



Understanding decision-makers and their needs: framing Global Burden of Animal Diseases offerings to enhance relevance and increase impact

D. Smith^{*(1,2)}, T.L. Cooper^(1,2), B.N. Utomo^(1,3), A. Wiyono^(1,3),
E. Kusumaningtyas^(1,3), D. Endrawati^(1,3), R.S. Adji^(1,3), G. Tenzin^(1,2),
H. Nuradji^(1,3), N.L.P.I. Dharmayanti^(1,3) & D. Grace^(1,4,5)

(1) Global Burden of Animal Diseases (GBADs) Programme, Institute of Infection, Veterinary and Ecological Sciences, University of Liverpool, 146 Brownlow Hill, Liverpool, L3 5RF, United Kingdom (<https://animalhealthmetrics.org>)

(2) Griffith Asia Institute, Griffith University, South Bank Campus, 226 Grey St, South Bank, Brisbane, QLD 4101, Australia

(3) Research Centre for Veterinary Science, Research Organization for Health, National Research and Innovation Agency, KST Soekarno, Jl. Raya Jakarta-Bogor Km. 46, Cibinong, Bogor, West Java 16911, Indonesia

(4) Natural Resources Institute, University of Greenwich, Medway Campus, Central Avenue, Chatham Maritime, Kent, ME4 4TB, United Kingdom

(5) International Livestock Research Institute, PO Box 30709, Nairobi, 00100, Kenya

*Corresponding author: dominic.smith@griffith.edu.au

Summary

In a world characterised by data deserts and data swamps, translating evidence into actionable policies and practices is not easy. This article addresses this challenge through the lens of evidence emerging from the Global Burden of Animal Diseases (GBADs) initiative. It 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 the authors outline the diverse landscape of decision-makers in this field, encompassing the public and private sectors, livestock keepers, civil society and international development agencies. Key issues such as disease prioritisation and lobbying are also discussed.

The authors propose an 'evidence ecosystem' approach, one that understands data users and their interactions, for analysing the needs of decision-makers, and framing GBADs offerings according to these needs. 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 article concludes by recommending that GBADs' future applications 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.

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 or 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 cases of brucellosis, a notifiable disease, do not appear in official reports [4]. Yet, 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, the World Health Organization [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 World 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 are 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 requires 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 using evidence to inform their own data needs and to improve their own decision-making processes.

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 well-understood evidence ecosystem [1]. Understanding of the evidence ecosystem requires an understanding of decision-makers, the types of decisions they need to make, differing perspectives and power dynamics [12] (Fig. 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] identify four key dimensions of decision-makers’ interactions with evidence from psychological science: i) awareness of sources and effectiveness of information; ii) adoption of solutions informed by evidence; iii) changes in attitudes towards the use of information to support decision-making; and iv) 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]. As 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 play a predominate role, and they often prioritise the diseases that threaten HICs because of potential for global spread. For example, there is much greater donor investment in control of transboundary animal diseases in LMICs than endemic livestock disease, yet evidence for the

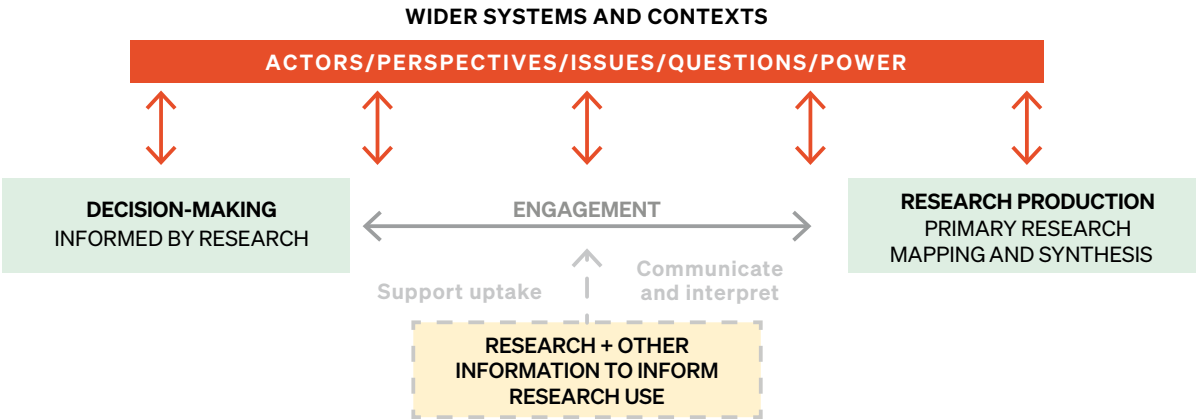


Figure 1
Decision-making systems and contexts
 Source: Gough *et al.* [12]

importance of transboundary animal diseases to the poor is conflicting and mainly theoretical [22]. In HICs, public concern and media attention often influence which diseases are 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 Dutch economic thresholds for health interventions by more than two orders of magnitude, an excess largely driven by public outrage [23].

The remainder of this article is structured as follows. First, it gives an overview of the GBADs context, including the key decision-makers targeted by the initiative, the types of problems they face and the GBADs offerings that could support their decision-making. Second, the article discusses key steps in the proposed method of applying evidence ecosystem thinking to the GBADs context. Third, it outlines two GBADs case studies, one recently completed and one ongoing at the time of writing, that apply the proposed method in analysing the potential role of GBADs in the evidence ecosystems around i) disease prioritisation globally and ii) development of animal health policy in Indonesia. Finally, it draws some conclusions on future applications of this method in the GBADs context.

Global Burden of Animal Diseases context

Recognising the gaps in systematically capturing and measuring animal disease losses and estimating disease mitigation expenditures, the GBADs programme was initiated in 2018 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 that results have relevance to decision-makers and hence also the potential to positively impact people's livelihoods. This is especially the case at the national and subnational levels, where key decisions on livestock development and animal health are made.

The aim of GBADs is to determine the economic, social and environmental burden of animal diseases through data gathering and use of new methodologies, in turn supporting evidence-based decision-making on animal health issues. As there are numerous types of decision-makers facing

numerous problems, it follows that there are also numerous pathways from the provision of evidence to improved decision-making to enhanced livelihoods.

An understanding of the GBADs context includes understanding of livestock and animal health decision-makers, the types of decisions they need to make and 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-homogeneous. [Table I](#) outlines some different types of decision-makers 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, ensuring resources are being allocated to priority diseases is a constant challenge. As disease can have economic, social and environmental impacts, disease prioritisation must 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, and 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 the Bill and Melinda Gates Foundation). Human health is considered an important end in itself, so it is rational to prioritise according to health burden; however, 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 those of bureaucrats and service providers, which presents a challenge for disease mitigation and/or management. For example, a

Table I

Characteristics of decision-makers in livestock and animal health

Decision-maker types	Characteristics
Public sector decision-makers	Can be at regional, national, subnational or local levels. These actors can be involved in policy development, in decisions around how policy should be implemented or 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 multilateral 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

state or provincial government may allocate significant resources and attention to a particular disease, whereas bureaucrats or 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 multilateral 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 high pathogenicity avian influenza pandemic of the 2000s, yet, due to large donor-funded projects, this occupied much of Veterinary Services' scarce manpower [D. Grace, personal communication, 2023].

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 these investment decisions could be better informed through provision of accurate information on animal disease burdens.

Global Burden of Animal Diseases 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, for example, the interactive Knowledge Engine Dashboards at <https://gbadske.org/dashboards>). 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 the Global Burden of Animal Diseases

The authors' 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;
- 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 requires first understanding which key decision-makers are involved in livestock and animal health. Each location will have a

Table II

Global Burden of Animal Diseases information offerings and potential applications

GBADs 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 provide 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 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 is the gap between ideal and actual production value due to animal health 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 borne 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

different subset of decision-makers drawn from the comprehensive list presented in Table I. 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 their influence 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 sectors. If cross-country analysis is being done, then a larger sample can be obtained and techniques such as empirical clustering can be used to segment decision-makers.

The authors propose a ‘demographic separation+’ approach to segmentation of decision-makers, with groups being defined both by their job function and by the issues and problems they face and the characteristics of information 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 can be developed. Based on this, a prioritisation of which information offerings to develop at what stage of the programme can 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 users of burden of animal disease data

To understand the demand for burden of animal disease (BAD) data and how end users might benefit from such data, GBADs first reviewed the literature on animal disease 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 [16]. 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 uses of data were (in order of decreasing number of citations by participants): publications and official reports, prevention and control of disease, policy development and proposal writing. Few used disease data for prioritisation or resource allocation; even fewer routinely used economic data for decision-making; and fewer 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 opined 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 the livestock population and the biomass and social and economic value of livestock, as well as 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 the 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 activity is still ongoing at the time of writing.

Developing an understanding of the decision-makers has two main steps. The first step is a policy analysis, which is developing an understanding of the GBADs evidence ecosystem, including identifying different relevant groups of public sector decision-makers at central, provincial and local level and understanding the roles of those decision-makers and the linkages between them. The second step is based on key informant interviews with decision-makers to identify the main 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 is also based on key informant interview findings and is focused on the job functions of the respondents and their perceptions of the relevance and adoptability of different GBADs offerings, how much influence they feel these offerings would have on their decision-making processes and their preferences 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 smallholder livelihoods through prioritising and framing GBADs information offerings for different groups of decision-makers in the country.

Conclusions

Preliminary results from the GBADs case studies indicate that policy analysis and needs assessment are valuable parts of an evidence ecosystem approach to such 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 upfront 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.

Acknowledgements

The Global Burden of Animal Diseases (GBADs) Indonesia case study is funded by the Australian Centre for International Agricultural Research. It is co-led by the Commonwealth Scientific and Industrial Research Organisation and Indonesia's National Research and Innovation Agency in partnership with PT Mitra Asia Lestari, Universitas Gadjah Mada and the Griffith Asia Institute. The case study is supported by the GBADs programme.

The authors would like to sincerely thank the Indonesian government officials responsible for livestock and animal health at national level, in West Java province and in regencies and towns within West Java, who are taking part in the policy analysis and needs assessment exercise outlined in this article.

Comprendre les décideurs et leurs besoins : encadrer les propositions du programme « Impact mondial des maladies animales » pour affiner leur pertinence et accroître leurs effets

D. Smith, T.L. Cooper, B.N. Utomo, A. Wiyono, E. Kusumaningtyas,
D. Endrawati, R.S. Adjii, G. Tenzin, H. Nuradji, N.L.P.I. Dharmayanti & D. Grace

Résumé

Dans un monde où l'on rencontre aussi bien des déserts de données que des marécages de données, il n'est guère facile d'utiliser avec succès des données probantes pour les traduire en politiques et en pratiques exploitables. Les auteurs abordent cette difficulté dans l'optique des données actuellement générées dans le cadre de l'initiative « Impact mondial des maladies animales » (GBADs). Ils soulignent l'importance de disposer d'une méthode volontariste capable de relier l'information issue de la recherche avec les besoins spécifiques des décideurs, en tenant compte des chemins d'impact spécifiques associés à chaque catégorie de décideurs.

Le programme GBADs vise à soutenir les décisions relatives à la santé animale ; les auteurs donnent une vue d'ensemble de la diversité des décideurs intervenant dans ce domaine, qui recouvre les secteurs public et privé, les éleveurs, la société civile et les organismes internationaux de développement. Certaines questions majeures comme le classement des maladies par ordre de priorité et les activités des groupes de pression sont également abordées.

Afin de pouvoir analyser les besoins de ces décideurs et d'encadrer les propositions du GBADs en conséquence, les auteurs proposent une approche qualifiée d'« écosystème d'éléments probants », qui permet de comprendre les utilisateurs de données et leurs interactions. À travers deux études de cas, l'une récemment achevée sur l'établissement des priorités sanitaires dans les prises de décision à l'échelle mondiale et l'autre actuellement en cours sur l'analyse des politiques et l'évaluation des besoins dans le cadre du GBADs en Indonésie, les auteurs démontrent comment l'analyse de l'écosystème d'éléments probants et la segmentation des destinataires permettent de moduler les informations proposées par le GBADs en fonction des différents groupes de décideurs auxquels elle sont destinées.

Les auteurs concluent en recommandant que les applications futures du GBADs établissent des priorités parmi les informations proposées, en les adaptant aux besoins des décideurs et en considérant le nombre de segments différents de décideurs qui vont utiliser l'information en vue de résultats tangibles.

Mots-clés

Chemin d'impact – Éclairage par des éléments probants – GBADs – Impact mondial des maladies animales – Maladie – Prise de décision – Santé animale.

Comprender a los responsables de la toma de decisiones y sus necesidades: enmarcar los servicios del programa sobre el impacto global de las enfermedades animales para mejorar su pertinencia y aumentar su repercusión

D. Smith, T.L. Cooper, B.N. Utomo, A. Wiyono, E. Kusumaningtyas,
D. Endrawati, R.S. Adjii, G. Tenzin, H. Nuradji, N.L.P.I. Dharmayanti & D. Grace

Resumen

En un mundo caracterizado por los desiertos y los pantanos de datos, no es una misión fácil traducir los datos en políticas y prácticas viables. Este artículo aborda este reto desde la óptica de los datos procedentes de la iniciativa sobre

el impacto global de las enfermedades animales (GBADs). Asimismo, subraya la necesidad de un planteamiento intencionado que conecte la información de las investigaciones con las necesidades específicas de los responsables de la toma de decisiones e identifique vías de impacto concretas asociadas a los distintos grupos de decisores. El programa del GBADs busca respaldar las decisiones en materia de sanidad animal y, a este respecto, los autores del artículo describen la diversidad de responsables de la toma de decisiones en dicho ámbito, entre los que figuran los sectores público y privado, los ganaderos, la sociedad civil y los organismos internacionales de desarrollo. También se abordan cuestiones clave como la priorización de enfermedades y los grupos de presión. Los autores proponen un enfoque basado en un «ecosistema de datos» que tenga en cuenta a los usuarios de los datos y sus interacciones a fin de analizar las necesidades de los responsables de la toma de decisiones y enmarcar los servicios del GBADs en función de dichas necesidades. Se presentan dos estudios de casos, uno mundial sobre la toma de decisiones en materia de priorización de enfermedades, que concluyó recientemente, y otro en curso sobre análisis de políticas y evaluación de necesidades del GBADs en Indonesia, con miras a demostrar cómo el análisis del ecosistema de datos y la segmentación de la audiencia podrían utilizarse para adaptar los servicios de información del GBADs a los distintos grupos de responsables de la toma de decisiones. El artículo concluye recomendando que las futuras aplicaciones del GBADs prioricen los servicios de información, los adapten a las necesidades de los responsables de la toma de decisiones y tengan en cuenta cómo utilizarán la información los distintos grupos de responsables para lograr repercusiones en el mundo real.

Palabras clave

Basado en datos – Enfermedad – GBADs – Impacto global de las enfermedades animales – Sanidad animal – Toma de decisiones – Vía de impacto.

References

- [1] World Health Organization (WHO). Evidence, policy, impact: WHO guide for evidence-informed decision-making. Geneva (Switzerland): WHO; 2021. 53 p. Available at: <https://www.who.int/publications/i/item/9789240039872> (accessed on 20 November 2023).
- [2] Scheufele DA, Krause NM. Science audiences, misinformation, and fake news. *Proc. Natl Acad. Sci. USA*. 2019;116(16):7662-9. <https://doi.org/10.1073/pnas.1805871115>
- [3] Iyengar S, Massey DS. Scientific communication in a post-truth society. *Proc. Natl Acad. Sci. USA*. 2019;116(16):7656-61. <https://doi.org/10.1073/pnas.1805868115>
- [4] Amenu K, McIntyre KM, Moje N, Knight-Jones T, Rushton J, Grace D. Approaches for disease prioritization and decision-making in animal health, 2000–2021: a structured scoping review. *Front. Vet. Sci.* 2023;10:1231711. <https://doi.org/10.3389/fvets.2023.1231711>
- [5] Oliver K, Lorenc T, Innvæ S. New directions in evidence-based policy research: a critical analysis of the literature. *Health Res. Policy Syst.* 2014;12:34. <https://doi.org/10.1186/1478-4505-12-34>
- [6] Cairney P, Oliver K. Evidence-based policymaking is not like evidence-based medicine, so how far should you go to bridge the divide between evidence and policy? *Health Res. Policy Syst.* 2017;15:35. <https://doi.org/10.1186/s12961-017-0192-x>
- [7] Doemeland D, Trevino J. Which World Bank reports are widely read? Policy Research Working Paper No. 6851. Washington DC (United States of America): World Bank; 2014. 32 p. <https://doi.org/10.1596/1813-9450-6851>
- [8] Aksnes DW, Langfeldt L, Wouters P. Citations, citation indicators, and research quality: an overview of basic concepts and theories. *SAGE Open*. 2019;9(1):1-17. <https://doi.org/10.1177/2158244019829575>
- [9] Best A, Holmes B. Systems thinking, knowledge and action: towards better models and methods. *Evid. Policy*. 2010;6(2):145-159. <https://doi.org/10.1332/174426410X502284>
- [10] Clark R, Haby M. Creating and implementing public policy: cross-sectoral debates. 1st ed. Abingdon (United Kingdom): Routledge; 2015. Evidence-based policy: why and how?; 15 p. <https://doi.org/10.4324/9781315751658>
- [11] Stewart R, Dayal H, Langer L, van Rooyen C. The evidence ecosystem in South Africa: growing resilience and institutionalisation of evidence use. *Palgrave Commun.* 2019;5:90. <https://doi.org/10.1057/s41599-019-0303-0>
- [12] Gough D, Maidment C, Sharples J. UK What Works Centres: aims, methods and contexts. London (United Kingdom): Evidence for Policy and Practice Information and Co-ordinating Centre, Social Science Research Unit, UCL Institute of Education, University College London; 2018. 153 p. Available at: <https://eppi.ioe.ac.uk/cms/Default.aspx?tabid=3731> (accessed on 20 November 2023).
- [13] Purtle J, Marzalik JS, Halfond RW, Bufka LF, Teachman BA, Aarons GA. Toward the data-driven dissemination of findings from psychological science. *Am. Psychol.* 2020;75(8):1052-66. <https://doi.org/10.1037/amp0000721>
- [14] Kreuter MW, Bernhardt JM. Reframing the dissemination challenge: a marketing and distribution perspective. *Am. J. Public Health*. 2009;99(12):2123-7. <https://doi.org/10.2105/AJPH.2008.155218>
- [15] Slater MD. Designing health messages: approaches from communication theory and public health practice. Thousand Oaks (United States of America): SAGE Publications, Inc.; 1995. Choosing audience: segmentation strategies and methods for health communication; p. 186-98. <https://doi.org/10.4135/9781452233451.n10>

- [16] Grace D, Amenu K, Daborn CJ, Knight-Jones T, Huntington B, Young S, *et al.* Current and potential use of animal disease data by stakeholders in the global south and north. *Prev. Vet. Med.* 2024;226:106189. <https://doi.org/10.1016/j.prevetmed.2024.106189>
- [17] Purtle J. Networks, knowledge brokers, and the public policymaking process. Cham (Switzerland): Palgrave Macmillan; 2021. Disseminating evidence to policymakers: accounting for audience heterogeneity; p. 27-48. https://doi.org/10.1007/978-3-030-78755-4_2
- [18] Druckman JN, Lupia A. The Oxford Handbook of the Science of Science Communication. New York (United States of America): Oxford University Press; 2017. Using frames to make scientific communication more effective; p. 350-60. <https://doi.org/10.1093/oxfordhb/9780190497620.013.38>
- [19] Milkman KL, Berger J. The science of sharing and the sharing of science. *Proc. Natl Acad. Sci. USA.* 2014;111(Suppl. 4):13642-9. <https://doi.org/10.1073/pnas.1317511111>
- [20] Young R, Hinnant A, Leshner G. Individual and social determinants of obesity in strategic health messages: interaction with political ideology. *Health Commun.* 2016;31(7):903-10. <https://doi.org/10.1080/10410236.2015.1018699>
- [21] Niederdeppe J, Roh S, Dreisbach C. How narrative focus and a statistical map shape health policy support among state legislators. *Health Commun.* 2016;31(2):242-55. <https://doi.org/10.1080/10410236.2014.998913>
- [22] Perry B, Grace D. The impacts of livestock diseases and their control on growth and development processes that are pro-poor. *Philos. Trans. R. Soc. Lond. B Biol. Sci.* 2009;364(1530):2643-55. <https://doi.org/10.1098/rstb.2009.0097>
- [23] Benedictus A, Hogeveen H, Berends BR. The price of the precautionary principle: cost-effectiveness of BSE intervention strategies in the Netherlands. *Prev. Vet. Med.* 2009;89(3-4):212-22. <https://doi.org/10.1016/j.prevetmed.2009.03.001>
- [24] Rushton J, Bruce M, Bellet C, Torgerson P, Shaw A, Marsh T, *et al.* Initiation of Global Burden of Animal Diseases programme. *Lancet.* 2018;392(10147):538-40. [https://doi.org/10.1016/S0140-6736\(18\)31472-7](https://doi.org/10.1016/S0140-6736(18)31472-7)
- [25] Rushton J, Huntington B, Gilbert W, Herrero M, Torgerson PR, Shaw APM, *et al.* Roll-out of the Global Burden of Animal Diseases programme. *Lancet.* 2021;397(10279):1045-6. [https://doi.org/10.1016/S0140-6736\(21\)00189-6](https://doi.org/10.1016/S0140-6736(21)00189-6)
- [26] Murray CJL. The Global Burden of Disease study at 30 years. *Nat. Med.* 2022;28(10):2019-26. <https://doi.org/10.1038/s41591-022-01990-1>
- [27] Havelaar AH, Kirk MD, Torgerson PR, Gibb HJ, Hald T, Lake RJ, *et al.* World Health Organization global estimates and regional comparisons of the Burden of Foodborne Disease in 2010. *PLoS Med.* 2015;12(12):e1001923. <https://doi.org/10.1371/journal.pmed.1001923>
- [28] Boschi-Pinto C, Young M, Black RE. The Child Health Epidemiology Reference Group reviews of the effectiveness of interventions to reduce maternal, neonatal and child mortality. *Int. J. Epidemiol.* 2010;39(Suppl. 1):i3-6. <https://doi.org/10.1093/ije/dyq018>
- [29] Rushton J, Uggla A, Magnusson U. Animal health in development – its role for poverty reduction and human welfare. Stockholm (Sweden): Expert Group for Aid Studies; 2017. 94 p. Available at: <https://eba.se/wp-content/uploads/2017/03/Webbversion-Djurh%C3%A4lsa.pdf> (accessed on 20 November 2023).
- [30] Brookes VJ, Del Rio Vilas VJ, Ward MP. Disease prioritization: what is the state of the art? *Epidemiol. Infect.* 2015;143(14):2911-22. <https://doi.org/10.1017/S0950268815000801>
- [31] Weissberg R. Why policymakers should ignore public opinion polls. Policy Analysis No. 402. Washington DC (United States of America): Cato Institute; 2001. 16 p. Available at: <https://www.cato.org/policy-analysis/why-policymakers-should-ignore-public-opinion-polls> (accessed on 20 November 2023).
- [32] World Organisation for Animal Health (OIE), French Agricultural Research Centre for International Development (CIRAD). The OIE PPP handbook: guidelines for public-private partnerships in the veterinary domain. Paris (France): OIE; 2019. 64 p. <https://doi.org/10.20506/PPP.2965>
- [33] Li Y, Mayberry D, Rushton J. Estimating livestock biomass across diverse populations and data ecosystems. *Rev. Sci. Tech.* 2024;43:23-9. <https://doi.org/10.20506/rst.43.3514>
- [34] Schrobback P. Methods and data needs to estimate the economic market value of livestock at different spatial scales. *Rev. Sci. Tech.* 2024;43:30-8. <https://doi.org/10.20506/rst.43.3515>
- [35] Gilbert W. Interpretation and utility of the Animal Health Loss Envelope as part of the Global Burden of Animal Diseases analytical process. *Rev. Sci. Tech.* 2024;43:108-14. <https://doi.org/10.20506/rst.43.3523>
- [36] Mayberry D, Dharmayanti NLP, Maulandari R, Ackermann J, Nuradji H. Partnerships for policy: initiating a Global Burden of Animal Diseases case study in Indonesia. *Rev. Sci. Tech.* 2024;43:126-32. <https://doi.org/10.20506/rst.43.3525>

© 2024 Smith D., Cooper T.L., Utomo B.N., Wiyono A., Kusumaningtyas E., Endrawati D., Adji R.S., Tenzin G., Nuradji H., Dharmayanti N.L.P.I. & Grace D.; licensee the World Organisation for Animal Health. This is an open access article distributed under the terms of the Creative Commons Attribution IGO Licence (<https://creativecommons.org/licenses/by/3.0/igo/legalcode>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited. In any reproduction of this article there should not be any suggestion that WOA or this article endorses any specific organisation, product or service. The use of the WOA logo is not permitted. This notice should be preserved along with the article's original URL.