International Livestock Research Institute

Global Burden of Animal Diseases: Ethiopia case study inception workshop report

18 March 2021, Lalibela Hall, ILRI campus, Addis Ababa

GBADs

Access to the recording of the meeting may be requested from Theo Knight-Jones (t.knight-jones@cgiar.org)

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Acknowledgements

Abbreviations and acronyms

CSIRO   Commonwealth Scientific and Industrial Research Organisation

DVM   Doctor of Veterinary Medicine

FAO   Food and Agriculture Organization of the United Nations

GBADs   Global Burden of Animal Diseases

HEARD   Health of Ethiopian Animals for Rural Development

ILRI   International Livestock Research Institute

OIE   World Organisation for Animal Health

PPR   peste des petits ruminants

T&T   tsetse and trypanosomiasis

Executive summary

The International Livestock Research Institute (ILRI) organized an inception workshop for the Global Burden of Animal Diseases (GBADs) Ethiopia case study. The workshop was held at the ILRI Addis Ababa campus on 18 March 2021. The objective of the half-day workshop was to introduce GBADs and the Ethiopia case study to key Ethiopian stakeholders, understand to what extent livestock policies and livestock disease management policies are currently informed by economic data, and identify key priorities of the main stakeholders with regards to activities of GBADs in Ethiopia. The workshop also allowed GBADs international partners to engage with and understand the GBADs Ethiopia case study and local stakeholder organizations.

Fifteen participants attended the face-to-face meeting, representing the main public and private institutions involved in livestock development in Ethiopia, including the Ministry of Agriculture, laboratory and research institutes, veterinary college, professional associations, non-governmental organizations and private sector associations representing the livestock industry. Moreover, international and local partners from University of Gondar, Jimma University, Hawassa University, University of Liverpool, University of Florida, University of Guelph, Pennsylvania State University, Washington State University, Kansas State University, University of Zurich, the World Organisation for Animal Health (OIE), the French Agricultural Research Centre for International Development, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Brooke attended the workshop virtually (see the list of participants in Annex 2).

The meeting was divided into three main sessions. During the first session, welcoming and opening remarks and introduction rounds of participants were made. The second session featured technical presentations from the GBADs Ethiopia case study and the disease prioritization work. Moreover, online participants representing various GBADs themes responded to two questions: (1) How do you see yourselves interacting with the GBADs case study? and (2) Are there particular stakeholders in Ethiopia that you see as very relevant for your theme?

During the third session (group work), Ethiopian stakeholders addressed the following key questions:
1. To what extent does your office/agency use economic data or analysis to make decision/policy related to livestock or livestock health?
2. What is the level of need and priority for economic data for decision/policymaking in your area of work, and what sorts of data/analyses are needed?
3. Do you have suggestions on how the GBADs approach can be improved to make the information generated usable for your needs?
4. What information/data does your office have that would be suitable for this approach? What are the major data gaps?
5. How can GBADs help to deliver the sorts of data and insights that you need?

The third session ended with a plenary discussion of the responses to these questions.

Major comments, suggestions and outstanding questions from the workshop were:
1. Participants noted that the level of need for economic data is high. Both qualitative and quantitative data are needed to inform policy decisions and investment in the Ethiopian livestock sector.
2. The production systems for the case study to focus on should be determined in consultation with national stakeholders. Production systems and sectors will be prioritized in consultation with stakeholders; use of a prioritization framework was suggested.
3. GBADs and stakeholders will explore and suggest options on how best sectors or production systems not covered by GBADs should be captured.
4. GBADs will depend on secondary data. It is a global program and cannot oversee collecting primary data. It will interact with various stakeholders to identify data sources that are available.
5. Some participants emphasized the need for collection of primary data especially on economic impacts of diseases which they think are hardly available and the available ones are of low quality.
6. GBADs needs to develop a systematic way to tap into the wealth of data resource in the country. Massive data have been collected from the country by various livestock projects over the past years. Moreover, Ethiopia also graduates hundreds of veterinarians annually and all these veterinarians publish theses with primary data for their Doctor of Veterinary Medicine (DVM) graduation.
7. GBADs will look at the wider/total burden of disease but also attribute that burden to specific diseases, OIE listed and non-OIE listed. It looks more generally at the aspects of animal health burden and stakeholders requested to look at specific diseases.

8. GBADs will empower and improve the capacity of stakeholders working in the sector on animal health economics and on how to present and communicate the data to end-users in a systematic way that can be easily understood.
9. The production of an estimate of the animal health loss envelope and attribution to causes is based on a model of an ideal (utopian) farm with no unavoidable mortality and maximal production. During the workshop, it was not possible to explain the details of all approaches and there was some misunderstanding of what this was and how it would be used. Details of analysis will be discussed with stakeholders in the future.
10. The initial lifetime of GBADs (two years) is short and there is a need to consider extension to bring a better impact and contribution. *In fact, GBADs is envisioned as a 10-year-plus program to embed these approaches within the relevant decision-making bodies; however, initial funding is for two years.*

Introduction

The Global Burden of Animal Diseases (GBADs) is a research program measuring and understanding the global burden of animal diseases. GBADs has a mission of 'measure to improve' animal health at local, national and global levels. It is intended to create information on the economic burden of livestock diseases to support animal health decision-making focused on the Sustainable Development Goals. GBADs has been initiated by the University of Liverpool, with support from the World Organisation for Animal Health (OIE), the International Livestock Research Institute (ILRI) and a group of international collaborating institutions and organizations. The current phase of GBADs (January 2021 to December 2022) is supported by the Bill & Melinda Gates Foundation and the United Kingdom government.

Below are the expected outcomes of GBADs:
1. Provide information for evidence-based investment plans in animal health systems.
2. Allow allocation of resources to key social, economic and environmental problems.
3. 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. Work in Ethiopia will be led by ILRI and implemented with local partners.

The GBADs Ethiopia case study held an inception workshop at the ILRI Addis Ababa campus on 18 March 2021. The specific objectives of the workshop were to:
- introduce GBADs and the Ethiopia case study to stakeholders;
- understand to what extent livestock policies and livestock disease management policies are currently informed by economic information and reasoning;
- identify key priorities of main stakeholders with regards to activities of GBADs in Ethiopia; and
- gain an understanding of the potential impact and utility of the case study.

Moreover, the workshop created an opportunity to engage with a broader group of key stakeholders, resulting in participatory knowledge exchange.

Workshop proceedings

Welcoming and opening remarks

Welcoming remarks by Theo Knight-Jones, Senior Scientist, ILRI: Theo, who leads the GBADs Ethiopia case study at ILRI, gave participants a background of the inception workshop and explained the need for the workshop. He thanked the stakeholders in the room and those from different parts of the world who participated online. He noted that animal diseases have massive impacts on food systems in Ethiopia and around the world, affecting food safety, food security through diminishing livelihoods, and the health and wellbeing of people and their animals. Decisions on how to manage animal diseases become very challenging and at times confusing if we do not have clear information on these diseases and how they affect people, who is affected and to what extent. In order to make informed decisions, we need to have this clear understanding and a better insight into how control measures should be prioritized, what their likely impact will be and how they will improve livelihoods and commerce. Through GBADs, we are looking to develop methods and approaches to deal with all these issues at all levels. But the key issue in Ethiopia and what we really want to do will be to empower government institutions and enterprises to be able to deal with these questions and give them the tools to better manage animal diseases and their impact, and through that improve wellbeing, livelihoods and food systems.

Opening remarks by Wubishet Zewdie, Director of Disease Prevention and Control Directorate, Ministry of Agriculture: Wubishet noted that a wide range of animal diseases are prevalent in Ethiopia, reducing livestock production and productivity and impacting livelihoods, the economy of the country and public health. Ethiopia is endemic to a number of livestock diseases causing a high degree of mortality and morbidity and posing significant economic, food security, livelihood and public health impacts. Our veterinary service is not strong enough to detect diseases in a timely manner. There is a surveillance system in place but not a system to determine the economic burden of these diseases in the various sectors and farming systems (pastoral, agro-pastoral, mixed systems, smallholder farming and commercial farms). As a result, policymakers lack the required information to make informed decisions for investment in the livestock sector. He noted that the GBADs case study in Ethiopia will aid the country to generate evidence on the economic burden of livestock diseases to support animal health decision-making focused on the Sustainable Development Goals. He thanked the donors and various players in GBADs for funding the project and selecting Ethiopia as a case study country.

Remarks by Samuel Wakhusama, Regional Manager for East Africa, OIE: He noted that the mission of the OIE is to improve animal health and welfare worldwide and that is exactly what GBADs is all about. This initiative will cement the mandate of the OIE via global partnership and leadership in the management of animal health and welfare. The vested interest of the OIE is to contribute to the development of tools and methods to measure global burden of diseases across regions and sectors, and provide these methods to member countries to apply them uniformly towards a truly global measurement of animal disease burden and, in time, contribute to prioritization of diseases on the basis of more subtle and refined metrics. OIE strongly supports this initiative at country level as it seeks to set a global standard for adoption by the year 2030.

Remarks by Mario Herrero, Chief Research Scientist, CSIRO: Mario leads the populations and production systems theme within GBADs. He described how this activity is linked to the Ethiopia case study. He noted that at the moment his team is collecting information from a range of livestock databases to try to develop the production system specification that will work on a global basis but that would be adaptable to local conditions. The development of the production system specification for Ethiopia should be led by local stakeholders. It is essential that, whatever we do, classifying systems have absolute relevance to how people locally see the production systems, hence we are relying on all stakeholders to ensure appropriate linkages.

Technical presentations

The GBADs Ethiopia case study by Wudu Temesgen (The presentation can be accessed at https://hdl.handle.net/10568/113149). Wudu described what GBADs is and what it does, its genesis, Ethiopia as a GBADs case study country, GBADs activity in Ethiopia, how GBADs can benefit Ethiopia and its set-up at ILRI. 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. In the coming two years, the GBADs Ethiopia case study will collect and collate data on livestock population, production and disease epidemiology, and production loss and control expenditure; estimate the livestock population, biomass and economic values of selected production systems; estimate the animal health burden on selected production systems/sectors; attribute the estimated burden to different diseases and health losses; make the information readily available for use by stakeholders and increase the capacity of policymakers and farmers on the use of economics in animal health decision-making. The work in Ethiopia will be led by ILRI and implemented with local partners.

Questions arising from Wudu's presentation

Q: How do you envision the potential role of stakeholders and how they are linked/interact and contribute to the Ethiopia and global GBADs team?
A: Stakeholders working in the sector have immense stake and contribution. They will be the primary beneficiaries of the GBADs outputs and will also have great role in providing data input.
A: GBADs empowers and improves the capacity of stakeholders working in the sector.

Q: Are you going to determine economic burden and impact of each specific disease? And in which category do you consider some inputs in livestock production (e.g. feed, drug supply, vaccines) which are important expenditures in disease management?
A: No, the approach is first to estimate the overall burden of livestock diseases and then attribute or apportion the overall burden to different specific diseases.
A: We are going to consider input parameters related to livestock production as expenditures. The animal health loss envelope includes not only the losses related to diseases but also expenditures such as feed, drugs, vaccines, biosecurity measures etc.

Q: How do you design the economic assessment without advocating for specific diseases? And how is the approach and the data collection considering this?
A: We are going to create a platform to utilize the existing data, develop a population model to estimate the animal health loss envelope and attribute this loss to specific disease burden.

Q: How can you cover different production systems, sectors and species to have a good picture of the country? Or do you have a plan/strategy to prioritize?
A: We will prioritize systems and sectors. Stakeholders will help us in this prioritization process and we are going to set a framework for prioritization. At this point we are thinking of the cattle systems.

Q: Will the focus be on advocating for investment in reducing individual diseases or will the case be made for animal health system strengthening broadly?
A: GBADs intends to investigate the animal disease burden broadly at the start, and the next step will be attributing these impacts to specific diseases and syndromes. At this point, some questions will arise such as: Can we measure the burdens of certain diseases such as foot-and-mouth disease or peste des petits ruminants (PPR)? What are their relative contributions to the overall economic burden of animal diseases in that structure? These and other related questions will lead us to the issue of disease prioritization.

Q: Could you clarify the data collection and how that will be institutionalized in supporting the sector in the future?
A: GBADs will not collect primary data. There are data kept by various partners in the public and private sector and GBADs will engage these stakeholders to obtain the data. GBADs will have a knowledge engine and use the data for analysis. We will also use the GBADs framework to identify where data gaps exist, so enabling prioritization to fill these gaps.

The GBADs disease prioritization work by Kebede Amenu: (The presentation can be accessed at https://hdl.handle.net/10568/113567). He noted that as resources are limited, priority setting is very crucial for resource allocation. He emphasized the need for rational and transparent tools or approaches to prioritize animal diseases which can further justify resource allocation. Major activities of GBADs prioritization work

include an iterative survey of end-users of GBADs and Resource Allocation Decision Support Suite of Tools and synthesis of lessons learnt on resource allocation for animal health. The survey could include assessment of the current practices related to disease prioritization and understanding of animal disease burden. The synthesis of lessons learnt on resource allocation for animal health will garner information from people with first-hand experience on resource allocation for animal health and conduct a systematic literature review of grey and published literature.

Questions arising from Kebede's presentation
Q: How does GBADs see linkages of national, regional and global priorities for the prioritization work?
A: We are creating a set of tools for users. The tools can be applied at local and global levels incorporating different criteria and perspectives. ILRI's work in Ethiopia has two roles: (1) leading the case study where we are linking to all the wider GBADs work and applying it to Ethiopia and (2) leading the disease prioritization global team with which Kebede is involved. We are looking into how prioritization is done around the world in different settings (what can be improved; lessons learnt etc.) and we are developing tools at the global level which will later be introduced to countries such as Ethiopia.

Q: The different data collection methods you mentioned, like survey of end-users and systematic literature review, might not help to get quality data unless you collect primary data. What type of primary data you are going to collect to prioritize diseases?
A: We are not going to collect primary data; we are going to provide supporting tools to enable disease prioritization. We will depend on secondary data. This is a global program and we cannot be significantly engaged in collecting primary data; that is the jurisdiction of countries such as Ethiopia. We will develop new frameworks to build on existing tools such as those developed by OIE. We expect to develop frameworks for disease prioritization by looking into different production system classifications globally which can be adapted to local contexts.

Q: We expected the GBADs tool to help in prioritization of production systems and diseases. Otherwise, which production system and animal species are you going to focus on? How will GBADs outputs help to address specific issues? What about wildlife which contributes immensely to the national economy?
A: To start with, the production system for the case study will be determined in consultation with stakeholders. With regards to wildlife, the animal health loss envelope deals with feed and forage in the context of land use and indirectly looks into wildlife. GBADs also considers terrestrial animals and aquaculture. We are not going to cover wildlife disease burden estimation at this stage but this might evolve eventually as the program proceeds.

Remark from Peter Moorhouse: It is a very ambitious program and I wish you success. You are thinking of using certain resource allocation tools and OIE tools in this project. From my experience, these tools tell you what you do not know. They are immensely data hungry. Ethiopia has been a recipient of millions of dollar projects. Massive data have been collected from the country by these projects. Annually, Ethiopia graduates 600 veterinarians who publish theses with primary data for their DVM graduation; you must develop a systematic way of tapping into these data.

Comment on the remark: We have a great informatics team working to curate all the grey literature (reports) and theses to make use of this rich resource of data. A very exciting process!

Remark from Jonathan Rushton: I would be very keen to know if the reports and dissertations mentioned could be made available electronically or perhaps there is already a place where they are stored. I am keen that we tailor how we work to the needs of Ethiopia.

Questions for online participants

During the break, the online participants were requested to respond to three questions via the chat box.

1. How do you see yourself interacting with the GBADs case study?
   - Deborah Stacey: The informatics theme needs to understand the various sources of data that are currently available from many different sectors: government, industry, non-governmental organizations, producer groups etc. This will facilitate sharing of the data within GBADs and to other stakeholders. It will also help us to identify data gaps. The informatics theme also needs to hear from various stakeholders what kinds of analytical tools they need access to and/or what kinds of reports/outputs that they want from the modellers and analysts in GBADs.
   - Alex Kappes: We will be estimating economic losses (asset values, producer and consumer welfare) from animal diseases at the aggregate level and developing a framework to be used for future economic loss estimation.
   - Marie McIntyre, University of Liverpool: I provide oversight on literature reviews for GBADs. I have developed a slide set to be used as a resource, discussing the structure and steps of a generic GBADs literature reviewing protocol, relevant pertinent points for systematic reviews, hyperlinked to appropriate guidelines/checklists, e.g. Cochrane, PRISMA-P. I can provide support and guidance to the case study when the literature review is undertaken.
   - Girma Berhan: Regarding working equids, we need to work with governmental and non-governmental organizations in Ethiopia as well as universities around the country, the Society for the Protection of Animals Abroad, Donkey Sanctuary Ethiopia and the Working Equids Owners Association at the district level. I will be working on the burden of animal diseases in working equids of Ethiopia and will fully be engaged on disease burden and prioritization and the welfare of working equids in Ethiopia.
   - Kassahun Wondimu: I can help with systematic literature review and meta-analysis and other technical support with supervision and technical guidance on primary data collection.
   - Alexis Delabouglise: I will contribute to the production losses and expenditure theme, mainly through data synthesis and analysis related to smallholder poultry production. I expect to have interactions. I am also trying to set the stage for a future GBADs case study in Senegal.
   - Violeta Munoz: (1) Interactions with the data provider to identify and describe major poultry production systems and co-construct analytical models, based on data available, to analyse gaps between actual and achievable levels of returns to smallholders. (2) Obtaining useful feedback for the Senegal case study.
   - Tsegaw Fentie, University of Gondar: I can support collection of data and literature review.

2. Are there particular stakeholders in Ethiopia you see as very relevant for your theme? Please answer in the chat and say who you are and mention your GBADs theme/role.
   - Deborah Stacey: The informatics theme would really like to interact with industry stakeholders and producer representatives/groups to understand the possibilities for leveraging any data that they might be willing to share with GBADs and/or other stakeholders. We would like to understand the possibilities for collaboration in this dimension of the data universe.
   - The informatics theme also needs to understand all the government data resources that are available from Ethiopia and develop a way to help leverage these datasets so that they represent the best current view of Ethiopia to GBADs modellers and serve as a baseline of data that can be enhanced and augmented by non-governmental sources of data.
   - Alex Kappes: The livestock and animal health industries are very important stakeholders within our theme, as well as stakeholders within regulatory functions. Looking forward to working with everyone and the future collaborations that will take place.
   - Alexis Delabouglise: My PhD will be targeting poultry and it would be great to connect with the poultry sector in Ethiopia. Looking forward to doing this!
   - Violeta Munoz: Stakeholders of the poultry sector.
   - Alexandra Shaw: In the production losses and expenditure theme, we are looking forward to working with a range of stakeholders in Ethiopia. We are grateful to Wudu Temesgen for providing such a very clear summary of the animal health loss envelope approach which underlies our work. In the very short run, we are focusing on poultry and cattle. Personally, I would also echo what Peter Moorhouse said about the rich data sources on livestock in Ethiopia; we have been discussing how to access some of the older data and reports with the Ethiopia team.
   - Mieghan Bruce, animal health ontology and attribution theme: For disease attribution, it would be great to work with groups in Ethiopia that have data on production parameters in various production

systems. This will also contribute to the development of the animal health ontology (classification of health, disease and the links to production loss and control expenditure).

3. For those not working on GBADs, please ask any questions you have about the program or comment on what will be important for GBADs to be successful in Ethiopia.
    - Alexandra Shaw: These presentations are very helpful. A recurrent theme is the need for GBADs to present its results in a way that is understandable to private and public sector decision-makers. If you can give more details of what you are looking for in terms of a helpful result, what would that be?

Group work and plenary discussion

During this session, participants were divided into four groups.

- Group 1: Ministry of Agriculture and professional associations (Ethiopian Society of Animal Production, Ethiopian Veterinary Association)
- Group 2: Private sector (Commercial Dairy Producers Association, Ethiopian Meat Producers and Exporters Association, Ethiopian Poultry Producers and Processors Association, EthioChicken)
- Group 3: Development organizations and projects (Food and Agriculture Organization of the United Nations [FAO], Health of Ethiopian Animals for Rural Development [HEARD] project, One Health)
- Group 4: Laboratory and research institutes (National Veterinary Institute, National Animal Health Diagnostic and Investigation Center, National Institute for Control and Eradication of Tsetse and Trypanosomiasis).

The groups discussed the following five questions:

1. To what extent does your office/agency use economic data or analysis to make decision/policy related to livestock or livestock health?
2. What is the level of need and priorities for economic data for decision/policy making in your area of work, and what sorts of data/analyses are needed?
3. How can GBADs help to deliver the sorts of data and insights that you need?
4. Do you have suggestions on how the GBADs approach can be improved to make the information generated usable for your needs?
5. What information/data does your office have that would be suitable for this approach? What are the major data gaps?

The responses from each group to each of the five questions are depicted in the tables below.

1. To what extent does your office/agency use economic data or analysis to make decision/policy related to livestock or livestock health?

Ministry of Agriculture and professional associations	Private sector	Development projects	Laboratory and research institutes
- The available data are used but there is a greater gap in the quality and comprehensiveness of data. - Generally, the culture of using data is low	We use data to some extent to decide the feasibility of the business, upgrade working procedures such as vaccination schedules, expand business, improve business efficiency and calculate costs and selling prices	The projects are not using the data by themselves. Due to lack of needed data, on occasion, there is a need to undertake field studies to fill gaps. For example, reliable estimates of losses due to specific diseases, herd dynamics data etc.	Economic data are useful in our agency in decision-making for livestock health such as prioritizing major economically important diseases, surveillance activities, vaccine production and designing of disease control strategies.

2. What is the level of need and priorities for economic data for decision/policy making in your area of work, and what sorts of data/analyses are needed?

Ministry of Agriculture and professional associations	Private sector	Development projects	Laboratory and research institutes
- The level of need for economic data is high. - Both qualitative and quantitative data are needed on production systems, animal diseases, livestock species, and contribution to the economy and livelihoods. - There is a need for a systematic way to communicate livestock and livestock health data.	- Disease prevalence - Production data - Data on culture of consumption	- It is high as we are supporting the government on evidence-based decision-making. - Examples include design of disease prevention and control strategies, investment, production plans and exports. By including socio-economic implications of disease occurrence so that producers' perceptions are considered.	There is a high-level need for economic data for cost-benefit analysis of surveillance activities, research and vaccine production, and disease control strategies.

3. How can GBADs help to deliver the sorts of data and insights that you need?

Ministry of Agriculture and professional associations	Private sector	Development projects	Laboratory and research institutes
- GBADs needs to tap into and understand the livestock and livestock health national data and information management system to provide support. - Support through capacity building. - Promote the proper use of available data. - Based on available data, communicate on business and economic impacts not just the direct impact of animal diseases. - Strengthen the capacity of persons in working in the livestock sector	- Produce reliable data. - Present the data to policymakers and senior government officials. - Present reliable data to end-users in a way that they can understand.	Lobby governments to collect more and better quality primary data. Herd health and productivity monitoring can provide needed data of high quality. Also, findings of disease dynamics in different production systems.	We expect that GBADs will help in providing data needed for disease prioritization, surveillance for a particular disease, and disease diagnosis and control.

4. Do you have suggestions on how the GBADs approach can be improved to make the information generated usable for your needs?

Ministry of Agriculture and professional associations	Private sector	Development projects	Laboratory and research institutes
- Targeting secondary data could be one limitation and the GBADs approach needs to be holistic enough to address various priorities (productions systems, animal species) - Consider a pilot investigation for primary data with some sort of prioritization in place - Strengthen collaboration with stakeholders - The lifetime for GBADs (two years) is short and there is a need to consider an extension for better impact and contribution.	- Focus on specific high-burden diseases and measure their impact instead of a broad approach in which impact might be difficult to measure in the limited period of the project. - Develop a system that delivers data to end-users in packages they can understand, e.g. in different languages.	Use higher education institutions as alternative data sources.	Should be based on primary data in addition to secondary data (reports, management data, Central Statistical Authority data, expert opinion)

5. What information/data does your office have that would be suitable for this approach? What are the major data gaps?

Ministry of Agriculture and professional associations	Private sector	Development projects	Laboratory and research institutes
Information/data available - Disease outbreak and related data - Livestock market data - National priority disease list - Various study reports - Veterinary workforce data Major data gaps - Data not submitted in a timely manner - Questions on quality of data - Lack of understanding on data collection tools and management systems - Data not tailored to be understood by policymakers	Data availability varies in different sectors, but we have data on - productivity of different flocks; - liveability or mortality; and - laboratory test results and titre levels for different diseases. Major data gaps - Updated disease surveillance data - Recent research findings - Updated socio-economic data such as consumption habits and supply and demand	- The data we are providing to the government such as project and program outputs/outcomes. We have various projects that collected data such as PPR control and eradication, tsetse and trypanosomiasis (T&T) control and elimination, HEARD project, national livestock development etc. - FAO: Rift Valley fever prediction data/system, T&T atlas, zoonotic disease prioritization, evaluations of surveillance and laboratory systems - The data collected for the livestock masterplan study (first phase) - HEARD: Outcomes of various public-private partnership models. Report of findings of historical herd health and productivity monitoring study. Estimate of national value of livestock outputs using the Intergovernmental Authority on Development model. - Resolve to Save Lives: National zoonotic diseases prioritization documents - Information and documents developed for multi-sectoral collaborations and coordination Major data gaps There are various sources of data but most are fragmented lacking in comprehensiveness and quality.	- Disease surveillance data (Livestock Information Management System) - Research output on disease impact and dynamic disease diagnosis data - Data from outbreak investigations - Atlas (T&T data) - Data on vaccines produced and distributed Major data gaps - Incomplete data for all diseases - Fragmented data - No ideal disease-free farm to estimate the overall economic burden (animal health loss envelope)

Plenary discussion

Q: For the private sector group, do you do much economic analysis on diseases, for example, in the poultry sector?

A: We do economic analysis; we don't have ready-made economic analysis reports but we have the data at hand. If there is, for example, Newcastle disease in poultry parent stock farm, its economic impact is very obvious affecting the number of commercial chicks supposed to hatch, the number of farmers supposed to get chicks etc.

Q: How does the program intend to trickle down its impact to the private sector to the level of individual businesses such as companies?

A: We do not want this to be an enormous academic exercise. We are devising methods to look at this problem in a better way. The key processes are not to help us as researchers to do research, but rather to help in building the capacity of the government, the livestock sector and the industry and create the links among themselves to deal with the problem.

Q: How is this project going to be linked to agencies such as the Economic and Finance Ministry and the Central Statistics Agency as they are highly engaged in data collection? How does the linkage between this project and socio-economic departments in universities help to produce more data on livestock health in general?

A: We will be working with you, reaching out to these key institutions to establish linkages.

Q: Peter mentioned a wealth of resources. How available are these data such as DVM theses? Will that be paper based?

A: Accessing the data would not be difficult. You can make personal contacts with the various projects. The DVM theses are documented in the respective university libraries. If you talk to the universities, they can guide you on how to access them.

Q: My take-home message from the presentations is that users such as decision-makers require the data to be made available in a format that they can use easily. What do you find useful? Are you looking for money figures and should this be in birr, dollar, international dollar? Are you looking for farm-level output or how it affects the whole economy? How would you prefer the data to be presented? What type of information is found to be not useful or complicated for decision-makers?

A: Professionals need to be effective communicators to convince decision-makers. The way we deliver the information is a major challenge and requires additional skills. Depending on the type of audience we are targeting, we need to define the type of format to share the output. For government officials, it is better to present the data in terms of money lost as this makes it more persuasive. There are many different levels of needs such as national, smallholder, private sector etc. so the way the data is made available needs to address these specific needs. Decision-makers do not need voluminous reports; simple infographics will be enough.

Online comments

Ben Huntington: We will be looking to attribute the burden of some specific diseases that are important to the country. The reason we start broadly is it is fundamental to the systematic method novel to our program.

Deborah Stacey: I am one of the colleagues from the informatics team of GBADs. We are developing the infrastructure in the cloud for GBADs. The discussion of data and your needs for data and identifying the gaps is really going to help and form what we are doing. We are basically setting up a system that will form a large data ecosystem for people to look at. We will tap into your resources over the coming one or two years to be able to set up the data ecosystem for Ethiopia.

Q (for Deborah): It seems the system you want to use is already well known. You know what data you require then we look where we can find those data. Don't you think this approach is better than looking for what is there?

A: Two-way system can work. Looking at the existing data and identifying the gaps; what is being used and where is the gap.

Summary of key messages from the stakeholder discussion

- Currently, there is limited practice of using economic data for decision-making, both in government and the private sector, mainly due to lack of high-quality and comprehensive data.
- There is a high need for data on socio-economic impacts of animal diseases for evidence-based decision-making by government agencies on issues such as disease surveillance, control and prevention, and vaccine production and distribution.
- Systematically organized disease impact data by production system, livestock species and disease are needed for better decision-making in the livestock sector.
- GBADs could help by analysing and promoting the use of existing data, lobbying the government for collection of more comprehensive and high-quality data through health and productivity monitoring, and strengthening the capacity of personnel working in the livestock sector in animal health economics.
- In addition to using secondary data, which often lack comprehensiveness and quality, GBADs needs to consider the need for better primary data in priority data gap areas.
- GBADs could use the data collected by higher education institutions as additional data sources.
- For some stakeholders, GBADs needs to see disease burden holistically considering the different production systems and livestock species by extending the current project period to cover all production systems. Some other stakeholders suggested focusing on selected high-burden diseases.
- Data that can be used by GBADs that are held by stakeholders include national priority diseases listing, disease surveillance data, outbreak and outbreak investigation data, livestock market data (from animal health directorates and the National Animal Health Diagnostic and Investigation Center), herd/flock productivity and mortality data (from the private sector), vaccine production and distribution data (from the National Veterinary Institute), and different data from development projects such as HEARD, Resolve to Save Lives, PPR Control and Eradication, T&T Elimination and the Livestock Master Plan Development project.
- Data/information gaps identified by stakeholders included lack of suitability (not tailor-made) of the available data/information for policymakers; incomplete, fragmented and low-quality data; lack of updated surveillance and socioeconomic impact data; and lack of farm data that could enable specification of a utopian farm for the animal health loss envelope analysis.
- The stakeholders emphasized that the project should produce an output that is beyond merely a project report and publication. The outputs should be useable by end-users for practical decision-making. For this to be effective, the information produced should be easy to understand and apply by non-academic users.
- While the GBADs systematic method requires disease burden to be considered broadly, attribution of the burden to specific diseases that are important to the country will be done.

Continual stakeholder engagement plan

The GBADS Ethiopia case study will continually engage stakeholders to inform them of the case study activities with their inputs, feedback and interests. Regular engagement will be achieved through the case study advisory committee comprising key stakeholders who will convene regularly to direct and support the case study. Training in animal health economics will be provided to stakeholders to facilitate their understanding of GBADs and uptake of GBADs approaches, and to obtain their feedback on these approaches. Towards the end of the current phase of the project, a second stakeholder workshop will be held to evaluate the achievements of GBADs and promote uptake of the project outputs by end-users.

Annex 1: Workshop program

Time	Activity	Responsible
0830-0900	Registration of participants	Beamlak Tesfaye and others
0900-0905	Opening remarks: ILRI GBADs	Theo Knight-Jones
0905-0915	Introduction of participants *Online questions via chat box*	Wondwosen Asfaw
0915-0920	Opening remarks: Ministry of Agriculture	Wubishet Zewdie
0920-0925	Briefing on workshop agenda and objectives	Wondwosen Asfaw
0925-0945	Introduction to GBADs and the Ethiopia case study	Wudu Temesgen
0945-0955	Q&A *Online questions via chat box*	
09:55-10:05	GBADs prioritization work presentation	Kebede Amenu
1005-1030	10 mins Q&A *Online questions via chat box* Remarks from international partners (OIE, CSIRO)	Wondwosen/Theo
1030-1050	**Break** *In-person participants return at 1050; online participants return at 1145 and post questions ready for the plenary session*	Participants
1050-1200	**In room group work**: Addis participants only *In groups, consider the questions below* • To what extent does your office/agency use economic data or analysis to make decision/policy related to livestock or livestock health? • What is the level of need and priorities for economic data for decision/policy making in your area of work, and what sorts of data/analyses are needed? • How can GBADs help to deliver the sorts of data and insights that you need? • Do you have suggestions on how the GBADs approach can be improved to make the information generated usable for your needs? • What information/data does your office have that would be suitable for this approach? What are the major data gaps?	Facilitator
1200-1300	*11:45 Online participants provide questions in the chat box* **Plenary with online participants**: Workshop participants present and discuss group work findings with Q&A Questions from online participants	
1300-1310	Words of acknowledgement and wrap-up	Theo Knight-Jones

Annex 2: List of participants

Participants physically present

Name	Designation	Organization
Wubishet Zewdie	Director, Disease Prevention and Control Directorate	Ministry of Agriculture, Ethiopia
Yesmashewa Wogayehu	Director, Epidemiology Directorate	Ministry of Agriculture, Ethiopia
Tesfaye Rufael	Head	National Animal Health Diagnostic and Investigation Center
Takele Abayneh	Lead researcher and director of research and development	National Veterinary Institute
Berisha Kapitano	Project coordinator	National Institute for Control and Eradication of Tsetse and Trypanosomiasis
Kebede Amenu	Associate professor of food safety and veterinary epidemiology; GBADS prioritization	College of Agriculture and Veterinary Medicine, Addis Ababa University
Wondrad Abreham	Chairperson	Commercial Dairy Producers Association
Birhanu Million	General manager	Ethiopian Poultry Producers and Processors Association
Abebaw Mekonen	Office manager	Ethiopian Meat Producers and Exporters Association
Berhane Girmay	Production manager	EthioChicken
Peter Moorhouse	Team leader	HEARD project
Tewodros Tesfaye	General manager	Ethiopian Veterinary Association
Daniel Temesgen	President	Ethiopian Society of Animal Production
Gijs Vantklooster	Head, Livestock and Pastoralism Thematic Program	Emergency Centre for Transboundary Animal Diseases, Food and Agriculture Organization of the United Nations, Ethiopia
Darsema Gulima	Senior advisor	One Health Prevent Epidemic Team
Theo Knight-Jones	Senior scientist	GBADs Ethiopia, ILRI (Host)
Wudu Temesgen	Postdoctoral fellow	GBADs Ethiopia case study, ILRI
Wondwosen Asfaw	Independent	GBADs Ethiopia, ILRI (Chair)

Online participants

Name	Institution	Location
Alexander Kappes	Washington State University	USA
Alexandra Shaw	Independent	UK
Ben Huntington	University of Liverpool	UK
Biruk Gemeda	ILRI	Ethiopia
Brecht Devleesschauwer	University of Florida; Sciensano	USA
Chadia Wannous	OIE	Kenya
Deborah Stacey	University of Guelph	Canada
Delia Randolph	ILRI	Kenya
Desta Arega	Brooke	Ethiopia
Girma Asteraye	Brooke	Ethiopia
Jonathan Rushton	University of Liverpool	UK
Kassahun Asmare	Hawassa University	Ethiopia
Klara Saville	Brooke	UK
Marie McIntyre	University of Liverpool	UK
Mario Herrero	CSIRO	Australia
Mieghan Bruce	Murdoch University	Australia
Patrick Bastiaensen	OIE	Kenya
Paul Torgerson	University of Zurich	Switzerland
Philip Rasmussen	University of Zurich	Switzerland
Samuel Wakhusama	OIE	Kenya
Simon Kihu	OIE	Kenya
Tadele Tolosa	Jimma University	Ethiopia
Tsegaw Fentie	University of Gondar	Ethiopia
Theresa Bernardo	University of Guelph	Canada
Thomas Dulu	OIE	Kenya
Tom Marsh	Washington State University	USA
Violeta Munoz	University of Zurich	Switzerland
Yin Li	CSIRO	Australia

Figure 1: The workshop included those physically present, observing COVID-19 control measures, and those joining online from around the world.