestock nutrition companies and companies involved in livestock breeding. In low- and middle-income countries, much of these inputs are provided by the informal sector
Private sector input suppliers and output purchasers	Input suppliers and output purchasers are key elements of the livestock value chain. While the scale of the main production and processing companies involved can be very large, often the agents' selling supplies and purchasing outputs from farmers are small scale family businesses
Livestock keepers	Operate at a variety of production scales from smallholder to large commercial. Livestock keepers can also be represented by societies and apex bodies
Civil society	Can include local and international non-governmental organisations operating in the livestock sector as well as associations (e.g. farmers associations) and community-based organisations
Philanthropic foundations	Have become increasingly active in providing funding support for livestock development and animal health and in shaping development agendas
International development agencies	Include bilateral donors and multi-lateral financing institutions, are active in providing support for governments in developing countries to develop livestock industries. Decisions made by these agencies can have significant impact on livestock development trajectories
Research community	Include both universities and research institutes within government. The research community can be involved in supporting the decision-making processes of other actors regarding livestock and animal health

Table II**Global Burden of Animal Diseases information offerings and potential applications**

GBABs information offering	Potential application to decision making
Biomass is the total weight of a livestock population, either at a particular point in time or measured over a particular time period [33]	Biomass value could support calculation of environmental impacts and feed use and give an easy way for decision makers to compare the quantity of livestock between regions
Livestock Value is a monetary value calculated at farmgate level and includes two principal components: value of livestock population and the value of the outputs of the livestock population over a year [34]	This could allow decision-makers to compare the economic contribution of different production systems and livestock types to gross domestic product
Animal Health Loss Envelope – The gap in production value due to plus current expenditure on animal health. This gives an overview of the total burden of all animal diseases [35]	This could allow decision makers to compare the losses due to animal health to the value of livestock. Decision makers could also compare the losses due to animal health with public and private expenditure on animal health
Attribution splits the AHLE for a particular livestock type into sections based on disease, animal age and gender	This allows decision makers to compare the impact of individual diseases on specific populations and to make decisions related to disease control costs and benefits
Wider Economic Impact recognises that the burden of livestock diseases is not born by all people in the same way and includes economic impact beyond the farmgate	This information could be used by decision makers to evaluate impacts on other actors in the value chain or impacts on other sectors of the economy
Environmental Impact quantifies the impact of animal disease on the environment	This information could be used by decision makers to evaluate the positive and negative impacts that animal diseases can have on the environment through changes in natural resource use

AHLE: Animal Health Loss Envelope
GBADs: Global Burden of Animal Diseases

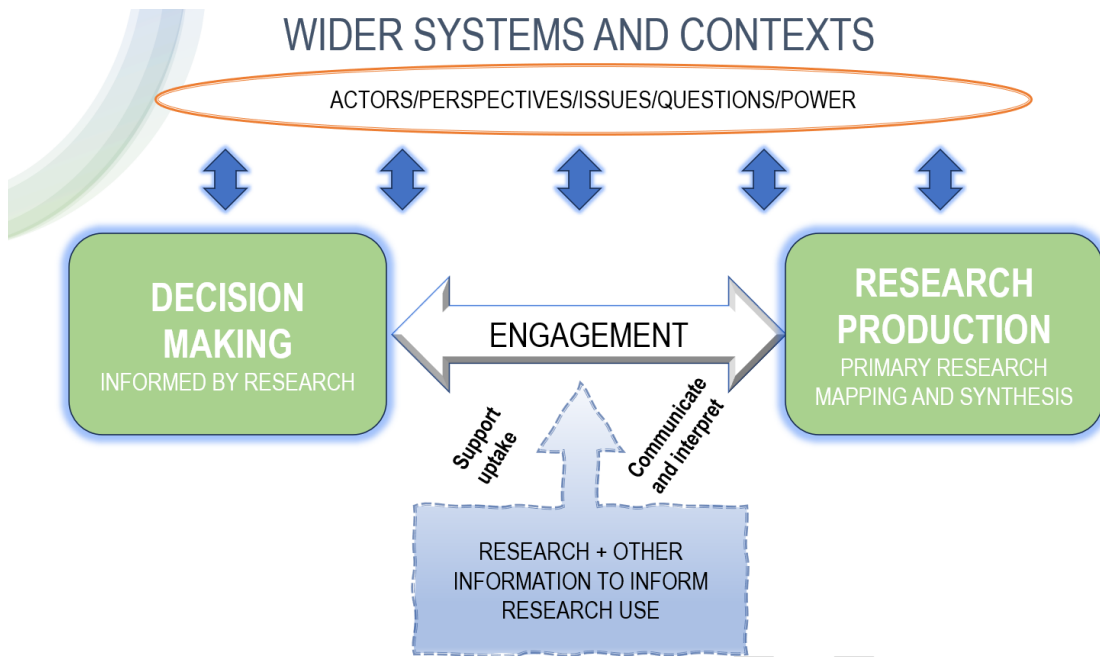


Figure 1

Decision making systems and contexts

Source: Gough *et al.* [12]