

PANORAMA

Thematic portfolio



Global Burden of Animal Diseases (GBADs)



PERSPECTIVES

DOSSIER

AROUND THE WORLD

EDITORIAL

Supporting investment decisions for animal health

KEYWORDS

#animal health, #decision, #economics in animal health, #Global Burden of Animal Diseases (GBADs), #World Organisation for Animal Health (OIE).



Photo by [Karan Mandre](#) on [Unsplash](#)

Given that we live in a world of interconnectedness, the importance of data and improving datasets is paramount to achieving evidence-based policy-making at international and national levels. The [Global Burden of Animal Diseases \(GBADs\) programme](#) will act as an essential piece of a bigger digital transformation at the World Organisation for Animal Health (OIE) and it will act in complementarity with other OIE datasets and workstreams such as the [Training Platform](#), [Observatory](#) and [PVS Pathway](#).

The PVS Pathway is an OIE flagship programme which aims to assess the capacities of Veterinary Services to carry out their missions. The PVS Pathway is a step-by-step process: after an assessment of the strengths and weaknesses of a country's Veterinary Services, the following steps aim to evaluate the resources needed to fill the gaps identified. This requires a critical prioritisation step that hinges on the ability to understand the impact of the disease on the country's economy including the well-being of animals, humans and the environment.

The consequence is that veterinary expertise exclusively is not sufficient, and the consideration of socio-economic data is important, to enable us to efficiently achieve several of the United Nations Sustainable Development Goals.

It is obvious to all that animal health and public health are linked and crucial for a sustainable and healthy planet. Thus, the links that GBADs is making with human disease burden studies at the World Health Organization and the Global Burden of Disease are of great interest when one remembers the critical role of animal-sourced food for

human nutrition and that very many animal diseases are transmissible to people.

The OIE has an important role in creating the institutional structures that will underpin the programme. This began with Resolution no. 35 adopted in 2016, creating a mandate for the 'development and testing of a methodology to determine the global burden of animal diseases in order to address deficiencies in economic information on national and world impact of animal diseases'.

Next, in 2018, the signing of a formal letter of intent between the University of Liverpool and the OIE enabled the launch of a partnership that led to the operationalisation of the project and to the subsequent roll-out thanks to generous funding from the Bill & Melinda Gates Foundation, the UK's Foreign, Commonwealth and Development Office, the European Union, Brooke, the Australian Centre for International Agricultural Research (ACIAR), and the University College Dublin. Then, eight additional academic and institutional partners actively committed to GBADs have formalised their engagement. The expertise generated by the programme will be shared through the establishment of Regional OIE Collaborating Centres for the economics of animal health, a competency package in the OIE's training framework, and ultimately by a chapter in the *Terrestrial and Aquatic Animal Health Codes*.

Finally, let me express my gratitude to all the contributing authors of this wide-ranging issue that explores the vision, methods and impact of this ambitious programme. To be very frank with you, many of us have been waiting for this programme for a long time because we have been looking forward to benefiting from its expertise. So it is in our interests to put effort into making GBADs successful.

Monique Éloit
Director General
World Organisation for Animal Health (OIE)

<https://doi.org/10.20506/bull.2021.1.3250>

PERSPECTIVES

► OIE ACTIONS

The utility of the GBADs programme

KEYWORDS

#animal health, #economics in animal health, #Global Burden of Animal Diseases (GBADs), #smallholder farmer.

AUTHORS

J. Rushton ^{(1)*}, W.T. Jemberu ^(2,3) & D. Grace Randolph ^(4,5)

(1) Director of the Global Burden of Animal Diseases (GBADs) Programme, [Institute of Infection, Veterinary and Ecological Sciences, University of Liverpool](#), United Kingdom.

(2) Research fellow for GBADs, [International Livestock Research Institute](#), Addis Ababa, Ethiopia.

(3) Associate professor of veterinary epidemiology and animal health economics, [University of Gondar](#), Ethiopia.

(4) Senior scientist and GBADs Disease Prioritisation Theme Lead, [International Livestock Research Institute](#), Nairobi, Kenya.

(5) Professor of Food Safety Systems, [University of Greenwich](#), London, United Kingdom.

* Corresponding author: j.rushton@liverpool.ac.uk

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



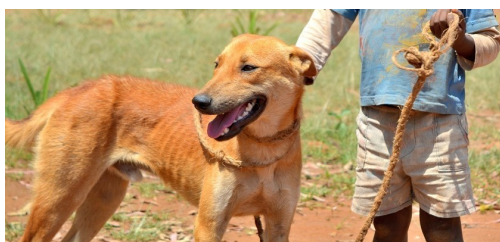
© OIE/G. Bruckner

What cannot be measured will not be managed. The burden of animal diseases is believed to be

huge but largely unmeasured. Livestock constitute 40% of the value of global agriculture and support the livelihoods of 1.3 billion people, most in poor countries. Understanding the impacts of animal disease is essential.

Public-funded Veterinary Services mainly focus on highly contagious animal diseases that create problems for society in terms of trade, food supply, farm-level profitability and, in some cases, direct human health issues. Underlying these diseases are a range of health and welfare issues that farmers are forced to manage alone, including endemic diseases, nutrition, environmental change and accidents. Smallholder farmers in particular have poor access to animal health services and products due to social, financial and geographical constraints, in various combinations.

The [Global Burden of Animal Diseases \(GBADs\) programme](#) will assess the economic importance of animals, and document what people lose from poor animal health and welfare, and what they spend on veterinary support. This information will show where inadequate resources are being allocated to meet the social, economic and gender needs of farmers. GBADs will provide a basis for sustainable, long-term programmes for veterinary systems that generate improved health and welfare for livestock, thereby enhancing livelihood opportunities for female and male livestock keepers.



© OIE/M.M Kung'u

Ms Perez, a poor farmer in the high Andes, was receiving no support for her flock. A development project identified parasite problems, and trained animal health workers in the use of antiparasite drugs. In Ethiopia, Mr Assefa has a dog to guard his property. Dog vaccines are not available and his dog exposed both his child and his ox to rabies.

GBADs information will support initiatives to address such smallholder farmer problems, by identifying the scale of investment needed and the return on that investment in terms of financial, economic and social outcomes.

<https://doi.org/10.20506/bull.2021.1.3251>

PERSPECTIVES

► OIE ACTIONS

Linking GBADs to the OIE's 7th Strategic Plan and digital transformation strategy

SUMMARY

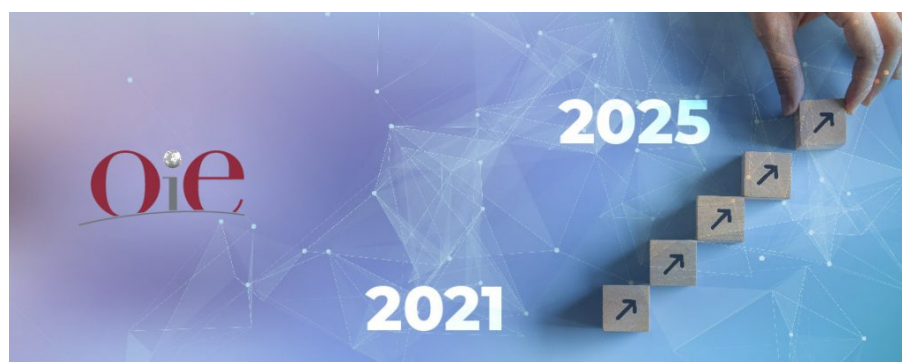
Interdisciplinary science, digital transformation, meeting Members needs, partnerships, and measuring performance: the GBADs programme is strongly linked to all five strategic objectives from the OIE's 7th Strategic Plan. At the heart of OIE's digital strategy is developing our data management approach in all workstreams, and our data governance practices as an organisation, to ensure we are fit for purpose as the steward of the global public good data with which our Members entrust us.

KEYWORDS

#animal health, #data management, #digital technology, #Global Burden of Animal Diseases (GBADs), #OIE Strategic Plan, #reference centre, #World Organisation for Animal Health (OIE).

AUTHORS

M. Stone, Deputy Director General, International Standards and Science, World Organisation for Animal Health (OIE).



© Getty Images

The 7th Strategic Plan of the World Organisation for Animal Health (OIE) provides the OIE's strategic direction summarised in five objectives (Fig. 1), all strongly aligned with the Global Burden of Animal Diseases (GBADs) programme.

Our mission of global improvement of animal health, animal welfare and veterinary public health requires investment in Veterinary Services. Epidemiology and economics are natural partners in this mission, providing the connection between life sciences and social sciences that is necessary to design and deliver comprehensive and sustainable evidence-based policy and results-based programmes.

OIE's digital transformation within our work programmes

A digital transformation is underway in the OIE. This involves infrastructure and architecture, workflows and efficiency, stewardship competencies and governance policies. But for our scientific work programmes, we also recognise it is fundamentally about our data management approach. We have established objectives that apply across all workstreams (Fig. 2). As a normative body, we use the cycle of standards development and implementation as the foundation for understanding our work (Fig. 3). At each step in this cycle we have important functions that generate data, typically through collecting information from our Members, but also through monitoring and evaluation activities in our programmes. The [OIE Observatory](#) introduces the conceptual 'standards monitoring framework', mapping our data-generating activities to our international standards, and ultimately to our core mandate (Fig. 4). An ambitious but realistic vision has been established that will see all our workstreams connected through our core referential data (standards, countries, diseases). An open-access principle will ensure this data is available to the global community. The resulting analysis and insights will help drive improvements and investment.

GBADs connection to OIE data and workstreams

Countries and diseases will also be core data within GBADs. GBADs will draw incidence and prevalence data on diseases from [OIE-WAHIS](#). Country Veterinary Service capability reported in OIE-WAHIS and performance derived from OIE PVS Pathway reports will inform estimation of actual and utopian scenarios during the definition of the [animal health loss envelope](#) [1]. GBADs estimates of losses attributable to diseases in production systems in countries will contribute to business cases for Veterinary Services' investment in PVS Gap Analyses. The GBADs data and system will become a critical tool in prioritisation and decision-making for investment in livestock systems, and monitoring performance of those systems in response to investments. GBADs economic data is a natural partner to OIE's epidemiological data.

Interdisciplinary scientific expertise and partnerships to serve our Members

There are currently over 300 [OIE Reference Centres \(Reference Laboratories and Collaborating Centres\)](#) hosted by our Members, committed to scientific collaboration to improve animal health, animal welfare and veterinary public health worldwide. The OIE is working to improve connections and collaborations through the establishment of disease (Reference Laboratory) and thematic (Collaborating Centre) networks. The broad network of GBADs partners connects significant new capability to this system, and will enhance interdisciplinary scientific capacity. We look forward to the establishment of a core of OIE Collaborating Centres in Animal Health Economics as a long-term goal.

Strategic goals and objectives 2021–2025

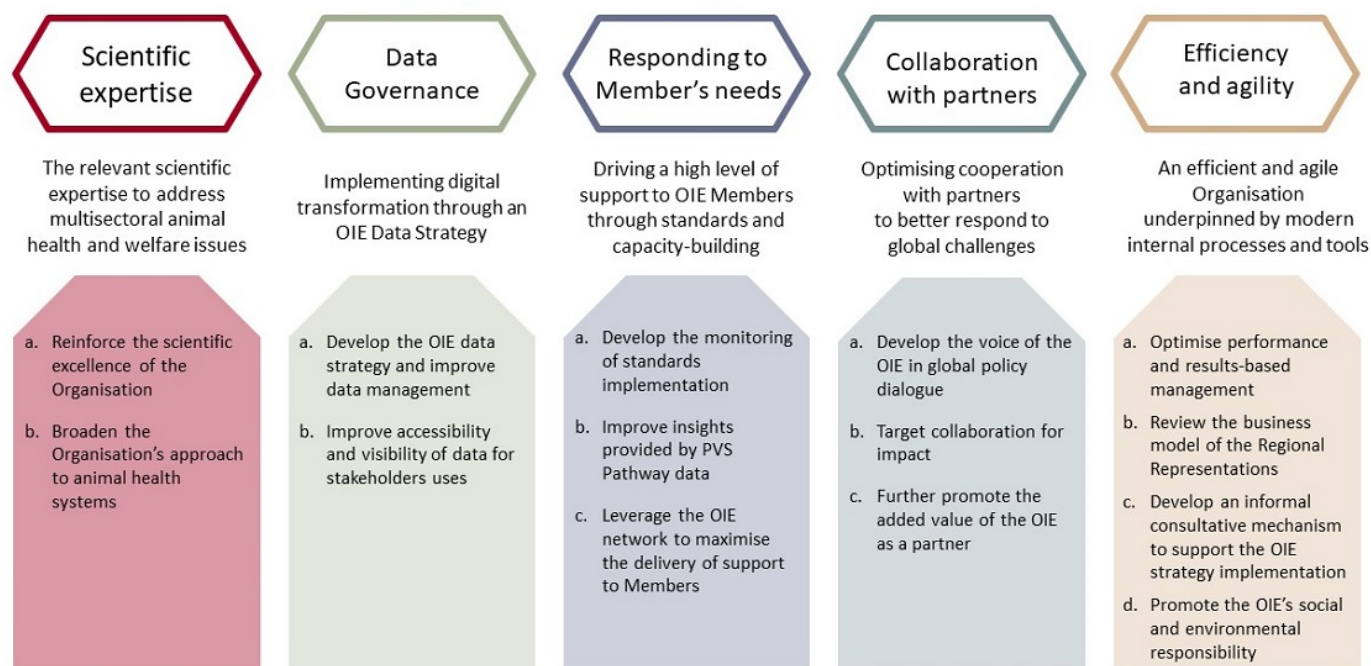


Fig. 1. The OIE's 7th Strategic Plan 2021–2025: summary of the five core objectives

OIE Digital Strategy: data management approach in work streams

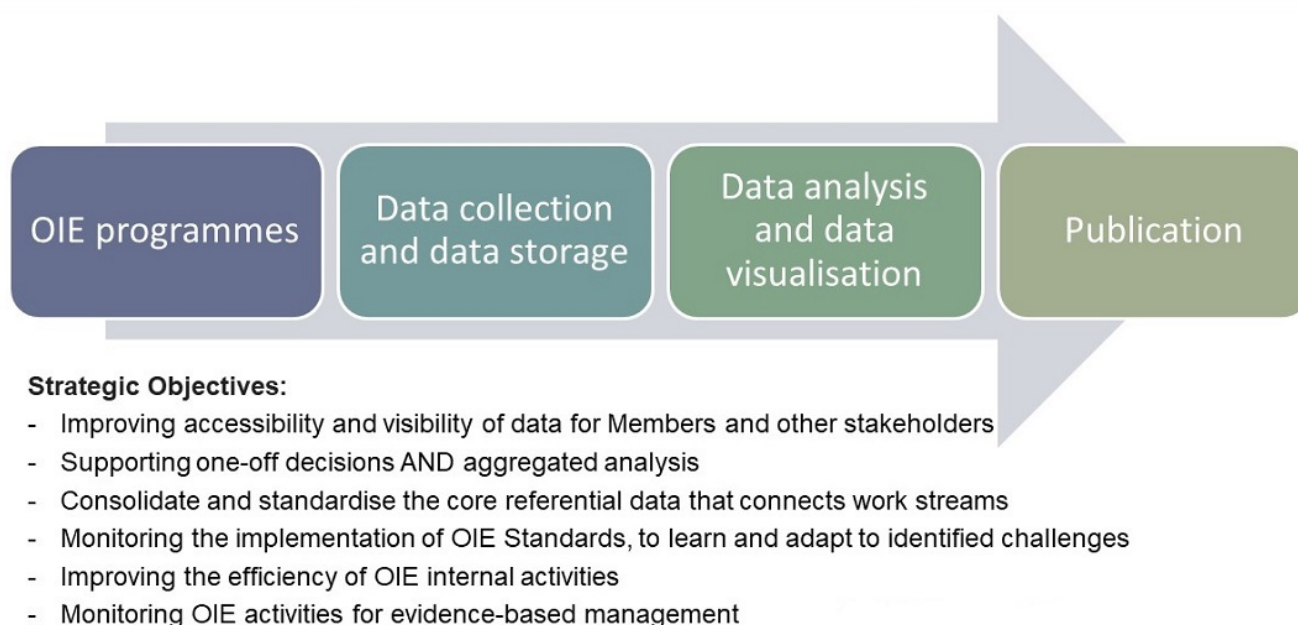


Fig. 2. As part of OIE's Digital Transformation, a set of core principles has been established for the data management approach in all science and technical workstreams

Links between OIE Standards and data sources

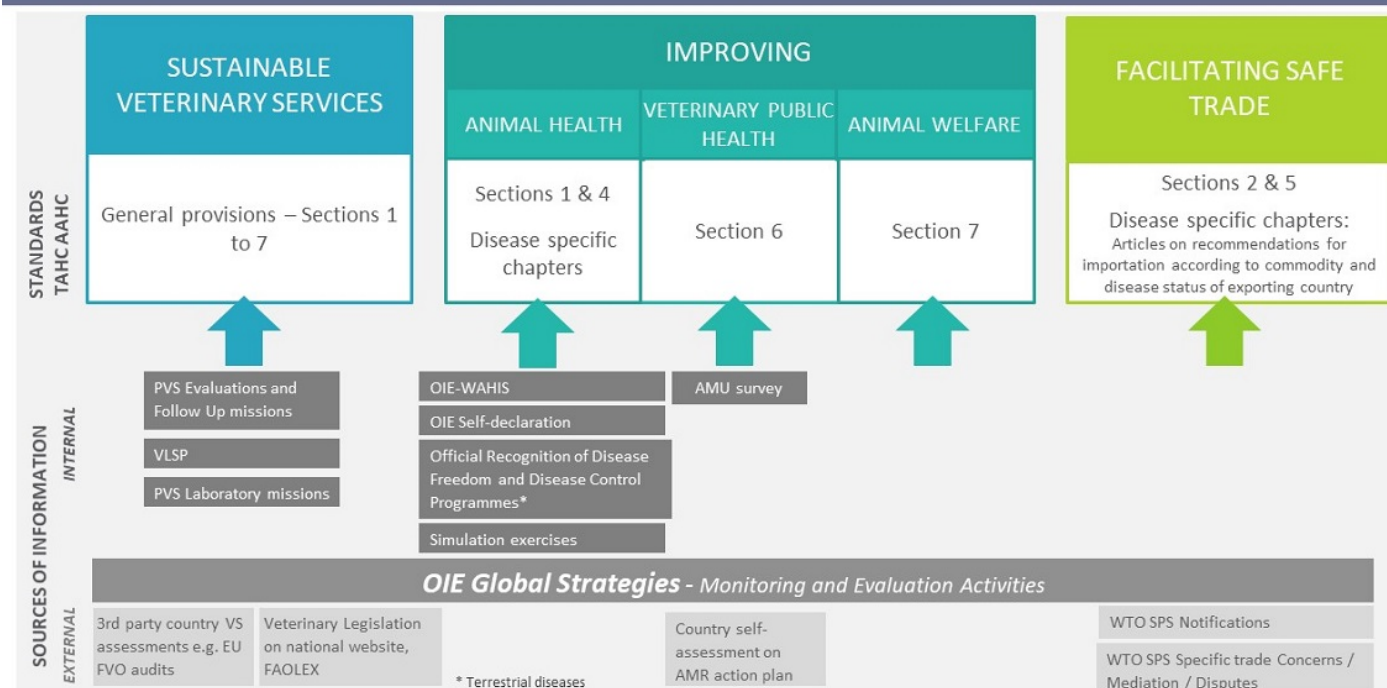


Fig. 3. Using the OIE Standards Development and Implementation Cycle to identify and link functions and activities, as the basis for a comprehensive workflow supporting business processes

OIE Standards Development and Implementation Cycle

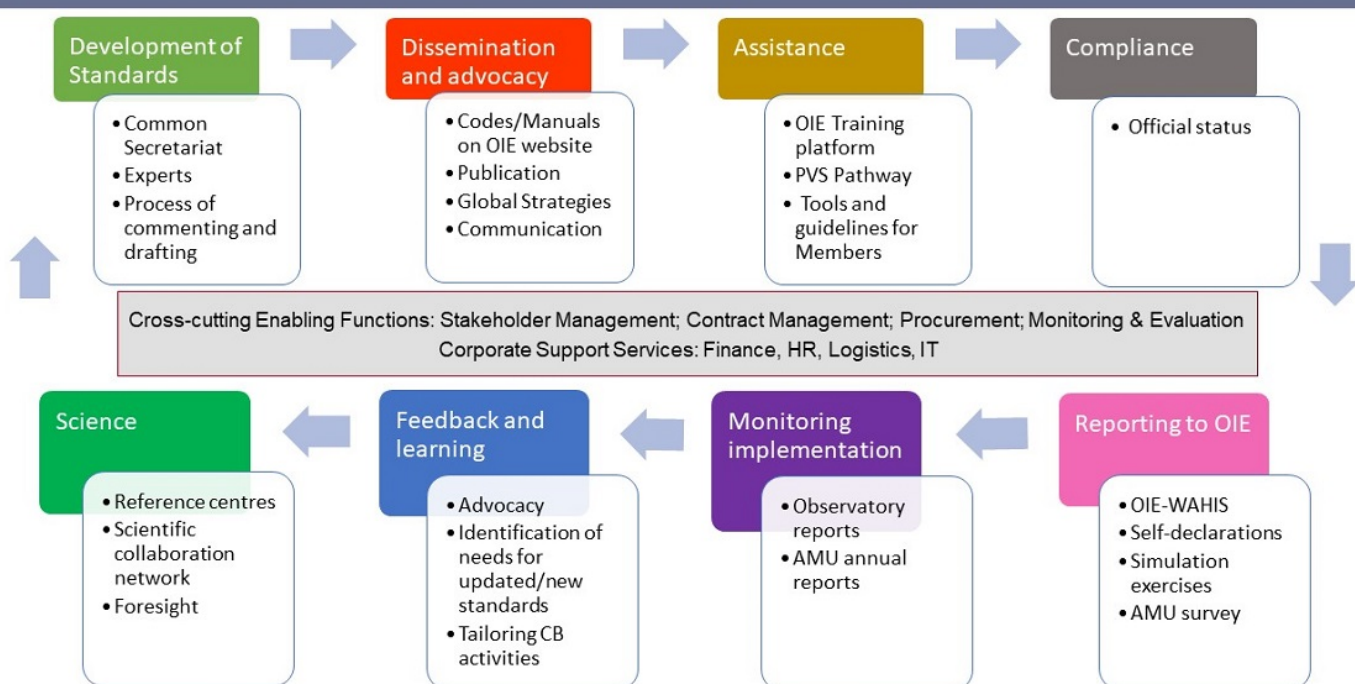


Fig. 4. The OIE Observatory Standards Monitoring Framework: linking OIE standards to data sources to monitor implementation

<https://doi.org/10.20506/bull.2021.1.3266>

REFERENCES

1. Rushton J., Bruce M., Bellet C., Torgerson P., Shaw A., Marsh T., Pigott D., Stone M., Pinto J., Mesenhowski S. & Wood P. (2018). – Initiation of Global Burden of Animal Diseases Programme (GBADs). *Lancet*, **392** (10147), 538–540. [https://doi.org/10.1016/S0140-6736\(18\)31472-7](https://doi.org/10.1016/S0140-6736(18)31472-7).

PERSPECTIVES

► OIE ACTIONS

What can the GBADs programme deliver?

The case of Ethiopia

KEYWORDS

#animal health, #decision, #Ethiopia, #Global Burden of Animal Diseases (GBADs), #livestock sector.

AUTHORS

W. Temsegen ^{(1)*}, W. Awoke ⁽²⁾, Y. Wogayehu ⁽³⁾ & T. Knight-Jones ⁽¹⁾

(1) [International Livestock Research Institute](#), Addis Ababa, Ethiopia.

(2) Independent consultant, Addis Ababa, Ethiopia.

(3) Veterinary Epidemiology Directorate, Ministry of Agriculture, Addis Ababa, Ethiopia.

* Corresponding author: W.Temesgen@cgiar.org

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© Derejeb/Getty Images

Livestock in Ethiopia contribute to the livelihoods of more than 11.3 million rural households and account for up to 25% of the national gross domestic product and 20% of export earnings. The

Ethiopian Government wants to further tap the immense potential of the livestock sector for poverty reduction, enhancing food and nutrition security, economic growth and foreign exchange earnings.

Deficiencies in animal health, feed and genetics constrain the livestock sector in Ethiopia. There is a lack of quality information to guide evidence-based policy and investments for further development of the sector. Poor animal health is endemic in the country, with a wide range of animal diseases and health problems burdening the livestock sector. Good quality and high-resolution data on the causes and scale of this animal health burden, and an understanding of who is affected and how, are essential if objectives for growing the sector are to be met. As in much of the developing world, these are lacking in Ethiopia. [Global Burden of Animal Diseases \(GBADs\)](#) – a global programme led by the University of Liverpool and the World Organisation for Animal Health (OIE) – seeks to address this problem.

The GBADs programme has the main objective of producing detailed data on the global burden of animal diseases, with flexible methodologies that can be used for evidence-based decisions on animal health policy and systems.



Ethiopia has been selected as a case study country for the GBADs programme. The available livestock and livestock-health related data will be searched and collated, and GBADs animal health metrics will be generated to estimate the animal health burden for different livestock sectors, livestock keepers and livestock health problems, identifying data gaps for future refinement. This understanding will improve the efficiency of policy and technology interventions and enhance the contribution of the livestock sector to national development objectives and the achievement of the United Nations Sustainable Development Goals.

<https://doi.org/10.20506/bull.2021.1.3252>

REFERENCES

1. Shapiro B.I., Gebru G., Desta S., Negassa A., Nigussie K., Aboset G. & Mechale H. (2017). – [Ethiopia livestock sector analysis](#). ILRI Project Report. Nairobi, Kenya: International Livestock Research Institute (ILRI).
2. Shapiro B.I., Gebru G., Desta S., Negassa A., Nigussie K., Aboset G. & Mechale H. (2015). – [Ethiopia livestock master plan](#). ILRI Project Report. Nairobi, Kenya: International Livestock Research Institute (ILRI).

PERSPECTIVES

► JOINT ACTIONS

The strength of partnership working

KEYWORDS

#decision, #Food and Agriculture Organization of the United Nations (FAO), #Global Burden of Animal Diseases (GBADs), #Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs), #partnership, #World Organisation for Animal Health (OIE).

AUTHORS

K. Sumption ^{(1)*} & J.-P. Dop ⁽²⁾

(1) Chief Veterinary Officer, Animal Health Service, [Animal Production and Health Division, Food and Agriculture Organization of the United Nations \(FAO\)](#).

(2) Deputy Director General Institutional Affairs and Regional Activities, [World Organisation for Animal Health \(OIE\)](#).

* Corresponding author: CVO@fao.org

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE or FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the authors. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE or FAO in preference to others of a similar nature that are not mentioned.



Photo by [Pascal Mariamal](#) on [Unsplash](#)

The Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) have enjoyed a long-standing partnership over seven decades in terrestrial and aquatic animal disease risk management, more specifically a Global Framework

for the Progressive Control of Transboundary Animal Diseases (GF-TADs)⁽¹⁾ since 2004 and, since 2010, a 'Tripartite' agreement involving the World Health Organization (WHO) on 'One Health' relating to risks at the animal-human-ecosystem interface.

These frameworks have played a significant role in developing global and regional strategies and coordinated efforts to promote and sustain national actions against global threats (foot and mouth disease, peste des petits ruminants, rinderpest, African swine fever), which have been prioritised because of their major impacts on the economy and livelihoods, and against additional diseases that have been prioritised by regional GF-TADS Committees. Regarding 'One Health', the Tripartite has led the international effort to address antimicrobial resistance (AMR), and priority zoonotic diseases including rabies, avian influenza and tuberculosis are addressed in both frameworks according to the extent of animal health service involvement in their management.

A key issue constraining investment in disease management is the paucity of data on the impact of animal disease upon efficiency of livestock production and food systems, and on associated outcomes of human nutrition, food security, livelihoods and human health (considering nutrition as well as zoonotic infections and AMR). The FAO collects data on production, inputs and outputs of agricultural systems from 245 territories which, together with the disease information collected by the OIE and the human health information provided by WHO, provide a level of evidence on disease distribution. The data have the potential to provide indicators of value, but progress with estimating burdens of disease, and returns on investment in control measures, could be transformative to improved priority setting by national public and private sectors as well as regional economic communities and financial institutions.

Priorities for FAO and the OIE under GF-TADS are to support improved decision-making on priorities for investments at regional and national levels, and to influence and leverage increased attention to animal disease based on better understanding of its role in economic and social development. Better understanding in this area will also assist understanding of how reduced disease could reduce livestock's environmental impact, and stimulate investment in animal health as part of the effort to mitigate global warming. Initiatives such as the [Global Burden of Animal Diseases \(GBADs\) programme](#) could be instrumental in this.

(1) [GF-TADS: Global Framework for the Progressive Control of Transboundary Animal Diseases](#) is a joint initiative of the OIE and FAO that endeavours to empower global and regional alliances in the fight against Transboundary Animal Diseases (TADs), to provide for capacity building and to assist in establishing programmes for the specific control of certain TADs based on global and regional priorities.

<https://doi.org/10.20506/bull.2021.1.3253>

PERSPECTIVES

► OPINIONS AND STRATEGIES

GBADs' time is now

SUMMARY

The importance of precisely prioritised interventions in animal health has never been more apparent, and the GBADs tool will bring that capability to livestock keepers around the world.

KEYWORDS

#animal health, #decision, #Global Burden of Animal Diseases (GBADs), #public health, #World Organisation for Animal Health (OIE).

AUTHORS

S. Mesenhowski ^{(1)*} & A. Tollervey ⁽²⁾

(1) Senior Program Officer Global Growth & Opportunity (GGO), [Bill & Melinda Gates Foundation](#), Washington, United States of America.

(2) Senior Livelihoods Adviser, [Research and Evidence Division, Foreign, Commonwealth and Development Office](#), United Kingdom.

* Corresponding author: Shannon.mesenhowski@gatesfoundation.org

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© OIE/Amit Sarkar

A global resource such as the Global Burden of Animal Diseases (GBADs) programme will transform livestock investment decisions made by those throughout the sector, from small-scale producers to national government officials, in the next ten years. Through GBADs, prioritising animal health interventions will become evidence-based, enabling better use of resources and resulting in healthier, more productive livestock around the world.

GBADs' innovative methodology for determining the economic burden caused by animal diseases, including those that are often under-emphasised, will shed light on the daily realities faced by livestock keepers that prevent them from maximising their livelihoods. This collaborative effort brings together experts who have long been working on the critical themes featured in GBADs and offers an opportunity to align efforts towards a cohesive and cooperative global public good, amplified by the expertise of the [World Organisation for Animal Health \(OIE\)](#).

In the current context of the COVID-19 global pandemic, the interrelatedness of animal, human and environmental health is clear. Moreover, diseases of zoonotic potential, emerging diseases, neglected tropical diseases, and diseases of economic significance are often competing for limited resources from livestock keepers and the public and private sector. And, while livestock contributes 40% of the global agricultural gross domestic product (GDP) [1], and 5% of the overall world GDP [2], the sector competes for just 2.5% of agricultural official development assistance (ODA) [3], thus highlighting the need for better evidence to design and prioritise the most effective animal health interventions that will have the greatest impact.

GBADs will identify weaknesses in the distribution of animal health resources and technology

GBADs' time is now because this tool will identify weaknesses in the distribution of animal health resources and technology and enhance the allocation of such resources by generating better information on livestock and aquatic systems. The programme will enable better animal health management, which in turn will have positive impacts on agricultural productivity and increase household incomes for small-scale producers around the world, lessening their vulnerability to climate change and other shocks.

<https://doi.org/10.20506/bull.2021.1.3254>

REFERENCES

1. Salmon G.R., MacLeod M., Claxton J.R., Pica Ciamarra U., Robinson T., Duncan A. & Peters A.R. (2020). – Exploring the landscape of livestock 'Facts'. *Global Food Sec.*, 25. <https://doi.org/10.1016/j.gfs.2019.100329>.
2. Global Livestock Advocacy for sustainable Development (GLAD). – Why Livestock Matter. *Prosperity*.
3. Food and Agriculture Organization of the United Nations (FAO). – AIDmonitor. *Analyse by sector*.

PERSPECTIVES

► OPINIONS AND STRATEGIES

Gender and the burden of animal diseases

KEYWORDS

#economics in animal health, #gender equality, #Global Burden of Animal Diseases (GBADs), #World Organisation for Animal Health (OIE).

AUTHORS

N. de Haan, Director, CGIAR GENDER Platform, Nairobi, Kenya.

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© OIE/Anis Usman

Global Burden of Animal Diseases (GBADs) has to be aware of the complexities of identifying who is impacted by the burden of disease and health problems in livestock and aquaculture. Expenditure on animal health can have gender impacts, diverting scarce financial resources. CGIAR GENDER Platform will support GBADs in making sense of gender impacts and making the invisible visible.

The first step in making the invisible visible is to obtain gender disaggregated data at household level. Simply put, this means interviewing both a man and a woman in a household, and not just the head of the household.

Moreover, data collection needs to be sensitive to gender norms, so, if possible, the man and the woman should be interviewed separately to give each a chance to express themselves. GBADs will support the development of frameworks of data collection to make the invisible visible, highlighting the need for such exercises to be adequately funded.

After the collection of this data, making sense of gender requires analysis. The GBADs analytics platform will need to seek and encourage data that is good enough for the purpose of a gender analysis. Such data will help provide answers to a series of questions such as:

- What are the implications of ownership of livestock – does asking who owns the animal actually help us?
- Are we looking at how animal disease impact disempowers women?

Gender is about power relationships – which are nuanced and very contextual; how can we explore this when working with big datasets?

At the national level it is important to have structures of analysis that can take the data on gender and animal health at the household level and **aggregate** this at the **national level**, while still being able to do an effective gender analysis.

We at the CGIAR GENDER Platform will work with GBADs to make sure these questions are asked and, more importantly, we will help answer them to ensure that the GBADs programme contributes to the achievement of the [United Nations Sustainable Development Goal No. 5 – Gender equality](#).

For more information, please visit the [CGIAR GENDER Platform](#)

<https://doi.org/10.20506/bull.2021.1.3255>

PERSPECTIVES

► OPINIONS AND STRATEGIES

Integrating private- and public-sector data for improved animal health investments

KEYWORDS

#animal health, #cost-benefit analysis, #decision, #economic impact, #economics in animal health, #Global Burden of Animal Diseases (GBADs), #public-private partnership.

AUTHORS

K. Watkins ^{(1)*}, G. Spronk ⁽²⁾ & S. Cohen ⁽³⁾

(1) [Managing Member, FoodFirst, LLC](#), Indianapolis, IN, United States of America.

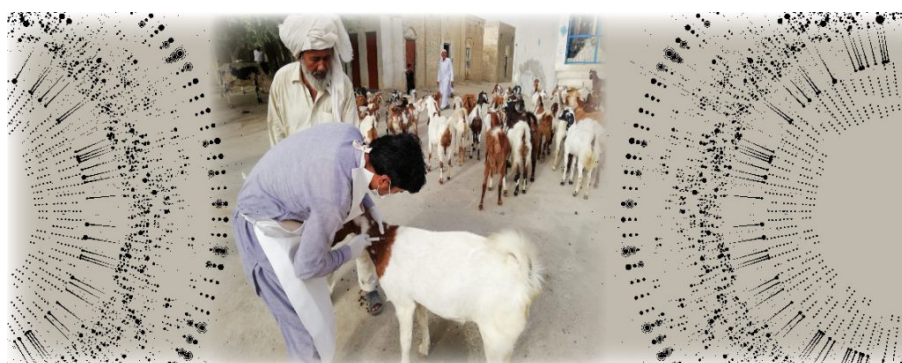
(2) Chair, Board of Directors, [Pipestone Veterinary Services](#), Pipestone, MN, United States of America.

(3) Vice President, [MTech Systems](#), Atlanta, GA, United States of America.

* Corresponding author: FoodFirstLLC@att.net

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© OIE/Uddin Naeem

Farmers of all scales, whether smallholders or large production companies, know that animal

health and welfare are essential for the sustainable production of animal-sourced food, fibre and draught power, and for their own economic survival. The impact of animal health on the global economy is seen in the ongoing spread of African swine fever, recent outbreaks of highly pathogenic avian influenza, and SARS-CoV-2.

Are we investing wisely?

While outbreaks of highly contagious diseases demand attention, these losses can pale in comparison to the economic, social and environmental burden of common diseases that degrade animal health and productivity every day. Trade-off decisions are continually made on when, where, and how to apply resources to ensure animal health. The most successful producers use field observations and standardised methods to make timely, data-based decisions on how to apply limited resources to achieve the best possible clinical outcomes and economic returns. But much of today's animal disease information remains privatised and fragmented, and is not collected or analysed consistently enough to support timely action at the national or global level.

From guessing to knowing

Initiatives such as the [Global Burden of Animal Diseases \(GBADs\) programme](#) [1] can bring public and private data sets together and standardise cost-benefit analyses. Access to integrated data and standardised methods will lead to more equitable, evidence-based analysis that improves prioritisation, cost-effectiveness, and the delivery of animal disease investments, locally, nationally and globally.

Partnerships and programmes

In addition to this call for data integration and standardisation, the authors support the Food and Agriculture Organization of the United Nations (FAO) and World Organisation for Animal Health (OIE)'s position that public- and private-sector partnerships play an essential role in animal health and food animal production [2, 3, 4]. Cross-sector collaboration and GBADs can lead to a greater return on, and prioritisation of, investments to reduce the burden of animal diseases and speed up achievement of the [United Nations Sustainable Development Goals](#). But, for the private sector to share data, GBADs must help producers with day-to-day operational management. If increased collaboration and GBADs help farmers, farmers will share more data.

<https://doi.org/10.20506/bull.2021.1.3256>

REFERENCES

1. Rushton J., Bruce M., Bellet C., Torgerson P., Shaw A., Marsh T., Pigott D., Stone M., Pinto J., Mesenhowski S. & Wood P. (2018). – Initiation of Global Burden of Animal Diseases Programme (GBADs). *Lancet*, **392** (10147), 538-540. [https://doi.org/10.1016/S0140-6736\(18\)31472-7](https://doi.org/10.1016/S0140-6736(18)31472-7).
2. Food and Agriculture Organization of the United Nations (FAO) (2013). – [Public-private partnerships for animal health: Strengthening laboratories for local economies and food safety](#).
3. Food and Agriculture Organization of the United Nations (FAO). – [Public-private partnerships boost capacity and know-how in agriculture](#).
4. World Organisation for Animal Health (OIE). – [Public-private partnerships \(PPPs\) in the veterinary domain](#).

PERSPECTIVES

► OPINIONS AND STRATEGIES

Balancing the nutritional benefits and infection risks of livestock in low- and middle-income countries

KEYWORDS

#animal health, #Campylobacter, #economic impact, #Ethiopia, #food safety, #Global Burden of Animal Diseases (GBADs), #low- and middle-income country (LMIC), #One Health, #public health, #statistics.

AUTHORS

A.H. Havelaar^{(1)*} & S.L. McKune⁽²⁾

(1) Professor, [Emerging Pathogens Institute](#), [Food Systems Institute](#) and [Department of Animal Sciences](#), University of Florida, Gainesville, FL, United States of America.

(2) Research Assistant Professor, [Department of Environmental and Global Health](#), [Center for African Studies](#) and [Food Systems Institute](#), University of Florida, Gainesville, FL, United States of America.

* Corresponding author: ariehavelaar@ufl.edu

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© OIE/H. Hadi

More than one in five children globally has stunted growth, a state of malnutrition associated

with increased mortality, impaired cognitive development, reduced income and life expectancy, and an increased risk of chronic diseases. Despite decreasing global prevalence, the trend is not sufficient to meet the United Nations [Sustainable Development Goals](#). Additional interventions that address the complex drivers of stunting are needed [1].

Child growth

Normal child growth and development require an adequate diet, protection from major diseases, and sufficient gut health. Animal-sourced foods are the best available sources of high-quality, nutrient-rich food for young children [2]. The sustainable intensification of livestock production in low- and middle-income countries (LMICs) helps to improve the livelihoods of the poor and can contribute to increased availability and consumption of animal-sourced foods [3]. However, relationships between animal ownership and child growth are complex. Several studies report net beneficial effects, but other studies suggest that these beneficial effects can be reduced or even negated by the exposure of children to animal faeces [4].

Child gut health

Environmental enteric dysfunction (EED) is a chronic subclinical disorder of the intestines associated with settings of poverty and unsanitary living conditions. Colonisation by intestinal pathogens and malnutrition are important triggers for EED [5].

The MAL-ED study⁽¹⁾, a birth cohort study in eight LMICs, found that 24-month, length-for-age Z scores were positively associated with complementary food and negatively associated with diarrhoea and (asymptomatic) colonisation by specific enteropathogens. Among these, *Campylobacter* bacteria were the frequently found genus in the stools of children, most commonly without any clinical symptoms. There was a significant negative association between the *Campylobacter* burden in children and faltering linear growth [6].

Transmission of *Campylobacter* from livestock reservoirs occurs through food, direct animal contact, or environmental contamination. In industrialised countries, foodborne transmission from chicken reservoirs is the main pathway. Very few data are available describing *Campylobacter* reservoirs or transmission pathways for infection in children in LMICs. Formative research in Ethiopia has shown that children are typically colonised by multiple *Campylobacter* species and suggests that chickens and ruminants may be important reservoirs [7].

Conclusion

Animal-sourced foods are essential components of a healthy diet for children in LMICs. Understanding reservoirs and pathways of zoonotic pathogens is essential for safely managing livestock production and animal-sourced food consumption to protect child health. The [Global Burden of Animal Diseases \(GBADs\)](#) Human Health theme works at the interface of human and animal health and is well positioned to contribute to tackle this challenge.

(1) MAL-ED: Etiology, Risk Factors, and Interactions of Enteric Infections and Malnutrition and the Consequences for Child Health and

Development study [6].

<https://doi.org/10.20506/bull.2021.1.3257>

REFERENCES

1. United Nations Children's Fund (UNICEF), World Health Organization (WHO), International Bank for Reconstruction and Development (The World Bank) (2020). – Levels and trends in child malnutrition: Key findings of the 2020 edition of the Joint Child Malnutrition Estimates. Licence: CC BY-NC-SA 3.0 IGO. <https://www.who.int/publications/item/jme-2020-edition>.
2. World Health Organization (WHO) (2014). – World Health Assembly global nutrition targets 2025: stunting policy brief. http://www.who.int/nutrition/topics/globaltargets_stunting_policybrief.pdf.
3. Adesogan A., Havelaar A.H., McKune S.L., Eilittä M. & Dahl G.E. (2020). – Animal source foods: Sustainability problem or malnutrition and sustainability solution? Perspective matters. *Global Food Sec.*, **25**, 100325. <https://doi.org/10.1016/j.gfs.2019.100325>.
4. Headey D., Nguyen P., Kim S., Rawat R., Ruel M. & Menon P. (2017). – Is exposure to animal feces harmful to child nutrition and health outcomes? A multicountry observational analysis. *Am. J. Trop. Med. Hyg.*, **96**, 961–969. <https://doi.org/10.4269/ajtmh.16-0270>.
5. Guerrant R., Deboer M., Moore S., Scharf R. & Lima A. (2013). – The impoverished gut—a triple burden of diarrhoea, stunting and chronic disease. *Nat. Rev. Gastroenterol. Hepatol.*, **10**, 220–229. <https://doi.org/10.1038/nrgastro.2012.239>.
6. Rogawski Elizabeth T., Liu Jie, Platts-Mills James A., Kabir Furqan, Lertsethtakarn Paphavee, Siguas Mery, Khan Shaila S., Praharaj Ira, Murei Arinao, Nshama Rosemary, Mujaga Buliga, Havt Alexandre, Maciel Irene A., Operario Darwin J., Taniuchi Mami, Gratz Jean, Stroup Suzanne E., Roberts James H., Kalam Adil, Aziz Fatima, Qureshi Shahida, Islam M. Ohedul, Sakpaisal Pimmada, Silapong Sasikorn, Yori Pablo P., Rajendiran Revathi, Benny Blossom, McGrath Monica, Seidman Jessica C., Lang Dennis, Gottlieb Michael, Guerrant Richard L., Lima Aldo A.M., Leite Jose Paulo, Samie Amidou, Bessong Pascal O., Page Nicola, Bodhidatta Ladaporn, Mason Carl, Shrestha Sanjaya, Kiwelu Ireen, Mduma Estomih R., Iqbal Najeeha T., Bhutta Zulfiqar A., Ahmed Tahmeed, Haque Rashidul, Kang Gagandeep, Kosek Margaret N. & Houpt Eric R. (2018). – Use of quantitative molecular diagnostic methods to investigate the effect of enteropathogen infections on linear growth in children in low-resource settings: longitudinal analysis of results from the MAL-ED cohort study. *Lancet Glob. Health*, **6**, e1319–e1328. [https://doi.org/10.1016/S2214-109X\(18\)30351-6](https://doi.org/10.1016/S2214-109X(18)30351-6).
7. Terefe Y., Deblais L., Ghanem M., Helmy Y., Mummed B. & Chen D. (2020). – Co-occurrence of *Campylobacter* species in children from eastern Ethiopia, and their association with environmental enteric dysfunction, diarrhea, and host microbiome. *Front. Public Health*, **8**, 1–16. <https://doi.org/10.3389/fpubh.2020.00099>.

DOSSIER

Improved animal population data and production systems classification to support estimates of the burden of animal diseases

KEYWORDS

#animal health, #economic impact, #economics in animal health, #Global Burden of Animal Diseases (GBADs), #statistics, #World Organisation for Animal Health (OIE).

AUTHORS

D. Mayberry⁽¹⁾, L. Yin⁽¹⁾, P. Schrobback⁽¹⁾ & Mario Herrero^{(2)*}

(1) Research Scientist, [Commonwealth Scientific and Industrial Research Organisation \(CSIRO\)](#), Brisbane, Australia.

(2) Chief Research Scientist, [Commonwealth Scientific and Industrial Research Organisation \(CSIRO\)](#), Brisbane, Australia.

* Corresponding author: Mario.Herrero@csiro.au

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



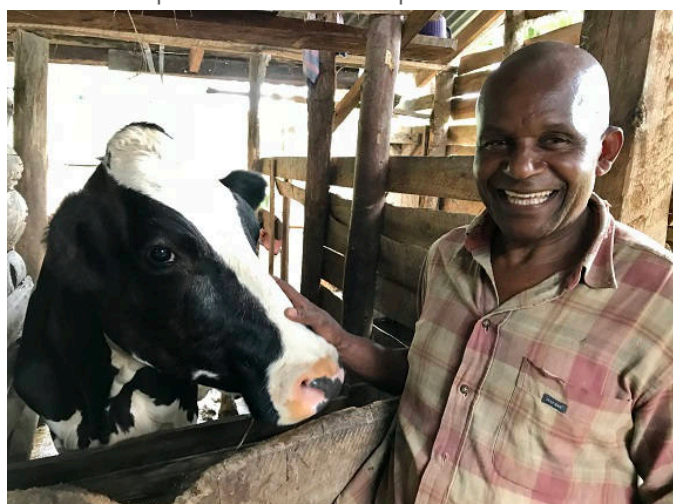
© Jeda Palmer

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) leads the aspect of the mission of the [Global Burden of Animal Diseases \(GBADs\)](#) programme that will describe the populations and production systems of livestock and aquatic animals. CSIRO will partner in this work with the Food and Agriculture Organization of the United Nations (FAO) and the

International Livestock Research Institute (ILRI).

A great deal of livestock data has been collected over time; however, the quality ranges from poor to excellent. Since these data are held by many different organisations, in many different forms, and much of this information is not available in a harmonised or even organised and cohesive manner, it can be difficult to access.

Our team of international scientists will collate existing data from livestock and aquatic animal production systems, focusing on populations, productivity and prices of inputs (such as feed) and outputs (such as meat and milk). Diverse data sources will include public, non-governmental and private organisations at the global level; in particular for [the case study country, Ethiopia](#). Our scientists will also identify any missing data that needs to be collected to provide a more comprehensive understanding of the burden of animal diseases.



Ngairo and his dairy cow Mze, Mbeya region, Tanzania. © Jeda Palmer

Working closely with colleagues from the University of Zurich, Switzerland, we will develop a classification system for the different livestock production systems data, providing the basis for an estimation of the [animal health loss envelope](#). Our analysis will provide information on the biomass of and economic investment into the animals in these production systems and, where possible, the gender roles involved in animal production. This will provide the basis for differentiating the burdens of animal disease between production systems, and highlight [the gender balance of the burden](#).

The methodology developed will be embedded in models hosted by the prototype GBADs knowledge engine which is being developed by collaborators at the University of Guelph, Canada. The GBADs network of scientists will make this information publicly available by developing easy-to-use, Web-based, data visualisation dashboards and publishing articles in scientific journals. This will enable decision-makers and other interested stakeholders to easily access and understand the livestock data, assisting in evidence-based decision-making for investments and minimising adverse impacts on the environment and public health. It will also help smallholder livestock keepers to allocate their scarce resources to those health issues that are most economically important to their livestock production enterprises, and therefore have more impact on their livelihoods.

<https://doi.org/10.20506/bull.2021.1.3258>

DOSSIER

A simple metric to capture losses

The concept of an animal health loss envelope

SUMMARY

Assessing the total burden of diseases and other sources of low productivity and premature death in livestock requires a method for capturing the difference between current productivity and a theoretical ceiling within each production system. The animal health loss envelope meets this need.

KEYWORDS

#animal health, #data management, #economic impact, #Global Burden of Animal Diseases (GBADs), #livestock sector, #statistics.

AUTHORS

P.R. Torgerson ^{(1)*} & A.P.M. Shaw ^(2,3)

(1) Section of Epidemiology, [Vetsuisse Faculty, University of Zurich](#), Switzerland.

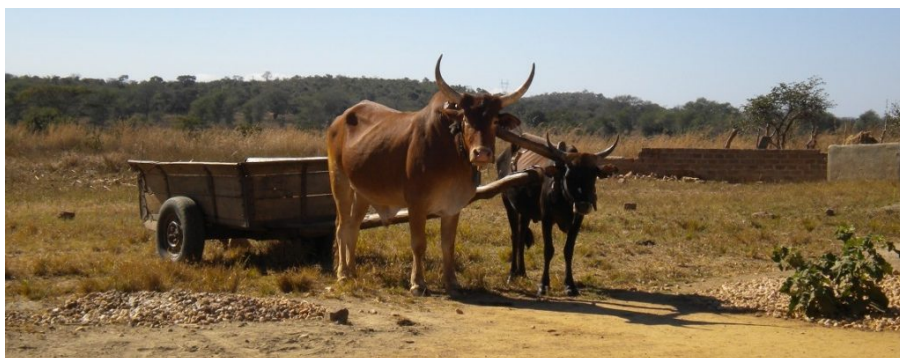
(2) Department of Livestock and One Health, [Institute of Infection, Veterinary and Ecological Sciences, University of Liverpool](#), United Kingdom.

(3) AP Consultants, 22 Walworth Enterprise Centre, Duke Close, Andover, SP10 5AP, United Kingdom.

* Corresponding author: paul.torgerson@access.uzh.ch

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



Mismatched work oxen, often the result of ill health. © Marie Ducrotoy

Most studies on the economic impacts of livestock diseases have a single disease focus with an advocacy role. They often produce a large figure for monetary losses which is used as an argument for mobilising the necessary resources to control the disease.

In the early stages of the Global Burden of Disease (GBD) study into human mortality and morbidity, for some age/gender categories, the sum of the deaths ascribed to individual diseases substantially outnumbered actual deaths [1]. The study solved this by assigning a worldwide maximum life expectancy, which imposed a ceiling on total deaths due to different causes. For livestock diseases, initial assessments of their global burden face a similar dilemma. Some studies report deaths due to communicable diseases which, when added up, exceed the total number of deaths observed. Individual studies are evidence-based, but a single disease focus means that they are often undertaken in high-incidence populations. They neither fully consider multiple causes of illness, which together result in death (co-morbidity), nor the fact that disease control interventions are often beneficial beyond the disease of interest. The relative orders of magnitude of the losses estimated for different diseases are probably correct, but, as for human disease, they need to be fitted within a ceiling.

Consequently, the [Global Burden of Animal Diseases \(GBADs\) programme](#) has developed the concept of an animal health loss envelope (AHLE) (Fig. 1). This measures the difference between current production and production if the animals were in perfect health. This optimum scenario or 'utopia' is when premature livestock mortality is absent and all other parameters (fertility, feed conversion, milk/egg/traction outputs, etc.) are at the maximum levels currently found in that production system. Animal health expenditure, a cost attributable to the presence of animal diseases, is set at zero in utopia.

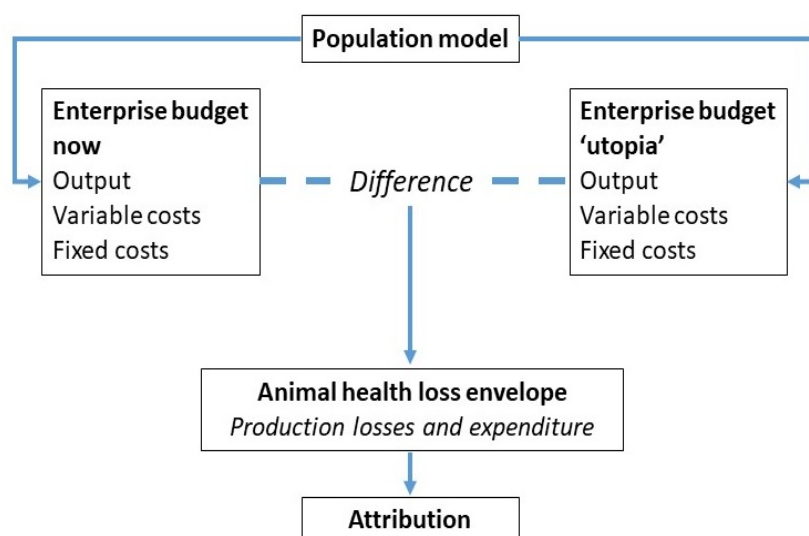


Fig. 1. The animal health loss envelope (AHLE)

For the initial calculation of the AHLE, the authors have selected an economic layout and terminology which is familiar to producers, veterinarians and economists – the farm budget. This covers all production, entries and exits from the herd and all fixed and variable costs borne by producers [2]. As well as monetary amounts, the AHLE also reflects the feasible range for each production parameter in a given production system. The AHLE can thus be estimated for different production systems, ranging from commercial dairy production to backyard poultry. Applying the AHLE ensures that total losses attributed to individual diseases cannot exceed the total losses experienced in the system, which are due not just to diseases, but also to injuries, predation, drought and other causes of sub-optimal production.

<https://doi.org/10.20506/bull.2021.1.3259>

REFERENCES

1. Murray C.J. & Lopez A.D. (1994). – Global and regional cause-of-death patterns in 1990. *Bull. WHO*, **72**, 447–480.
2. Rushton J., Thornton P. & Otte M.J. (1999). – Methods of economic impact assessment. In *The economics of animal disease control. Rev. Sci. Tech. Off. Int. Epiz.*, **18** (2), 315–338. <http://dx.doi.org/10.20506/rst.18.2.1172>.

DOSSIER

Animal health ontology and attribution

Linking key elements in the GBADs programme

KEYWORDS

#animal health, #data management, #economics in animal health, #Global Burden of Animal Diseases (GBADs), #livestock sector, #statistics.

AUTHORS

M. Bruce ^{(1)*} & K.M. McIntyre ⁽²⁾

(1) Senior Lecturer Veterinary Epidemiology, Centre for Animal Production and Health, [School of Veterinary Medicine, Murdoch University, Australia](#).

(2) Senior Analyst, GBADs, Department of Livestock and One Health, [Institute of Infection, Veterinary and Ecological Sciences, University of Liverpool, United Kingdom](#).

* Corresponding author: Mieghan.Bruce@murdoch.edu.au

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© Mieghan Bruce

What is an ontology and why do we need one for animal health? How do we combine data from different databases in a meaningful way? How much of the total burden of animal disease is

attributable to a specific disease such as foot and mouth disease?

Animal health ontology

The development of digital technologies in agricultural infrastructure produces large quantities of data that provide information on the structure of animal populations and production systems and enable the compilation of health-related records, e.g. disease reports, clinical observations. Collation and synthesis of these data will facilitate understanding of livestock health systems and the burden of disease [1].

An ontology organises data resources into meaningful, computer-readable information [2], allowing characterisation of key data concepts and categories, facilitating understanding of relationships between data resources, and providing digital representation of core subjects.

Animal health ontology (AHO) supports the interoperability of data collated for the [Global Burden of Animal Diseases \(GBADs\) programme](#) by building on existing ontologies [3, 4] and harnessing GBADs' international expertise in animal health, economics and informatics.

An ontology is a representation of the animal health domain (or part thereof) where key concepts, as well as the relationships between those concepts, are defined.

Using ontologies to link GBADs' methods and metrics to [OIE-WAHIS](#), global data sets (e.g. [FAOSTAT](#)), published research, and government and private-sector databases will allow seamless integration of these systems.

Disease attribution

Quantifying the burden of specific diseases, e.g. foot and mouth disease (FMD), helps us to determine the appropriateness of current control expenditure and to understand where additional resources should be assigned. In FMD-free countries, disease incursions are mitigated by large investment in surveillance and border-control measures [5]. In contrast, where FMD is endemic, local outbreaks can have devastating effects, with related losses being 16–60% of annual household income [6]. Other factors to consider include: the livestock production system; country/region/zone-specific trade agreements; and seasonal aspects determining production losses.

AHO and attribution methodology will integrate components of GBADs, transforming core subject understanding to inform priority setting in the animal health sector.

<https://doi.org/10.20506/bull.2021.1.3260>

REFERENCES

1. Drury B., Fernandes R., Moura M.F. & de Andrade Lopes A. (2019). – A survey of semantic web technology for agriculture. *Info. Process. Agri.*, **6** (4), 487–501. <https://doi.org/10.1016/j.inpa.2019.02.001>.
2. Slater L.T., Gkoutos G.V. & Hoehndorf R. (2020). – Towards semantic interoperability: finding and repairing hidden contradictions in biomedical ontologies. *BMC Med. Inform. Decis. Mak.*, **20** (Suppl 10), 311. <https://doi.org/10.1186/s12911-020-01336-2>.
3. Arnaud E., Laporte M.A., Kim Soonho, Aubert C., Leonelli S., Miro B., Cooper L., Jaiswal P., Kruseman G., Shrestha R., Buttigieg P.L., Mungall C.J., Pietragalla J.,

- Agbona A., Muliro J., Detras J., Hualla V., Rathore A., Das R.R., Dieng I., Bauchet G., Menda N., Pommier C., Shaw F., Lyon D., Mwanzia L., Juarez H., Bonaiuti E., Chiputwa B., Obileye O., Auzoux S., Yeumo E.D., Mueller L.A., Silverstein K., Lafargue A., Antezana E., Devare M. & King B. (2020). – The Ontologies Community of Practice: A CGIAR initiative for big data in agrifood systems. *Patterns*, **1** (7), 100105. <https://doi.org/10.1016/j.patter.2020.100105>.
4. Dórea F.C., Vial F., Hammar K., Lindberg A., Lambrix P., Blomqvist E. & Revie C.W. (2019). – Drivers for the development of an Animal Health Surveillance Ontology (AHSO). *Prev. Vet. Med.*, **166**, 39-48. <https://doi.org/10.1016/j.prevetmed.2019.03.002>.
5. Knight-Jones T.J. & Rushton J. (2013). – The economic impacts of foot and mouth disease – what are they, how big are they and where do they occur? *Prev. Vet. Med.*, **112** (3-4), 161-173. <https://doi.org/10.1016/j.prevetmed.2013.07.013>.
6. Nampanya S., Khounsy S., Phonvisay A., Young J.R., Bush R.D. & Windsor P.A. (2015). – Financial impact of foot and mouth disease on large ruminant smallholder farmers in the Greater Mekong Subregion. *Transbound. Emerg. Dis.*, **62** (5), 555-564. <https://doi.org/10.1111/tbed.12183>.

DOSSIER

Moving from FAIR to FAIRS and CARE for data sharing in GBADs

KEYWORDS

#animal health, #data management, #decision, #digital technology, #economics in animal health, #Global Burden of Animal Diseases (GBADs), #livestock sector, #statistics, #World Organisation for Animal Health (OIE).

AUTHORS

D. Stacey ^{(1)*}, T. Bernardo ⁽²⁾ & K. Raymond ⁽³⁾

(1) Co-lead Global Burden of Animal Diseases (GBADs) Informatics Theme, and Associate Professor, [School of Computer Science, University of Guelph](#), Guelph, Canada.

(2) Co-lead Global Burden of Animal Diseases (GBADs) Informatics Theme, and Professor, Population Medicine, [Ontario Veterinary College, University of Guelph](#), Guelph, Canada.

(3) Research Associate, GBADs, and [School of Computer Science, University of Guelph](#), Guelph, Canada.

* Corresponding author: dastacey@uoguelph.ca

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© OIE/Batchuluun Enkhtuul

The [Global Burden of Animal Diseases \(GBADs\) programme](#) is an initiative to improve decision-making for animal health/economics by integrating data from many sources and sharing analysis

and modelling. GBADs is developing a data sharing approach that embraces FAIR and CARE principles while adding 'Secure by design'.

There are many challenges with sharing data, regardless of where they fall on the spectrum from private to shared to open. GBADs seeks to improve the quality, velocity and scope of livestock data by going beyond the sharing of open data to include data generated by the private sector. It often takes a long time for open data to become available, so it is necessary to speed up the 'time to science' by utilising all data via advanced data sharing principles and protocols.

How can open and private data exist in the same system while providing ease of use and availability for the former and security and privacy for the latter?

FAIR [1] stands for:

- Findable
- Accessible
- Interoperable
- Reusable.

Beyond the principle of 'open as possible, and as closed as necessary', we have extended FAIR to FAIRS, whereby all data are **Secure by design**. Secure data sharing will be ensured by using appropriate access permissions, identification management, encryption and machine-to-machine communications.

GBADs is also integrating CARE into its data sharing framework. CARE [2] articulates data sharing-principles for indigenous data. The CARE principles are:

- Collective benefit to the owners of data
- Authority of data owners to control usage and access
- Responsibility to ensure benefit and respect for indigenous peoples
- Ethics grounded in respect.

FAIRS+CARE data sharing should help to ensure that all private data in the system are shared while respecting the privacy and needs of the data owners, be they private companies or indigenous peoples.

<https://doi.org/10.20506/bull.2021.1.3261>

REFERENCES

1. Wilkinson M.D., Dumontier M., Aalbersberg I.J., Appleton G., Axton M., Baak A., Blomberg N., Boiten J.W., da Silva Santos L.B., Bourne P.E., Bouwman J., Brookes A.J., Clark T., Crosas M., Dillo I., Dumon O., Edmunds S., Evelo C.T., Finkers R., Gonzalez-Beltran A., Gray A.J., Groth P., Goble C., Grethe J.S., Heringa J., 't Hoen P.A., Hooft R., Kuhn T., Kok R., Kok J., Lusher S.J., Martone M.E., Mons A., Packer A.L., Persson B., Rocca-Serra P., Roos M., van Schaik R., Sansone S.A., Schultes E., Sengstag T., Slater T., Strawn G., Swertz M.A., Thompson M., van der Lei J., van Mulligen E., Velterop J., Waagmeester A., Wittenburg P., Wolstencroft K., Zhao J. & Mons B. (2016). – The FAIR guiding principles for scientific data management and stewardship. *Sci. Data*, **3**, 160018. <https://doi.org/10.1038/sdata.2016.18>.
2. Global Indigenous Data Alliance (2020). – [CARE principles for indigenous data governance](#).

DOSSIER

A quantitative understanding of animal health has the potential to improve human health

KEYWORDS

#animal health, #data management, #Global Burden of Animal Diseases (GBADs), #livestock sector, #public health, #statistics, #World Organisation for Animal Health (OIE).

AUTHORS

D. Pigott ^{(1)*} & B. Devleesschauwer ^(2, 3)

(1) Assistant Professor, [Institute for Health Metrics and Evaluation, University of Washington](#), Seattle, WA, United States of America.

(2) Epidemiologist, [Department of Epidemiology and Public Health, Sciensano](#), Brussels, Belgium.

(3) Visiting Professor, [Department of Veterinary Public Health and Food Safety, Ghent University](#), Merelbeke, Belgium.

* Corresponding author: pigottdm@uw.edu

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



Photo by [Wim van 't Einde](#) on [Unsplash](#)

The approach taken over the last two decades of quantifying global human health outcomes through quality- and disability-adjusted life years (QALYs and DALYs) has provided more informed and better targeted, data-driven policy decisions to improve health [1]. A successful

delivery of the Global Burden of Animal Diseases (GBADs) programme⁽¹⁾ is not only potentially equally transformative in the animal health sector, it can also enhance our understanding of human health outcomes.

Zoonoses

Many endemic and emerging diseases are zoonotic in origin, transmitted between humans and animals. Existing estimates of the burden of these shared pathogens would benefit from robust quantification of their status in livestock populations, especially when categorised by production system, as these factors are key determinants in human exposure and the possible human health impact. Combining veterinary and public health interventions in locations where both animal and human populations are affected is an essential part of managing these diseases. Since most emerging pathogens are zoonotic [2], routine tracking of animal health is needed to identify anomalous patterns.

Diet and food safety

Given the significant contribution of the livestock sector to global diets [3], any quantification of the quality and safety of products consumed by humans is important. Estimates of the impact of unsafe food suggest a significant but manageable burden [4]; detailing which livestock species are affected by key food-borne pathogens in which locations would enable necessary interventions in the appropriate sectors. Quantifying production losses, as well as potential losses of any dietary nutrients, will focus efforts on improving food security and enriching local diets through improved livestock health.

Future of human health

The fate of humans and livestock is inextricably linked. While forecasts of human health currently incorporate the trajectories of key risk factors, such as smoking [5], the future of livestock species is rarely addressed in a comprehensive manner through consensus processes. A robust contemporary estimate of animal health, and its effect on humans, is a necessary foundation to develop forecasts that show how animal health policies could alter human health trajectories for decades to come.

<https://doi.org/10.20506/bull.2021.1.3262>

REFERENCES

1. Murray C.J.L., Abbafati C., Abbas K.M., Abbasi M., Abbasi-Kangevari M., Abd-Allah F., Abdollahi M., Abedi P., Abedi A., Abolhassani H., Aboyans V., Abreu L.G., Abrigo M.R.M., Abu-Gharbieh E., Abu Haimed A.K., Abushouk A.I., Acebedo A., Ackerman I.N., Adabi M., Adamu A.A., Adebayo O.M., Adelson J.D., Adetokunboh O.O., Afarideh M., Afshin A., Agarwal G., Agrawal A., Ahmad T., Ahmadi K., Ahmadi M., Ahmed M.B., Aji B., Akinyemiju T., Akombi B., Alahdab F., Alam K., Alanezi F.M., Alanzi T.M., Albertson S.B., Alemu B.W., Alemu Y.M., Alhabib K.F., Ali M., Ali S., Alicandro G., Alipour V., Alizade H., Aljunid S.M., Alla F., Allebeck P., Almadhi M.A.H., Almasi-Hashiani A., Al-Mekhlafi H.M., Almulhim A.M., Alonso J., Al-Raddadi R.M., Altirkawi K.A., Alvis-Guzman N., Amare B., Amare A.T., Amini S., Amit A.M.L., Amugsi D.A., Anbesu E.W., Ancuceanu R., Anderlini D., Anderson J.A., Andrei T., Andrei C.L., Anjomshoa M., Ansari F., Ansari-Moghaddam A., Antonio C.A.T., Antony C.M., Anvari D., Appiah S.C.Y., Arabloo J., Arab-Zozani M., Aravkin A.Y., Arba A.A.K., Aripov T., Årnlöv J., Arowosegbe O.O., Asaad M., Asadi-Aliabadi M., Asadi-Pooya A.A., Ashbaugh C., Assmus M., Atout M.M.W., Ausloos M., Ausloos F., Ayala Quintanilla B.P., Ayano G., Ayanore M.A., Azari S., Azene Z.N., Darshan D.B., Babaei E. *et al.* (2020). – Five insights from the Global Burden of Disease Study 2019. *Lancet*, **396** (10258), 1135–1159. [https://doi.org/10.1016/S0140-6736\(20\)31404-5](https://doi.org/10.1016/S0140-6736(20)31404-5).
2. Jones K.E., Patel N.G., Levy M.A., Storeygard A., Balk D., Gittleman J.L. & Daszak P. (2008). – Global trends in emerging infectious diseases. *Nature*, **451**, 990–993. <https://doi.org/10.1038/nature06536>.
3. Food and Agriculture Organization of the United Nations (FAO) (2020). – Nutrition and livestock. Technical guidance to harness the potential of livestock for

improved nutrition of vulnerable populations in programme planning. <https://doi.org/10.4060/ca7348en>.

4. Havelaar A.H., Kirk M.D., Torgerson P.R., Gibb H.J., Hald T., Lake R.J., Praet N., Bellinger D.C., de Silva N.R., Gargouri N., Speybroeck N., Cawthorne A., Mathers C., Stein C., Angulo F.J. & Devleeschauwer B., on behalf of World Health Organization Foodborne Disease Burden Epidemiology Reference Group (2015). – World Health Organization global estimates and regional comparisons of the burden of foodborne disease in 2010. *PLoS Med.*, **12** (12), e1001923. <https://doi.org/10.1371/journal.pmed.1001923>.

5. Foreman K.J., Marquez N., Dolgert A., Fukutaki K., Fullman N., McGaughey M., Pletcher M.A., Smith A.E., Tang K., Yuan C.W., Brown J.C., Friedman J., He J., Heuton K.R., Holmberg M., Patel D.J., Reidy P., Carter A., Cercy K., Chapin A., Douwes-Schultz D., Frank T., Goettsch F., Liu P.Y., Nandakumar V., Reitsma M.B., Reuter V., Sadat N., Sorensen R.J.D., Srinivasan V., Updike R.L., York H., Lopez A.D., Lozano R., Lim S.S., Mokdad A.H., Vollset S.E. & Murray C.J.L. (2018). – Forecasting life expectancy, years of life lost, and all-cause and cause-specific mortality for 250 causes of death: reference and alternative scenarios for 2016–40 for 195 countries and territories. *Lancet*, **392** (10159), 2052–2090. [https://doi.org/10.1016/S0140-6736\(18\)31694-5](https://doi.org/10.1016/S0140-6736(18)31694-5).

AROUND THE WORLD

► NETWORK INITIATIVES

Establishment of a Collaborating Centre for Economics in Animal Health

KEYWORDS

#animal health, #economics in animal health, #Europe, #Global Burden of Animal Diseases (GBADs), #OIE Collaborating Centre, #World Organisation for Animal Health (OIE).

AUTHORS

E. Brun ⁽¹⁾, A. Stegeman ⁽²⁾, W. Steenveld ⁽³⁾, B. Huntington ^(4, 5) & J. Rushton ^{(6)*}

(1) Director, Department of Aquatic Animal Health and Welfare, [Norwegian Veterinary Institute](#), Norway.

(2) Chair of [Farm Animal Health, Department of Population Health Sciences](#), Utrecht University, The Netherlands.

(3) Assistant Professor of Animal Health Economics, Utrecht University, The Netherlands.

(4) Programme Manager, The Global Burden of Animal Diseases, [Institute of Infection, Veterinary and Ecological Sciences](#), University of Liverpool, United Kingdom.

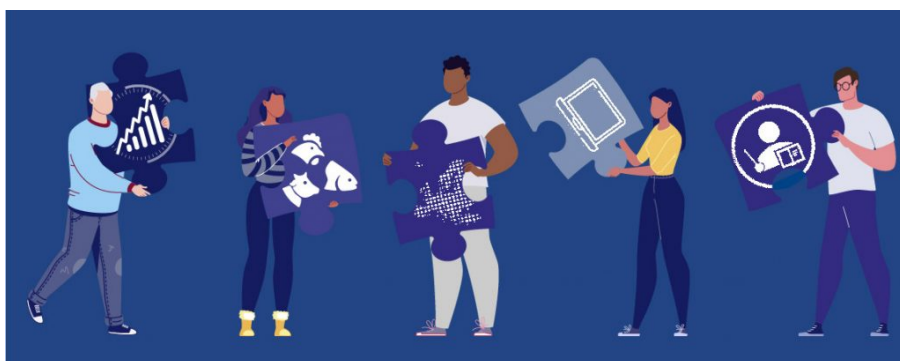
(5) Pengwern Animal Health Ltd., Wallasey Village, United Kingdom.

(6) Director of the University of Liverpool's [Centre of Excellence for Sustainable Food Systems](#); Director of the Global Burden of Animal Diseases Programme, [Institute of Infection, Veterinary and Ecological Sciences](#), University of Liverpool, United Kingdom.

* Corresponding author: jrushton@liverpool.ac.uk

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© Getty Images

One of the strategic objectives of the Global Burden of Animal Diseases (GBADs) programme is to use the established mechanisms of the World Organisation for Animal Health (OIE) to institutionalise the use of economics in animal health. To support this aim, a consortium of the University of Liverpool, Utrecht University and the Norwegian Veterinary Institute has created the first OIE Collaborating Centre for Economics in Animal Health.

The OIE is known for its ability to work in partnership to support the long-term sustainability of new initiatives. For GBADs, this will involve forging links with [reference experts and laboratories](#), [veterinary education twinning projects](#), and a wide [network of Collaborating Centres](#) to glean data, [build capacity](#) and create strategic partnerships that support the wider roll-out of the programme. In return, GBADs collaborators will support OIE Members through direct participation, by responding to their need for economic assessments of animal health.

The first OIE Collaborating Centre for Economics in Animal Health is in the European region. It will pioneer the development and use of GBADs methods from the global programme to support case studies and capacity building in the European region. Work will take place at the national level to eventually provide robust regional information. The Centre will work with livestock and aquatic animals, reflecting the expertise of the consortium members, and will focus on the systematic use of economics in animal health, as well as training in its methods, to work towards outcomes that are aligned with the GBADs programme. This will be achieved by a multi-disciplinary team of economists, epidemiologists, veterinary clinicians, computer scientists and educators. The team will include early career researchers and provide PhD opportunities as it aims to grow expertise in the discipline.

It is our intention to support the development of similar consortia to become Collaborating Centres for Economics in Animal Health in the other OIE regions.

<https://doi.org/10.20506/bull.2021.1.3263>

AROUND THE WORLD

► NETWORK INITIATIVES

Development banks and the burden of animal diseases

KEYWORDS

#Asian Development Bank (ADB), #economics in animal health, #Global Burden of Animal Diseases (GBADs), #World Bank.

AUTHORS

F.C.J. Berthe^{(1)*} & J.F. Hinrichs⁽²⁾

(1) Senior Livestock Specialist, [World Bank](#), Washington DC, United States of America.

(2) Senior Natural Resources Economist, [Asian Development Bank](#), Mandaluyong, The Philippines.

* Corresponding author: fberthe1@worldbank.org

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© OIE/S.Ostovari

The World Bank, like the Asian Development Bank, recognises the substantial contribution made by livestock to food security and nutrition in developing countries, as well as to people's livelihoods. As a result, both banks provide financing for smallholder livestock development to improve productivity, animal health and welfare, and equity, while minimising the impact on

climate change and natural resource use along the value chain [1].

Investment into improved animal husbandry, which is one of the foundations of livestock sustainability frameworks, is an essential element of the One Health approach, ensuring biosecurity and optimising human, animal and environmental health. There is a need to carefully assess the strengths and weaknesses of the livestock and aquaculture sectors, to identify those areas in which these investments will have the greatest impact, and show the best returns [2, 3].

Yet, what do we truly know of the production losses and reductions in efficiency caused by the occurrence of disease and other health problems in these animals? How much information exists on the current levels of public and private expenditure on terrestrial and aquatic animal health in different countries? In addition, where do the burdens of poor animal health fall in society? On farmers or consumers, on the poor or the wealthy, on women or men?

In reality, assessing the livestock and aquaculture sectors takes significant time and skill because there are no databases that provide ready information on animal health losses and expenditure. Making such data available to support the case for investment will reduce the time it takes to make the business case for improving animal health and also increase the probability that these investments will have a significant impact on the global [Sustainable Development Agenda](#).

The framework and roll-out of the [Global Burden of Animal Diseases \(GBADs\) programme](#) will begin to provide such evidence for development banks, among other investors. In turn, such investors will support the institutionalisation of data collection and analysis of the burden of animal diseases at the local and national levels. They see this as a way of achieving greater efficiencies on their investment mechanisms, and also of contributing more effectively to global efforts towards the United Nations Sustainable Development Goals.

<https://doi.org/10.20506/bull.2021.1.3264>

REFERENCES

1. The World Bank (2020). - [Moving towards sustainability: The livestock sector and the World Bank](#).
2. Asian Development Bank (2021). - [What Asia can do to protect against animal-borne diseases](#).
3. The World Bank (2020). - [Safeguarding animal, human and ecosystem health: One Health at the World Bank](#).

AROUND THE WORLD

► NETWORK INITIATIVES

Supporting the Veterinary Services' implementation of the GBADs programme, thanks to the OIE Training Platform

KEYWORDS

#animal health, #capacity building, #cost-benefit analysis, #decision, #economics in animal health, #education, #Global Burden of Animal Diseases (GBADs), #guidelines, #OIE PVS Pathway, #One Health, #public health, #training, #Veterinary Services, #World Organisation for Animal Health (OIE).

AUTHORS

[N. Leboucq](#), Secretary of the OIE Training Platform for Veterinary Services, Capacity-Building Department, [World Organisation for Animal Health \(OIE\)](#).



© Getty Images

Promoting Veterinary Services' knowledge of the social, political and economic sciences is a key challenge for future training programmes of the World Organisation for Animal Health (OIE) aimed at Delegates of OIE Members and other decision-makers in the field of animal health.

The technical validity of a public animal health policy should be sufficient justification for it to be adopted and funded. Yet it still has to be demonstrated that the policy is acceptable and economically viable, so that decision-makers and beneficiaries can give it their approval and fully support its implementation. In particular, evaluating the cost of animal diseases and performing cost-benefit analyses should be considered essential and transparent tools that support decision-making and therefore good sanitary governance, thereby avoiding animal health remaining the poor relation when it comes to strategic decisions and public investments, especially in 'peacetime'.

However, few of those working in the Veterinary Services know how to perform these analyses. One of the reasons

is that initial and continuing veterinary education curricula are too heavily weighted in favour of technical subjects, to the detriment of a holistic approach to animal health. Public policies, including health policies, fall within the realm of the social and political sciences, teaching of which is often reserved for those seeking administrative careers.

What are the tools to help countries?

During the current reform of its training system with the help of a platform of pedagogical and technical experts, the OIE has launched the construction of a major component in this renovation: **a Competence-Based Training Framework for the Veterinary Services**. This Training Framework is structured around 15 'competency packages' that together cover all the OIE's standards, guidelines and other recommendations. **One of these competency packages (CP14) will be entirely devoted to the economics of animal health.**

The [University of Liverpool](#) in the United Kingdom, [Utrecht University](#) in the Netherlands and the [Norwegian Veterinary Institute](#) have formed a consortium to become [the first OIE Collaborating Centre on the Economics of Animal Health](#). This Collaborating Centre will support the OIE in drawing up the **terms of reference of CP14**, which will be developed in collaboration with an extensive network of animal health economics experts and pedagogical experts, in many cases drawn from other OIE Collaborating Centres. This scoping document will describe: the animal health economics competencies required by the Veterinary Services; the training objectives by level; the target audiences; and links with the other competency packages and with the critical competencies of the OIE Tool for Evaluation of the Performance of Veterinary Services (PVS Tool) [1]. This introductory work, performed within the framework of the [Global Burden of Animal Diseases \(GBADs\) programme](#), will provide the basis for complementary actions on the subject: preparation of new OIE guidelines, enhancement of the OIE PVS Tool, and the development of training modules – or the labelling of existing modules – on the economic concepts, methods and tools applicable in the field of animal health. The CP14 terms of reference and the new OIE pedagogical guidelines will provide a strict framework for these modules, in terms of both form and content.

<https://doi.org/10.20506/bull.2021.1.3267>

REFERENCES

1. World Organisation for Animal Health (OIE) (2019) – [OIE Tool for the evaluation of performance of Veterinary Services](#). 7th edition.

AROUND THE WORLD

► SUCCESS STORIES

The LD4D community of practice

KEYWORDS

#community of practice, #data management, #economics in animal health, #Global Burden of Animal Disease (GBADs), #innovative solution, #livestock sector.

AUTHORS

[K. Smyth](#), Deputy Director, [Centre for Supporting Evidence-Based Interventions in Livestock \(SEBI-Livestock\)](#), The Royal (Dick) School of Veterinary Studies, United Kingdom.

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



© OIE/Riziki Ngogo | © OIE/Htun Win Htun | © OIE/Riziki Ngogo



Livestock Data for Decisions (LD4D) is a community of practice bringing together actors from across the livestock sector, including academia, industry, government and not-for-profit organisations.

As an LD4D member, [Global Burden of Animal Diseases \(GBADs\)](#) can actively participate and share ideas in LD4D community events and meetings, and get involved in working groups. These aim to generate innovative solutions to common problems such as livestock ontologies and modelling.

All outputs will be published via livestockdata.org, the community's data and evidence hub.



The 2020 LD4D Community of Practice meeting was hosted by FAO in Rome from 4 to 6 February 2020

<https://doi.org/10.20506/bull.2021.1.3265>

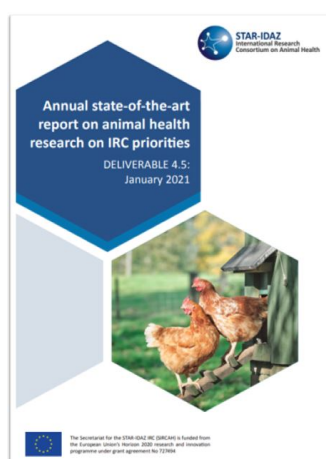
 SUCCESS STORIES

STAR-IDAZ International Research Consortium

#Global Burden of Animal Diseases (GBADs), #Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses – International Research Consortium on Animal Health (STAR-IDAZ IRC).



© Getty Images



The STAR-IDAZ⁽¹⁾ International Research Consortium (IRC) is a global initiative aimed at coordinating research to assist in the development of strategies and control tools for priority animal diseases.

The expert groups of the IRC perform gap analyses on priority diseases, and draft research roadmaps that provide focus on where research is most needed, identifying bottlenecks and critical gaps.

The [Global Burden of Animal Diseases \(GBADs\) programme](#) will collaborate with the IRC expert groups to identify research needs when attempting to estimate the burden of animal diseases. The participation of the GBADs programme will enable IRC partners to focus on the task of providing important baseline data to establish the cost-benefits of new strategies.

(1) STAR-IDAZ (Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses) is a global network for animal disease research.

For more information please visit the [STAR-IDAZ website](#)

AROUND THE WORLD

► SUCCESS STORIES

Feed the Future Innovation Lab for Livestock Systems

KEYWORDS

#animal health, #economics in animal health, #Global Burden of Animal Diseases (GBADs), #innovative solution, #livestock sector, #research, #United States Agency for International Development (USAID).

AUTHORS

A. Adesogan^{(1)*}, S. Hendrickx⁽²⁾ & A. Bisson⁽³⁾

(1) Director, [Feed the Future Innovation Lab for Livestock Systems](#), University of Florida, United States of America.

(2) Deputy Director, [Feed the Future Innovation Lab for Livestock Systems](#), University of Florida, United States of America.

(3) Senior Livestock Advisor, Center for Resilience, [Bureau for Resilience and Food Security, United States Agency for International Development \(USAID\)](#), United States of America.

* Corresponding author: livestock-lab@ufl.edu

The designations and denominations employed and the presentation of the material in this article do not imply the expression of any opinion whatsoever on the part of the OIE concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

The views expressed in this article are solely the responsibility of the author(s). The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by the OIE in preference to others of a similar nature that are not mentioned.



Photo by [Urban Johnsson](#) on [Unsplash](#)

The United States Agency for International Development (USAID) funded the [Feed the Future](#) Innovation Lab (i-Lab) for Livestock Systems and other i-Labs to conduct research on the causes, impacts, costs, prevention and mitigation

of livestock diseases in selected Asian and African countries. These data will be shared to allow systematic estimation of the global burden of animal diseases to drive evidence-based resource allocation. This work will provide much-needed data to support animal health interventions for some of the poorest livestock producers.



Assessing calf health in Ethiopia. Credit: University of California – Davis

For more information please visit the [Feed the Future Innovation Lab for Livestock Systems website](#)

AROUND THE WORLD

► THEMATIC EVENTS

‘Connecting animals, people, and their shared environments’

16th International Symposium of Veterinary Epidemiology and Economics (ISVEE 16), Halifax, Canada, 7-12 August 2022

KEYWORDS

#conference, #economics in animal health, #epidemiology, #Global Burden of Animal Diseases (GBADs), #veterinary domain.



The International Symposium of Veterinary Epidemiology and Economics (ISVEE) is a global forum for graduate students, postdoctoral fellows, junior and senior investigators, as well as health policy-makers to exchange information that can advance the fields of veterinary epidemiology and economics, and related disciplines in the health and social sciences.

Thomas Marsh, Global Burden of Animal Diseases (GBADs) Wider Economic Impacts Theme Co-Lead, is an [invited speaker](#). Also, a special session at the conference will be dedicated to the GBADs programme.

For more information please visit the [ISVEE 16 website](#)

Please visit the [GBADs website](#)

RESOURCES

► OIE PUBLICATIONS

Global Burden of Animal Diseases: a novel approach to understanding and managing disease in livestock and aquaculture

(Abstract from article)

KEYWORDS

#animal health, #aquaculture, #decision, #economics in animal health, #gender equality, #Global Burden of Animal Diseases (GBADs), #livestock sector, #OIE publication, #One Health, #Scientific and Technical Review, #World Organisation for Animal Health (OIE).



Authors: B. Huntington, T.M. Bernardo, M. Bruce, B. Devleeschauwer, W. Gilbert, A. Havelaar, M. Herrero, T.L. Marsh, S. Mesenhowski, D. Pendell, D. Pigott, D. Grace, M. Bondad-Reantaso, A.P. Shaw, D. Stacey, M. Stone, P. Torgerson, K. Watkins, B. Wieland & J. Rushton.

The full paper was published in September 2021 in *Veterinary Services in a changing world: climate change and other external factors*, [OIE Scientific and Technical Review](#), Volume 40, Issue 2. Editors: Delia Grace Randolph, Hu Suk Lee & Jimmy Smith.

[[Access the article](#)]

Summary:

Investments in animal health and Veterinary Services can have a measurable impact on the health of people and the environment. These investments require a baseline metric that describes the burden of animal health and welfare in order to justify and prioritise resource allocation and from which to measure the impact of interventions.

This paper is part of a process of scientific enquiry in which problems are identified and solutions sought in an inclusive way. It poses the broad question of what a system to measure the animal disease burden on society should look like and what value it would add. Moreover, it aims to do this in such a way as to be accessible by a

wide audience, who are encouraged to engage in this debate. Given that farmed animals, including those raised by poor smallholders, are an economic entity, this system should be based on economic principles. Subsistence farmers are negatively impacted by disparities in animal health technology, which can be addressed through a mixture of supply-led and demand-driven interventions, reinforcing the relevance of targeted financial support from government and non-governmental organisations.

The [Global Burden of Animal Diseases \(GBADs\) programme](#) will glean existing data to measure animal health losses within carefully characterised production systems. Consistent and transparent attribution of animal health losses will enable meaningful comparisons of the animal disease burden to be made between diseases, production systems and countries, and will show how it is apportioned by people's socio-economic status and gender. The GBADs programme will produce a Cloud-based knowledge engine and data portal, through which users will access burden metrics and associated visualisations, support for decision-making in the form of future animal health scenarios, and the outputs of wider economic modelling. The vision of GBADs – strengthening the food system for the benefit of society and the environment – is an example of One Health thinking in action.

DOI of the original article: <https://doi.org/10.20506/rst.40.2.3246>

RESOURCES

► OIE RESOURCES

The economics of animal health: direct and indirect costs of animal disease outbreaks

Technical item presented during the 84th General Session of the OIE

KEYWORDS

#animal health, #economic impact, #epizootic, #Global Burden of Animal Diseases (GBADs), #resource mobilisation, #Technical Item, #World Organisation for Animal Health (OIE).



World Organisation for Animal Health (OIE)
2016

Technical item presented to the World Assembly of Delegates during the 84th General Session of the OIE, Paris, 22-27 May 2016.

Authors: Jonathan Rushton & Will Gilbert

18 pages

Summary:

Animal disease outbreaks have been shown to cause major economic losses over the centuries and are the reason for the existence of significant investments in animal health services across the world. Data are required on both production losses and the costs of interventions to disease presence or risks in order to allow economics to guide resource prioritisation and allocation to improve the health and welfare of animals under the care of people. This paper presents data available on the impacts of disease outbreaks across the world through a survey of national Veterinary Services of OIE Members.

Overall the survey and the descriptive analysis demonstrate the interest of OIE Members on the use of economics in animal health, yet there is a paucity of data on direct and indirect costs of animal diseases. This needs to be addressed so that economic analysis can bring greater value to animal health decision making in terms of:

1. justification of existing and requested resources for animal health
2. identification of global imbalances of resources for animal health
3. prioritisation of resources between animal diseases
4. improved allocation of resources within specific disease control programmes.

In order to achieve these outcomes from the economic analysis of animal disease, it is recommended that three practical actions are initiated:

1. education in the use of economics of animal health by veterinary undergraduates, postgraduates and current professionals is improved through better curricula and materials
2. a programme is established that will begin to generate a dataset on the global burden of animal diseases which would include production losses, control costs and impacts on trade and wider economic impacts
3. a programme is initiated that regularly captures investments in animal health education, research, infrastructure and critical coordination activities.

DOI of the original report: <https://doi.org/10.20506/TT.2551>

[[Download the report](#)]

RESOURCES

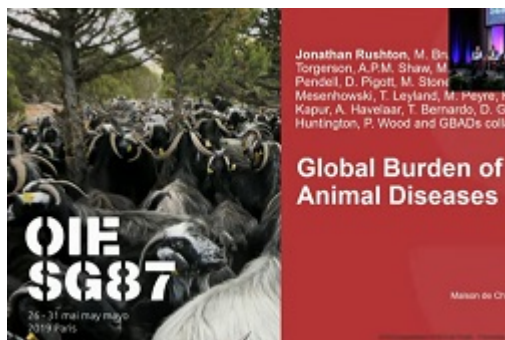
► OIE RESOURCES

Using economic data to drive prioritisation, strategic planning and performance monitoring of animal health interventions

International organisation panel discussion

KEYWORDS

#animal health, #economics in animal health, #Global Burden of Animal Diseases (GBADs), #OIE General Session, #World Organisation for Animal Health (OIE).



During the 87th General Session of the World Organisation for Animal Health (OIE), in May 2019, a panel which included participants from the World Trade Organization (WTO), the Organisation for Economic Co-operation and Development (OECD), the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO) and the World Bank Group was dedicated to 'Using economic data to drive prioritisation, strategic planning and performance monitoring of animal health interventions'. On this occasion, Prof. Jonathan Rushton, Director of the [Global Burden of Animal Diseases \(GBADs\) programme](#) described the current use of economics in animal health, how the project will support improved data management, and ultimately how the information provided can contribute to the strengthening of Veterinary Services.

The presentation of the GBADs project and the stakeholder panel discussion are displayed on the video below. In addition, a full summary of the presentation and the discussion is available in the [final report of the 87th General Session](#), from paragraph 60 to paragraph 89.

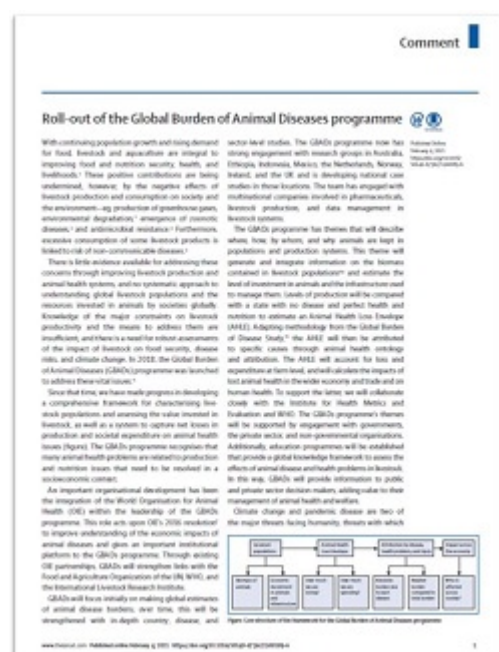
RESOURCES

EXTERNAL RESOURCES

Roll-out of the Global Burden of Animal Diseases programme

KEYWORDS

#animal health, #environmental impact, #Global Burden of Animal Diseases (GBADs), #public health, #socio-economic impact.



Authors: J. Rushton, B. Huntington, W. Gilbert, M. Herrero, P.R. Torgerson, A.P.M. Shaw, M. Bruce, T.L. Marsh, D.L. Pendell, T.M. Bernardo, D. Stacey, D. Grace, K. Watkins, M. Bondad-Reantaso, B. Devleesschauwer, D.M. Pigott, M. Stone & S. Mesenhowski.

The Lancet, Volume 397, Issue 10279, P1045-1046

March 2021

[https://doi.org/10.1016/S0140-6736\(21\)00189-6](https://doi.org/10.1016/S0140-6736(21)00189-6)

The [Global Burden of Animal Diseases \(GBADs\) programme](#) team is committed to a better understanding of our livestock systems and of their positive and negative impacts on society and the environment locally, globally and nationally. There is an urgent need to develop intelligence systems able to improve decision-making for people managing livestock to limit the environmental consequences and public health risks related to livestock production and consumption, while also helping people across the world access high-quality protein and micronutrients, produced in a humane way.

[[Access the article from the Lancet website](#)]

RESOURCES

▶ OTHER RESOURCES

Visit the website of the GBADs programme

KEYWORDS

#economics in animal health, #Global Burden of Animal Diseases (GBADs), #World Organisation for Animal Health (OIE).

GBADs



GBADs

ABOUT US OUR APPROACH ▼ OUR WORK ▼ NEWS CONTACT US

Global Burden of Animal Diseases

GBADS WILL MEASURE AND IMPROVE SOCIETAL OUTCOMES FROM LIVESTOCK AND HAVE A POSITIVE IMPACT ON THE SUSTAINABLE DEVELOPMENT GOALS CONTRIBUTING TO A WORLD IN WHICH THERE IS ZERO HUNGER, GOOD HEALTH AND WELL-BEING, GENDER EQUALITY, DECENT WORK AND ECONOMIC GROWTH AND RESPONSIBLE CONSUMPTION AND PRODUCTION

in

twitter

<https://animalhealthmetrics.org/>

The OIE is an international organisation created in 1924 with a mandate from its 182 Members to improve animal health and welfare. Its activities are permanently supported by 329 centres of scientific expertise and 13 regional offices with a presence on every continent.



Follow the OIE: www.oie.int



@OIEAnimalHealth



World Organisation for Animal Health - OIE



OIEVideo



World Organisation for Animal Health



World Organisation for Animal Health (OIE)



Digital version: www.oiebulletin.com



WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future

12, rue de Prony - 75017 Paris, France
Tel.: +33 (0)1 44 15 18 88 - Fax: +33 (0)1 42 67 09 87 - oie@oie.int