Global Burden of Animal Diseases: Ethiopia case study phase II closing stakeholder workshop report

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Abbreviations and acronyms

AAU	Addis Ababa University
ADONIS	Animal Disease Notification System
AHE	Animal Health Economics
aLIVE	a Livestock Information Vision for Ethiopia
ARIS	Animal Resources Information System
AU-IBAR	African Union - Interafrican Bureau for Animal Resources
BMGF	Bill & Melinda Gates Foundation
CAHW	Community animal health workers
CGIAR	CGIAR Research Program on Livestock
CSA	Central Statistical Agency
DOVAR	Disease Outbreak Verification and Response
DRDIP	Development Response to Displacement Impacts Project
EAA	Eastern Africa Association
ECTAD	Emergency Centre for Transboundary Animal Diseases
ESS	Ethiopia Socioeconomic Survey
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistical Database
FERG	Foodborne Disease Epidemiology Reference Group
FMD	Foot and mouth disease
FSRP	Food Security Research Project
GBADs	Global Burden of Animal Diseases
GBD	Global Burden of Disease
GDP	Gross domestic product
GLEWS	Global Early Warning System
IHME	Institute for Health Metrics and Evaluation
ILRI	International Livestock Research Institute
LDP	Livestock Development Project
LFSDP2	Livestock and Fishery Development Project 2

LITS	Livestock Identification and Traceability System
LLRP	Livestock and Livelihoods Recovery Project
MoA	Ministry of Agriculture
NGOs	Non-governmental organizations
PPR	Peste des petits ruminants
PVS	Performance of Veterinary Services
RESTORE	Restoration of Livestock Services in Conflict and Drought Affected Areas of Ethiopia
UK Aid	UK Foreign, Commonwealth and Development Office
UN	United Nations
USAID	United States Agency for International Development
USAID LMD	United States Agency for International Development Livestock Market Development
WHO	World Health Organization
WOAH	World Organisation for Animal Health

Acknowledgements

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Executive summary

The Global Burden of Animal Diseases (GBADs): Ethiopia case study phase II closing stakeholder workshop was conducted on 26 April 2024 at the International Livestock Research Institute (ILRI) campus in Addis Ababa, Ethiopia. This workshop presented and discussed the outputs of the GBADs Ethiopia case study and future needs for economic decision-making around disease control. The participants considered future analytical steps and how the program is to be embedded in local institutions.

Stakeholders from various government agencies, the private sector, non-governmental organizations (NGOs) and research and academic institutions participated in the workshop, which was officially opened by Jonathan Rushton, GBADs program director, and Meron Moges on behalf of Wubshet Zewde, the executive lead of Animal Health and Veterinary Public Health, Ministry of Agriculture. The workshop objectives and agenda were introduced by GBADs Program Manager, Ben Huntington, followed by a brief introductory overview of the GBADs program by its director Prof Jonathan Rushton (University of Liverpool).

In the morning session three presentations provided the latest results of the Ethiopia case study – livestock biomass, economic value and animal health loss envelope, attribution to specific causes and wider economic impacts. Two other presentations focused on the results of the burden of animal diseases in working equids, and an approach that is using climatic factors and published data to estimate the prevalence of coccidiosis in backyard chickens in East Africa. The afternoon session consisted of group work in which Ethiopian stakeholders answered questions relating to the following topics (i) experiences of use of the current GBADs outputs by stakeholders and future potential uses, (ii) priority information and data needs of Ethiopian stakeholders from next GBADs phase and (iii), local institutionalization of GBADs for long-term sustainability.

The main conclusions reached in the workshop were: the GBADs information is already being used, for example, to support the improved status of the Ethiopian government in its Progressive Control Pathway for peste des petits ruminants (PPR). Furthermore, GBADs methods and results are being taught at Addis Ababa University, building understanding of the use of economics in animal health in the next generation of Ethiopian vets. GBADs outputs need to be communicated much more broadly across the Ethiopian livestock sector and associated industries/ professions. Even among the participants there was a discrepancy in exposure to GBADs with the Ministry of Agriculture team (especially the core group on animal health economics) having the strongest grasp of the program. The regional vet services and researchers need to be further engaged in a way that allows them to contribute to and benefit from the next phase of the GBADs program. The stakeholders called for continuation of the program and showed a willingness to play additional roles in the conceptualization and execution of the next phase of the program. The Ethiopian Ministry of Agriculture and Animal Health Institute representatives will work together to clarify their strategy for the phase III effort, prior to engaging with ILRI, University of Liverpool and the GBADs consortium, the current partners, to prepare a funding proposal. The proposal will describe a process of transition of responsibility for production of GBADs estimates to local scientists, who will be guided and coached by ILRI and GBADs international experts.

Other major outcomes and recommendations from the workshop were:

- Utilization of GBADs outputs: Stakeholders from various sectors, including the Ministry of Agriculture and regions' veterinary services, are using or planning to use GBADs outputs for strategic decision-making, such as assessing economic impacts, budgeting, resource allocation, and developing control and prevention projects. There is a particular emphasis on integrating GBADs data with existing surveillance systems for more informed policymaking.
- Enhanced understanding and capacity building: There is a reported increase in understanding among stakeholders, particularly within the Ministry of Agriculture, regarding animal health economics. This has fostered a desire for further capacity building in data management, analysis, and the application of GBADs tools and frameworks to strengthen local expertise.
- Data needs and access: A recurring theme across the discussions was the need for specific, actionable data. This included requests for enhanced data on disease-specific estimates and access to comprehensive surveillance data, which are crucial for both current assessments and future planning phases of GBADs.
- Research and development: Researchers expressed interest in using GBADs outputs to refine disease burden estimates, develop convincing research proposals, and prioritize diseases for future studies. The need for integrating epidemiological and economic data to enhance the precision of disease impact assessments was emphasized.
- Institutional integration and sustainability: Discussions highlighted the importance of integrating GBADs frameworks within national and regional institutions, with a focus on sustainable transitions to local ownership. This includes forming consortiums with various stakeholders to ensure the ongoing utility and application of GBADs findings.
- Stakeholder engagement and policy influence: The engagement of stakeholders in using GBADs data for lobbying, project proposal development, and influencing policy decisions was noted as crucial for animal health. This engagement aimed to enhance investment in animal health and support the economic valuation of livestock sectors, demonstrating the high impact and value of disease management.

Introduction

Global Burden of Animal Diseases (GBADs) is a research program that is measuring and understanding the global burden of animal diseases. Its mission is to 'measure to improve' animal health at a local, national and global levels. GBADs intends to create information on the economic burden of livestock diseases to support animal health decision-making focused on the Sustainable Development Goals. GBADs was initiated by the University of Liverpool with support from the World Organization for Animal Health (WOAH), the International Livestock Research Institute (ILRI) and a group of international collaborating institutions and organizations. GBADs current phase is supported by the Bill & Melinda Gates Foundation (BMGF) and the United Kingdom's Foreign, Commonwealth and Development Office.

1. Expected outcomes of GBADs include to:
2. Provide information for evidence-based investment plans in animal health systems,
3. Allow allocation of resources to key social, economic and environmental problems
4. Support high-quality evaluation of existing animal health investments demonstrating the value of animal health systems

Ethiopia has been selected as one of the first GBADs case study countries and will serve as a natural staging post for GBADs to expand its reach in subsequent phases of the program. The work in Ethiopia consists of specific case studies exploring animal disease burden in the country and disease burden prioritization methodologies with wider, global relevance. The work in Ethiopia is led by ILRI and implemented with local partners.

After the inception stakeholder workshop in March 2021, the GBADs Ethiopia case study team held the first stakeholders' workshop in November 2022 to review the progress of the work done on GBADs in Ethiopia. During this workshop, close to 30 participants made valuable comments, identified and prioritized possible follow-up work of value to national stakeholders. The second review workshop was held in May 2023 to provide updates on key recommendations made in November and to consider how GBADs information and data will be fed into policy and decision-making and how this will make a difference. This third stakeholders' review workshop presented and discussed the outputs of the GBADs Ethiopia case study and evaluated future needs for economic decision-making around disease control because the current phase of the project funding is closing. The participants considered future analytical steps and how the program is to be embedded in local institutions.

Workshop proceedings

Opening remarks

Opening remark—Prof. Jonathan Rushton, director of the GBADs program

Rushton explained that the GBADs program addresses crucial deficits in the animal health sector, particularly in data availability and funding. The GBADs program aims to improve animal health systems by accurately estimating the economic and social impacts of animal diseases, focusing on terrestrial and aquatic species.

The presentation underscored several persistent issues: a severe lack of data for effective business case construction within the public and private sectors, inadequate funding for major global animal health programs like those for foot and mouth disease (FMD), and peste des petits ruminants (PPR), and the inefficacy of animal health policy due to insufficient success metrics. Additionally, there is an absence of time series data that isolates animal health inputs from livestock production productivity and trade impacts, complicating public strategy and policy development.

Moving forward, GBADs plans to implement phase III, which includes global estimations and customized country case studies based on experiences from countries like Ethiopia and Senegal where case study has been tested. The program aims to develop guides and frameworks to aid in intervention identification, prioritize policy needs, and build capacity within the animal health economics field. The ultimate goal is to establish more resilient and effective animal health systems that can better serve communities and improve overall livestock management worldwide.

Opening remark—Meron Moges on behalf of Wubishet Zewdie, director of Disease Prevention and Control Directorate, Ministry of Agriculture

Meron, in her opining speech, noted that Ethiopia is endowed with huge livestock resources which contributing significantly to household and national economy. However, the contributions are not comparable to exist potential. Among the other factors, animal diseases are affecting the sector causing morbidity and mortalities, resulting in reduced production and productivities. More importantly, transboundary animal diseases (TADs) such as FMD and PPR, etc. cause high economic losses due their associated high morbidity and mortality, which hinder export markets which impacts the national economy at large. On the other hand, there is high burden on the public health due to the prevailing zoonotic diseases like rabies and anthrax, and others.

She said her office recognizes the importance of quality data in the decision-making and designing animal disease control programs. However, despite having surveillance systems and other data sources, information related to burden of animal diseases is lacking in Ethiopia. Luckily, the country was selected for GBADs case study and in last couple of years a lot has been done in the analysis of disease burden, capacity building and development of an animal disease dashboard specific for Ethiopia. The GBADs case study output will be used to inform decision-making, in the formulation of policies, and designing of subsequent strategy and control programs. GBADs findings

will also useful for prioritization of interventions for wise use of the limited resources. So far, under the program, the disease burden has been estimated at national and subnational levels for the overall causes of diseases such as FMD, PPR and brucellosis. In addition, there is need for more information on disease burden for other priority TADs and zoonoses including scaling up of the capacity for their assessment to the subnational level. This will not be realized by the ministry alone, and collaborate with GBADs, WOAH and other stakeholders should be used to design a sustainable program to expand the initiatives through a country-led consortium.

Finally, she acknowledged the support from GBADs, WOAH, ILRI and BMGF and other partners in the successful implementation of the second phase of the GBADs Ethiopia case study, which has set foundation for the more animal disease burden analysis in the future and the built capacity in animal health economic analysis in the country.

Technical presentations

Overview of GBADs and disease burden estimates from the Ethiopia case study–Wudu Temesgen

The presentation gave a brief overview of GBADs and then presented detail analytical outputs related to biomass, economic value and disease burden estimates. The farm-level disease burden estimates (animal health loss envelope) were presented in by species, production system, in dollar value and output loss in physical quantities.

Questions and explanations:

1. The participants who were less familiar with GBADs methods raised questions about the inclusion of factors such as genetics, nutrition, housing and biosecurity in the current and ideal states and whether there were plans to estimate the burden of diseases due to these factors.

   Answer: *The ideal situation considers only the absence of diseases including external forces such as accidents and predation. Most of these factors were kept constant between the ideal and current situation. Only acute feed shortage was considered as a health problem and included in the models. The others may be considered risk-factors rather than causes of burden.*

2. Comments were made that the burden estimates are alarmingly high. On one hand this demonstrates the importance of the project in addressing a major gap in quantifying disease burdens. On the other hand, we were encouraged to revisit assumptions and calculations given that the total loss from the cattle sector is beyond the country's annual budget.

   Answer: *We will continue to refine assumptions and data sources and consider how best to communicate the burden to policymakers vs academic audiences.*

3. There were specific questions on the nomenclature of production systems and potential reasons for differences in burden between the systems. Why are disease burdens higher in pastoral systems than in crop-livestock mixed systems?

   Answer: *The analysis is time specific, with estimates presented for 2021. The nomenclature used is largely determined by the way in which the data already collected are disaggregated. Disease burden was higher in the pastoral lowlands than highland mixed system. This could be due to less accessibility of animal health service in pastoral system or due to harsher environment in this system. e.g. young stalk mortality is reported to be higher in the pastoral system than the lowland mixed system.*

4. Considering the high estimate of burden, clarification was sought on the time period of the analysis and whether interventions and recent developments were taken into account. A query was raised about the reliability of using data from expert elicitation and secondary sources.

Answer. *The burden was estimated for 2021. This means the estimated burden considers the initiatives happing in that year. We have not analysed the effects of intervention. Expert elicitation was not the first choice of data source and used when there was no other means of data sourcing. It was noted that a certain comfort with modelling and imputation is useful to limit resource use for additional primary data collection.*

Global Burden of Animal Diseases (GBADs): attribution of the animal health loss envelope—The next level,' – Mieghan Bruce

This presentation introduced the process of attributing the estimated animal health loss envelope (AHLE), presenting the high-level (infectious, non-infectious and external forces) burden attribution for cattle and small ruminants by production system and for specific disease such as PPR and brucellosis. The next steps in the disease-specific attribution were explained, including for non-infectious diseases and external forces, using the examples of copper deficiency and predation respectively.

Questions and explanations:

1. A question was raised on whether the brucellosis burden in humans was considered and if the impact of the disease is being measured beyond livestock. Was there any specific case or intervention impact analysis done?

   Answer: *The burden of brucellosis is for livestock only at this stage. In the wider program we are also considering impact of livestock diseases on human health in collaboration with the World Health Organization (WHO) initiative (FERG) and the Institute for Health Metrics and Evaluation (GBD). Burden estimates on human health are forthcoming. We have not considered the effect of interventions at this stage, they will be considered in the future.*

Wider economic impact of burden of cattle and small ruminant diseases–Dustin Pendell

The presentation focused on the broader economic impact of diseases in cattle and small ruminants. Key points included the transition from current animal health status to an 'ideal animal health equilibrium', which could significantly boost Ethiopia's economy. Specifically, improvements in animal health have the potential to increase Ethiopia's GDP by up to USD2.452 billion (3.6% of GDP in 2021), reflecting economic benefits for consumers, processors, and producers alike.

The methodological approach involves using partial and general equilibrium models to measure economic welfare changes across the supply chain and the broader economy, respectively. The models used data on animal health losses to simulate scenarios where improvements in livestock health lead to increased productivity, which then translates into economic gains. The analysis indicated that all stakeholders in the livestock production chain—producers, processors, and consumers—benefit from enhanced animal health. Producers gain from higher output, processors enjoy more product throughput, and consumers benefit from lower prices and increased product availability. The presentation underscored the critical role of animal health improvements not just in enhancing economic welfare but also in fostering sustainable agricultural practices and improving national food security.

Questions and explanations:

1. The presenter was asked to clarify the term 'economic welfare' for non-economists.

   Answer: *This can be understood as the standard of living or quality of life. We need to take care to use understandable language when translating our estimates into policy briefs.*

2. The chair asked the participants which organizations have people with the expertise to carry out the kinds of economic modelling that Dustin has presented.

Answer: Ministry of Economics and Development, Institute of Agricultural Research. The program should also consider engaging with the Ethiopia Economic Association.

Estimating the economic value of donkeys in different production systems in Ethiopia– Girma Asteraye

The presentation highlighted the significant economic value of donkeys in Ethiopia, demonstrating their vital role in reducing household labour (in particular of women and girls) and enhancing agricultural productivity. Girma's analysis shows that donkeys, owned by half of rural households in the country, contribute substantially to the GDP by providing essential transportation and draft services. This research underpins further GBADs studies on the economic impacts of equine diseases, emphasizing the need for targeted animal health policies to optimize the welfare and productivity of donkeys, thus improving the livelihoods of millions across Ethiopia.

Questions and explanations:

1. The presenter was asked his opinion of the economic value of products from donkeys as opposed to the work they contribute.

   Answer: *It was clear from the analyses that donkeys are more valuable alive than slaughtered for skin or meat.*

Prevalence of coccidiosis in backyard chickens in East Africa–Violeta Muñoz Gomez

This study uses regression imputation methods to estimate disease prevalence, a critical step given the substantial data gaps in disease monitoring across the Horn of Africa. The research illustrates the practical application of integrating disease prevalence data into the Global Burden of Animal Diseases (GBADs) framework. By providing accurate prevalence data, the study enables more precise adjustments of productivity losses—such as mortality and reductions in weight and egg production—thereby refining the economic assessments of coccidiosis's impacts. The work sets a precedent for applying similar methodologies to other animal diseases, thereby improving the overall effectiveness and precision of the GBADs initiative in attributing economic impacts to specific health issues in livestock.

Questions and explanations:

1. The presenter was asked why coccidiosis was chosen rather than an important viral disease such as Newcastle Disease.

   Answer: *Using a parasitic disease made sense to test the modelling approach as more is known about the influence of climatic factors on their prevalence. To use the same method for viral diseases, factors that impacted their prevalence in different geographies would need to be established and used for modelling purposes.*

2. A participant was interested to know about access to any vaccines for coccidiosis.

   Answer: *Currently the vaccine is not accessible for some production systems, the prediction in the study helps countries form an alliance to make the disease prevention interventions more accessible.*

3. Another participant asked about the use of the results of the sensitivity analysis.

   Answer: *We looked into the data of Intergovernmental Panel for Climate Change (IPCC) and countries in the Horn are expected to have 10% more precipitation and we liked to see the impact of this on the prediction. So, it is useful to know the sensitivity of the prediction to climate change in the future.*

4. Another participant asked if the sample size is sufficient to make predictions across regions and about the accuracy of the model.

   Answer: *The study tried to make the best of the available prevalence data. We weighed prevalence data points based on the sample size they were derived from, with higher weight for prevalence data points derived from a large sample size study. Accuracy will be improved as more data becomes available. More details on the model and its accuracy are available in the corresponding publication.* DOI: 10.1016/j.vetpar.2024.110143

Group work and plenary discussion

During this session participants were divided into three groups (Ministry of Agriculture, regional veterinary services, and research institutes and universities) to discuss each of the following three topics.

1. Experiences of use of the current GBADs outputs by stakeholders and future potential uses.
2. Priority information and data needs of Ethiopian stakeholders from the next GBADs phase.
3. Local institutionalization of GBADs for long-term sustainability.

Responses from each group on questions related to each of the topics is depicted below.

Session 1: Utilization of GBADs outputs

Questions

Are you using GBADs outputs? If yes, what outputs and for what purpose? If no, why not? How have you changed your way of thinking about your work after hearing about or being involved in GBADs? What would you like to use GBADs information for in the future?

Responses

Ministry of Agriculture (MoA)

- Using GBADs outputs for assessing national gross economic impact and wider economic impacts, such as the contribution of small ruminants to the economy.
- Noted limited awareness of the GBADs dashboard.
- Reported a better understanding of animal health economics, including the impact, return on investment, and cost-benefit of interventions.
- Expressed a desire to use GBADs for strategy development, informed decision-making, prioritizing diseases for intervention, and annual planning with the Ministry of Finance. Integration with surveillance data is desired.

Regional veterinary services

- Not specifically using GBADs outputs but utilizing related data for budgeting, resource allocation, intervention, and convincing decision makers. Data types include mortality and morbidity data, economic loss due to disease, population data, and veterinary expenditure data.
- Recognized a high impact of disease burden and the significant economic value (GDP) of the livestock sector, emphasizing the need for investment in animal health.

- Interested in using GBADs outputs to initiate control and prevention projects, prepare project proposals, and lobby decision makers to invest in animal health activities. Also, to attract investors and strengthen veterinary services for targeted surveillance or prevention works.

Researchers

- Using GBADs for research and publication: as reference material for teaching, prioritizing diseases to research, and communicating disease burden. No awareness of dashboards was noted.
- Reported changes in their way of thinking about livestock potential and the value of new methods, procedures, and techniques introduced through GBADs.
- Plan to use GBADs evidence for developing more convincing research project proposals, allocating resources for livestock-related development or research activities, and refining estimates of livestock's contribution to GDP, which is often underestimated.

Session 2: Information and data needs for future GBADs phases

Questions:

What information would stakeholders like to create in the next phase of GBADs in Ethiopia, related to the current GBADs analytical framework and outside it, such as other economic tools? What data will be needed for these analyses, and how can we access it? Are they secondary or primary data?

Responses:

Ministry of Agriculture (MoA)

- Specific estimates for priority diseases and a link-up with systems such as Global Early Warning System (GLEWS).
- Data needs include surveillance data from sources such as ESS, FAOSTAT, ARIS (AU-IBAR), WOAH (Performance of Veterinary Services), and research data, including clinical services data.
- Prioritized surveillance data and ESS as crucial, exploring how to better use regional administrative data managed by local agricultural bureaus.

Regional veterinary services

- Interested in analysis related to husbandry, genetics, climate change, greenhouse gas emission impacts, and product-specific economic burdens. Also interested in wildlife disease burden.
- Suggested using primary data from the MoA database (surveillance data), including regional data and professional contributions (potentially private data?).
- Prioritized husbandry and genetics as risk factors for disease occurrence on farms and their impact on disease prevention and control, as well as the impact of genetic improvement versus disease resistance.

Researchers

- Focused on disease-specific burden analysis and going further into the analysis of intervention measures on selected diseases and impact assessments.
- Highlighted the need for primary and secondary data, suggesting that future Demographic Health Surveys should incorporate a One Health focus, including livestock data.
- Aimed towards generating primary data for GBADs outputs.

Session 3: Local institutionalization of GBADs

Questions

Can you give examples where projects have managed the transition to sustained local ownership well? What transition is needed and what is feasible in the short term (2025-26)? Possible member institutions of a consortium, other projects to align with? Are there related areas where capacity building and training is needed?

Responses

Ministry of Agriculture (MoA):

- Examples of successful local integration include surveillance systems like Animal Disease Notification System (ADONIS)–FAO, Disease Outbreak Verification and Response (DOVAR) of the Livestock Development Project (LDP), and the Livestock Identification and Traceability System (LITS), United States Agency for International Development Livestock Market Development (LMD), which have been integrated into national frameworks (systems).
- Transition needs include exit strategies, strengthening the Animal Health Economics (AHE) core group, and capacity building at the subnational level.
- Suggested member institutions for a consortium include the Ministry of Finance, Ministry of Planning and Development, Ethiopia Socioeconomic Survey (ESS), MoA, AHI, EAA, Ministry of Health. Projects mentioned include a Livestock Information Vision for Ethiopia (aLIVE), Emergency Centre for Transboundary Animal Diseases (ECTAD), Restoration of Livestock Services in Conflict and Drought Affected Areas of Ethiopia (RESTORE), Food Security Research Project (FSRP), Livestock and Fishery Development Project 2 (LFSDP2), Development Response to Displacement Impacts Project (DRDIP), Livestock and Livelihoods Recovery Project (LLRP).
- Identified capacity building needs in AHE, data management and analysis, surveillance at the local level, and dashboard creation and use.

Regional veterinary services

- Cited examples like Productive Safety Net, PV Pharmacies (for vaccination), and CAHW/paravets.
- Emphasized the need for institutionalization at federal and regional levels, suggesting the assignment of a contact person for each and forming a task force/working group.
- Proposed consortium members include research institutes, academics, regional offices, projects working on animal health services, NGOs, UN Agencies, private animal health service providers, producers, central statistics agency, and veterinary labs.
- Stressed the need for awareness creation at all levels on GBADs frameworks and tools, training on data collection, analysis, and dissemination, and development of software and guidelines.

Researchers

- Mentioned WOAH lab twinning projects focused on capacity building and the AAU vet epi master's program in collaboration with Free University of Berlin as examples of successful transitions to local ownership.
- Discussed identifying the right local institute to own the project and forming a consortium to include regional bureaus, the Ethiopian Institute of Agricultural Research (and regional centres), the Central Statistics Agency (CSA), universities, development partners, and other international partners.
- Highlighted needs for human and material capacity building, coaching for the transfer of knowledge, technology, and best practices.

Overall, the discussions highlighted a unified call for enhanced access to GBADs outputs, better integration with broader data systems, and structured plans for capacity building and institutionalization to sustain the initiative's benefits into the future.

Workshop closing remarks

Theo Knight Jones discussed the ongoing efforts to extend the program into another phase, focusing on priority diseases and refining methodologies for global and national application. He highlighted that the program aims to provide frameworks and templates that can be adapted nationally to generate useful outputs for handling animal disease burdens. There is an emphasis on the progress made in developing local infrastructure and processes that support this work. The key takeaways are listed below:

Expansion and focus

- The program is looking to enter a new phase, expanding its focus on priority diseases.
- There is an ongoing effort to refine approaches that have been globally developed to enhance national implementation.

Utility of program outputs

- Recent developments have produced estimates of disease burden that are now being integrated into strategy documents and policy impact assessments (e.g. PPR control strategy).
- These tools and data are beginning to prove useful for national strategy development, with tangible outputs observed over the past six months to a year.

Institutional integration and local expertise

- The future phase aims to further embed these methodologies within national institutions, enhancing local capacity to manage and utilize disease burden data effectively.
- The goal is not to replicate a global method in every local institution but to support them with a global framework and management while fostering local expertise and decision-making capabilities.

Data utilization and decision-making

- GBADs estimates emphasize the importance of integrating epidemiological and economic data to inform local decision-making processes.
- This integrated data to support project lifecycle decisions and broader economic planning.

The remarks conclude with acknowledgments to various contributors, including international partners and local stakeholders, highlighting the collaborative nature of the project. A special mention was made of key individuals who have played significant roles in facilitating this workshop.

Getenet Abi, deputy director of the Ethiopian Animal Health Institute officially closed the workshop. Getenet offered his congratulations to the GBADs consortium for their significant achievements. He pointed out the challenges in conveying the impact of diseases in economic terms to policymakers due to the often-descriptive

nature of available information from research scientists. The GBADs outputs, he noted, have been instrumental in bridging this gap, providing clear economic insights that can significantly aid in discussions with policymakers and politicians. Expressing gratitude on behalf of the Ministry of Agriculture and his institute. Getenet acknowledged the consortium's efforts in beginning to facilitate transition of knowledge and skill to local colleagues and institutions. This transition needs to continue in order to build a self-sustaining system capable of continuing the work of the consortium and achieving its long-term vision. He emphasized the need for careful review of the transition of roles to local institutes to ensure sustainable progress. He said the Ministry of Agriculture and the Animal Health Institute should be involved in discussions on the next steps in enhancing animal health investment in Ethiopia.

Workshop program

Time	Activity	Responsible	Facilitator/chair
8:30–9:00	Registration	Participants	Yodit Girma, Eyob Gelan
9:00–9:05	Welcoming remarks	Theo Knight-Jones	Ben Huntington
9:05–9:15	Opening remarks	Prof. Jonathan Rushton	
9:15–9:25	Opening remarks	Dr. Meron Moges	
9:25–9:35	Self-introduction	Participants	
9:35–10:00	Overview of GBADs and disease burden estimates from the Ethiopia case study	Wudu Temesgen	
10:00–10:20	Attributing the burden of disease to specific causes in small ruminants and cattle	Mieghan Bruce (online)	
10:20–10:40	Q and A		
10:40–11:10	Health break		
11:10–11:30	Wider economic impact of burden of cattle and small ruminant diseases	Tom Marsh, Dustin Pendell (online)	Ben Huntington
11:30–11:40	Q and A		
11:40–11:55	Estimating the economic value of donkeys in different production systems in Ethiopia	Girma Birhan (online)	
11:55–12:10	Prevalence of coccidiosis in backyard chickens in East Africa	Violeta Muñoz Gomez (online)	
12:10–12:30	Q and A		
12:30–13:30	Lunch		
13:30–13:40	Enhancing evidence-informed decision-making in animal health sectors in Ethiopia	Getachew Dinede	Ben Huntington
13:40–14:30	Experiences of use of the current GBADs outputs by stakeholders and future potential uses	Group work for all local participants	Ben Huntington, Wudu Temesgen and Theo Knight-Jones
14:30–15:20	Priority data and information needs of Ethiopian stakeholders from next GBADs phase	Group work for all local participants	
15:20–15:40	Health break		
15:40–16:40	Local institutionalization of GBADs for long term sustainability	Group work for all local participants	Ben Huntington, Wudu Temesgen and Theo Knight-Jones
16:40–16:50	Rapid summary of learnings	Theo Knight-Jones	Ben Huntington
16:50–17:00	Closing remarks	Meron Moges	