University of Gondar
The Ohio State University

OIE Veterinary Education Twinning Program

University of Gondar, Faculty of Veterinary Medicine
Curriculum Mapping and OIE Day-1 Competency Evaluation Report

WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future

Table of Contents

Section I
Curriculum Mapping and Analysis

Methodology:

To assist countries who are developing new veterinary education programs, the OIE developed Guidelines for a Model Core Veterinary Curriculum (http://www.oie.int/Veterinary_Education_Core_Curriculum.pdf). Within these guidelines, the OIE lists core courses as well as Day 1 Competency training that each class should fulfill. In addition, the OIE provides a recommended sequence that the courses should be taught in a strong veterinary curriculum (i.e. early, mid, late).

Using the OIE Core Curriculum Guidelines, the twinning partners mapped and analyzed the University of Gondar (UoG) Doctor of Veterinary Medicine (DVM) curriculum. Currently, the UoG has a detailed Study Program (August 2013 version) document describing the curriculum that veterinary students follow to obtain their DVM degree. From this document, the UoG course codes and names were recorded in a spreadsheet with a short course description. The UoG course summary was compared with the OIE course guideline descriptions, to determine which OIE course was satisfied. The UoG course description was also compared against the recommended Day 1 Competency that the OIE expected to be achieved within that specific class. Class descriptions that met the recommended Day 1 Competency training were logged as "yes" and for those that did not meet the requirements as "no". Lastly, the sequence of the UoG courses was compared to the OIE recommended series. All misalignments and discrepancies were highlighted in red in the curriculum analysis tables shown in the Appendix A on page 58.

Outcomes of University of Gondar Veterinary Curricular Analysis:

After the curricular mapping and analysis, it was determined that the majority of the core curriculum recommended by OIE is currently included in the UoG Veterinary Curriculum. In addition, with the exception of three courses, all current classes follow the OIE recommended timeline or year of placement in the Curriculum. Furthermore, the majority of the OIE Day 1 Competencies were covered based on the different descriptions of the course. It is important to highlight that the depth and detail in which these competencies are taught and the proficiency of the students upon completion of the course could not be determined through the curricular mapping. However, the assessment of graduate proficiency was completed during the evaluation of the competencies described in section two in this document.

While the majority of competencies were covered, the following discrepancies or misalignments were noted:

- Three OIE Day 1 Competencies are currently not covered in the UoG Veterinary curriculum: General Certification Procedures (2.10), Inspection and Certification Procedures (3.2), and International Trade Framework (3.7) (Tables 1 and 2).

- There is no apparent in-depth instruction of risk analysis. The current Epidemiology course only provides a superficial introduction to risk analysis.

- The curricular description of parasitology, microbiology, and virology courses in UoG veterinary curriculum do not include parasitic, viral, or bacterial diseases that are of importance to food safety.

- Similarly, discussions on antimicrobial resistant organisms are not listed in the course description for either the microbiology nor the pharmaceutical courses. However, after further review it was reported that antimicrobial resistance is generally covered in two courses:
  - In Veterinary Microbiology I it is covered under antimicrobial agents and their mode of action. There is also a practical demonstration on antimicrobial susceptibility test which teach resistance.
  - Under pharmacology and therapeutic II course there is one Chapter about chemotherapy, which deals with antimicrobial resistance. Therefore, each graduate will have a general knowledge about this issue.

- While disease prevention and control programs could be implied in the parasitology and microbiology course descriptions, it is not specifically mentioned in the curriculum. However, after further review it was identified the students indeed covered topics on prevention and control not only in these courses, but also in other courses like medicine, preventive medicine and epidemiology.

- The Veterinary pharmacology course's description does not mention drug withdraw times or their importance in preventing drug residues in animal tissues to protect

public health. Even though there is a chapter that deals about drug pharmacokinetics (absorption, distribution, metabolism and excretion of drugs), which can potentially affect the withdrawal periods. No specific withdrawal periods of commonly used drugs is currently part of the currriculum.

- Animal welfare is taught in the 5th year of the UoG veterinary curriculum, but the OIE recommends that it is taught early in the DVM curriculum (i.e. 1st or 2nd year).

- While animal welfare is taught as a course, students struggle in applying such concepts to everyday situations. Especially due to the fact that currently in Ethiopia, there are not major regulations and laws in this subject.

- Biostatistical courses are offered in the 5th year of the UoG veterinary curriculum when the OIE suggest that they should be offered in the first or second year of the program.

- Likewise, the OIE Core Veterinary Curriculum recommends that Veterinary Epidemiology courses should be taught early in the program. UoG veterinary curriculum introduces these courses in the 5th year just before their clinical rotations, at which point it is considered late as the epidemiology background/knowledge is a foundational component of the basic DVM training.

- In regards to animal production courses (i.e. Sheep, Dairy, Beef), there is no description of education and training on animal welfare, advance food hygiene topics (i.e. residue training, animal and animal product tracing, sanitation procedures), inspection and certification procedures, or application of risk analysis in the UoG Veterinary Curriculum.

- In addition, the curriculum description among the various animal production courses it is not very specific in regards to the coverage of three important OIE competencies: veterinary products, zoonotic diseases, and management of contagious diseases.

- Veterinary public health course descriptions illustrate the depth of knowledge for food hygiene and safety. However, the OIE advocates that public health courses should also include lessons on environmental health and biological waste management. The OIE states that the goal of a public health course is to "attain optimal health for people, domestic animals, wildlife, plants, and our environment".

- Even though in the aquaculture and apiculture courses it is included lessons on prevention of disease or how to control infectious diseases, this is not clearly indicated in the current curriculum.

- While English is covered in the UoG Veterinary Curriculum, there is a discrepancy with the OIE recommendations. The OIE recommends that language training should be actively implemented throughout the program using multiple courses and activities, including public speaking, composition writing, medical record writing, critical

reading, and critical thinking. Currently, the UoG only offers actual English courses in the first year of the veterinary program. Although all the DVM science and medical courses are instructed in English, additional English courses and pedagogical activities could enhance their English writing and speaking skills.

Table 1: Coverage of Specific OIE Competencies in the UoG Veterinary Curriculum

OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Curriculum
Epidemiology (2.1)	Yes
Transboundary Diseases (2.2)	Yes
Zoonoses (2.3)	Yes
Emerging and Re-emerging Diseases (2.4)	Yes
Disease Prevention and Control Programs (2.5)	Yes
Food Hygiene (2.6)	Yes
Veterinary Products (2.7)	Yes
Animal Welfare (2.8)	Yes
Veterinary Legislation and Ethics (2.9)	Yes
General Certification Procedures (2.10)	No
Communication Skills (2.11)	Yes

Table 2: Coverage of Advance OIE Competencies in the UoG Curriculum

OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Curriculum
Organization of Veterinary Services (3.1)	Yes
Inspection and Certification Procedures (3.2)	No
Management of Contagious Diseases (3.3)	Yes
Food Hygiene (3.4)	Yes
Application of Risk Analysis (3.5)	Yes
Research (3.6)	Yes
International Trade Framework (3.7)	No
Administration and Management (3.8)	Yes

Section II
Competency Evaluation

Methodology:

As part of the OIE PVS Pathway program, the OIE has created a series of recommended competencies that graduating veterinarians must fulfill by their graduation. The goal of the Day 1 Competencies is to assure that young veterinary professionals can support their Country's National Veterinary Services. To assess these competencies in regards to the proficiency level of the average Day 1 UoG DVM graduate, an Evaluation Tool was designed to systematically collect and analyze the perception of University of Gondar (UoG) faculty, veterinary students, recent graduates and stakeholders. This Evaluation Tool expands on the components of the 11 specific and 8 advanced competency guidelines by providing examples and definitions of knowledge and performance expectations from a highly competent veterinary graduate to an insufficient or not competent graduate.

The Evaluation Tool defined a highly competent new DVM graduate as one who is very knowledgeable/skillful about the topic and is able to perform the task/activity without additional support or guidance. Moderately competent individuals are knowledgeable or skillful about the topics but need some support or guidance to perform the task or activity. New DVM graduates who are aware of the topic but require substantial support or assistance with the task or activity are classified as insufficiently competent. Those who are unaware of the topic and are unable to perform the task or activity without further education or training are considered "not competent." If the topic is not currently in the UoG veterinary curriculum, then that topic should be recorded as such. If the evaluator is unfamiliar with the competency level of new graduates regarding a particular competency, they have the option to select "not sure".

After the OSU and UoG Veterinary Twinning Partners reviewed and edited the Tool, it was distributed to Ohio State veterinary faculty and new veterinary graduates. This pilot study allowed the partners to assess the ease of using the Evaluation Tool as well as collect data regarding the competency level of the average OSU veterinary graduate with the OIE recommended competencies. Based on the suggestions from the OSU veterinary faculty and new graduates, minor changes were made for the UoG faculty and students. The tool was further adapted for a one-on-one interview with stakeholders.

To establish an accurate profile of the perceived proficiency at day 1 of the UoG veterinary graduates with respect to the OIE Day 1 Competencies. Multiples activities were planned to gather the opinions and judgements of faculty and instructors, senior students, recent graduates and major stakeholders or boundary partners.

***Faculty*.** To collect the evaluations of the UoG faculty, a Faculty Retreat was organized in Bahir Dar, Ethiopia. In this setting, the Evaluation Tool was modified for use in small groups. During the Faculty Retreat, the UoG faculty were divided into 9-10 small groups of approximately 6 individuals based on their area of expertise. Each group was assigned a set number of competencies to review and a facilitator from the veterinary twinning partner group or OIE. The role of the facilitator was to moderate the discussion. All the

competencies were thoroughly reviewed over 4 one-hour sessions. Evaluation forms from each member of the small groups were collected and analyzed by the partners after the Faculty Retreat. At the end of each session, an additional general vote was collected via clicker's technology from all the faculty members for each competency evaluated in the small groups. This data was saved and evaluated by the partners at a later date to minimize bias in the assembly voting.

***Students*.** Select senior students and recent graduates were invited to a town hall meeting to review the OIE Day 1 Competencies using a PowerPoint version of the Evaluation Tool. During this session, each competency was described to the students, with specific examples for each level. Then, they were asked to assess, in their opinion, the level of proficiency of the average veterinary graduate student for each competency, using the same scale from the Evaluation Tool (i.e. high, moderate, insufficient, and not competent). Before each voting session, the floor was open to allow the students and new graduates to freely express their opinions and ideas in regards to the subject at hand, comments that were recorded by the OSU coordinator. At the time of the voting, students were able to enter their opinions anonymously using a clicker system, which saved all the results for later analysis.

***Stakeholder Interviews*.** For the stakeholder interviews, the UoG partners selected 20 current employers and supervisors of new UoG DVM graduates. Among them were: 1) professionals at regional state livestock development and promotion agencies, specifically those in charge of recruiting their graduates; 2) professionals working in regional animal disease diagnosis and investigation laboratories who also hire or work with UoG graduates; 3) senior professionals at Zonal or district level who supervise UoG graduates; and 4) colleagues working with or monitoring and supervising UoG graduates. These individuals were interviewed by the UoG partners using a modified version of the Evaluation Tool so that all the competencies could be evaluated within a shortened timeframe. Responses were recorded at the time of the interview and entered into an excel spreadsheet for analysis. To de-identify the individual stakeholders, responses were associated with a number instead of a name to analyze the results anonymously.

Table 3: Summary showing percentage of each surveyed group ranking UoG DVM recent graduates as highly or moderately competent in each one of the *Specific* OIE Day 1 Competencies

OIE Day 1 Competency	Faculty	Students	Stakeholders
Epidemiology (2.1)	73.6%	87%	88.9%
Transboundary Diseases (2.2)	76.7%	48%	83.3%
Zoonoses (2.3)	72.2%	67%	77.8%
Emerging and Re-emerging Diseases (2.4)	73.4%	36%	72.2%
Disease Prevention and Control Programs (2.5)	73.6%	52%	72.2%
Food Hygiene (2.6)	78.2%	79%	77.8%
Veterinary Products (2.7)	71.9%	47%	94.7%
Animal Welfare (2.8)	67.6%	46%	68.4%
Veterinary Legislation and Ethics (2.9)	58.7%	34%	61.1%
General Certification Procedures (2.10)	52.6%	21%	72.2%
Communication Skills (2.11)	77.9%	48%	66.7%

Table 4: Summary showing percentage of each surveyed group ranking UoG DVM recent graduates as highly or moderately competent in each one of the Advanced OIE Day 1 Competencies

OIE Day 1 Competency	Faculty	Students	Stakeholders
Organization of Veterinary Services (3.1)	45.8%	13%	82.4%
Inspection and Certification Procedures (3.2)	60.4%	19%	50%
Management of Contagious Diseases (3.3)	61.4%	36%	79.0%
Food Hygiene (3.4)	67.7%	32%	58.8%
Application of Risk Analysis (3.5)	45.3%	44%	58.8%
Research (3.6)	64.8%	66%	61.1%
International Trade Framework (3.7)	36.3%	32%	50.0%
Administration and Management (3.8)	75.3%	71%	76.5%

Specific Competencies:

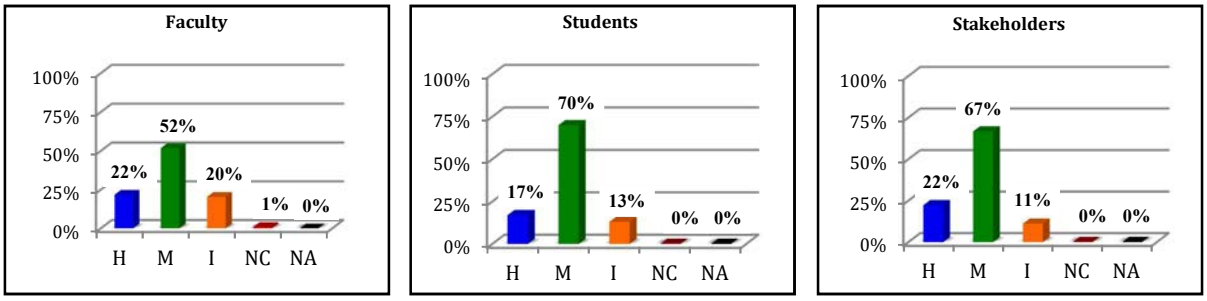
OIE Day 1 Competency: 2.1 Epidemiology

An understanding of epidemiology will allow veterinarians to study the factors that affect the health of animal populations and use this information to make scientifically sound judgments for preventive medicine and veterinary public health. To be competent in epidemiology, a new veterinary graduate needs to grasp the general principles of descriptive epidemiology including measuring and describing disease occurrence and spatial distributions. Day 1 veterinary graduates should be aware of the disease control applications of epidemiology such as disease surveillance, evaluating and interpreting screening or diagnostic tests, and understanding risk factors. Lastly, a veterinarian competent in epidemiology should know the steps of a basic outbreak investigation.

Results:

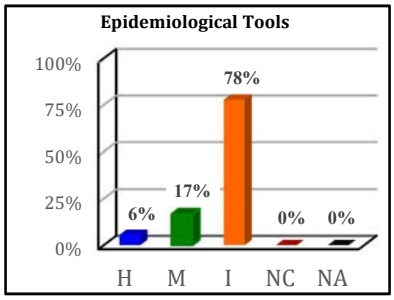
- More than 73% of the faculty, students, and stakeholders considered the average Day 1 University of Gondar DVM graduate to be competent (highly or moderate competent) in epidemiology based on the current needs of the country.

***Figure 1*: Overall Assessment of 2.1 Epidemiology Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**



- Nevertheless, 77.8% of the faculty still estimate that the average UoG DVM graduate is insufficiently competent in using epidemiological tools to evaluate screening/diagnostic tests.

***Figure 2:* The competency level of the average UoG DVM graduate for appropriately using epidemiological tools to evaluate screening or diagnostic tools as ranked by the faculty.**



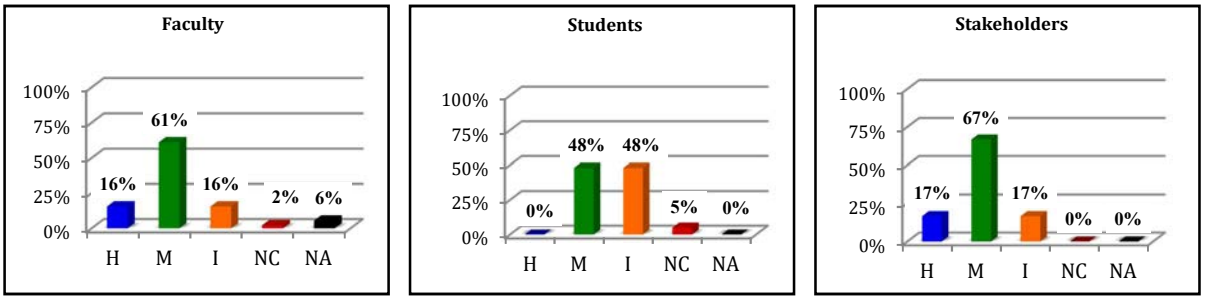
OIE Day 1 Competency: 2.2 Transboundary Animal Diseases

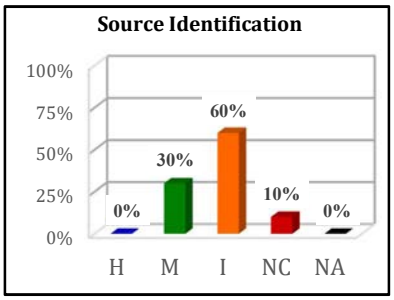
Transboundary animal diseases (TADs) are highly contagious diseases that have the potential to spread quickly across national borders. These diseases have the capacity to produce devastating impacts on the global economy and trade as well as global public health. Veterinarians who are competent in TADs are able to describe important diseases and their related pathogens as well as current global distribution. These veterinarians are able to identify and describe current surveillance programs and the related agencies that monitor for important TADs. Competent Day 1 veterinary graduates should also be able to quickly identify suspicious clinical signs, and then determine the most appropriate sample and diagnostic technique to rule out TADs. They also need to be knowledgeable in all appropriate national or international reporting systems for TADs.

Results:

- The majority of faculties believe that the students are provided with the appropriate information to be competent and the stakeholders consider the average Day 1 veterinary graduate as competent in identifying and handling TADs. In contrast, the students reported a lack of confidence in regards of identifying and handling transboundary animal diseases, with fifty-three percent (53%) reporting that they do not feel competent in this area (Figure 3).

***Figure 3*: Overall Assessment of 2.2 Transboundary Animal Diseases (TADs) Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students and stakeholders.**





- Of faculty who participated in evaluating TADs, 70% believe that the average UoG DVM graduate is insufficient or not competent in identifying updated national and international TADs information sources (Figure 4).

***Figure 4:* The competency level of the average UoG DVM graduate in identifying important sources of up-to-date information on national and international TADs distribution.**

- Almost half of the faculty indicated that the proper process of reporting TADs (40%, Figure 5) as well as the authorities involved at the national and international level (50%, Figure 6) is not taught in the current UoG veterinary curriculum.

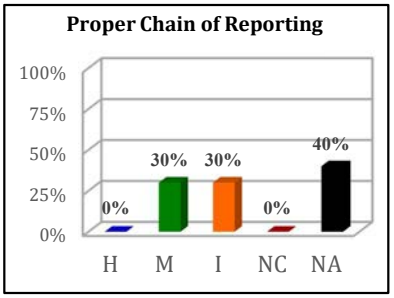


Figure 5: **The faculty determined competency level of the average UoG DVM graduate's knowledge of the proper official chain to report TADs.**

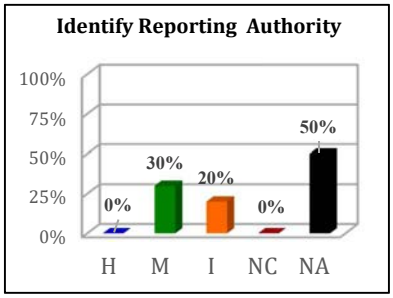


Figure 6: **The competency level of the average UoG DVM graduate's knowledge to whom TADs should be reported as ranked by the faculty.**

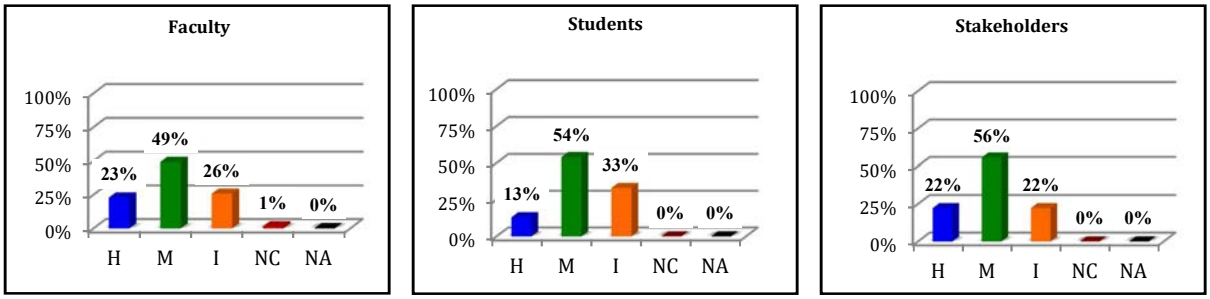
OIE Day 1 Competency: 2.3 Zoonoses (including food borne diseases)

Zoonotic diseases, including food borne diseases, are those diseases that have the potential to be transmitted from animals or animal products to humans, thus these diseases can have a large impact on public health and global trade. Day 1 veterinary graduates who are competent in zoonotic diseases are able to describe common and important pathogens, their routes of transmission, and appropriately select a diagnostic technique. Competent veterinarians understand the public health, agricultural, and economic importance of these diseases and are able to identify the appropriate national or international reporting authority.

Results:

- Over 72% of the faculty and stakeholders believe that the average UoG new DVM graduate is competent in zoonotic diseases. While the percentage was slightly lower, the majority (67%) of the students believe that they are competent in diagnosing and managing zoonotic diseases (Figure 7).

***Figure 7*: Overall Assessment of <u>2.3 Zoonoses (including food borne diseases) Competency</u> ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**



- Even though, overall, the DVM graduates are considered competent in the topic of zoonotic diseases, 70% of the faculties surveyed still believe that the average UoG DVM graduate is insufficiently competent in interpreting diagnostic test results for important zoonotic and foodborne diseases.

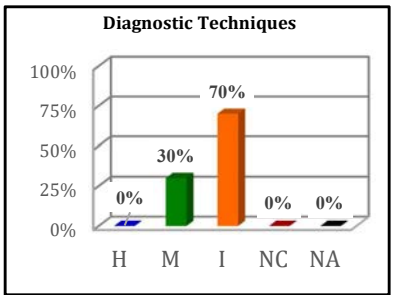
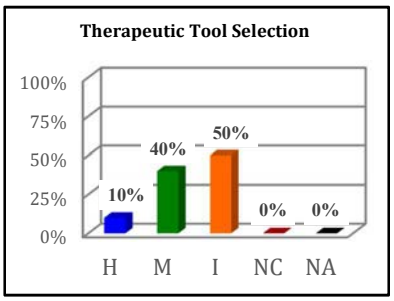
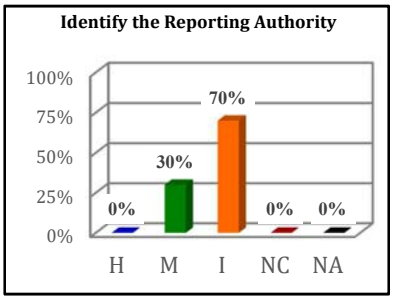


***Figure 8:* The competency level of the average UoG DVM graduate's ability to interpret results from zoonotic and food borne diagnostic tests as ranked by the faculty.**



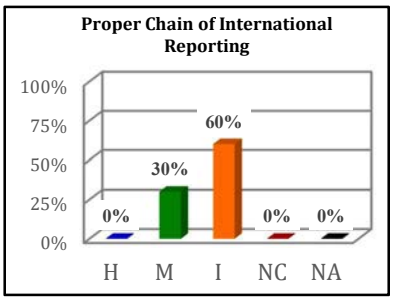
- The faculty also indicated that 50% of the average Day 1 UoG veterinary graduate is insufficiently competent in selecting an appropriate therapeutic tool to control and prevent common zoonotic or food borne diseases.

Figure 9: **The competency level of the average UoG DVM graduate's ability to select appropriate therapeutic tools as ranked by the faculty.**



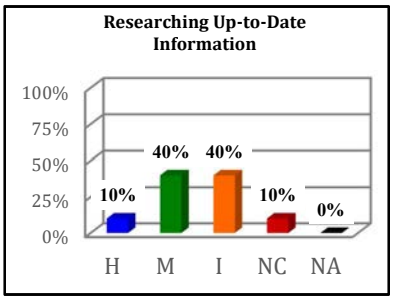
- Similar to the evaluation of TADs, the majority of faculty believe that the average DVM graduate is insufficiently competent in identifying the appropriate reporting authority for zoonotic and foodborne diseases.

Figure 10: **The competency level of the average UoG DVM graduate's ability to identify the reporting authority for zoonotic diseases according to the faculty.**



- These graduates were also reported to be insufficiently competent with identifying the proper national and international reporting chain for zoonotic diseases.

Figure 11: **The faculty determined competency level of the average UoG DVM graduate's understanding of the reporting chain for zoonotic diseases.**



- Half of the faculty reported that UoG DVM graduates are either insufficient or not competent in researching and handling up-to-date information for zoonotic diseases.

Figure 12: **The competency level, as ranked by the faculty, of the average UoG DVM graduate's ability to research up-to-date information on zoonotic diseases.**

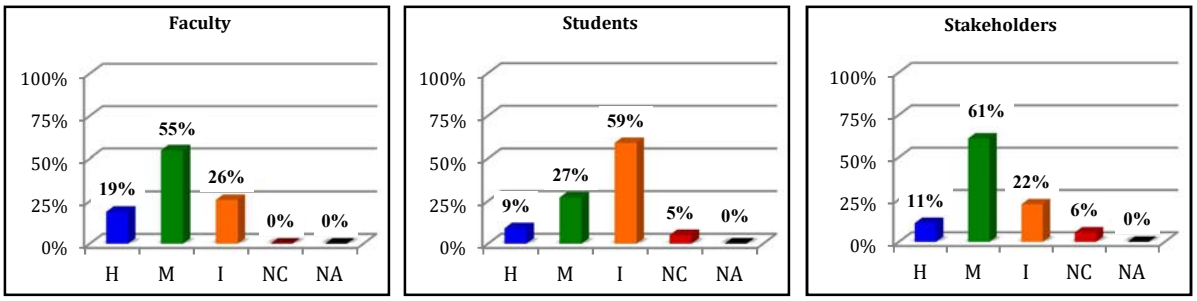
OIE Day 1 Competency: 2.4 Emerging and Re-emerging Diseases

An emerging or re-emerging disease is an infection that results from an organism not previously recognized, or an existing pathogenic agent that has evolved or spread to a new geographic population. Veterinarians who are competent in emerging and re-emerging diseases are able to list common and high-risk pathogens and identify associated clinical signs in animal populations. They understand common risk factors that increase the likelihood of an emerging or re-emerging disease outbreak and are aware of the appropriate reporting authority for suspected cases.

Results:

- While the faculty and stakeholders believe that the average Day 1 DVM graduate is competent in emerging and re-emerging diseases, 64% of the students reported that they are insufficiently or not competent in this area (Figure 13).
- As with other competencies associated with infectious diseases such as TADs (2.2) and Zoonoses (2.3), students do not have confidence in their ability to clinically recognize, nor properly diagnose and manage an emerging or re-emerging disease.
- Students and new graduates reported that they have the knowledge to determine which diagnostic technique to select; however, once selected they indicated that they lack the experience in performing diagnostic techniques or such tests are not available to them as a clinician in Ethiopia.
- Additionally, students claimed insecurity with the reporting process and responding to these emerging and re-emerging diseases even in their local communities.

***Figure 13*: Overall Assessment of 2.4 Emerging and Re-emerging Diseases Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**



- While the majority of the faculty believes that the average UoG graduate is proficient in most aspects of emerging and re-emerging diseases, a higher percentage of faculty (37.5%) stated that the graduates are insufficiently competent in recognizing factors that drive an emergence or cause an outbreak of infectious diseases.

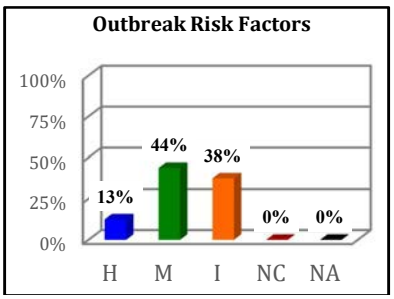
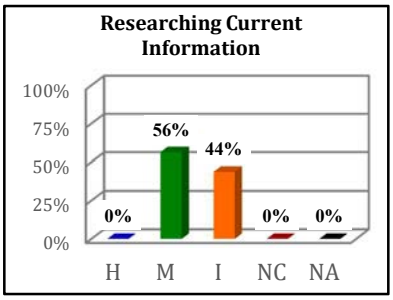


***Figure 14:* The competency level of the average UoG DVM graduate's ability to recognize factors that cause outbreaks according to the faculty.**



- Again almost half of the faculty (43.7%) considers the average DVM graduate insufficiently competent in researching current and up-to-date information for emerging and re-emerging diseases.

Figure 15: **The competency level of the average UoG DVM graduate to research up-to-date information on emerging and re-emerging diseases as ranked by the faculty.**

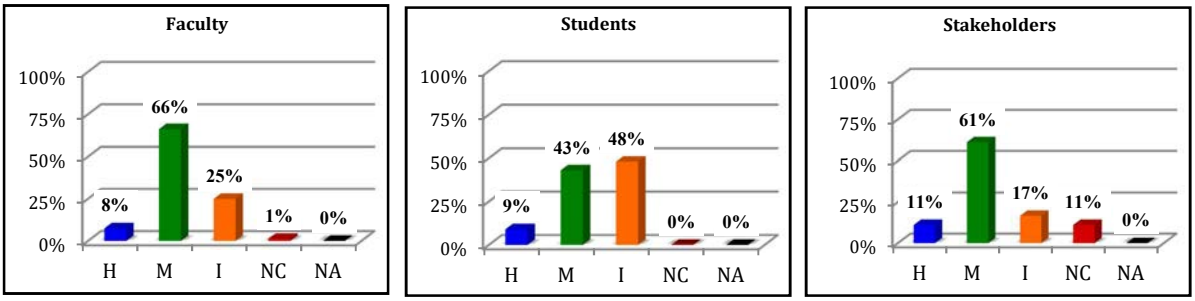
OIE Day 1 Competency: 2.5 Disease Prevention and Control Programs

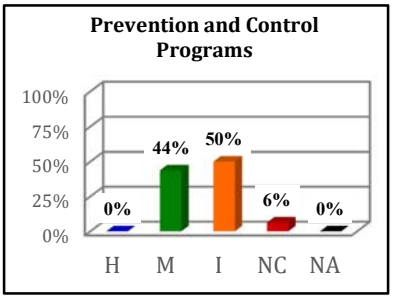
Veterinarians who are competent in disease prevention and control programs are able to institute preventive measures for different animal populations at various population levels. They are able to describe the current national established programs and identify their proper regulatory authority. These individuals are able to competently participate in the implementation of contingency plans to identify and trace exposed animals as well as humane euthanasia of large quantities of animals when advised.

Results:

- Only 52% of students considered themselves competent in developing and applying sanitary programs with their current knowledge level (Figure 16).

***Figure 16*: Overall Assessment of 2.5 Disease Prevention and Control Programs Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**





- While 70% of faculties believe that the average UoG DVM graduate is competent in disease prevention and control programs (Figure 16), over 56% of them consider graduates to be either insufficient or not competent in describing current disease control programs in Ethiopia (Figure 17).

***Figure 17:* The competency level of the average UoG DVM graduate's ability to describe established prevention and control programs as ranked by the faculty.**

- Interestingly, almost 40% of the faculty deem the average DVM graduate insufficiently competent in establishing disease prevention and control programs for farmers or pastoralists.

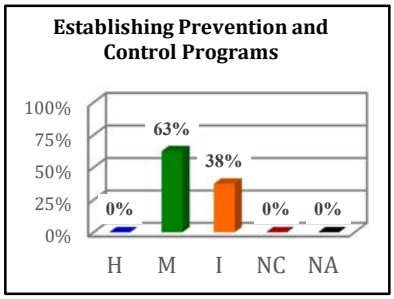
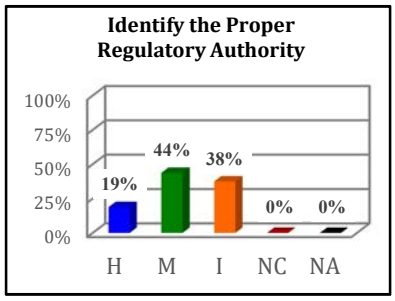


***Figure 18:* The faculty determined competency level of the average UoG DVM graduate's ability to establish prevention and control programs.**



- Identifying the appropriate regulatory authority for Ethiopian disease control programs were another aspect that 37.5% of the faculty think the average graduate is insufficiently competent.

Figure 19: **The competency level of the average UoG DVM graduate to identify the proper regulatory authority for disease prevention and control programs as ranked by the faculty.**

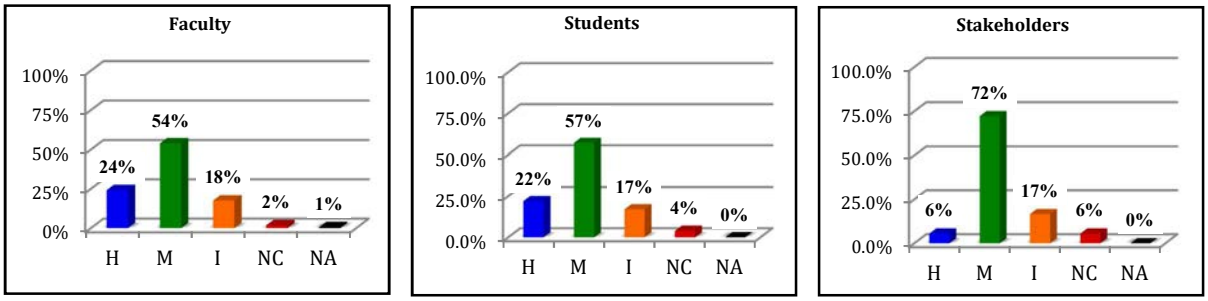
OIE Day 1 Competency: 2.6 Food Hygiene

Veterinarians who are competent in basic food hygiene understand the techniques required to ensure safe and wholesome food of animal origin. They should be able to recognize safe preharvest management practices in animals to reduce the risk of zoonotic food borne pathogens. Competent veterinarians are able to complete an *ante mortem* and *post mortem* examination without extensive support and are familiar with humane slaughter procedures. They should also be knowledgeable with the concepts and practices associated with good sanitary practices and reducing the risk of secondary contamination.

Results:

- More than 77% the faculty, students, and stakeholder consider the average Day 1 University of Gondar DVM graduates to be competent enough in basic food hygiene for the current needs of the country.

***Figure 20*: Overall Assessment of 2.6 Food Hygiene Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**



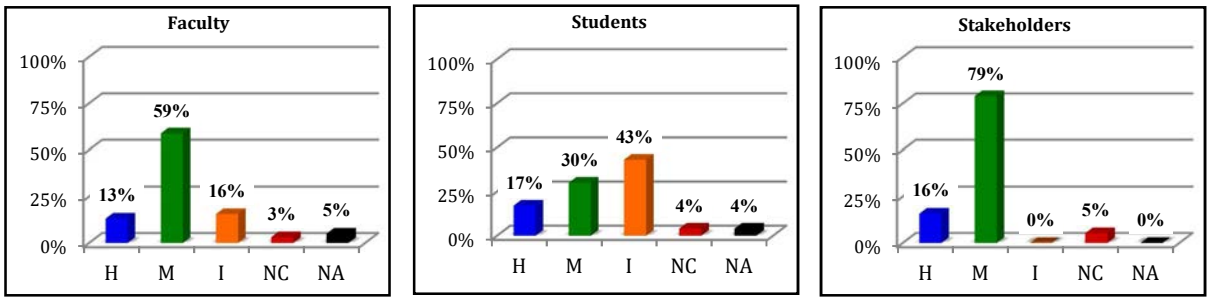
OIE Day 1 Competency: 2.7 Veterinary Products

Veterinarians who are competent in veterinary products understand how to properly use, apply, store, and dispose of various products including drugs, vaccines, and biological items. They should be familiar with the common mechanisms that lead to antimicrobial resistance and the association of antimicrobial use in food animals with the development of antimicrobial resistance in human pathogens. When working with food producing animals, veterinarians need to be knowledgeable in drug withdrawal times to prevent drug residues in animal products. In addition to understanding the use of veterinary products, they should be proficient at maintaining legible, complete, and up-to-date records.

Results:

- While the majority of faculty and stakeholders ranked the average UoG DVM graduate as highly or moderately competent in properly using veterinary products, only 47% of students and new graduates consider themselves competent in this aspect of veterinary practice.

***Figure 21*: Overall Assessment of 2.7 Veterinary Products Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**



- While the majority (71.9%) of faculty believes that the average UoG DVM graduate is competent in veterinary products (Figure 21), 31% reported that the recent graduates were insufficient or not competent in Ethiopian veterinary products laws and regulations (Figure 22).

- In addition, 50% of the faculty reported that the veterinary curriculum did not cover Ethiopian laws and regulations for veterinary pharmaceutical products.

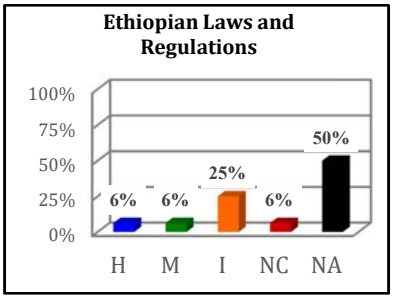
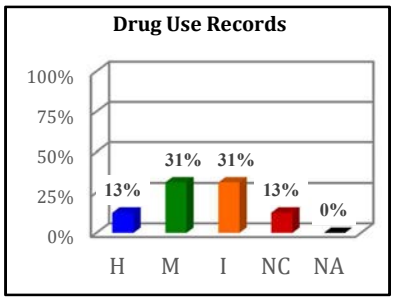


***Figure 22:* The competency level of the average UoG DVM graduate of Ethiopian laws and regulations for veterinary products according to the faculty.**



- Almost half of the faculty (43.75%) believe that the average graduate is either insufficient or not competent with maintaining accurate veterinary product records.

Figure 23: **The competency level, as ranked by the faculty, of the average UoG DVM graduate in maintaining up-to-date and legible drug records.**

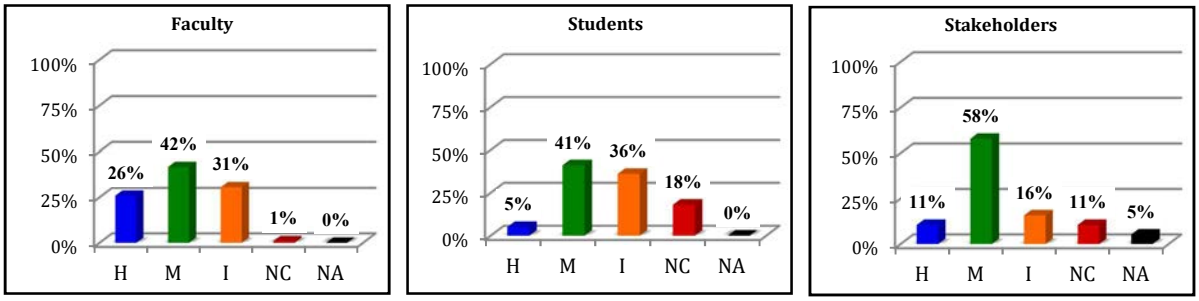
OIE Day 1 Competency: 2.8 Animal Welfare

A veterinarian who is competent in animal welfare is able to use scientific knowledge to determine if an animal is healthy, well nourished, and sufficiently comfortable to express its innate behaviors. Veterinarians, who understand the importance of animal welfare, recognize the scientific and economic implications of animals that are fearful, stressed, or in pain. Using this knowledge, veterinarians can implement corrective actions especially during production, transportation and euthanasia procedures. Competent veterinarians should be able to explain the importance of animal welfare to owners, producers, and farmers, as well as the community at large.

Results:

- Less than 68% of all faculty, students, and stakeholders interviewed believe that the average Day 1 DVM graduate is competent on general concepts of animal welfare based on the current situation in Ethiopia (Figure 24). However, students and faculty stressed that there are no current laws for animal welfare in the country; therefore, students have trouble translating their theory based knowledge to real world situations.

***Figure 24*: Overall Assessment of 2.8 Animal Welfare Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**



- Half of the faculty (50%) believe that the average veterinary graduate is insufficiently competent in explaining the local, national, and international standards and laws for animal production, transportation, and humane euthanasia (Figure 25).

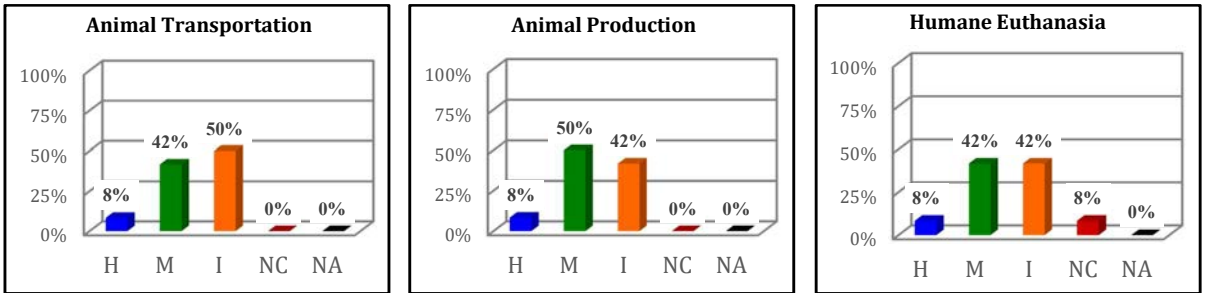
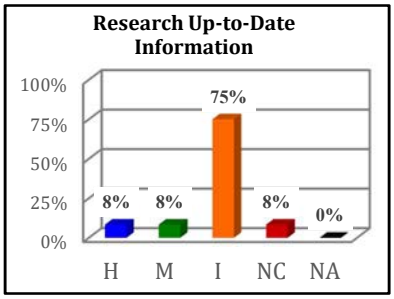


***Figure 25:* The competency level of the average UoG DVM graduate regarding animal welfare standards and regulations for animal transportation, animal production, and humane euthanasia as ranked by the faculty.**



- Seventy-five percent of faculty ranked the average DVM graduate as insufficiently competent in researching animal welfare laws and regulations.

Figure 26: **The faculty determined competency level of the average UoG DVM graduate's ability to research up-to-date information on animal welfare.**

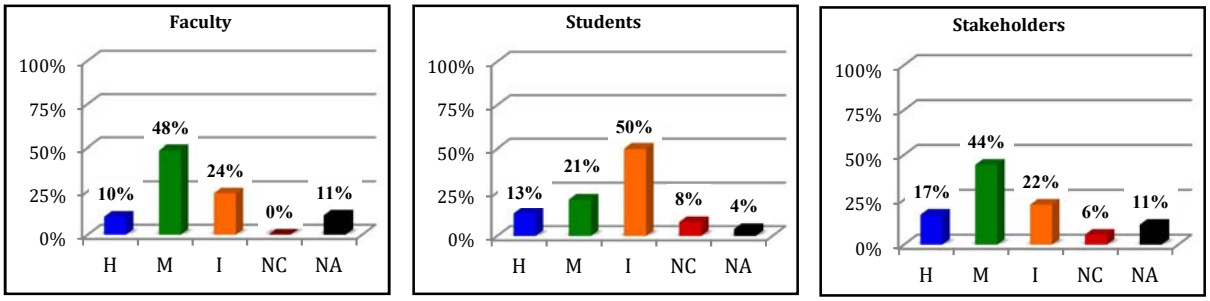
OIE Day 1 Competency: 2.9 Veterinary Legislation and Ethics

Veterinary legislation is the national infrastructure that regulates and governs the veterinary profession to ensure a standard level of care is provided to protect animal health, public health, the environment, and the economy. Veterinarians who are competent in veterinary legislation understand and follow the laws and regulations that apply to the veterinary profession. Veterinarians who are competent in veterinary ethics are able to maintain professional high standards of care and integrity when faced with various ethical dilemmas.

Results:

- Only 34% of students believe that they are competent in Ethiopian veterinary legislation and ethics. In contrast, 61% of the stakeholders and 58% of the faculty reporting that the average Day 1 DVM graduate is competent in veterinary legislation and ethics (Figure 27).

***Figure 27*: Overall Assessment of 2.9 Veterinary Legislation and Ethics Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**



- While the knowledge is taught in the veterinary curriculum, students reported that this course is taught using a theory-based approach; therefore, they do not feel confident applying this knowledge to real situations.

- One third of the faculty reported that the fundamental national veterinary laws and regulations are not included in the current veterinary curriculum. This was supported by the 39% of faculty who claimed that the average DVM graduate is insufficiently competent in describing the veterinary laws and regulations.

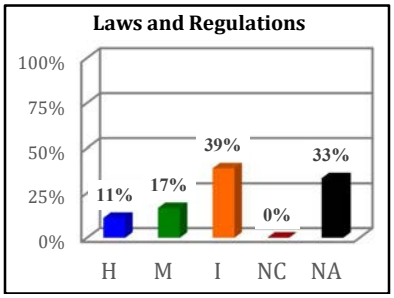
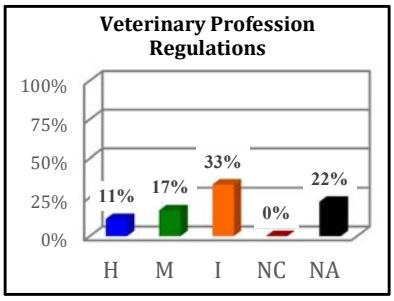


***Figure 28:* The competency level of the average UoG DVM graduate's ability to describe the fundamentals of the national veterinary legislation as described by the faculty.**



- Almost a quarter of the faculty claimed that students are not instructed on how to apply veterinary laws and regulations. Another third stated that the average UoG graduate is insufficiently competent with the laws and regulations that apply to the veterinary profession.

Figure 29: **The competency level of the average UoG DVM graduate to describe specific rules and regulations that apply to the veterinary profession according to the faculty.**

OIE Day 1 Competency: 2.10 General Certification Procedures

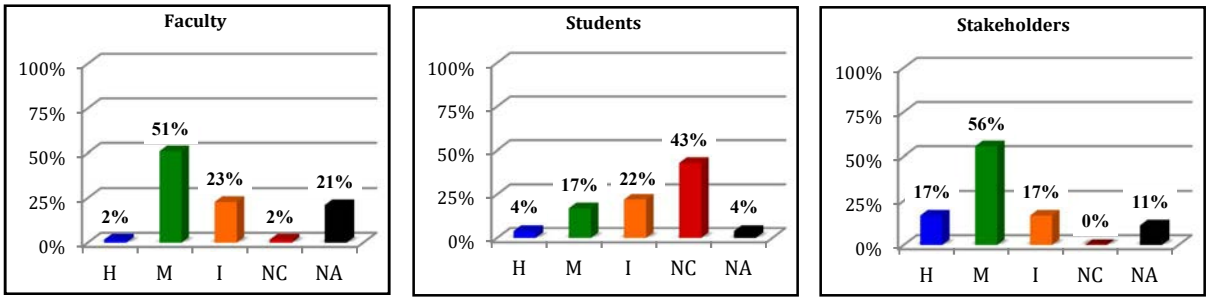
Veterinary competency in general certificate procedures indicates an individual is able to appropriately evaluate animals or animal products for signs of infectious diseases with the purpose of completing a health certificate or other travel paperwork based on the national regulations.

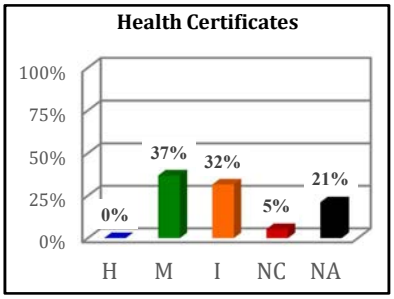
Results:

- Over half of the faculty who participated in the Faculty Retreat reported that the average Day 1 DVM graduate is competent in general certification procedures. Similarly, the majority of stakeholders (72%) who participated in the Evaluation Tool consider the graduates to be competent in general certification procedures (Figure 30).

- Contrastingly, only 21% of the students who partook in the town hall meeting felt that they were competent in general certification procedures.

***Figure 30*: Overall Assessment of 2.10 General Certification Procedures Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**





- While the majority of faculty (68%) reported that the average DVM graduate is competent in evaluating animals for signs of infectious diseases (Figure 30), 37% of the faculty said that the average graduate is insufficient or not competent with recording these finding on a health certificate. Twenty-one percent of the faculty stated that completing health certificates is not included in the current DVM curriculum (Figure 31).

***Figure 31:* The competency level of the average UoG DVM graduate to complete health certificates and other transportation paperwork as ranked by the faculty.**

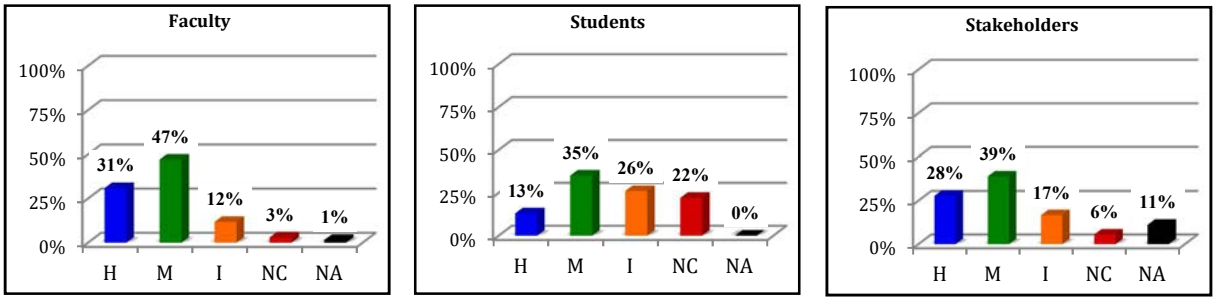
OIE Day 1 Competency: 2.11 Communication Skills

Veterinarians with competent communication skills are able to provide clear and concise verbal and written information to various audiences regarding veterinary and scientific information.

Results:

- Over three-fourths of the faculty and 67% of the stakeholders surveyed believe that the average Day 1 DVM graduate has competent communication skills. However, only 48% of the students who were surveyed believe that they have competent communication skills.

***Figure 32*: Overall Assessment of 2.11 Communication Skills Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**



Advanced Competencies:

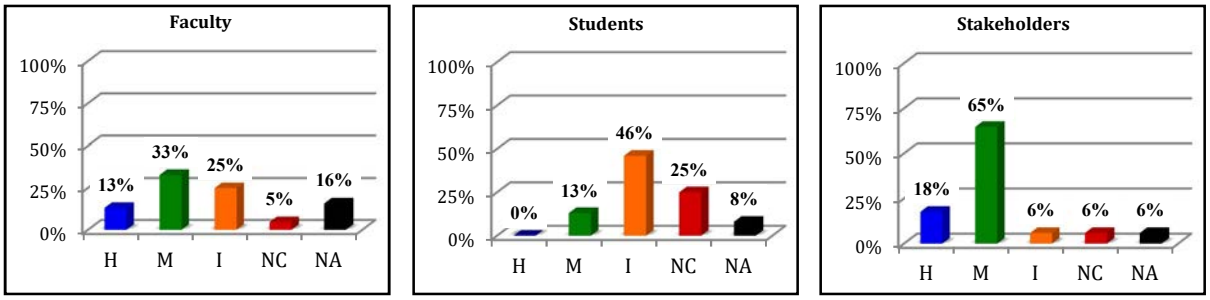
OIE Day 1 Competency: 3.1 Organization of Veterinary Services

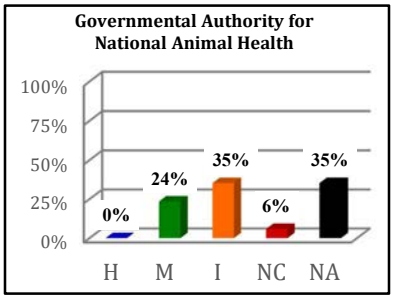
Veterinarians who are competent in the components and organization of veterinary services understand the structure of governmental and nongovernmental agencies that implement the OIE standards and recommendations described in the *Terrestrial* and *Aquatic Animal Health Codes*. Competent veterinarians understand the government veterinary service's role in protecting agriculture, public health, and the economy as well as the laws and regulations that provide them their authority. Understanding the importance of veterinary services supports a strong relationship between private and public sector veterinarians to implement these standards.

Results:

- When rating the competency level of the organization of veterinary services for the average Day 1 University of Gondar DVM graduate, 82% of the stakeholders surveyed believe that they are competent. In contrast, only 48% of the faculty surveyed believe that the average Day 1 DVM graduate is competent regarding the organization of veterinary services. That difference was even higher as the majority (71%) of the surveyed students and new graduates believe that they are insufficiently competent or not competent in the organization of veterinary services (Figure 32).

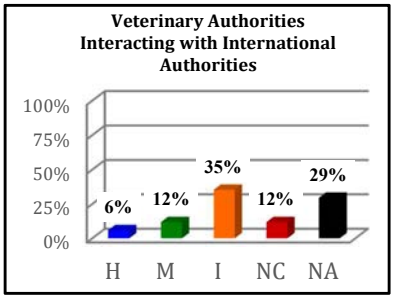
***Figure 32*: Overall Assessment of <u>3.1 Organization of Veterinary Services Competency</u> ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders.**





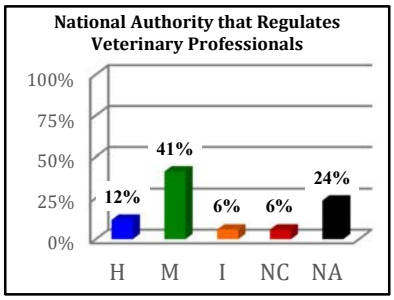
- Over a third (35%) of the faculty who participated in the Evaluation Tool reported that the current veterinary curriculum does not properly teach students about the government authority responsible for ensuring national animal health. Another 35% ranked the average DVM graduate as insufficiently competent in this specific portion of competency 3.1.

***Figure 33:* The competency level of the average UoG DVM graduate's ability to describe the governmental authority for implementing national animal health and welfare measures.**



- Similarly, 35% of the faculty believe that the average DVM graduate is insufficiently competent in identifying the laws and regulations that provide veterinary services (VS) their authority or how the VS interacts with other countries' VS. Twenty-nine percent or more of the faculty said that this is not even included in the veterinary curriculum.

Figure 34: **The average UoG DVM graduate's ability to describe how the Ethiopian Veterinary Authorities interact with international authorities according to the faculty.**



- Surprisingly, 24% of the faculty claimed that the national authority is not included in the veterinary curriculum, but 41% believe that the average graduate is moderately competent in this area (Figure 35). It is apparent that there is an important discrepancy in regards to this issue.

Figure 35: **The competency level of the average UoG DVM graduate to describe the Ethiopian National Authority that regulates veterinary professionals.**

- Thirty-five percent of faculty also reported that the average UoG DVM graduate is unable to identify the laws and regulations that provide the governmental VS. their authority (Figure 36).

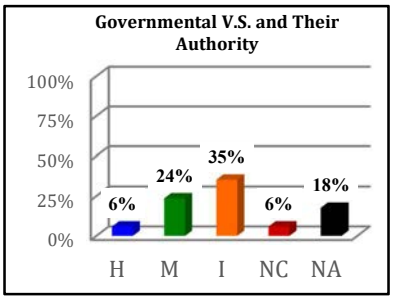


Figure 36: **The competency level of the average UoG DVM graduate's ability to identify the laws and regulations that provide the Governmental VS their authority.**

- The majority (53%) of faculty believe that the average DVM graduate is insufficiently competent in the OIE PVS tool and how it is used to evaluate National Veterinary Services.

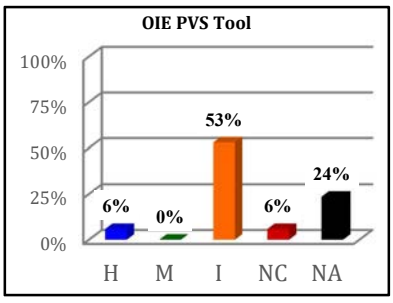


Figure 37: **The competency level of the average UoG DVM graduate regarding the OIE PVS tools used to evaluate National Veterinary Services.**

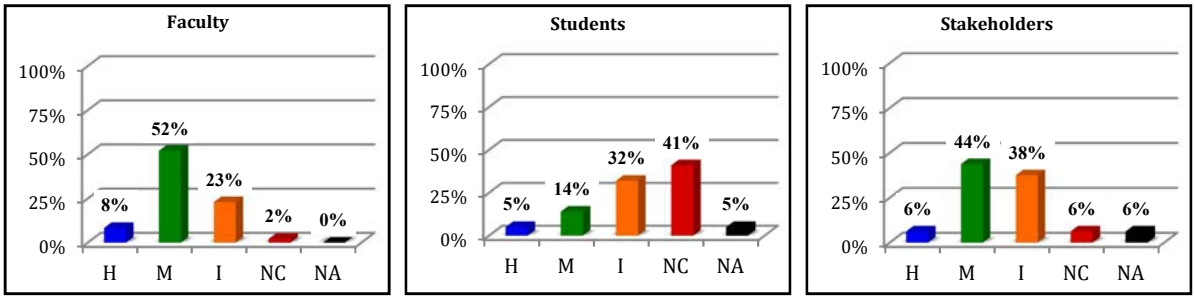
OIE Day 1 Competency: 3.2 Inspection and Certification Procedures

Competent Veterinarians in inspection and certification procedures are effectively able to assess the health status of animals for the purpose of drafting health certificates for transportation, domestic consumption, or exportation based on international and national standards and regulations.

Results:

- Sixty percent of faculty and 50% of stakeholder believe that the average UoG Day 1 DVM graduate is competent in inspection and certification procedures for exportation. However, only 19% of students and recent graduates interviewed were confident in their inspection and certification skills of animals and animal products for exportation (Figure 38).

***Figure 38*: Overall Assessment of 3.2 Inspection and Certification Procedures Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders**



- Almost half of the faculty claimed that the average DVM graduate is insufficient or not competent in assessing the safety of animal products for transportation or exportation health certificates. Additionally, a third of faculty reported that the new graduates are insufficiently competent in completing health certificates based on national and international regulations. (Figures 39 and 40)

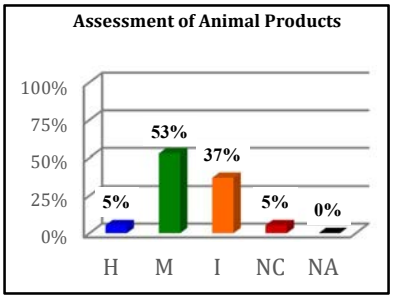


***Figure 39:* The competency level of the average UoG DVM graduate to assess the safety of animal products for health certificates for transportation and exportation.**

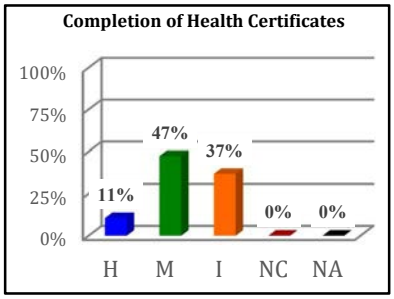


***Figure 40:* The competency level of the average UoG DVM graduate to complete health certificates based on national and international regulations.**

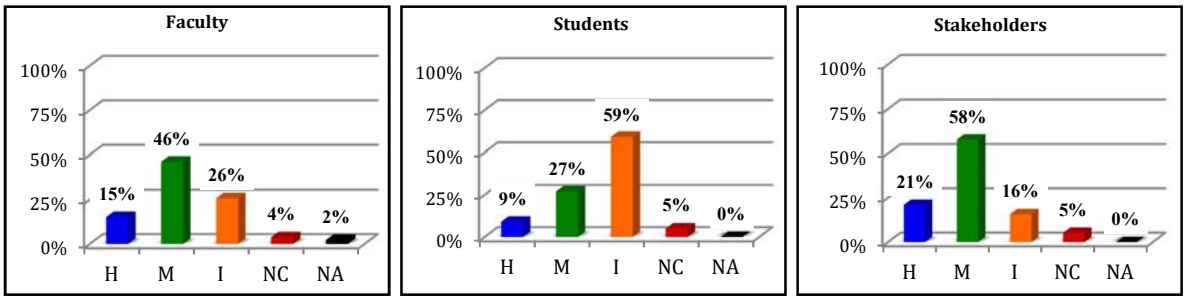
OIE Day 1 Competency: 3.3 Management of Contagious Disease

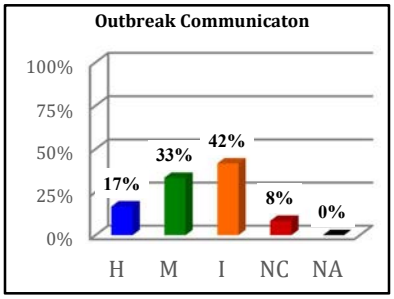
Veterinarians who are able to competently manage contagious diseases are acquainted with monitoring and conducting disease surveillance. These professionals are proficient in outbreak investigations to identify the source and route of transmission. In addition, they are knowledgeable with movement control, quarantine, mass humane euthanasia, carcass disposal, and zoning principles to manage these diseases.

Results:

- The majority of students (54%) who participated in the town hall meeting reported that they are either insufficiently competent or not competent in managing contagious diseases in animal populations. On the other hand, the majority of faculty (61.4%) and stakeholders (79%) consider the average new UoG DVM graduate either highly or moderately competent in managing disease outbreaks (Figure 41).

***Figure 41*: Overall Assessment of 3.3 Management of Contagious Disease Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders**





- Half of the faculty reported that the average DVM graduate is insufficient or not competent with communicating epidemiological information to other public health professionals during an outbreak investigation.

***Figure 42:* The average UoG DVM graduate's ability to communicate epidemiological information to other public health professionals.**

- Forty-one percent of the faculty believe that the average DVM graduate is insufficiently competent with animal identification and movement tracing during an outbreak investigation.

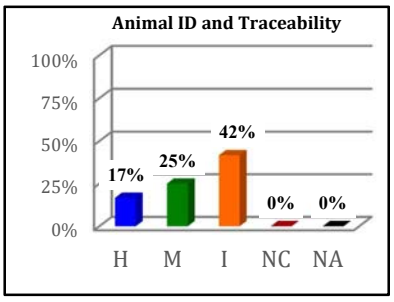
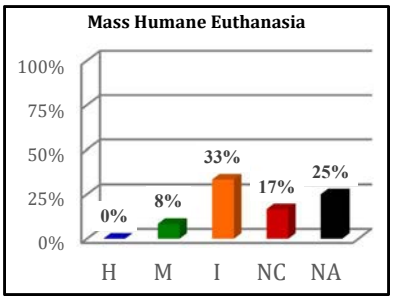


***Figure 43:* The competency level of the average UoG DVM graduate to use animal identification and traceability of animal movement during an outbreak investigation.**



- One quarter of the faculty reported that humane euthanasia of large populations of animals is not taught in the current DVM curriculum. Supporting this percentage is 50% of the faculty who believe that the average DVM graduate is insufficient or not competent in performing humane mass euthanasia. (Figure 44)

Figure 44: **The average UoG DVM graduate's capability to use humane euthanasia methods for large populations of animals.**

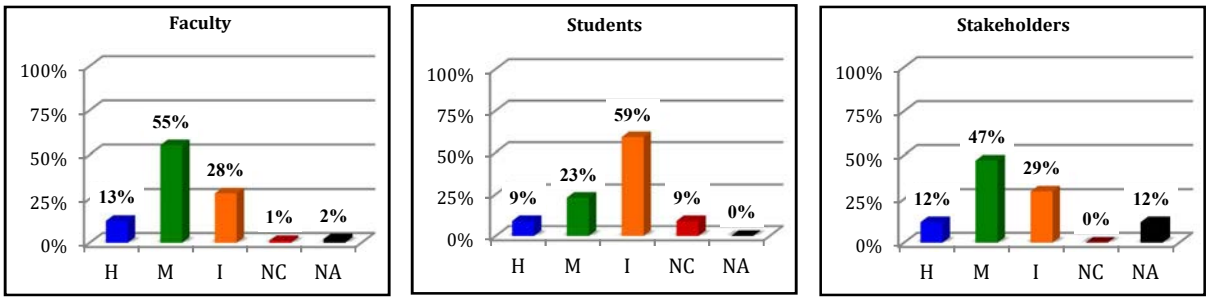
OIE Day 1 Competency: 3.4 Advanced Food Hygiene

Competent veterinarians in advanced food hygiene are proficient in drug residue testing to ensure that animal products are free of adulterants such as antimicrobials, pesticides, hormones, and heavy metals that could pose risk to human health. Furthermore, these veterinarians are able to adequately review food processing sanitation procedures and describe proper preparation or storage of animal-based food products.

Results:

- While both the faculty and stakeholders selected a high to moderate advanced food hygiene competency level for the average Day 1 DVM graduate, 68% of the students did not consider themselves competent in this area.

***Figure 45*: Overall Assessment of 3.4 Advance Food Hygiene Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders**



- One of the weak points, selected by half of the faculty, is that the average DVM graduate is not sufficiently competent to apply appropriate trace back of animal products during outbreaks. (Figure 46)

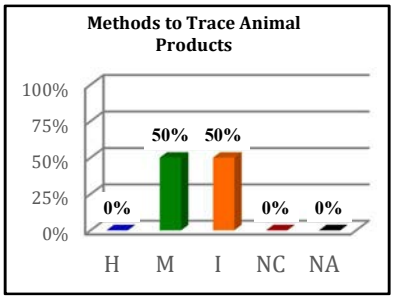


***Figure 46:* The average UoG DVM graduate's ability to appropriately trace animal products.**

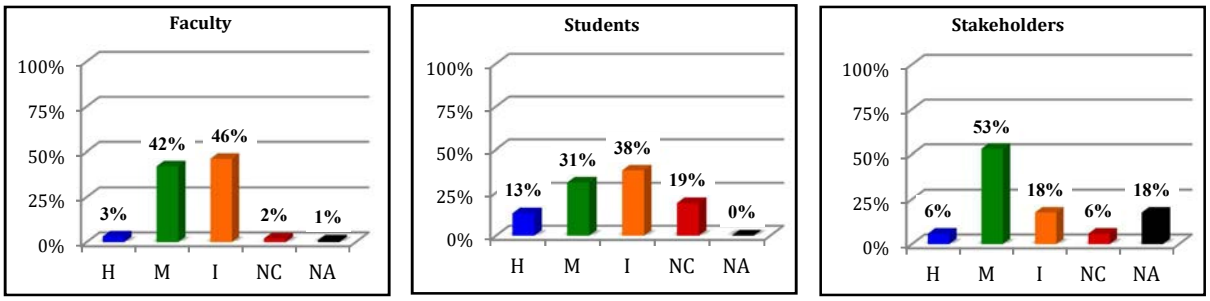
OIE Day 1 Competency: 3.5 Application of Risk Analysis

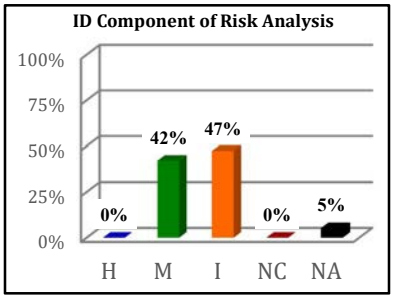
Veterinarians who are competent in the application of risk analysis understand how the likelihood of disease occurrence and magnitude can adversely impact animal and human health as well as the economy. Proficiency in risk analysis is knowledge of the four components: hazard identification, risk assessment, risk management, and risk communication. Using risk analysis, veterinarians can identify adequate veterinary services to protect the health of animals, humans, and the environment.

Results:

- Even though over half of the stakeholders (59%) reported that the average UoG DVM graduate has a clear understanding of the application of risk analysis, 48% of the faculty and 57% of the students indicated that the UoG graduates were insufficiently competent or not competent in regards to this competency (Figure 47)

***Figure 47*: Overall Assessment of 3.5 Application of Risk Analysis Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders**



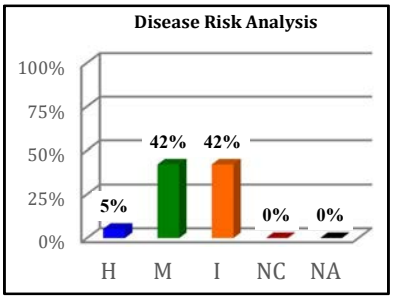


- When ask to identify where that deficiency was, almost 50% of the faculty reported that the average DVM graduate is insufficient in their knowledge of the four main components of risk analysis (Figure 48).

***Figure 48:* The average UoG DVM graduate's understanding of the four main components of risk analysis.**

- Almost half of the faculty claimed that the average DVM graduate is insufficiently competent in understanding how risk analysis is used to assess the risk of animal disease and ensure adequate protection of the health of animals, humans, and the environment (Figure 49 and 50).

***Figure 49:* The average UoG DVM graduate's understanding of risk analysis to assess the risk of animal diseases.**



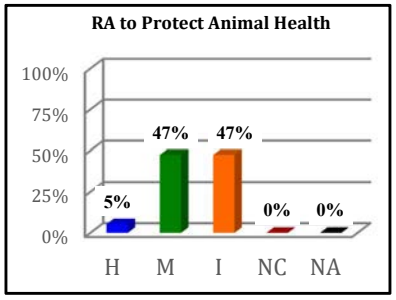


Figure 50: **The average UoG DVM graduate's understanding of risk analysis to ensure adequate veterinary services to protect animal health.**

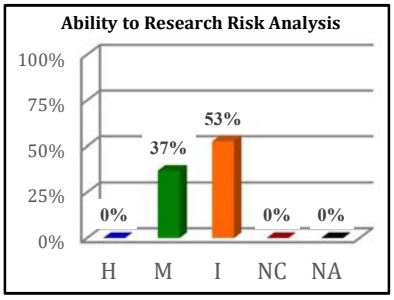


Figure 51: **The competency level, according to the faculty, of the average UoG DVM graduate's ability to research updated information on risk analysis.**

- Finally, over 50% of the faculty reported that the average DVM graduate is insufficiently competent in researching up-to-date information on risk analysis (Figure 51).

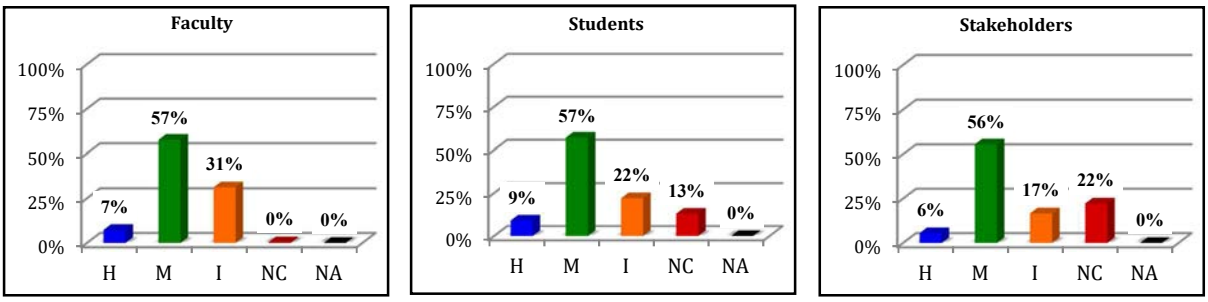
OIE Day 1 Competency: 3.6 Research

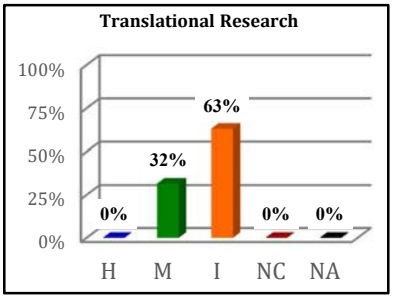
Veterinary graduates who are competent in research are able to develop and test a hypothesis along with design a study or experiment using scientific methods. Then, they are able to determine and use the appropriate statistical analysis based on the type and amount of data collected. From this information, a competent veterinarian should be able to review the analysis performed and interpret the results as well as establish the strength of the conclusion.

Results:

- The majority of faculty, students, and stakeholders, who participated in the evaluation, believed that the average UoG DVM graduate is highly or moderately competent in basic public health and preventive medicine research. (Figure 52)

***Figure 52*: Overall Assessment of 3.6 Research Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders**





- Even though the majority of faculty, students, and stakeholders believe that the graduates are proficient in this competency, over half of the faculty reported that the average UoG DVM graduate is insufficiently competent in understanding the concept of translational research (Figure 53).

***Figure 53:* The average UoG DVM graduate's ability to understand the concept of translational research according to faculty surveyed.**

- Similarly, almost three-fourths (68%) of the faculty reported that the average UoG DVM graduate is insufficiently competent to select the appropriate statistical test based on the available data (Figure 54).

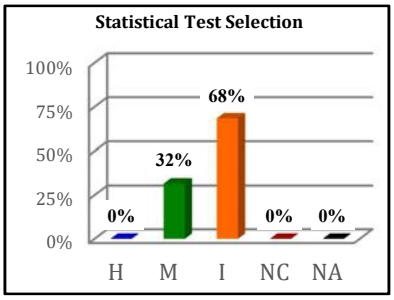
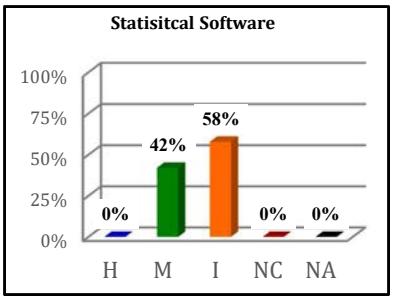
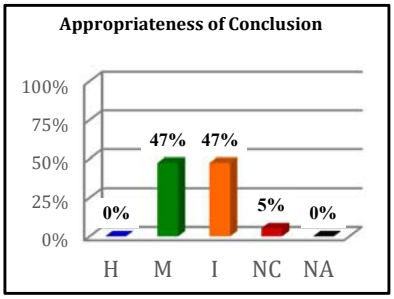


***Figure 54:* The average UoG DVM graduate's ability to determine the appropriate statistical test according to surveyed faculty.**



- A large proportion of the faculty (58%) reported that the average UoG DVM graduate is also insufficiently competent with the common statistical software packages that are frequently used to analyze data (Figure 55).

Figure 55: **The average UoG DVM graduate's ability to use common statistical software packages.**



- Finally, determining the appropriateness of the study design and the strength of a conclusion is another area that the majority (52%) of faculty reported that the average UoG DVM graduate was insufficiently competent. (Figure 56)

Figure 56: **The average UoG DVM graduate's ability to determine the appropriateness of the design and strength of conclusion.**

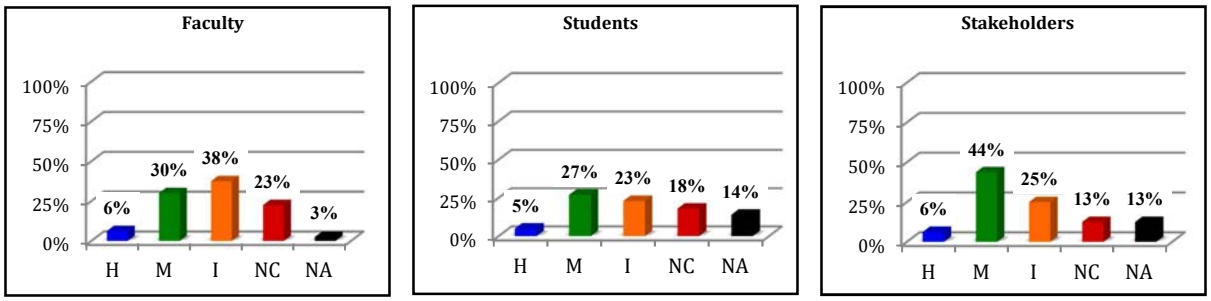
OIE Day 1 Competency: 3.7 International Trade Framework

Competency in international trade framework implies that a veterinarian understands the laws and regulations that govern safe international trade of animals and animal products. These veterinarians should be acquainted with the World Trade Organization (WTO) Sanitary and Phytosanitary (SPS) Measures as well as the roles and responsibilities of the OIE and the Food and Agriculture Organization (FAO) in developing science-based regulations for international trade.

Results:

- While 50% of the stakeholders believe that the average UoG new DVM graduate is highly or moderately competent in the framework for international trade, the faculty and students predominantly reported that they were insufficiently or not competent in the laws and regulations for international trade of animals and animal products (Figure 57).

***Figure 57*: Overall Assessment of 3.7 International Trade Competency ranked from High [H], Moderate [M], Insufficient [I], Not-Competent [NC], or Not in the Curriculum [NA] by faculty, students, and stakeholders**



- Almost half of the faculty stated that the average UoG DVM graduate is either insufficiently competent or not competent in their understanding of the OIE's roles and responsibilities. Furthermore, 10% of the faculty reported that this topic is not even in the UoG veterinary curriculum (Figure 58).

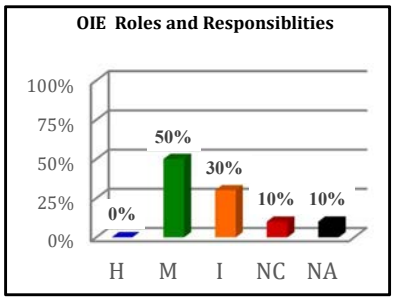
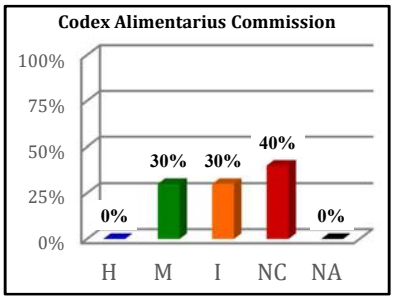
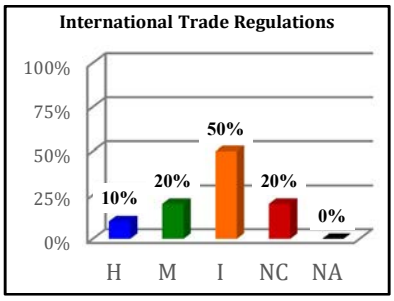


***Figure 58:* The average UoG DVM graduate's knowledge of the OIE roles and responsibilities for developing science-based regulations for international animal trade.**



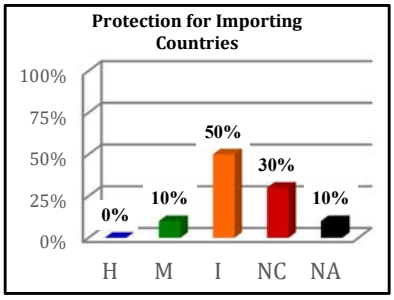
- Seventy percent of the faculty claimed that the average UoG DVM graduate was unaware of the *Codex Alimentarius* as well as how its Commission develops science-based regulations for international trade of animal origin food products (Figure 59)

Figure 59: **The average UoG DVM graduates understanding of the *Codex Alimentarius* Commission.**



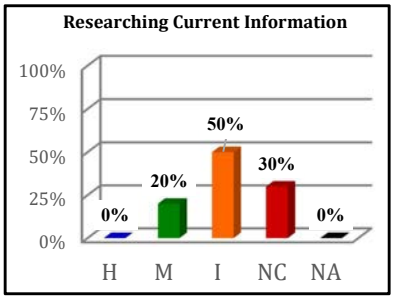
- Similarly, the majority (70%) of the faculty reported that the average UoG DVM graduate is either insufficiently or not competent with the current regulations for international trade of animal products (Figure 60).

Figure 60: **The average UoG DVM graduates understanding of the current regulations for safe international trade of animal products.**



- In the same line, 80% of the faculty recorded their graduates were insufficient or not competent with international control mechanisms and certification procedures for importing products, with 10% of faculty indicating that this topic is not included in the curriculum (Figure 61).

Figure 61: **The average UoG DVM graduates awareness of important control mechanisms and certification processes to protect the health of importing countries.**



- Similar to other competencies, the majority of faculty reported that the average UoG DVM graduate is either insufficiently or not competent in researching the current regulations for international trade (Figure 62).

Figure 62: **The ability of the average UoG DVM graduate to research current information on international trade.**

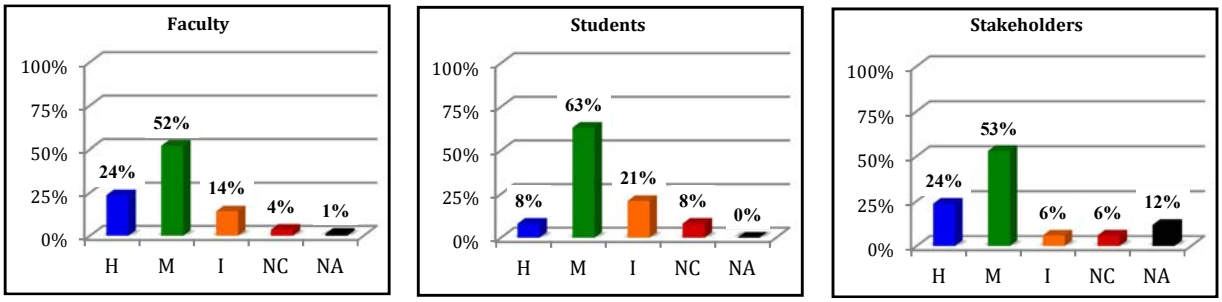
OIE Day 1 Competency: 3.8 Administration and Management

Veterinarians who are competent in administration and management are able to plan, organize, and lead to efficiently achieve common goals and objectives. This includes effective written and verbal communication skills in at least one OIE language as well as public communication skills to deliver public service announcements and press releases.

Results:

- The majority (>70%) of all three groups believe that the average Day 1 UoG DVM graduate is highly or moderately competent in administration and management (Figure 63).

***Figure 63*: Overall Assessment of 3.8 Administration and Management Competency ranked High [H], Moderate [M], Insufficient [I], No-Competent [NC], or Not in the Curriculum [NA] by faculty, students and stakeholders**



Section III
Conclusions and Recommendations

Recommendations Based on the Veterinary Curriculum Mapping:

The UoG Veterinary Curriculum includes the majority of the recommended OIE competencies. However, several points for improvement were identified:

- Only three competencies (General Certification Procedures (2.10), Inspection and Certification Procedures (3.2), and International Trade Framework (3.7)) were not included in the current UoG curriculum.
- Three courses (Animal welfare, Biostatistics, Veterinary Epidemiology) were considered misaligned with the OIE recommended timeline or year of placement in the Curriculum.
- Important core skills (i.e. risk analysis) that are backbones of multiple OIE competencies are not part of the current curriculum.
- In multiple courses, where several OIE competencies should be covered, it was unclear if such competencies were covered or not based on their description alone.

Based on this analysis, the following recommendations were drawn:

- **Inclusion in the UoG curriculum of the three OIE Day 1 Competencies currently not covered**: General Certification Procedures (2.10), Inspection and Certification Procedures (3.2), and International Trade Framework (3.7). The lack of inclusion of these competencies in the different courses throughout the curriculum was reflected later by their lower competency level of Day 1 Graduates as reported by the faculty, students and stakeholders.

- It is recommended the identified discrepancies or misalignments be fixed in future revisions of the UoG curriculum, among them:
  - **Move the Veterinary Epidemiology courses earlier in the UoG veterinary curriculum.** Presenting this information at the beginning of the curriculum could strengthen the student's foundation and understanding of disease control and prevention or management of contagious diseases, thus reassuring their confidence in these areas. It will also reinforce their interpretation of diagnostic tests and techniques that are introduced and applied throughout the DVM training.
  - Similarly, **Animal welfare is recommended to be taught in the 1st and 2nd year of the DVM curriculum**, but is currently taught in the 5th year of the UoG veterinary curriculum. The earlier the students learn about the main concepts and benefits of animal welfare, the earlier they will apply in everyday situations through their professional training.
  - **Biostatistics is also recommended to be taught in the first or second year of the DVM program.**

- As indicated in section I, there is a lack of in-depth teaching of some important topics, among them:
  - Risk analysis (RA) is not currently covered in the UoG curriculum; therefore, **it is highly recommended to include an introduction to risk analysis**, describing its

main four components and the role of RA in protecting human, animal and environmental health. The classroom content should be created following the OIE Risk Analysis Guidelines, either as a module inside one of the current courses or as a standalone elective.
    - Environmental health and biological waste management were also not included in the curriculum; therefore, the inclusion of these topics in the current class associated with production management is recommended.

- **It is recommended to update the UoG curricular description of multiple courses** (i.e. parasitology, microbiology, virology, pharmacology and animal production systems) to better reflect and identify the main OIE competencies covered (see Section I and Appendix A for details).

- The OIE recommends that language and communication training are actively implemented throughout the program using multiple courses and activities, including public speaking, composition writing, medical record writing, critical reading, and critical thinking. Therefore, **it is highly recommended to add additional communication courses throughout the veterinary curriculum**, specifically focusing on English writing and risk communication for different audiences as well as public speaking and scientific writing.

- Finally, because we could not assess how the competencies are taught and the pedagogy used in their delivery, **it is highly recommended to perform external, peer-review, individual course audits** to determine the depth and detail of the OIE competencies covered in each of the courses. These audits can also be used to analyze and study the pedagogy used in each subject, specifically in those courses where the OIE competencies are covered but the students still do not feel confident/competent in their abilities.

Recommendations based on the Proficiency Evaluation of Day-1 Competencies

Overall recommendation

- One consistency across the evaluation of all nineteen OIE Day 1 Competencies is the insufficiency of the average new graduate's ability to search for up-to-date information in different areas of veterinary preventive medicine such as infectious diseases, laws and regulations, and control programs. There could be multiple reasons for this finding as identified by the evaluation tool. For instance, students may not have access to various research sources or subscriptions to journal articles during their veterinary training. Therefore, **providing access to a wide range of literature sources** (in both paper and digital) could improve this competency level. Another explanation could be a lack of specific literature research during the veterinary curriculum, which could be resolved by **incorporating literature search techniques into the early years of the veterinary curriculum.** This change could provide the required foundation for students to build on after graduation, provided they have access to a wide range of literature sources.

- One of the major challenges is that the curriculum is mostly theory than practical. In many instances, faculty and stakeholders expressed confidence in graduate competencies, while the graduates still considered themselves insufficiently or not-competent. While an audit of courses may identify further gaps which could improve the education, the consistency of the lack of student confidence may also stem from a lack of hand-on activities and broad range of experience. The UoG experience is largely based on theoretical training with limited practical, hands-on experience due to limited access to resources, including equipment, supplies and reagents. For example, detection of subclinical mastitis using the California Mastitis Test (CMT) is done while milking a cow. However, because of the lack of the CMT reagent to perform the reaction, the instructor can only show theoretical how the sample will be collected in the pallet, and then show pictures on how the reaction will looks like. Additional problems listed were the absence of well-equipped laboratories, as well as the skill level of laboratory technicians and staff is not as required to provide a high level of training. In conclusion, even though practical demonstration for many courses are given, there is indeed more to be done to enhance the skills of the UoG graduates.

OIE Day 1 Competency: 2.1 Epidemiology

- Based on the results of the Evaluation Tool for the OIE epidemiology competency recommendations, the average UoG DVM graduate is appropriately instructed in the veterinary curriculum. Nevertheless, **it is recommended to reinforce and emphasize how to properly use epidemiology tools to evaluate diagnostic tests** such as sensitivity, specificity, positive and negative predictive values, and how these factors apply to various diseases and screening programs. This could further strengthen the average new DVM graduate's proficiency in regards to using epidemiological concepts for disease control.

OIE Day 1 Competency: 2.2 Transboundary Animal Diseases

- While the basic knowledge to recognize and manage transboundary animal diseases is provided in the UoG curriculum, new DVM graduates reported lacking the confidence to apply that knowledge in a clinical setting. Therefore, **it is recommended to modify the current pedagogical methods to include scenario-based training such as a mock outbreak investigation(s) of an important(s) TAD(s).** These cases will provide graduates hands-on experience under a controlled environment, which could help to improve graduate confidence in identifying and managing these cases in practice.

- Currently training of proper reporting authority and chain of command of TADs is not part of the UoG veterinary curriculum. Therefore, **it is recommended to include the reporting process of TADs into the courses that cover these diseases, and to make it an integral part of the training scenarios to be developed**.

OIE Day 1 Competency: 2.3 Zoonoses (including food borne diseases)

- Interpreting zoonotic and food borne disease diagnostic techniques was considered an area where the average new graduate lacked competence. Therefore, the zoonotic disease classes need **to include a more in-depth diagnostic component that emphasizes the practical part as well as interpretation and application of diagnostic test results.**

OIE Day 1 Competency: 2.4 Emerging and Re-emerging Diseases

- Even though the curriculum includes important concepts needed for a young veterinary professional to be competent in emerging and re-emerging diseases, they still lack confidence in identifying and managing these diseases. The main reason the students alleged was the fact that the delivery of such content is merely theory-based, and that they lack hands-on opportunities. Consequently, as with TAD competency (2.2), **scenario-based and concept application training methods should be added to courses that include emerging and re-emerging disease topics**.

- While the average new graduate is comfortable with determining an appropriate diagnostic technique to identify emerging and re-emerging diseases, they are inexperienced with performing such tests or they face the problem that such tests are not available to the average Ethiopian clinician. To improve this situation, **it is recommended to expand the diagnostic laboratory services offered at the University of Gondar.** By doing so, students would obtain hands-on training in performing as well as interpreting results of diagnostic techniques, while at the same time improving the veterinary services for the region**.** Expansion of the diagnostic laboratory services at the University will help to improve diagnostic options for local veterinary clinicians as well as producers and animal owners.

- Comparable to TADs and zoonotic diseases, new veterinary graduates struggle with understand the proper reporting chain for emerging and re-emerging diseases. Hence, **adding different training opportunities which require knowing the proper**

reporting authority and chain of command of TADs and zoonotic diseases, emerging and re-emerging disease would be beneficial.

OIE Day 1 Competency: 2.5 Disease Prevention and Control Programs

- The majority of faculty, as well as the students, reported that the average DVM graduate is unaware of their roles and responsibilities in the current disease prevention and control programs at the country level. As a result, **this topic of national control and eradication programs, their plans and active components, should be added to the courses that incorporate disease prevention and control.** As part of this intervention, government veterinarians, who currently are involved in the national programs, could be included in the curriculum so they can share their experiences directly with the students. They could also work as an additional resource for new graduates.

- The students, supported by the faculty responses, indicated that they were insufficiently competent in developing disease prevention and control programs for different productions systems and animal populations. **The addition of experiential-learning and concept application training methods, focused on developing sanitary program for various animal populations, would strengthen their practical/applied skills.** This coursework could provide students with hands-on training in establishing prevention programs using commonly available products and procedures that are available to the average Ethiopian veterinarian.

OIE Day 1 Competency: 2.6 Food Hygiene

- Based on the results from the Evaluation Tool for 2.6 Food Hygiene, the UoG DVM curriculum sufficiently fulfills the competentency in basic food hygiene for the current needs of the country at this time.

OIE Day 1 Competency: 2.7 Veterinary Products

- The faculty recorded that Ethiopian veterinary product laws and regulations are currently not taught in-depth in the veterinary curriculum, which explains why the students were not confident in this issue. In addition, it is interesting to highlight that Ethiopia has very few laws and regulations for dispending veterinary pharmaceutical products, especially in regards to withdraw times, environmental impact, among others. This further impacts the confidence of the students in regards to the proper selection and use of veterinary products. **Therefore, in addition of reinforcing this topic and its related nuances in the current curriculum, it is also recommended to use basic laws and regulations from developed countries as a foundation for the coursework**.

- It was also determined that the average DVM graduate is insufficiently competent in maintaining legible, complete, and up-to-date records in regards to veterinary products use. While there are no national laws that regulate and enforce this, **teaching new graduates how to properly add veterinary products to medical records** will assist with managing disease prevention and control programs as well as improve

communication among public health professionals. For example, in the veterinary pharmaceutical course at Ohio State, veterinary students are taught to record all pharmaceutical information in the medical record so that the next veterinary professional working with that animal could repeat the exact procedure. Then during clinical rotations, the lead clinician evaluates the medical record for proper recording of pharmaceutical products. The students are provided with feedback on the completeness of their medical record, thus re-enforcing their classroom training.

OIE Day 1 Competency: 2.8 Animal Welfare

- While the veterinary curriculum offers an animal welfare course, the average DVM graduate is considered insufficiently competent in this OIE Day 1 competency. Therefore, **adding case-based courses or content that train veterinary students on how to educate farmers, clients, and producers on animal welfare concepts based on OIE and national standards** could improve their ability to apply the concepts taught in the curriculum. Practicing the application of these theories in a controlled environment, will strengthen students' approach to these cases in practice.

OIE Day 1 Competency: 2.9 Veterinary Legislation and Ethics

- Even though veterinary legislation and ethics is taught in the veterinary curriculum a lower percentage of new graduates were considered competent in this area. Students reported that the course is taught using a theory-based approach but they struggle with applying this knowledge in clinical practice. By adding case-based pedagogy methods dealing with important ethical and legal issues to the curriculum, the student may be more successful with transferring this knowledge to real life situations, thus improving their competency level as well as confidence.

- One third of the faculty reported that the fundamentals of the Ethiopian veterinary laws and regulations are not discussed with sufficient depth and practical application in the veterinary curriculum. This is a very important gap within the curriculum. In addition, Ethiopia lacks some important veterinary laws and regulations dealing with major OIE competencies such as drug withdraw times, drug residues, quarantine, control of animal movement, animal identification, traceability, etc. Therefore, as suggested previously, incorporating established laws and regulations from more agricultural developed countries in the veterinary curriculum may help build a foundation for this course and UoG graduates.

OIE Day 1 Competency: 2.10 General Certification Procedures

- This point showed a major disconnection between the faculty and stakeholder perceptions and the actual curriculum. Even though these groups indicated that the average new graduate is competent in general certification procedures, the curriculum mapping showed that such topic is not currently been covered. This explains why the students and new graduates did not consider themselves proficient in this subject. To fill this gap, **it is necessary to develop material as well as hands-on and training-based opportunities to train DVM students on the steps and protocols used to**

screen and identify infectious disease and appropriately record this information on a health certificate.

OIE Day 1 Competency: 2.11 Communication Skills

- While the majority of faculty, students, and stakeholders claim that the average new DVM graduate is competent in their written and oral communication skills, almost one-fourth of the students ranked themselves insufficient. This is another area that can be developed with practices and further activities. **Incorporating mock oral and written exercises throughout the curriculum could improve their proficiency and confidence.** For instance, at OSU, veterinary students are required to take a communication class where they practice presenting scientific information to various mock audiences and then are critiqued to improve their skills. The scenarios that they practice include one on one communication with a client, group presentations, as well as written articles such as client handouts and public service announcements. This course gives new graduates a stronger foundation in communicating veterinary topics to other public health professionals and the general public.

Recommendations for Advanced Competencies:

OIE Day 1 Competency: 3.1 Organization of Veterinary Services

- The faculty reported that the current veterinary curriculum does not properly cover the veterinary organizations that are responsible for ensuring health of the nation's animal populations. **Therefore, incorporating the available agencies as well as the laws and regulations that provide them their authority into the veterinary curriculum** could greatly improve new DVM graduates competency levels. Being aware of these agencies and their roles in Ethiopia's veterinary services, could also be a mentoring resource for new graduates and allow them to identify potential career paths after graduation.

OIE Day 1 Competency: 3.2 Inspection and Certification Procedures

- All three interviewed groups reported that the average DVM graduate was either insufficient or not competent in the competency of advanced inspection and certification procedures. While Ethiopia does not have any laws or regulations for completing in-country health certificates, it does have rules that regulate health certificates for exportation. Consequently, **it is recommended to incorporate into the curriculum hand-on training on laws and procedures on how to evaluate and record findings of animals and animal products to produce health certificates for exportation.** Training veterinarians with these skills could ensure safer animals and animal products for exportation, thus opening more trade opportunities and strengthening the Ethiopian economy.

OIE Day 1 Competency: 3.3 Management of Contagious Diseases

- It appears the veterinary curriculum incorporates the necessary material to train new veterinarians in the management of contagious diseases. However, the course work appears to be more theory based, which can be difficult to translate into real-life situations. **By adding scenario-based methods, such as mock outbreak investigation, focused on how to approach and manage outbreaks of contagious diseases to corresponding courses,** students will learn to apply the information to a hands-on situation under the guidance of their instructors. With this teaching method, students will participate in all the stages of an investigation including identifying, animal tracing, collecting and analyzing epidemiological information, as well as communicating with all the necessary agencies, health professionals and general public. This course could be added to the core curriculum for final year veterinary students or offered as a continuing education option for young veterinary professionals and other public health officials.

OIE Day 1 Competency: 3.4 Food Hygiene

- When evaluating advanced food hygiene, the faculty stated that the average new DVM graduate was insufficiently competent in applying the appropriate methods for tracing animal products. While the faculty reported that it is taught in veterinary curriculum, improving the methods by which it is instructed could improve the students' level of

proficiency. Many of the courses appear to be theory-based, which can be difficult to apply to clinical practice. This can be resolved by **adding more case-based methods or experiential opportunities to the advanced food hygiene classes.**

- Based on the OIE description of this competency, new graduates need to understand the importance of veterinary product residues in animal products for human consumption. However, it was mentioned by the faculty that there are no Ethiopian laws and regulations for animal tissue residues. Without laws and regulations to enforce this public health threat, practicing veterinarians may struggle with applying these concepts in practice. Therefore, **it is recommended to include modified/adapted standards of veterinary drug residues that are followed by other countries to protect public health and the environment in the UoG veterinary curriculum.** Such modifications should be done to fit and represent current Ethiopian situations.

OIE Day 1 Competency: 3.5 Application of Risk Analysis

- The application of risk analysis was another competency that all three interviewed groups reported a high percentage of new DVM graduates as insufficient or not competent. Risk analysis is taught as part of the veterinary epidemiology course in the veterinary curriculum; however, it is only an introduction of the concepts. Therefore, **it is recommended that a risk analysis class be added as an elective for students who plan on a career in veterinary public health or as an advanced continuing education course for veterinary and other health professionals in Ethiopia.**

OIE Day 1 Competency: 3.6 Research

- The majority of faculty, students, and stakeholders considered the average DVM graduate moderately or highly competent in research techniques. However, a high percentage of faculty remarked that the average graduate struggles with determining the appropriate statistical test based on the available data as well as assessing the strength of the conclusion. **Moving the epidemiology and biostatistical courses from the 5th year to the first year in the veterinary curriculum will provide the students more time in the educational career to master such concepts during their clinical rotations.** Additionally, adding a journal review course or journal club to the curriculum would give the students experience reviewing other research projects for appropriateness of statistical tests and strength of conclusions. This course could also continue to help veterinary students build their communication skills by evaluating other authors' writing skills.

OIE Day 1 Competency: 3.7 International Trade Framework

- While the stakeholders considered the average new graduate to be competent in their understanding of international trade laws and regulations for Ethiopia's needs, the faculty and students reported that they were insufficiently competent in the knowledge of the organizations and documents that establish these laws and regulations. The faculty even reported that the laws and regulations developed by the OIE are not currently covered in the veterinary curriculum. Therefore, as a first step, **it would be**

advisable to add basic description and information to the current courses regarding agencies and institutions involved in International Trade. Then, **it is recommended to develop an elective course or an advanced continuing education course for veterinary student and/or veterinary professionals who work or plan on working in this aspect of the profession.** Thus, strengthening Ethiopia's international trade opportunities in the long term.

OIE Day 1 Competency: 3.8 Administration and Management

- Based on the results from the Evaluation Tool for 3.8 Administration and Management, the UoG veterinary curriculum sufficiently fulfills the administration and management competency for the average DVM graduate.

Other important findings

During the described activities of curricular mapping and competency evaluation, additional information was collected that certainly influences the competency and confidence of recent UoG veterinary graduates. These topics will be further discussed in the Focus Forward and the result of such discussion and analysis will be added to the final action plan.

1. Lack of motivation on part of the veterinary students

Both faculty and students reported a very severe lack of motivation that affects the learning process. Among the issues reported that could explain the low motivation recorded were:

a. The current admission process of students to the UoG-FVM is selecting individuals who are not the keenest or enthusiastic to attend veterinary school (i.e. their first choice was either medicine, nursing, or other career, rather than veterinary medicine). Therefore, they are not highly motivated in pursuing this degree, which is reflected in the way how they approach classes and interact with the faculty.
b. The students also report lack of available vocations or occupations to apply the newly earn veterinary degree. They indicated that there are no clear career paths after veterinary school that allow them to prepare or target as they go through the professional curriculum.
c. Lack of good mentors or role models is another important limitation reported by current and recently graduated veterinarians. The students also indicated that while most of the available careers are within the federal service, contact with the federal veterinarians is limited, further dificulting the identification of professional career paths.

2. Teaching is mostly theory-based

Many students, and even faculty, indicated at different points of the site visit that many of the OIE competencies were reported to be primarily delivered thorugh theory-based teaching with limited clinical and experiential opportunitites for them in both classroom and field settings. Such deficit was especially notice in competencies with a clinical component. Some of the reasons listed were:

i. There are no diagnostic or service laboratories at the university and the teaching laboratories are largely didactic due to limited resources.
ii. There are not (or are very limited) field diagnostic tests (i.e. CMT) for practice and teaching purposes, as well as limited supplies and materials for field training (i.e. sample collection).
iii. Lack of real life experience by faculty was reported to compound the issue of theory-based teaching even further.
    - Associted with this point was the report of lack or very limited continuing education and advanced training opportunities for the faculty, so they can improve and expand their own experience.

Several of these limitations were deem to be structural and not under the control of the faculty and instructors or the College.

3. Pedagogical problems

Some of the issues reported, by both students and faculty, that could be interfering with an effective teaching and learning environment were:

- Multiple pedagogy or instructional method problems (from course design to class delivery and evaluation/assessment), compound by lack or very limited continuing education in teaching methodology and assessment.
- Teaching methods are mostly lecture-based education with limited technology used (as described in previously).
- Unenthusiastic students with little motivation to learn.
- Limited clinical or professional experience by some members of the faculty in several of the OIE Day-1 Competencies.
- A very hierarchical structure shapping student to faculty interactions, even within faculty ranks, was reported as a very important issue that damper a positive learning and academic enviorment condusive to higher learning.

4. Structural limitations

Some of the structural limitations indicated by the faculty and students that directly and indirectly affect some of the previous points were:

a. Sufficient laboratory space is available however the labs are not adequately equipped or fully functional to provide a high level training experience.
   i. Students need more clinical experience in the laboratory and the field.
   ii. More diagnostic tests and testing supplies need to be made available.
b. National regulations, standards and disease control programs are early in development and not available as a teaching guide.
   i. Other countries in this situation teach best practices from other countries that have such programs in place and in more advance stages; however, the faculty don't have ready access to that information.
c. Lack of reliable technology available at all time to faculty and students. Among the problems reported associated with this issue were:
   i. Limited availability to computers with reliable internet access.
   ii. Access to digital library of current texts and research.

Appendices

Appendix A
Curriculum Mapping Summary Tables

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
EnLa1011	Communicative English	Students will learn how to express themselves through writing, compose reports and research proposals and long texts. This course also includes learning how to compose correspondences by technology such as email	Communication	Communication Skills (2.11)	Yes	**1st**	**Throughout**
EnLa1012	Basic Writing Skills		Communication	Communication Skills (2.11)	Yes	**1st**	**Throughout**
Vetm1031	Vet Embryology	Students will learn medical terms, gross and microscopic anatomical structures of a variety of animal species. Students will also learn how to make across species comparisons the anatomy structures	Anatomy	General	--	1st	Early
Vetm1032	Vet Gross Anatomy I		Anatomy	General	--	1st	Early
Vetm1033	Vet Gross Anatomy II		Anatomy	General	--	1st	Early
Vetm1034	Vet Histology I		Anatomy	General	--	1st	Early
Vetm1035	Vet Histology II		Anatomy	General	--	1st	Early
Vetm1041	Vet Physiology I	Students will study the details of normal body organ and system physiology in various animal species to give them a strong foundation for pharmacology and disease pathophysiology	Physiology	General	--	1st	Early
Vetm1042	Vet Physiology II		Physiology	General	--	1st	Early

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm2071	Organic Chemistry	The student will develop an understanding of the basic biochemical principles. This includes being able to define the structure and function of DNA and RNA, DNA transfer, and chemical and biochemical processes. This will help develop their foundation for disease pathophysiology, animal nutrition, and genetics.	Biochemistry	General	--	2nd	Early
Vetm2072	Veterinary Biochemistry I		Biochemistry	General	--	2nd	Early
Vetm2073	Veterinary Biochemistry II		Biochemistry	General	--	2nd	Early
Vetm2074	Introduction to Molecular Biology		Genetics	General	--	2nd	Early
Vetm2081	Vet Parasitology I	Introduction to Parasitology, Basic Terminologies, Effects of Parasites on their host and their economic significance, Types of parasitism, host and organ specificity, parasitic life cycle; Immunity and resistance Helminthology: general classification, morphology, life cycle, pathogenesis, clinical signs, epidemiology, diagnosis, treatment, control and or prevention of helminth parasites of veterinary and public health importance. Importance of chemotherapy in relation to helminth control program, anthelmintic medication and issues related to anthelmintic resistance.	Parasitology	Zoonoses (2.3)	Yes	2nd	Mid
				TAD (2.2)	Yes		
				Disease Prevention and Control Programs (2.5)	Yes		
				Emerging and Re-emerging Diseases (2.4)	Yes		
				Food Hygiene (2.6)	**No**		
				Veterinary Products (2.7)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm2082	Vet Parasitology II	Students will continue their understanding of parasitology with a focus on arthropods and protozoan parasites in this course	Parasitology	Zoonoses (2.3)	Yes	2nd	Mid
				TAD (2.2)	Yes		
				Disease Prevention and Control Programs (2.5)	Yes		
				Emerging and re-emerging diseases (2.4)	Yes		
				Food Hygiene (2.6)	**No**		
				Veterinary Products (2.7)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm2083	Vet Microbiology I	Students will develop an understanding of general morphology, structure, physiology, reproduction/replication, growth and nutrition requirement of bacterial and fungal pathogens; microbial genetics, virulence and pathogenicity; antibiotics and antibiotic resistance in bacteria, and antifungal chemotherapy cultivation, preservation and inactivation of bacteria, biochemical properties, gram reactions, physiology and reproduction of bacteria, Bacterial genome and mechanisms of genetic variation. Antibacterial agents, and resistance mechanisms, Bacterial colonization, tissue invasion and clinical diseases that are important in veterinary medicine.	Microbiology	Zoonoses (2.3)	Yes	2nd	Mid
				TAD (2.2)	Yes		
				Disease Prevention and Control Programs (2.5)	Yes		
				Emerging and re-emerging diseases (2.4)	Yes		
				Food Hygiene (2.6)	No		
				Veterinary Products (2.7)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm2084	Vet Microbiology II	Students will continue their study of microbiology with a focus on viruses including DNA and RNA viruses of importance in veterinary medicine. They will also learn about prions and the various animal and human diseases that they cause	Microbiology	Zoonoses (2.3) TAD (2.2) Disease Prevention and Control Programs (2.5) Emerging and re-emerging diseases (2.4) Food Hygiene (2.6) Veterinary Products (2.7)	Yes Yes Yes Yes Yes Yes	2nd	Mid
Vetm2085	Vet Immunology	Students will develop an understanding of basic immunology including the fundamental principles and the immune mechanisms of an animal in health and disease conditions. Student will also learn about methods of manipulating the immune system in diagnosis, prevention & control of animal diseases.	Immunology	General	--	2nd	Early
AnPS2091	Principles of Animal Genetics and Breeding	Students will learn about basic genetic concepts; cyto- and immunogenetics; types of gene actions; population genetics and law of Hardy-Weinberg including forces that affect gene frequencies in a breeding population; quantitative genetics, includes estimation of heritability; selection and breeding methods; principles of molecular genetics; genetic basis of disease resistance in farm animals.	Genetics	General	--	2nd	Early

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
AnPS2092	Animal Nutrition	Students will develop and understanding of the various classification, characterization and functions of basic nutrients. The structure and capacity of digestive systems of different farm animals. The process of nutrient digestion, transport, and absorption in different species of farm animals. Nutritional deficiencies, toxicities and metabolic disorders in farm animals. Students will also learn how to complete a feed evaluation including chemical composition, digestibility, energy value, and protein value of feeds.	Herd Health Management and Nutrition	Food Hygiene (2.6)	Yes	2nd	Late
				Veterinary products (2.7)	Yes		
				Animal welfare (2.8)	N/A		
				Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	N/A		
				Disease Prevention and Control programs (2.5)	N/A		
				Management of Contagious Diseases (3.3)	N/A		
				Inspection and certification procedures (3.2)	N/A		
				Food Hygiene (3.4)	N/A		
				Application of Risk Analysis (3.5)	N/A		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
AnPS3101	Poultry and Swine Production	Students will develop an understanding of the biology and economics of poultry and swine production. Poultry production will include Incubation and hatchery management, brooding, rearing, broiler and layer management, and poultry production system. Swine production includes feeding, breeding, health care and housing. Students will also learn about common Swine and poultry diseases.	Rural Economics, Business Management, and Animal Production	Administration and management (3.8)	Yes	3rd	Mid to late
				Veterinary products (2.7)	Need more info		
				Animal welfare (2.8)	No		
			Herd Health Management and Nutrition	Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	Need more info		
				Disease Prevention and Control programs (2.5)	Yes		
				Management of Contagious Diseases (3.3)	Need more info		
				Inspection and certification procedures (3.2)	No		
				Food Hygiene (3.4)	No		
				Application of Risk Analysis (3.5)	No		
				Food Hygiene (2.6)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
AnPS3102	Sheep and Goat Production	Students will develop and understanding the Importance of sheep and goats production in Ethiopia including reproduction, growth and developments, feeding, breeding, housing and other production managements (meat, milk and wool and mohair production), processing and marketing of sheep and goats products, prevention and control of diseases, and record keeping in sheep and goats enterprises.	Rural Economics, Business Management, and Animal Production	Administration and management (3.8)	Yes	3rd	Mid to late
			Herd Health Management and Nutrition	Veterinary products (2.7)	Need more info		
				Animal welfare (2.8)	No		
				Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	Need more info		
				Disease Prevention and Control programs (2.5)	Yes		
				Management of Contagious Diseases (3.3)	Need more info		
				Inspection and certification procedures (3.2)	No		
				Food Hygiene (3.4)	No		
				Application of Risk Analysis (3.5)	No		
				Food Hygiene (2.6)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
AnPS3103	Dairy Cattle Production and Management	Students will develop an understanding of the milk production systems, dairy housing systems, major feed resources for dairy cattle, ration formulation, feed storage and feeding practices, reproduction management, lactation management, proper milking practices, milk handling and marketing, dairy herd health management, and record keeping.	Rural Economics, Business Management, and Animal Production	Administration and management (3.8)	Yes	3rd	Mid to late
				Veterinary products (2.7)	Need more info		
				Animal welfare (2.8)	No		
			Herd Health Management and Nutrition	Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	Need more info		
				Disease Prevention and Control Programs (2.5)	Yes		
				Management of Contagious Diseases (3.3)	Need more info		
				Inspection and certification procedures (3.2)	No		
				Food Hygiene (3.4)	No		
				Application of Risk Analysis (3.5)	No		
				Food Hygiene (2.6)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
AnPS3104	Beef Cattle Production and Management	Students will develop an understanding of common breeds used for beef production and the various beef operations such as breeding and feeding operations. The students will also learn about common health problems associated with beef cattle and beef production facilities.	Rural Economics, Business Management, and Animal Production	Administration and management (3.8)	Yes	3rd	Mid to late
				Veterinary products (2.7)	Need more info		
				Animal welfare (2.8)	No		
			Herd Health Management and Nutrition	Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	Need more info		
				Disease Prevention and Control Programs (2.5)	Yes		
				Management of Contagious Diseases (3.3)	Need more info		
				Inspection and certification procedures (3.2)	No		
				Food Hygiene (3.4)	No		
				Application of Risk Analysis (3.5)	No		
				Food Hygiene (2.6)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
AnPS3105	Skin and Hide Management	Students will develop an understanding of the skin and hide production system and the importance to the economy.	Rural Economics, Business Management, and Animal Production	Administration and management (3.8)	Yes	3rd	Mid to late
				Veterinary products (2.7)	Need more info		
				Animal welfare (2.8)	No		
			Herd Health Management and Nutrition	Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	Need more info		
				Disease Prevention and Control Programs (2.5)	Yes		
				Management of Contagious Diseases (3.3)	Need more info		
				Inspection and certification procedures (3.2)	No		
				Food Hygiene (3.4)	N/A		
				Application of Risk Analysis (3.5)	No		
				Food Hygiene (2.6)	N/A		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
AnPS3106	Working Animal Management	Students will develop and understanding of working animals including the economic and social significances. They will also learn about feeding requirements, management, and prevention plans for various working species.	Rural Economics, Business Management, and Animal Production	Administration and management (3.8)	Yes	3rd	Mid to late
				Veterinary products (2.7)	Need more info		
				Animal welfare (2.8)	No		
			Herd Health Management and Nutrition	Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	Need more info		
				Disease Prevention and Control Programs (2.5)	Yes		
				Management of Contagious Diseases (3.3)	Need more info		
				Inspection and certification procedures (3.2)	No		
				Food Hygiene (3.4)	N/A		
				Application of Risk Analysis (3.5)	No		
				Food Hygiene (2.6)	N/A		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm3111	Vet General Pathology	Students will develop a basic understanding of the pathogenesis of animal diseases and be able to describe the macroscopic and microscopic changes that occur. They will develop and understanding of tissue changes from different etiological agents. The will develop a systematic approach to conducting post-mortem procedures and use these findings to assist with a disease investigation	Pathology	Zoonoses (2.3) TAD (2.2) Epidemiology (2.1) Emerging and re-emerging diseases (2.4)	Yes Yes Yes Yes	3rd	Mid
Vetm3112	Vet Systemic Pathology	Students will continue to develop their understanding of animal disease pathology with a focus on systemic diseases.	Pathology	Zoonoses (2.3) TAD (2.2) Epidemiology (2.1) Emerging and re-emerging diseases (2.4)	Yes Yes Yes Yes	3rd	Mid

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm3121	Veterinary Pharmacology and Therapeutics I	Students will develop an understanding of veterinary pharmacology with a focus on pharmacokinetics, pharmaceuticals, drug disposition, pharmacodynamics, drug interactions, drug toxicities, drug prescriptions and dispensing. They will also learn how pharmaceutical physical and chemical characteristics, classifications, indications, and dosage regimens, mechanism of actions, toxicities, and drugs' interactions.	Pharmacology/Toxicology	Veterinary products (2.7)	Yes	3rd	Mid
Vetm3122	Veterinary Pharmacology and Therapeutics II	Students will continue to develop an understanding of veterinary pharmacology	Pharmacology/Toxicology	Veterinary products (2.7)	Yes	3rd	Mid
Vetm3123	Veterinary Toxicology	Students will develop an understanding of important veterinary toxicants including common exposures sources, toxicodynamics, toxicokinetics, common clinical manifestations, and management of these cases. Students will also develop an understanding of major air and water pollutants of public health concern.	Pharmacology/Toxicology	Veterinary products (2.7)	Yes	3rd	Mid

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm3131	Veterinary Clinical Diagnosis	Students will develop their restraint and physical exams skills as well as what the physical exam can tell them about the health of the animal using a systemic approach. Students will learn how animal welfare is incorporated into restraint of the physical exam and collection of various samples.	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes/Animal Welfare (2.8)	3rd	Mid to late
Vetm3132	Vet General Medicine						
Vetm4141	Large Animal Medicine	Students will learn about specific infectious and non-infectious diseases of various domestic and wild animals. This will include how to diagnose, treat, control, and prevent diseases in animals.	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes/Disease Prevention and Control Programs (2.5)	4th	Mid to late
Vetm4142	Small Animal Medicine						
Vetm4143	Wildlife Health						
Vetm4144	Poultry Diseases						
Vetm4145	Camel Health and Production						
Vetm4146	Equine Medicine						
Vetm4151	Veterinary General Surgery and Anesthesiology	Students will develop an understanding of local and general anesthesia products and how to use them. They will also learn about surgical instruments, terminology, techniques, and approaches for routine procedures.	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes	4th	Mid to late
Vetm4152	Veterinary Operative Surgery						

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm4153	Veterinary Diagnostic Imaging	Students will develop an understanding of diagnostic imaging tools and techniques for diagnosing disease	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes	4th	Mid to late
Vetm4161	Theriogenology I	Students will develop and understanding of female reproduction in different species to enhance animal production systems. This will include identifying and managing reproductive diseases, managing obstetrical problems, and completing breeding soundness exams.	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes	4th	Mid to late
Vetm4162	Theriogenology II	Students will develop and understanding of the male reproduction in different species to enhance animal production systems. This will include identifying and managing reproductive diseases, managing obstetrical problems, and completing breeding soundness exams.	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes	4th	Mid to late

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm4171	Vet Public Health I	Students will develop an understanding of food hygiene for foods from animal origin. This includes knowledge of occurrence of foodborne diseases, reservoirs, mode of transmission, clinical signs, and control and prevention. Students will learn how to apply HACCP and complete risk assessment of food products of animal origin. They will learn how to complete an ante and post mortem inspection.	Food Safety	Zoonoses (2.3)	Yes	4th	Late
				Disease Prevention and Control Programs (2.5)	Yes		
				Food Hygiene (2.6)	Yes		
				Veterinary Products (2.7)	No		
				Organisation of veterinary services (3.1)	No		
				Inspection and certification procedures (3.2)	No		
				Management of Contagious Diseases (3.3)	No		
				Food hygiene (3.4)	No		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm4172	Vet Public Health II	Students will develop an understanding of common and important zoonotic diseases and important prevention and control strategies for these diseases. They will also learn important concepts for a zoonotic disease outbreak investigation.	Transmissible Diseases	Zoonoses (2.3)	Yes	4th	Late
				Disease Prevention and Control Programs (2.5)	Yes		
				Epidemiology (2.1)	Yes		
				Emerging and re-emerging disease (2.4)	Yes		
				Management of Contagious Diseases (3.3)	Yes		
Vetm4181	Clinical Practice I	Students will have the opportunity to practice their clinical skills and gain experience on a variety of animals. Student will also have the chance to practice public communication skills	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes/Communication Skills (2.11)	4th	Mid to late
Vetm4182	Clinical Practice II						

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm5191	Fisheries and Fish Diseases	Students will develop an understanding of the fish biology and aquaculture product for fresh water fish. They will also learn how to identify and treat fish disease common in Ethiopia	Herd health management and nutrition	Veterinary products (2.7)	Yes	5th	Late
				Animal welfare (2.8)	No		
				Epidemiology (2.1)	Yes		
				Zoonoses (2.3)	Yes		
				Disease Prevention and Control Programs (2.5)	Yes		
				Management of Contagious Diseases (3.3)	Yes		
				Inspection and certification procedures (3.2)	No		
				Food Hygiene (3.4)	No		
				Application of Risk Analysis (3.5)	No		
				Administration and management (3.8)	No		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm5192	Apiculture and bee diseases	Students will develop an understanding of bee biology and apiculture production. They will also learn how to identify and treat/manage bee diseases	Herd health management and nutrition	Veterinary products (2.7)	Yes	5th	Late
				Animal welfare (2.8)	No		
				Epidemiology (2.1)	No		
				Zoonoses (2.3)	N/A		
				Disease Prevention and Control Programs (2.5)	Yes		
				Management of Contagious Diseases (3.3)	Yes		
				Inspection and Certification Procedures (3.2)	No		
				Food Hygiene (3.4)	No		
				Application of Risk Analysis (3.5)	No		
				Administration and management (3.8)	No		
Vetm5201	Veterinary Ethics and Jurisprudence	Student will develop an understanding of the regulations for Ethiopian veterinarians and principles of ethics in the veterinary medical profession	Professional jurisprudence and ethics	Veterinary legislation and ethics (2.9)	Yes	5th	Late
				General Certification procedures (2.10)	No		
Vetm5202	Animal Behavior and Welfare	Students will develop an understanding of animal behavior and how animal welfare affects animal production	Animal welfare and ethology	Animal welfare (2.8)	Yes	5th	Early to mid

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm5211	Veterinary Clinical Pathology I	Students will use their clinical and pathology skills to determine causes of disease with a focus on hematology. Students will need to understand the pathophysiological changes in diseased animals, determine which laboratory tests will need to be performed and how to interpret results.	Pathology	Zoonoses (2.3)	N/A	5th	Mid to late
				TAD (2.2)	N/A		
				Epidemiology (2.1)	N/A		
				Emerging and re-emerging disease (2.4)	N/A		
			Clinical and diagnostic sciences	Veterinary products (2.7)	Yes		
Vetm5212	Veterinary Clinical Pathology II	Students will use their clinical and pathology skills to determine causes of disease with a focus on chemistry tests and urinalysis. Students will need to understand the pathophysiological changes in diseased animals, determine which laboratory tests will need to be performed and how to interpret results.	Pathology	Zoonoses (2.3)	N/A	5th	Mid to late
				TAD (2.2)	N/A		
			Clinical and diagnostic sciences	Epidemiology (2.1)	N/A		
				Emerging and re-emerging disease (2.4)	N/A		
				Veterinary products (2.7	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm5221 **Vetm5222**	Introduction to statistics Biostatistics and Research Methodology	Students will learn how to collect, analyze, interpret, and present data results	Biomathematics	Epidemiology (2.1)	Yes	5th	Early
Vetm5223	Senior Seminar on Animal Health	Students will develop an understanding of how to design a research proposal, collect, summarize, analyze, and interpret scientific data. This will also include how to complete a scientific literature review.	N/A	Research (3.6)	Yes	5th	N/A
Vetm5232	Vet Epidemiology	Students will develop an understanding of how to identify factors affecting the distribution of diseases in animal populations and apply control, prevention, and eradication principles to manage animal diseases. They will be able to quantify disease occurrence in animal populations, apply surveillance concepts to monitor to disease occurrence.	Epidemiology	Epidemiology (2.1) Disease Prevention and Control Programs (2.5) Veterinary Legislation and ethics (2.9) Emerging and re-emerging diseases (2.4) Management of Contagious Diseases (3.3) Food hygiene (3.4) Risk analysis (3.5)	Yes Yes N/A Yes Yes N/A Yes	5th	Mid

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm5233	Vet Preventive Medicine	Students will learn to apply appropriate disease control and preventative programs based their understanding of disease epidemiology	Epidemiology	Emerging and re-emerging diseases (2.4) Epidemiology (2.1) Disease Prevention and Control Programs (2.5) Veterinary Legislation and ethics (2.9) Management of Contagious Diseases (3.3) Food hygiene (3.4) Risk analysis (3.5)	Yes Yes Yes N/A Yes No No	5th	Mid
Vetm5234	Animal Health Economics	Student will learn about the economic impacts of animal disease including production analysis, application of economics in disease control, and decision-making for disease control.	Rural Economics, business management, and animal production	Administration and management (3.8)	Yes	5th	Mid to late
Vetm5241 **Vetm5242**	Clinical Practice III Clinical Practice IV	Students will continue to develop their clinical skills in diagnosis, treatment, control, and prevention of diseases	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes	5th	Late
Vetm5251	Animal Health Extension and Pastoralism	Students will learn about different animal production systems in Ethiopia such as pastoralism and agro-pastoralism.	Rural Economics, business management, and animal production	Administration and management (3.8)	Yes	5th	Mid to late
Vetm5252	Entrepreneurship and Small business management	Students will learn how to apply and develop a business plan including organizing, financing, and marketing a small firm.	Rural Economics, business management, and animal production	Administration and management (3.8)	Yes	5th	Late

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm6261	Laboratory Work Experience I	Students will expand on their clinical medicine experience focusing on laboratory techniques to diagnose, control, and treat animal diseases	Microbiology	Zoonoses (2.3)	NA	6th	Mid to late
				TAD (2.2)	NA		
			Parasitology	Epidemiology (2.1)	NA		
				Emerging and re-emerging disease (2.4)	NA		
				Disease Prevention and Control Programs (2.5)	NA		
			Pathology	Food Hygiene (2.6)	NA		
				Veterinary Products (2.7)	Yes		
Vetm6262	Laboratory Work Experience II	Students will expand on their clinical medicine experience focusing on laboratory techniques to diagnose, control, and treat animal diseases	Microbiology	Zoonoses (2.3)	NA	6th	Mid to late
				TAD (2.2)	NA		
			Parasitology	Epidemiology (2.1)	NA		
				Emerging and re-emerging disease (2.4)	NA		
				Disease Prevention and Control Programs (2.5)	NA		
			Pathology	Food Hygiene (2.6)	NA		
				Veterinary Products (2.7)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm6263	Experience in Veterinary Public Health I	Students will expand on their clinical medicine experience focusing on ante-mortem and post-mortem examinations and inspection of animals for human consumption	Food Safety	Zoonoses (2.3)	N/A	6th	Mid to late
				Disease Prevention and Control Programs (2.5)	N/A		
				Food Hygiene (2.6)	Yes		
				Veterinary Products (2.7)	N/A		
				Organization of veterinary services (3.1)	N/A		
				Inspection and certification procedures (3.2)	N/A		
				Management of Contagious Diseases (3.3)	N/A		
				Food hygiene (3.4)	Yes		

UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm6264	Experience in Veterinary Public Health II	Students will expand on their clinical medicine experience focusing on ante-mortem and post-mortem examinations and inspection of animals for human consumption	Food Safety	Zoonoses (2.3)	N/A	6th	Mid to late
				Disease Prevention and Control Programs (2.5)	N/A		
				Food Hygiene (2.6)	Yes		
				Veterinary Products (2.7)	N/A		
				Organization of veterinary services (3.1)	N/A		
				Inspection and certification procedures (3.2)	N/A		
				Management of Contagious Diseases (3.3)	N/A		
				Food hygiene (3.4)	Yes		

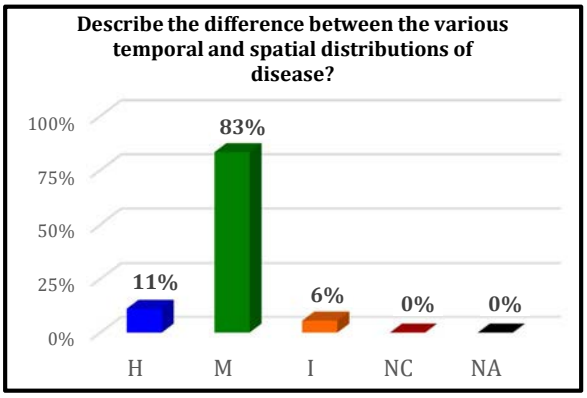
UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm6265	Farm Experience I	Students will expand on their clinical medicine experience focusing on management of livestock farms	Herd Health Management and Nutrition	Veterinary products (2.7)	N/A	6th	Mid to late
				Animal welfare (2.8)	No		
				Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	N/A		
				Disease Prevention and Control Programmes (2.5)	N/A		
				Management of Contagious Diseases (3.3)	N/A		
				Inspection and Certification Procedures (3.2)	N/A		
				Food Hygiene (3.4)	N/A		
				Application of Risk Analysis (3.5)	N/A		
			Rural Economics, business management, and animal production	Administration and management (3.8)	Yes		

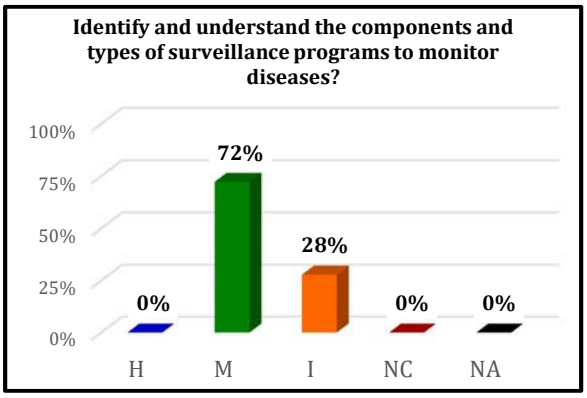
UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm6266	Farm Experience II	Students will expand on their clinical medicine experience focusing on management of livestock farms	Herd Health Management and Nutrition	Veterinary products (2.7)	N/A	6th	Mid to late
				Animal welfare (2.8)	No		
				Epidemiology (2.1)	N/A		
				Zoonoses (2.3)	N/A		
				Disease Prevention and Control Programmes (2.5)	N/A		
				Management of Contagious Diseases (3.3)	N/A		
				Inspection and Certification Procedures (3.2)	N/A		
				Food Hygiene (3.4)	N/A		
				Application of Risk Analysis (3.5)	N/A		
			Rural Economics, business management, and animal production	Administration and management (3.8)	Yes		

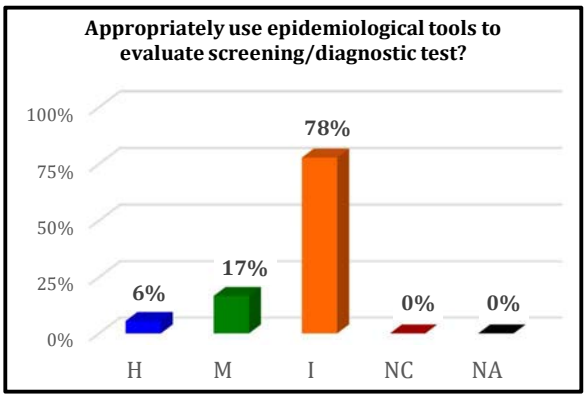
UoG Course Code	UoG Course Title	Description of UoG Course	OIE Course Satisfied	OIE Day 1 Competencies that should be Covered	OIE Day 1 Competencies Actually Covered in UoG Courses	UoG Year of Curriculum	OIE Recommended year of Curriculum
Vetm6267	Clinical Field Experience I	Students will expand on their clinical medicine experience focusing on hands-on experience to diagnose, treat, and control diseases.	Clinical and diagnostic sciences	Veterinary products (2.7)	Yes	6th	Mid to late
Vetm6268	Clinical Field Experience II						
Vetm6271	DVM Thesis I	Students will complete a thesis project using the scientific method. They will develop a research proposal, collect, analyze and interpret data and write a scientific manuscript	N/A	Research (3.6)	Yes	6th	N/A
Vetm6272	DVM Thesis II						

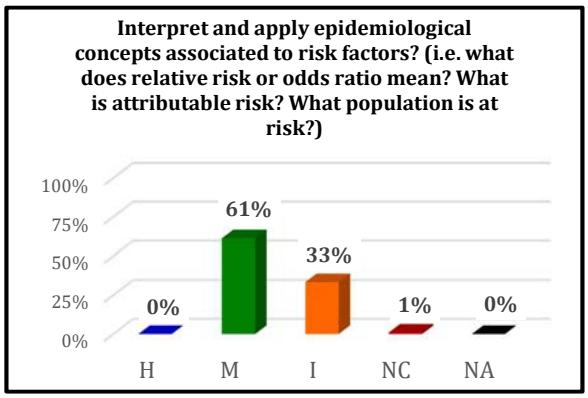
Appendix B
Specific Competencies Complete Results

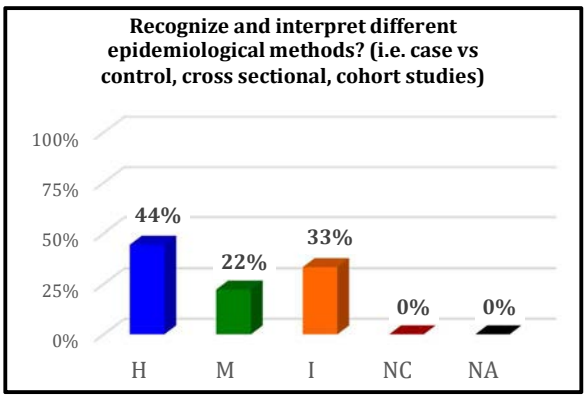
Appendix 2.1 – Epidemiology

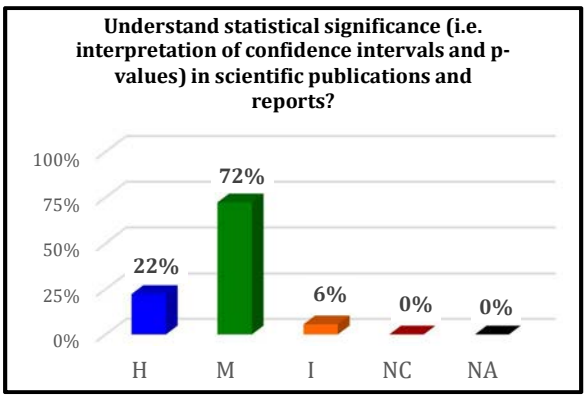


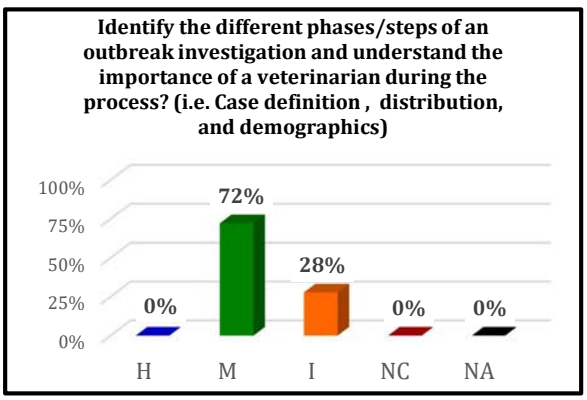


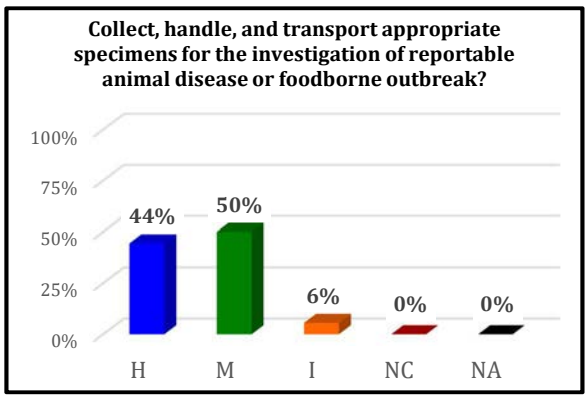


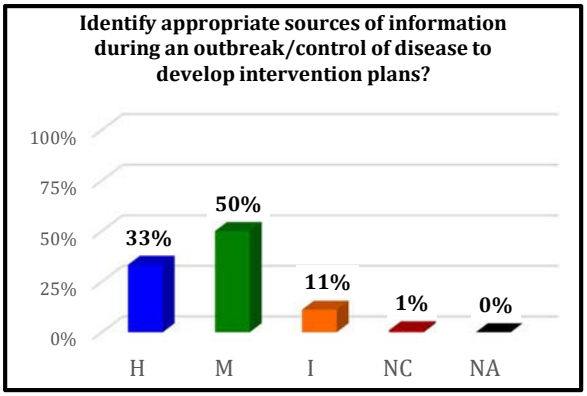


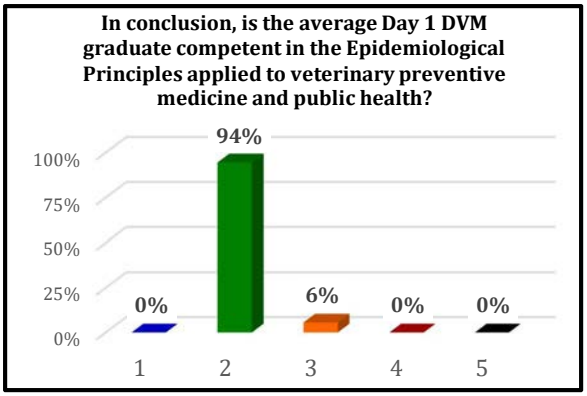




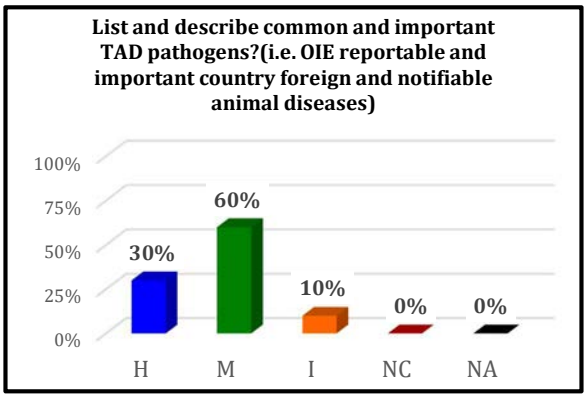


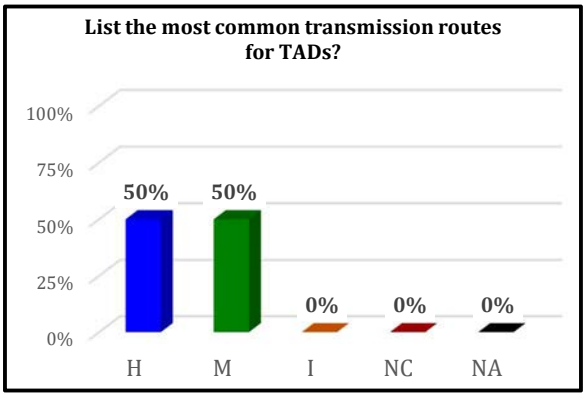


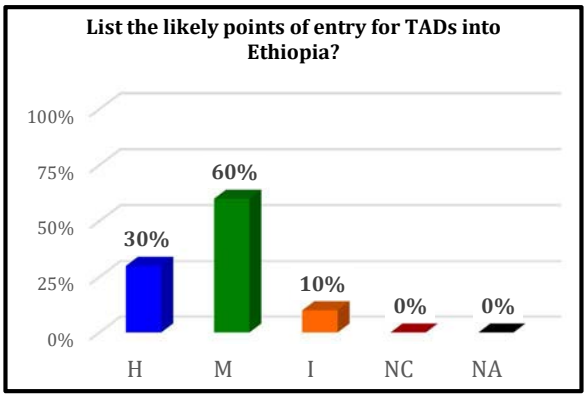

Identify appropriate sources of information during an outbreak/control of disease to develop intervention plans?
100%
75%
50%
25%
0%
33%
50%
11%
1%
0%
H
M
I
NC
NA

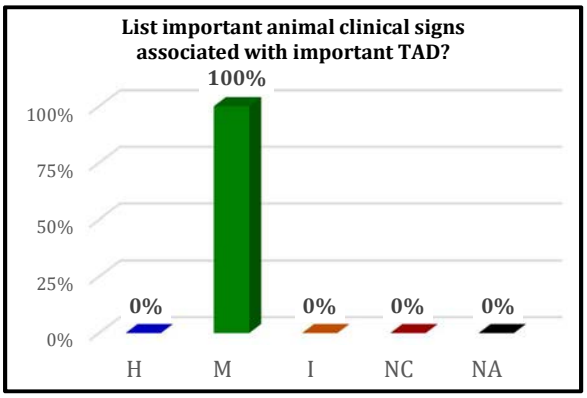

In conclusion, is the average Day 1 DVM graduate competent in the Epidemiological Principles applied to veterinary preventive medicine and public health?
100%
75%
50%
25%
0%
0%
94%
6%
0%
0%
1
2
3
4
5

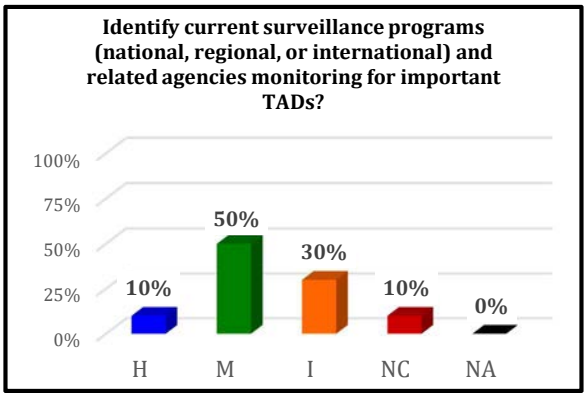
Appendix 2.2 - Transboundary Animal Diseases (TAD)

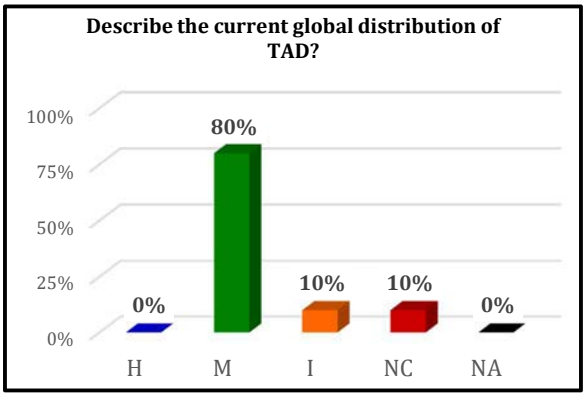


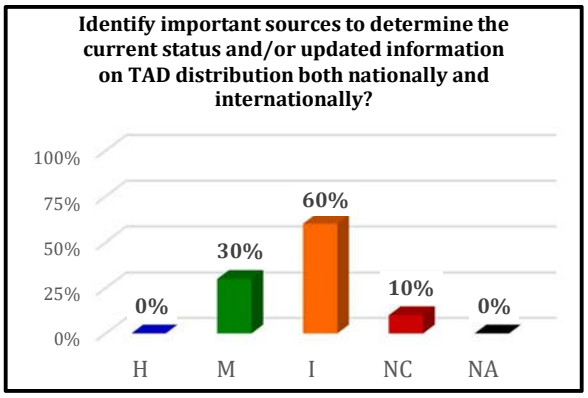


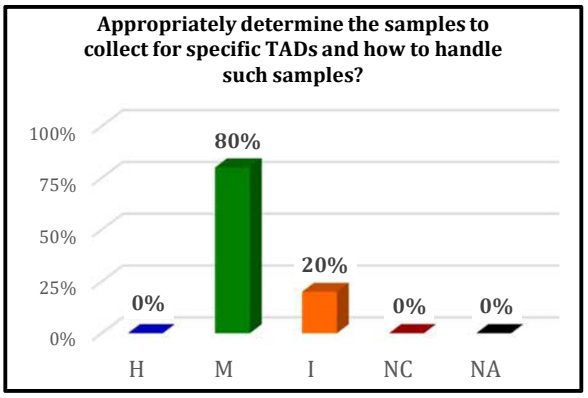


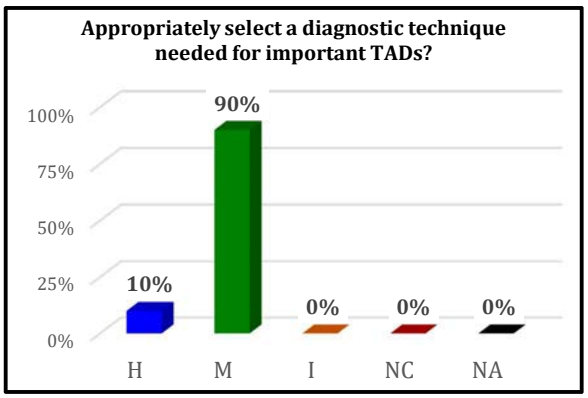


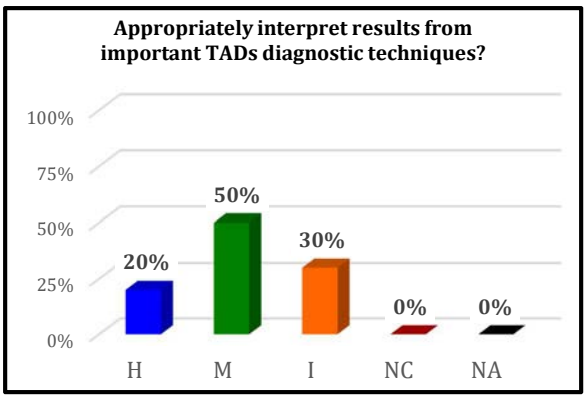


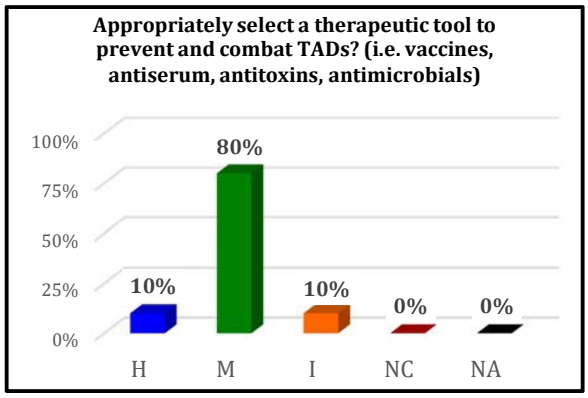


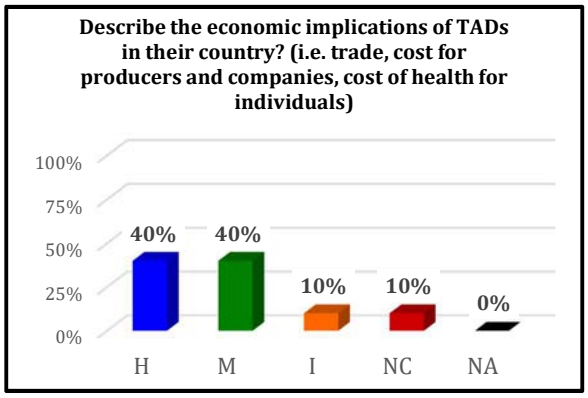


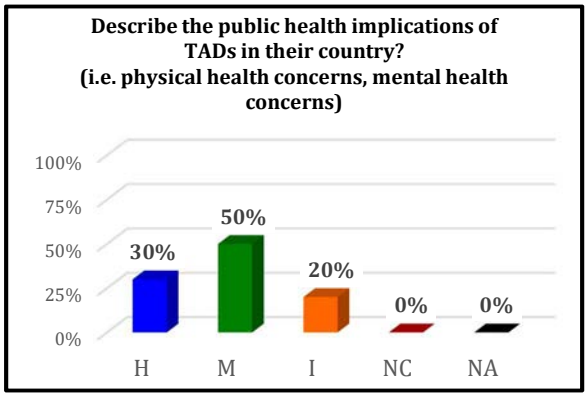


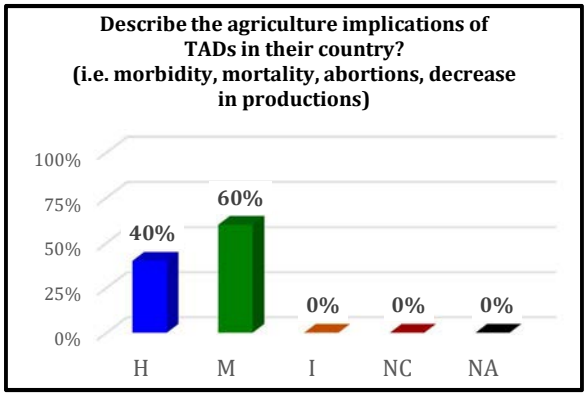

Appropriately select a diagnostic technique needed for important TADs?
100%
75%
50%
25%
0%
10%
90%
0%
0%
0%
H
M
I
NC
NA

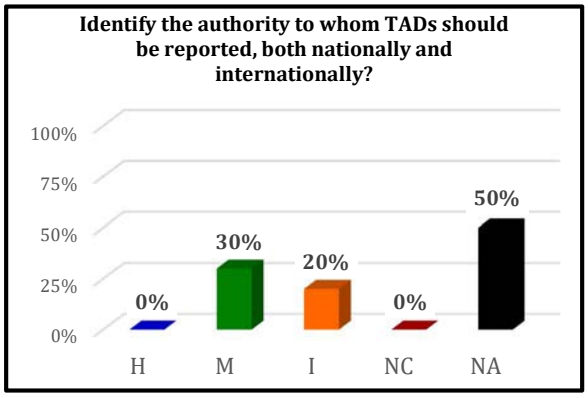

Appropriately interpret results from important TADs diagnostic techniques?
100%
75%
50%
25%
0%
20%
50%
30%
0%
0%
H
M
I
NC
NA

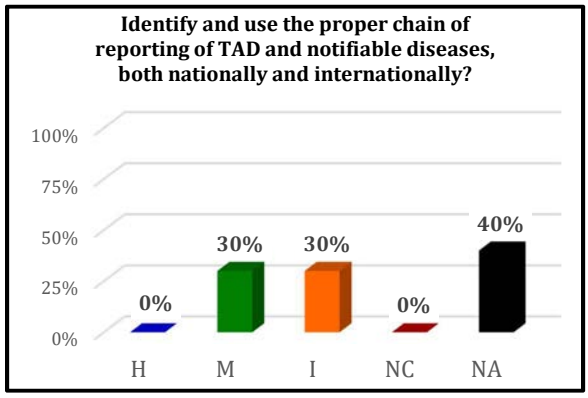

Appropriately select a therapeutic tool to prevent and combat TADs? (i.e. vaccines, antiserum, antitoxins, antimicrobials)
100%
75%
50%
25%
0%
10%
80%
10%
0%
0%
H
M
I
NC
NA

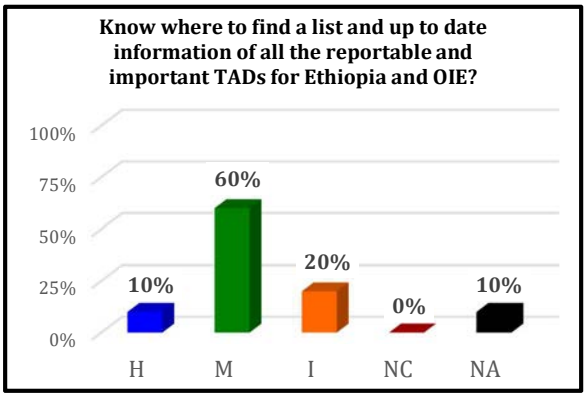

Describe the economic implications of TADs in their country? (i.e. trade, cost for producers and companies, cost of health for individuals)
100%
75%
50%
25%
0%
40%
40%
10%
10%
0%
H
M
I
NC
NA

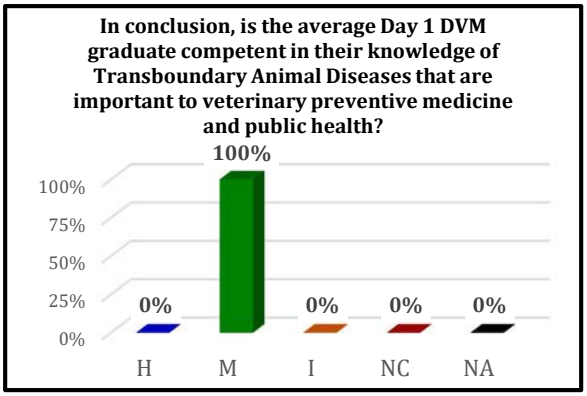

Describe the public health implications of TADs in their country? (i.e. physical health concerns, mental health concerns)
100%
75%
50%
25%
0%
30%
50%
20%
0%
0%
H
M
I
NC
NA


Describe the agriculture implications of TADs in their country? (i.e. morbidity, mortality, abortions, decrease in productions)
100%
75%
50%
25%
0%
40%
60%
0%
0%
0%
H
M
I
NC
NA

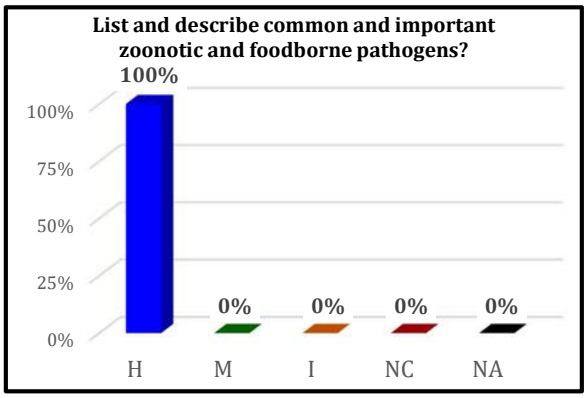

Identify the authority to whom TADs should be reported, both nationally and internationally?
100%
75%
50%
25%
0%
0%
30%
20%
0%
50%
H
M
I
NC
NA

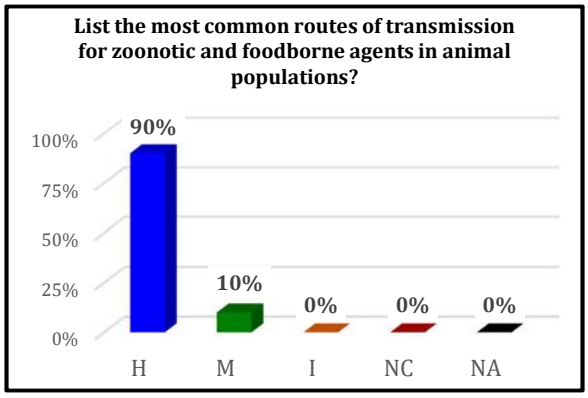

Identify and use the proper chain of reporting of TAD and notifiable diseases, both nationally and internationally?
100%
75%
50%
25%
0%
0%
30%
30%
0%
40%
H
M
I
NC
NA

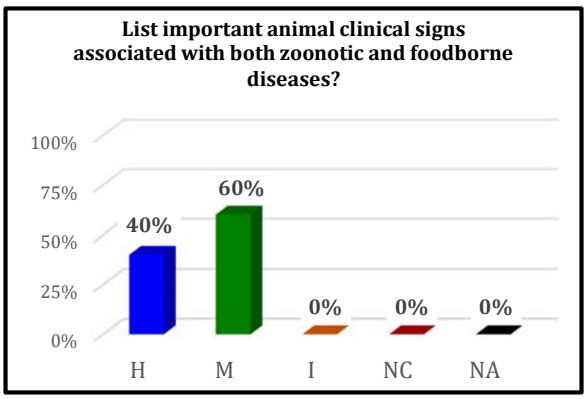

Know where to find a list and up to date information of all the reportable and important TADs for Ethiopia and OIE?
100%
75%
50%
25%
0%
10%
60%
20%
0%
10%
H
M
I
NC
NA

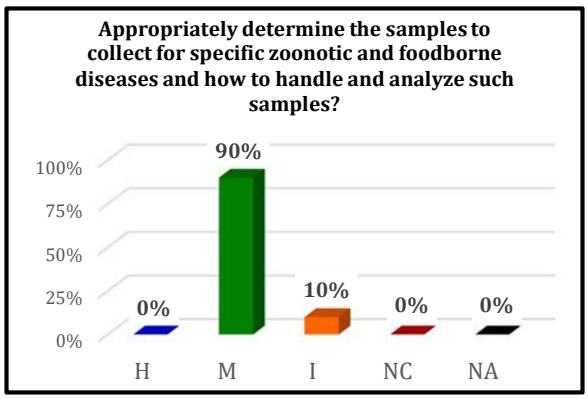

In conclusion, is the average Day 1 DVM graduate competent in their knowledge of Transboundary Animal Diseases that are important to veterinary preventive medicine and public health?
100%
100%
75%
50%
25%
0%
0%
0%
0%
0%
H
M
I
NC
NA

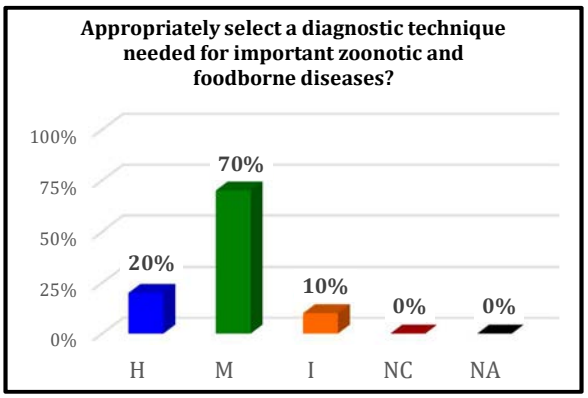
Appendix 2.3 - Zoonosis (Including Foodborne Diseases)

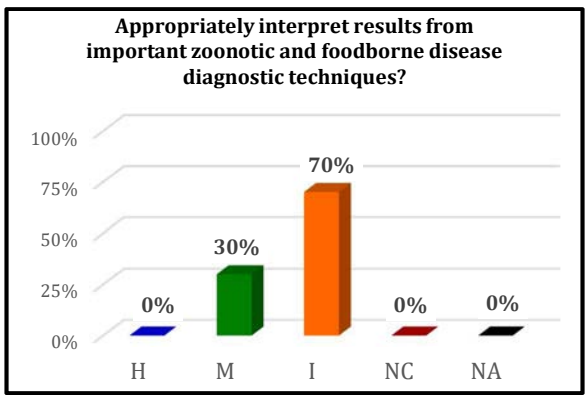


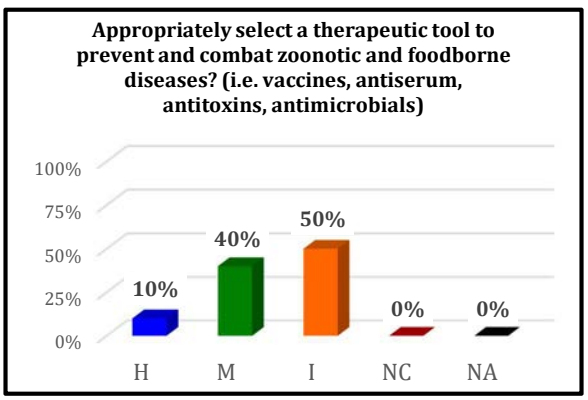


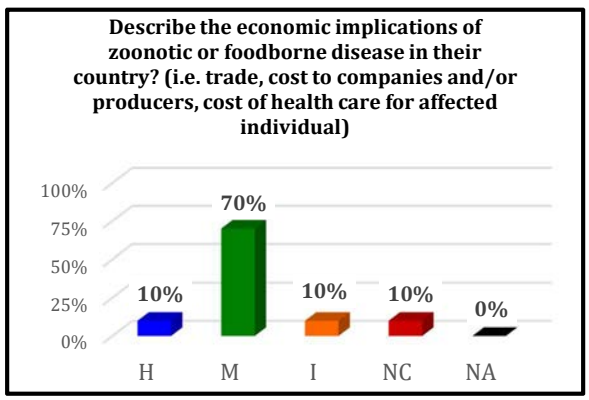


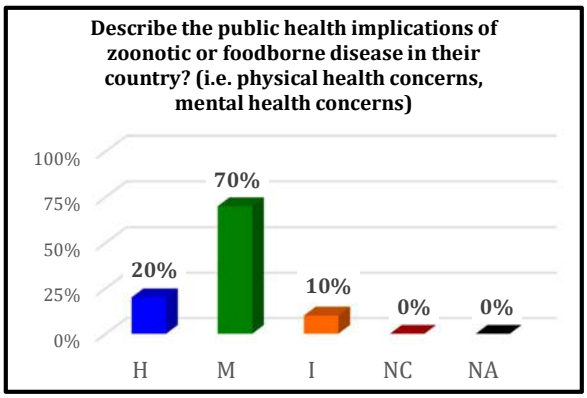


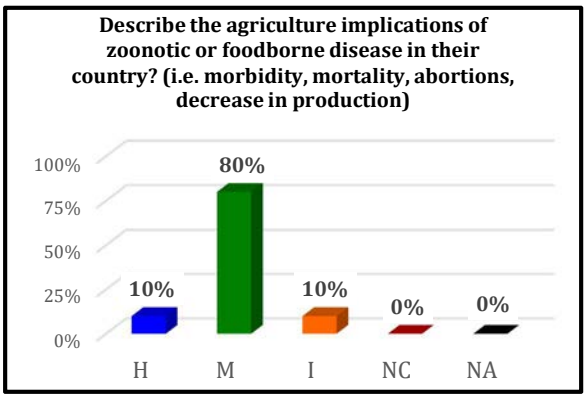


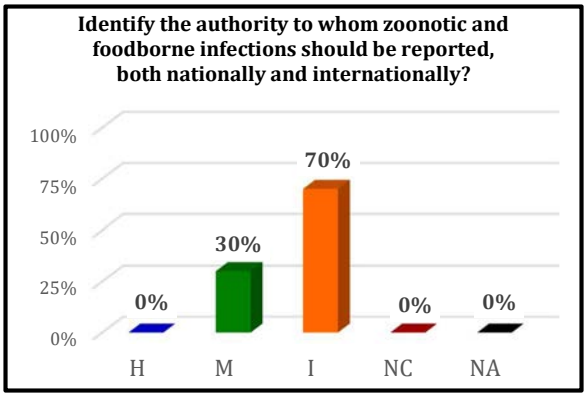


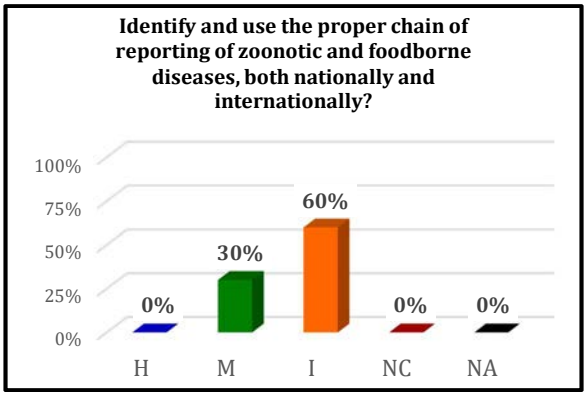


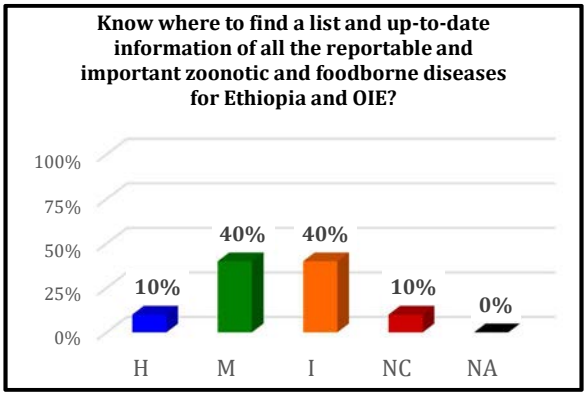


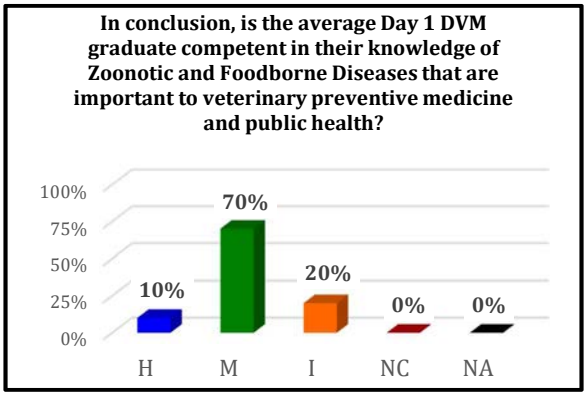

Describe the public health implications of zoonotic or foodborne disease in their country? (i.e. physical health concerns, mental health concerns)
100%
75%
50%
25%
0%
20%
70%
10%
0%
0%
H
M
I
NC
NA


Describe the agriculture implications of zoonotic or foodborne disease in their country? (i.e. morbidity, mortality, abortions, decrease in production)
100%
75%
50%
25%
0%
10%
80%
10%
0%
0%
H
M
I
NC
NA

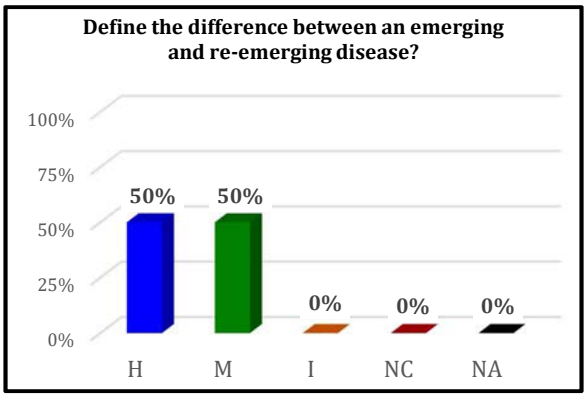

Identify the authority to whom zoonotic and foodborne infections should be reported, both nationally and internationally?
100%
75%
50%
25%
0%
0%
30%
70%
0%
0%
H
M
I
NC
NA

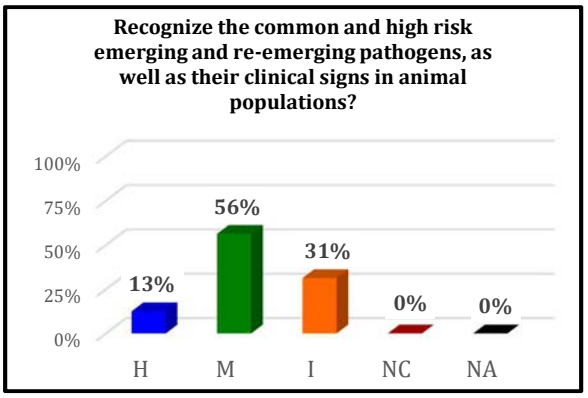

Identify and use the proper chain of reporting of zoonotic and foodborne diseases, both nationally and internationally?
100%
75%
50%
25%
0%
0%
30%
60%
0%
0%
H
M
I
NC
NA

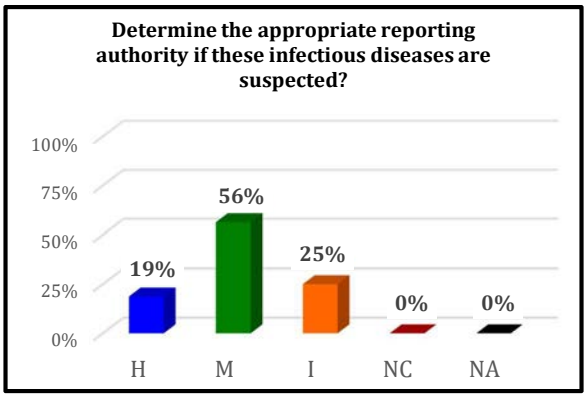

Know where to find a list and up-to-date information of all the reportable and important zoonotic and foodborne diseases for Ethiopia and OIE?
100%
75%
50%
25%
0%
10%
40%
40%
10%
0%
H
M
I
NC
NA

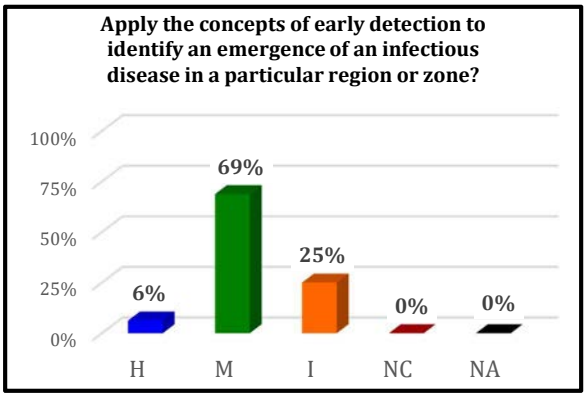

In conclusion, is the average Day 1 DVM graduate competent in their knowledge of Zoonotic and Foodborne Diseases that are important to veterinary preventive medicine and public health?
100%
75%
50%
25%
0%
10%
70%
20%
0%
0%
H
M
I
NC
NA

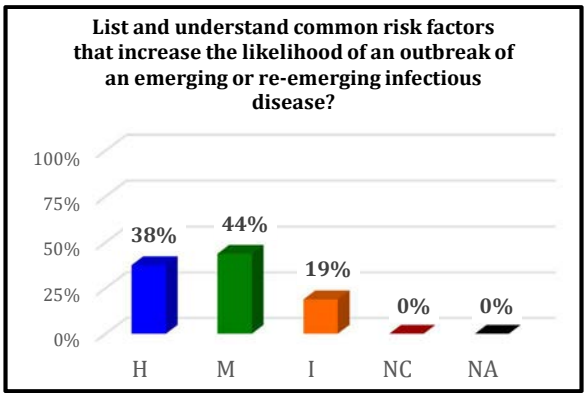
Appendix 2.4 - Emerging and Re-Emerging Diseases

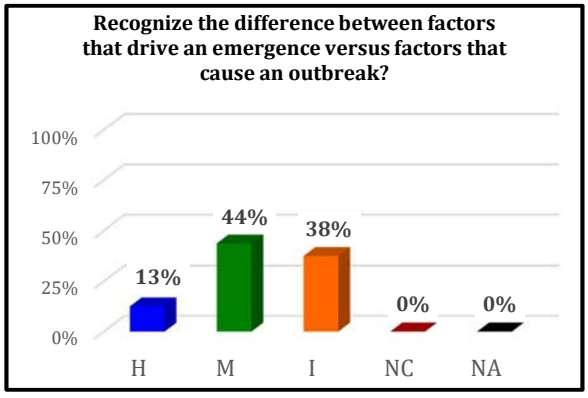


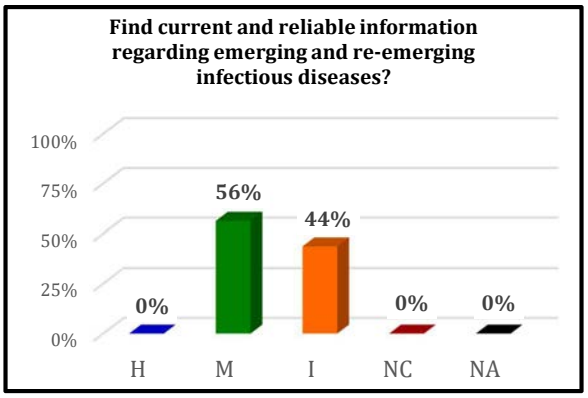


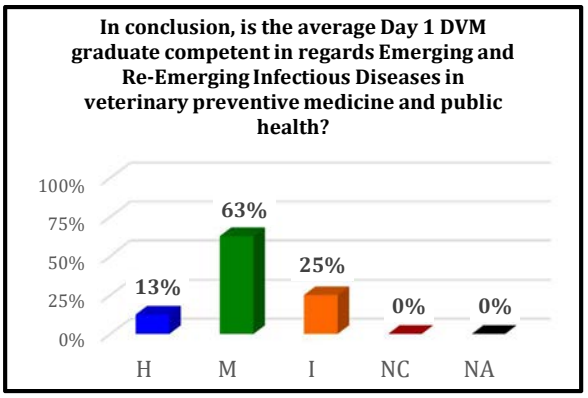




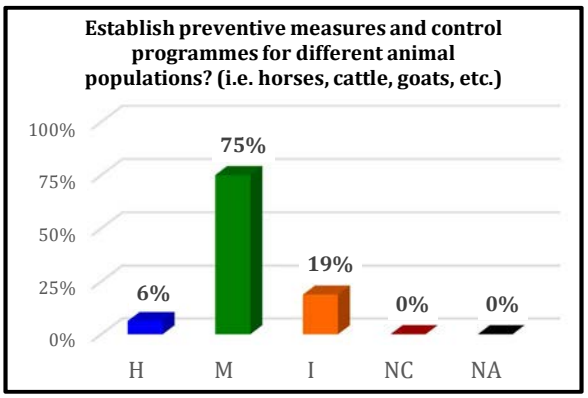


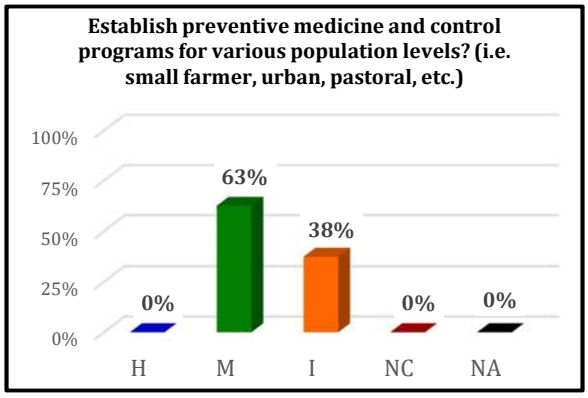


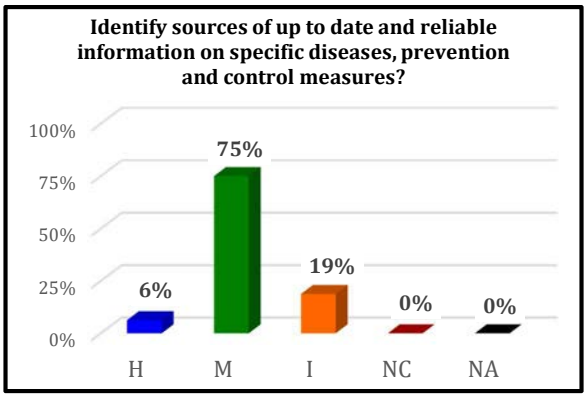


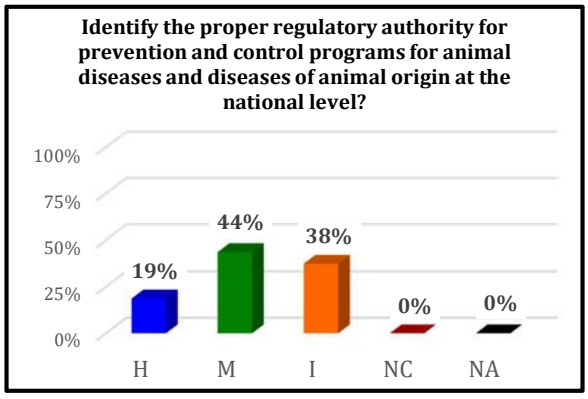


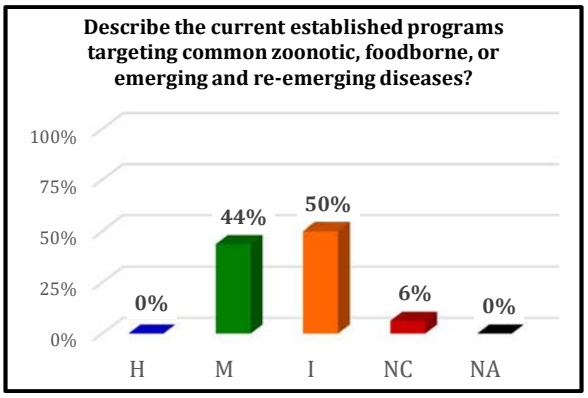
Appendix 2.5 - Disease Prevention and Control Programmes

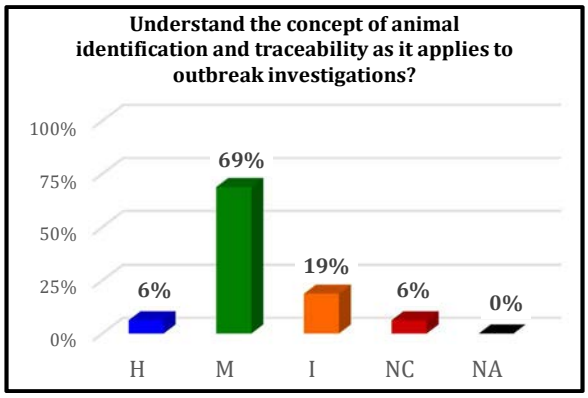


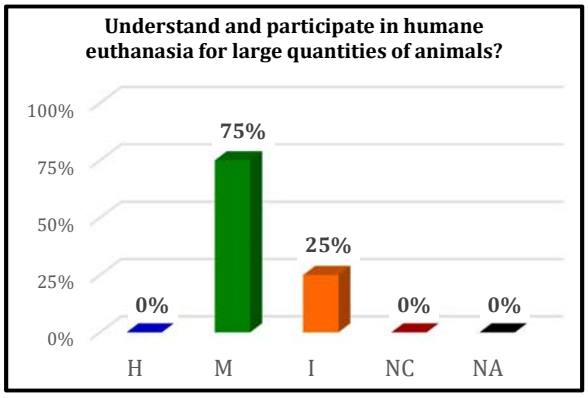


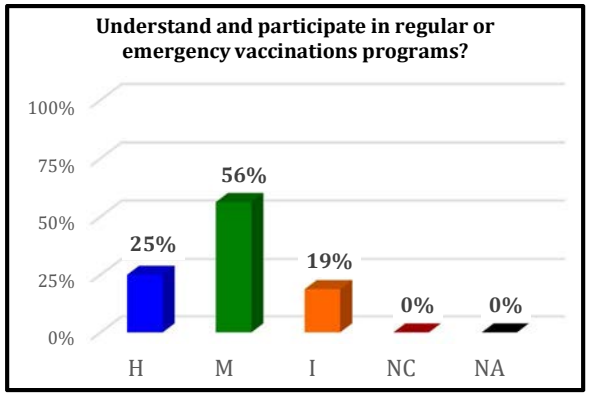


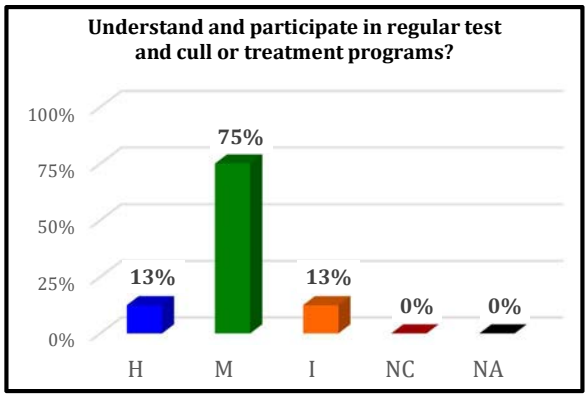


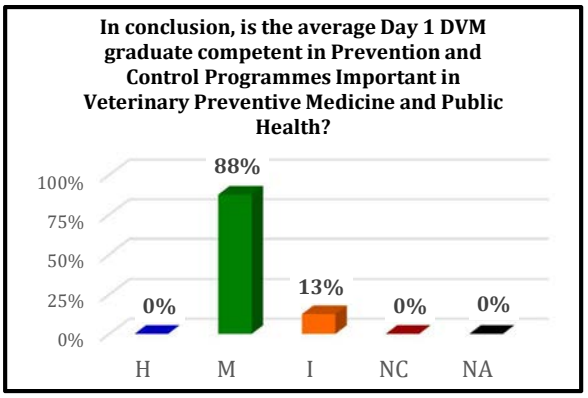




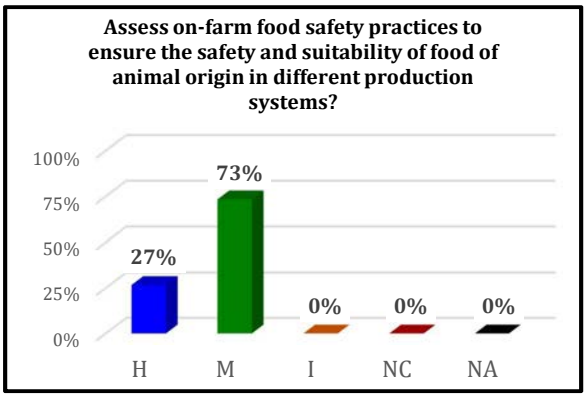


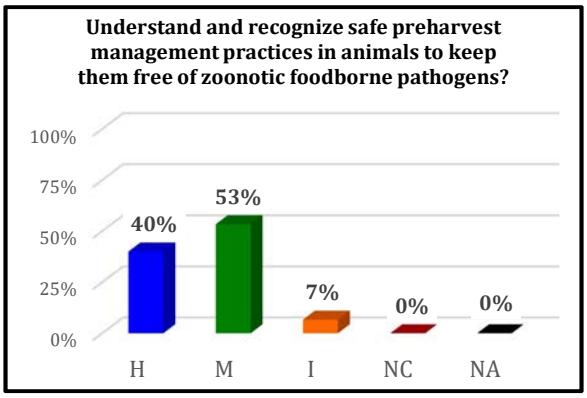


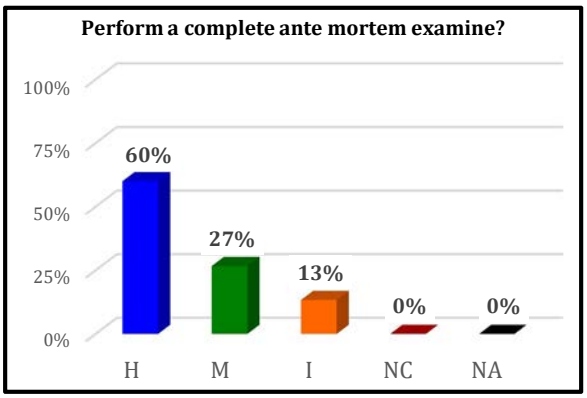

Understand and participate in regular test and cull or treatment programs?
100%
75%
50%
25%
0%
13%
75%
13%
0%
0%
H
M
I
NC
NA

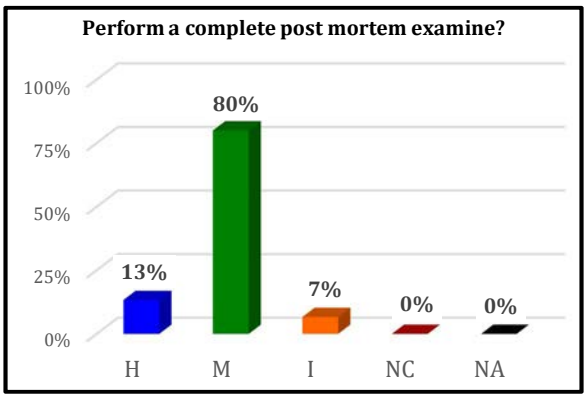

In conclusion, is the average Day 1 DVM graduate competent in Prevention and Control Programmes Important in Veterinary Preventive Medicine and Public Health?
100%
75%
50%
25%
0%
0%
88%
13%
0%
0%
H
M
I
NC
NA

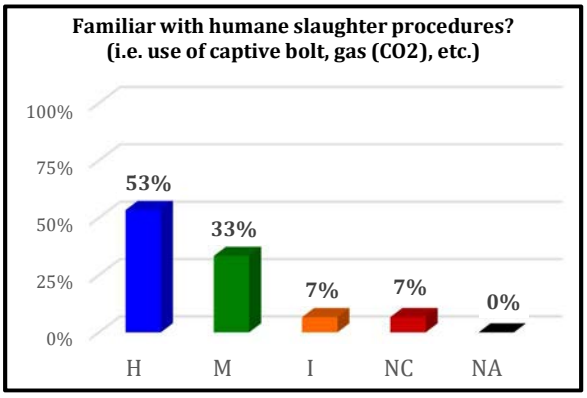
Appendix 2.6 - Food Hygiene

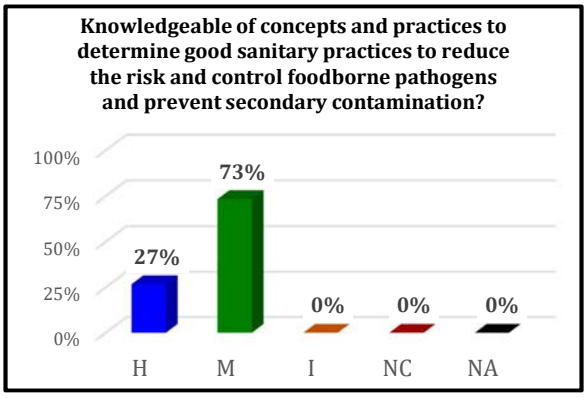


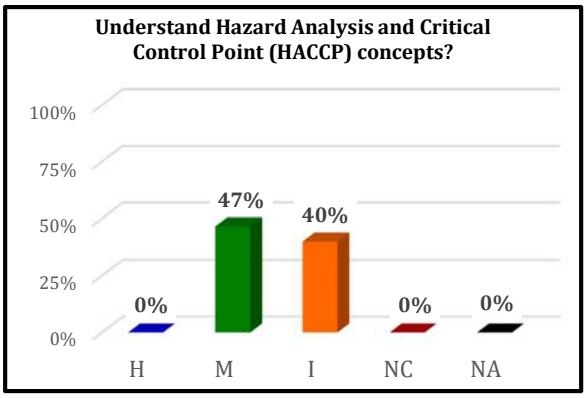


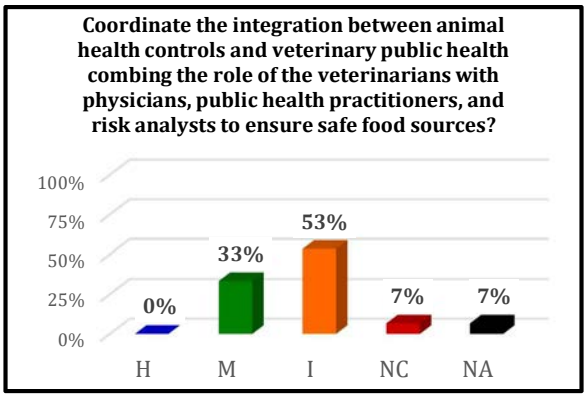


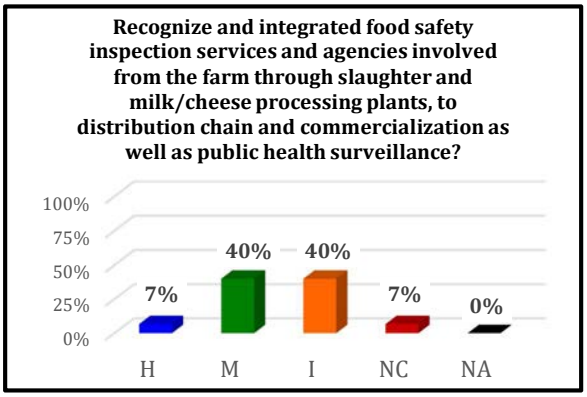


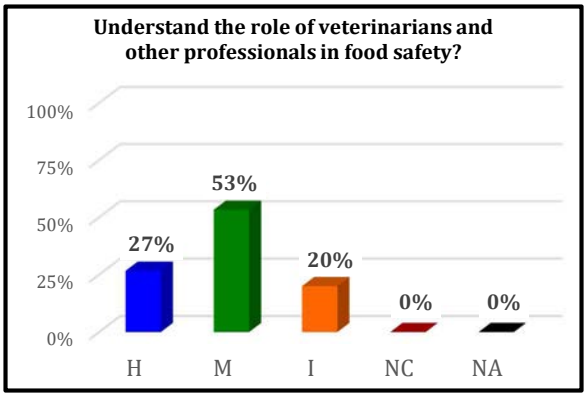


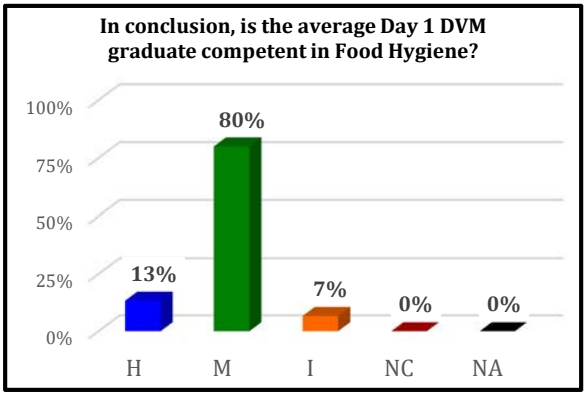




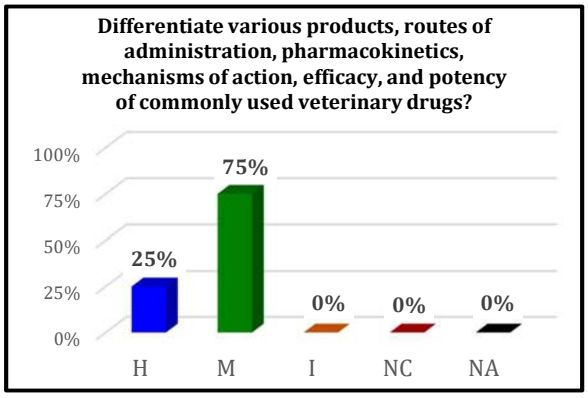


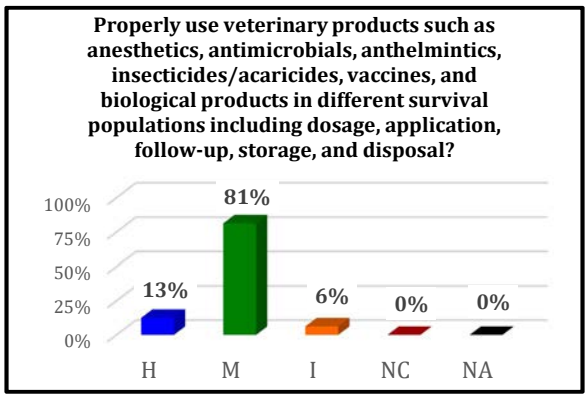

Recognize and integrated food safety inspection services and agencies involved from the farm through slaughter and milk/cheese processing plants, to distribution chain and commercialization as well as public health surveillance?
100%
75%
50%
25%
0%
7%
40%
40%
7%
0%
H
M
I
NC
NA

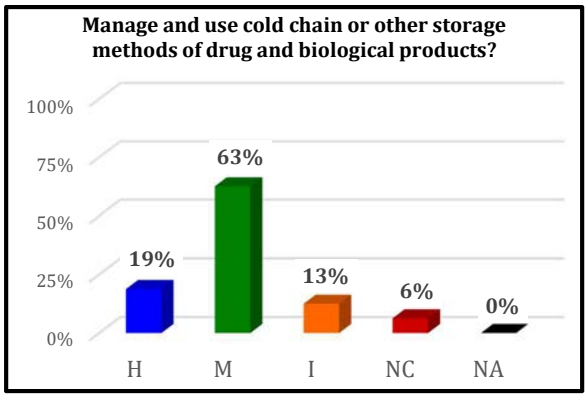

Understand the role of veterinarians and other professionals in food safety?
100%
75%
50%
25%
0%
27%
53%
20%
0%
0%
H
M
I
NC
NA

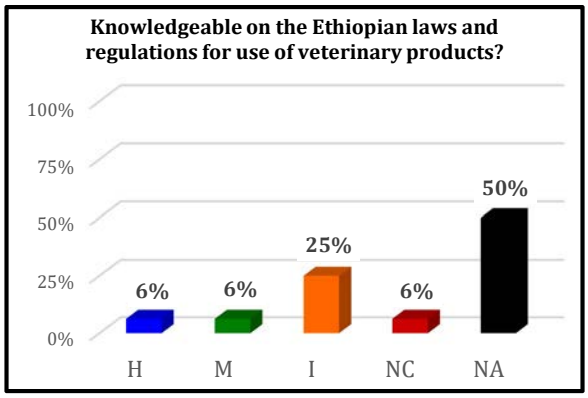

In conclusion, is the average Day 1 DVM graduate competent in Food Hygiene?
100%
75%
50%
25%
0%
13%
80%
7%
0%
0%
H
M
I
NC
NA

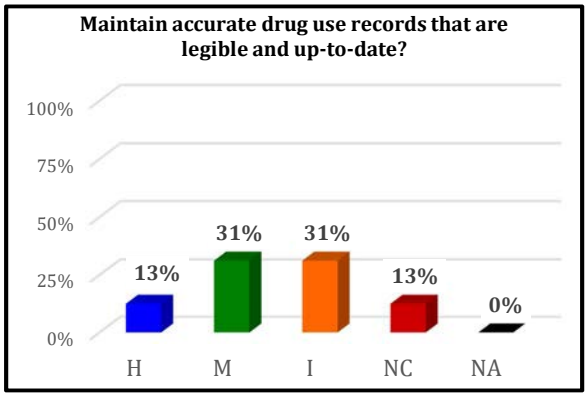
Appendix 2.7 - Veterinary Products

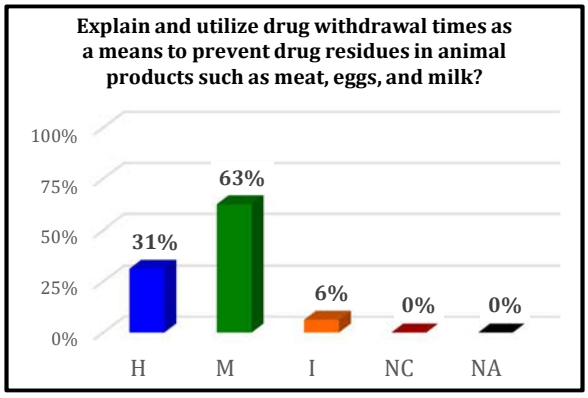


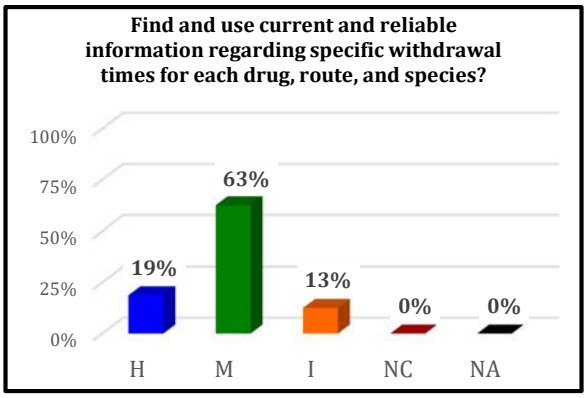


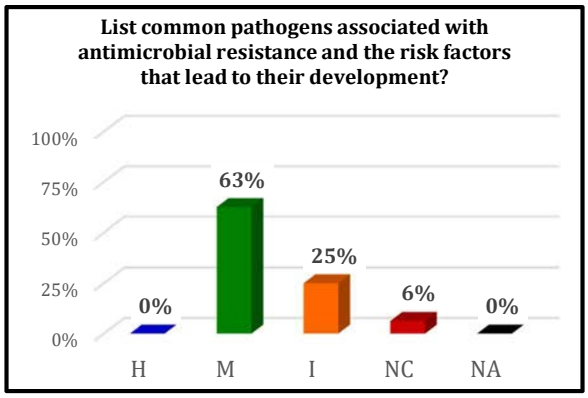


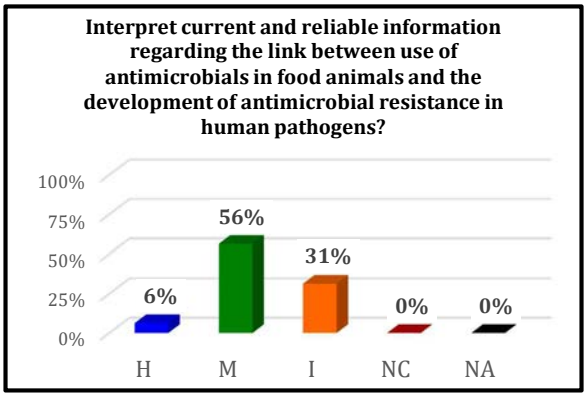


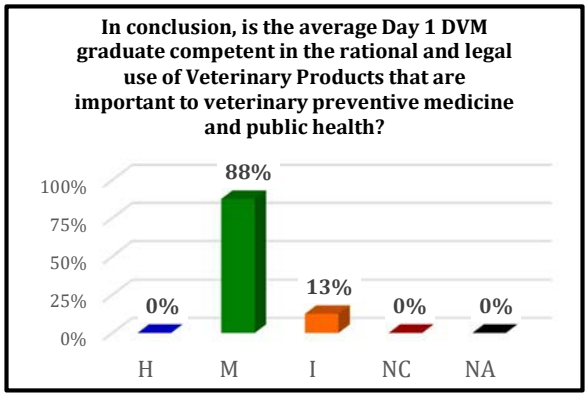




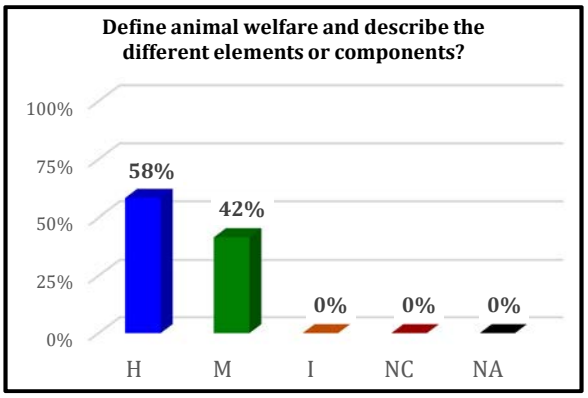


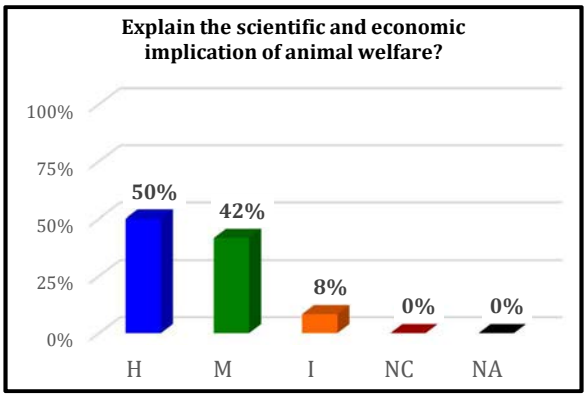


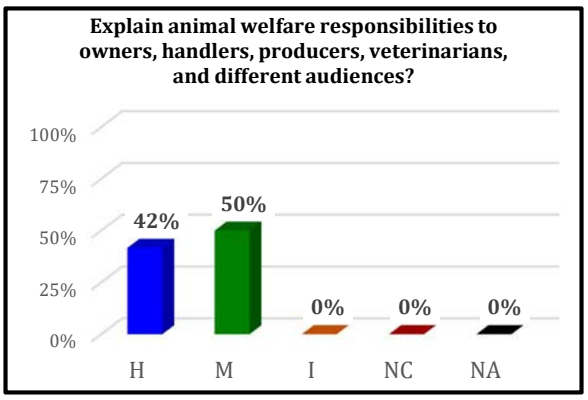

Interpret current and reliable information regarding the link between use of antimicrobials in food animals and the development of antimicrobial resistance in human pathogens?
100%
75%
50%
25%
0%
6%
56%
31%
0%
0%
H
M
I
NC
NA

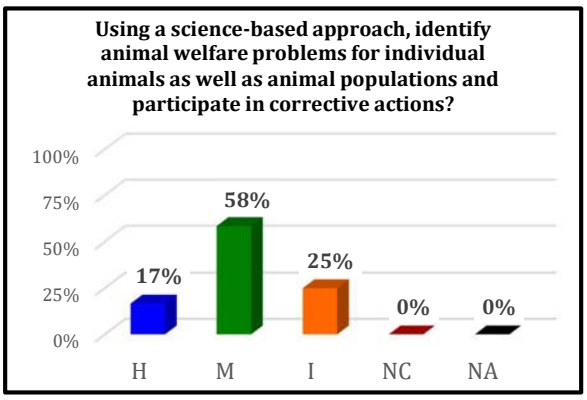

In conclusion, is the average Day 1 DVM graduate competent in the rational and legal use of Veterinary Products that are important to veterinary preventive medicine and public health?
100%
75%
50%
25%
0%
0%
88%
13%
0%
0%
H
M
I
NC
NA

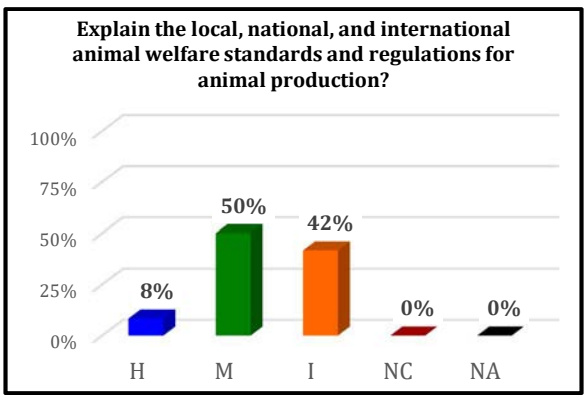
Appendix 2.8 - Animal Welfare

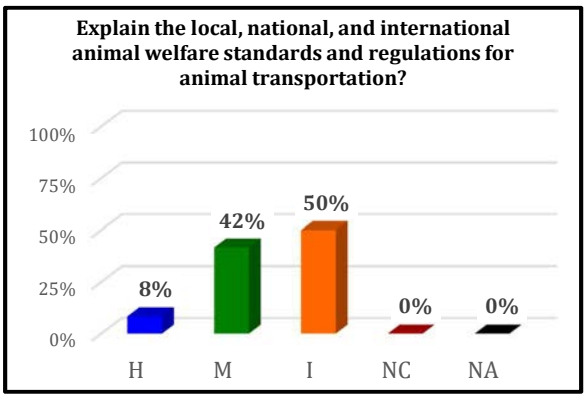


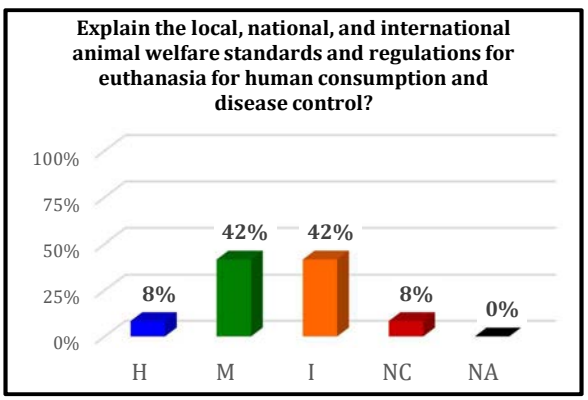


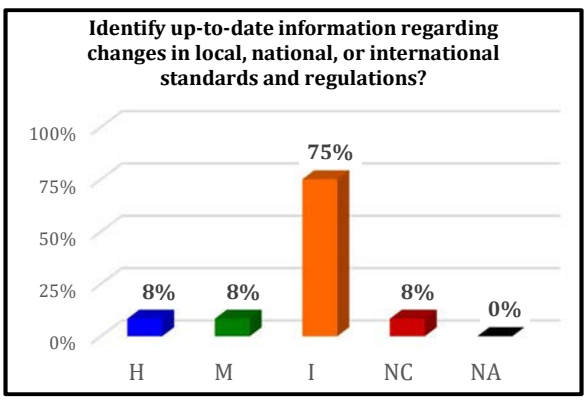




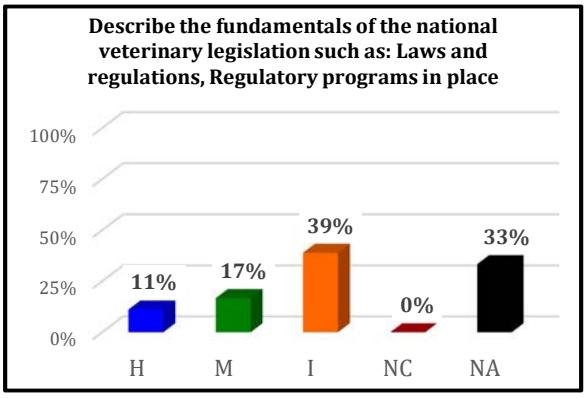


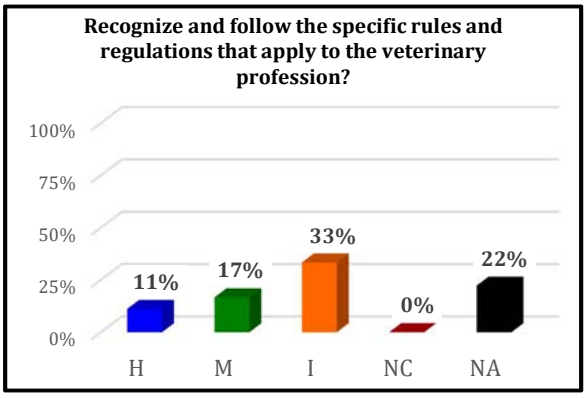


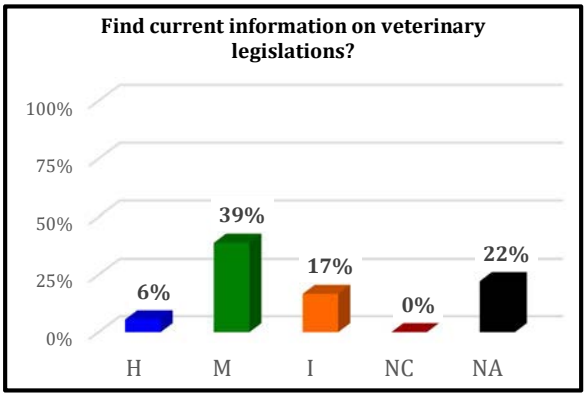


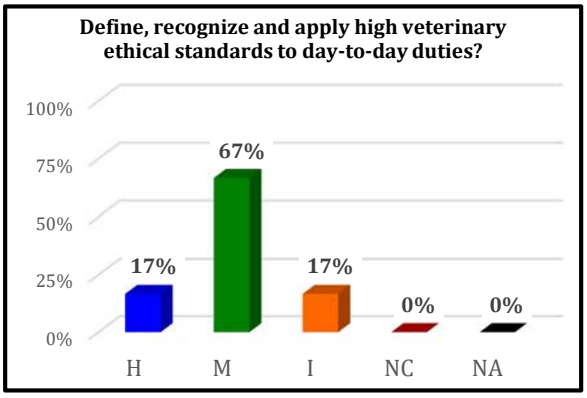


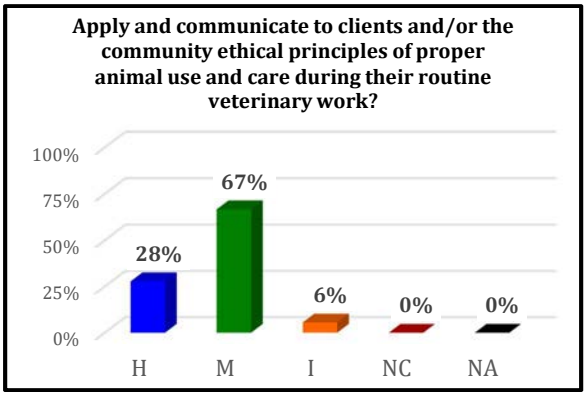
Appendix 2.9 – Veterinary Legislation and Ethics

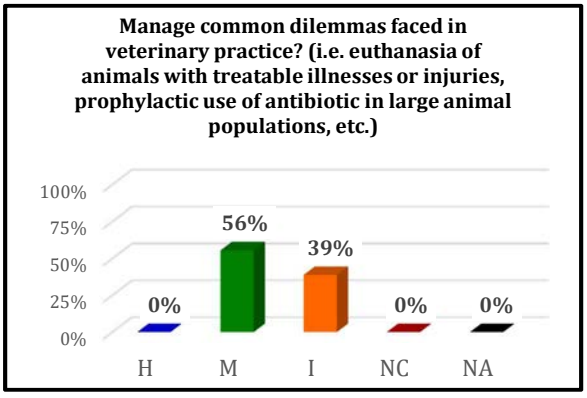




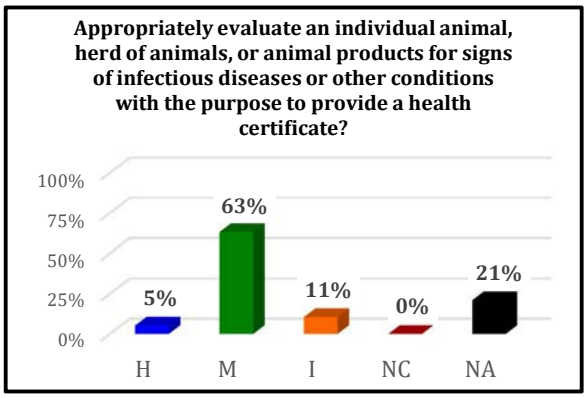


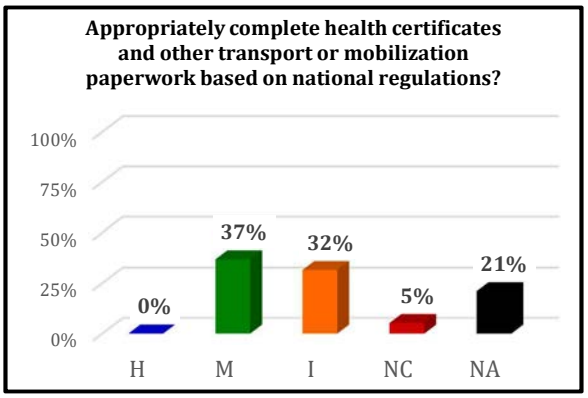




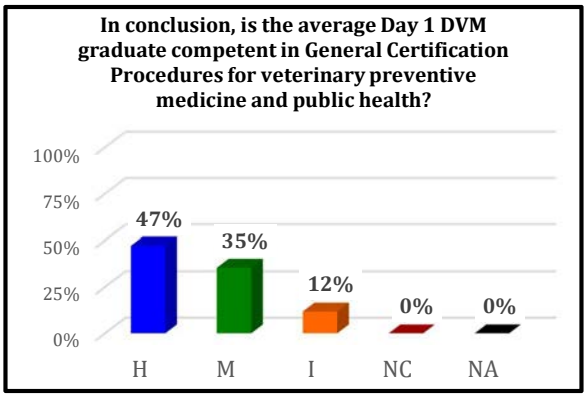


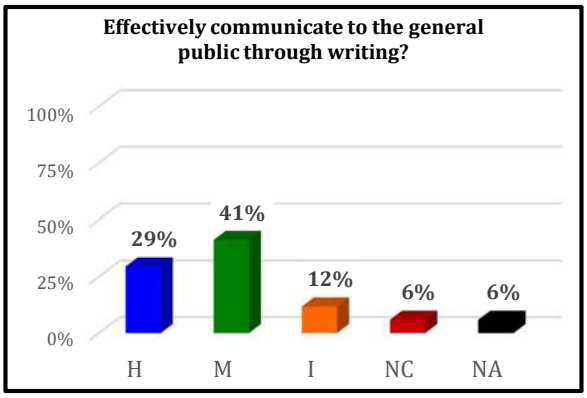
Appendix 2.10 – General Certification Procedures

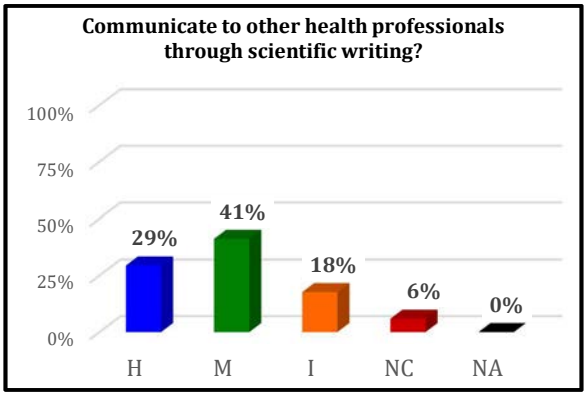




Appendix 2.11 – Communication Skills

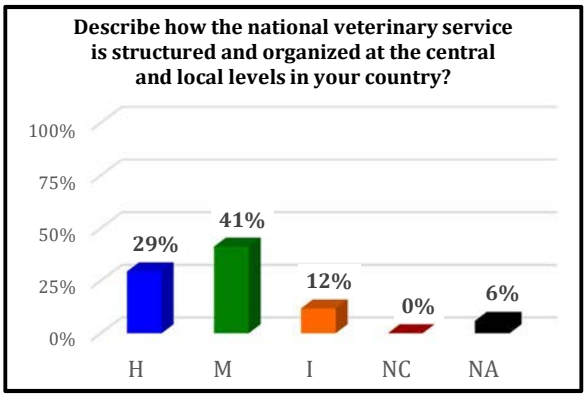


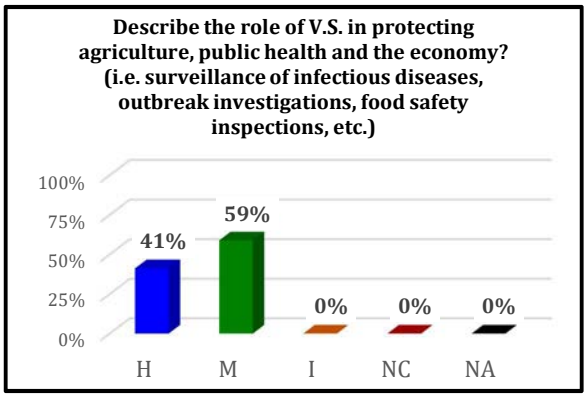


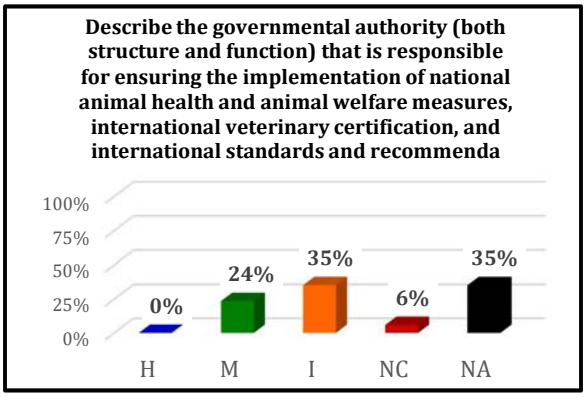


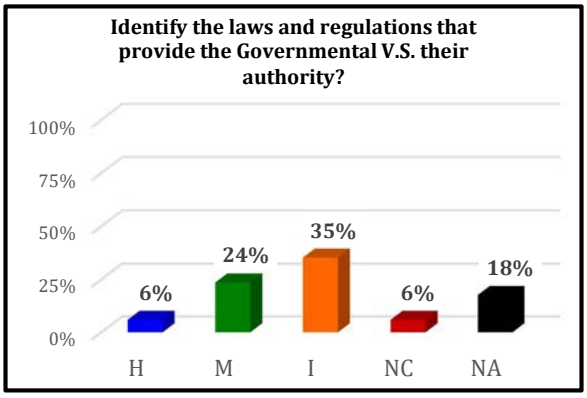
Appendix C
Advanced Competencies Complete Results

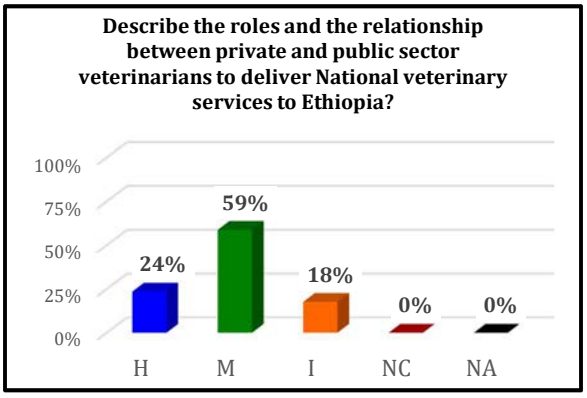
Appendix 3.1 – Organization of Veterinary Services

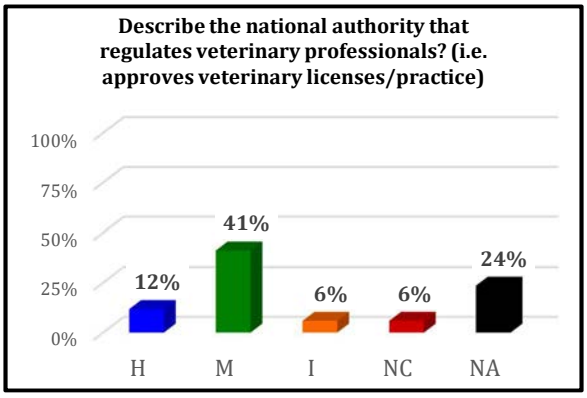


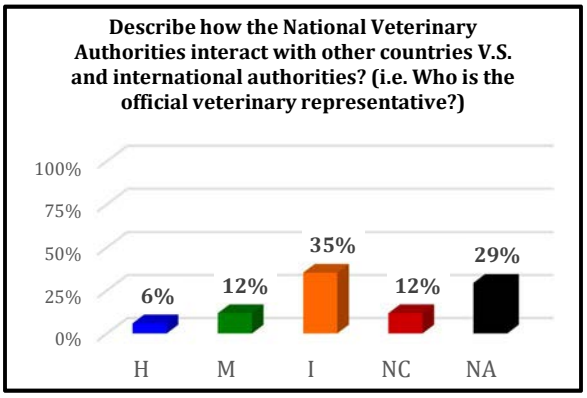


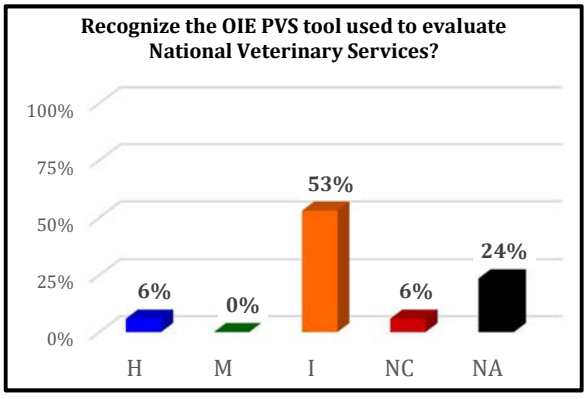




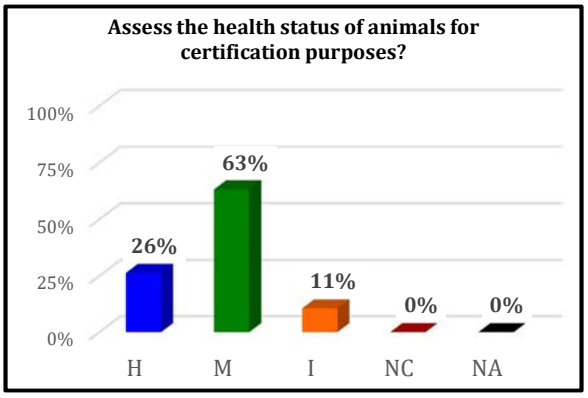


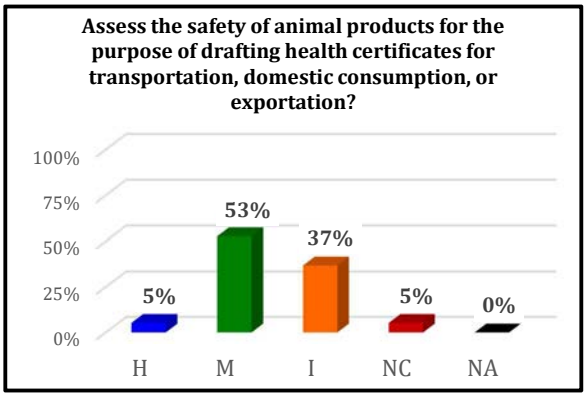


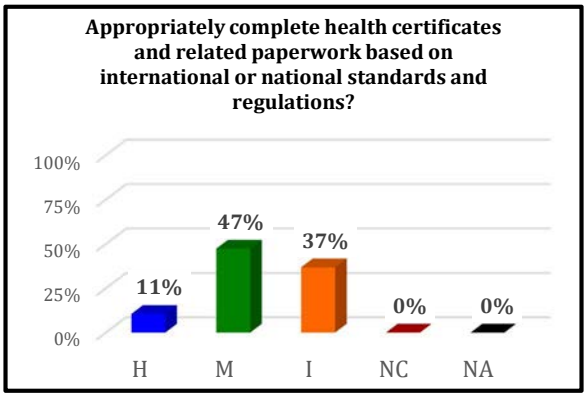




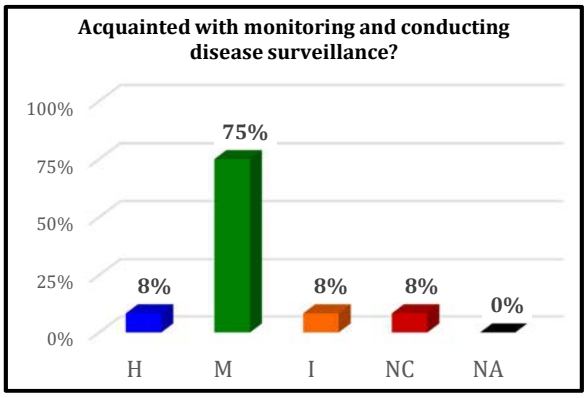
Appendix 3.2 – Inspection and Certification Procedures for Exportation

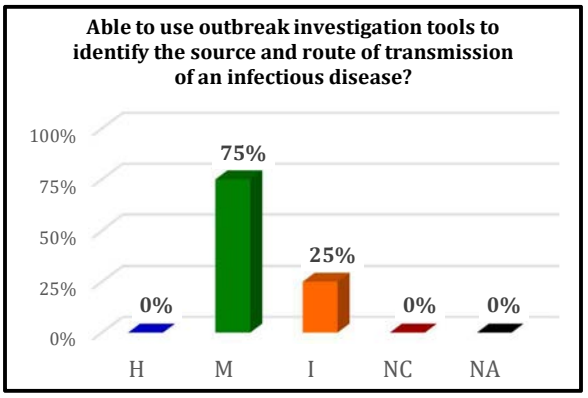


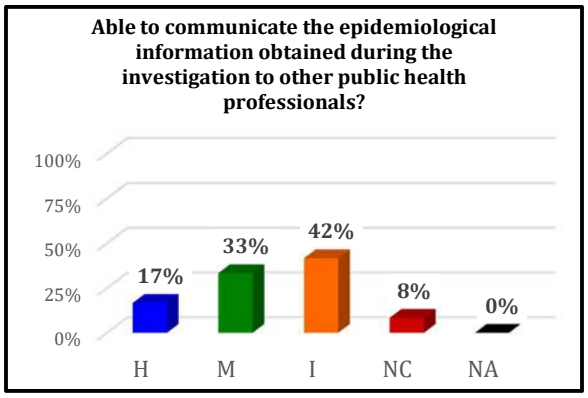


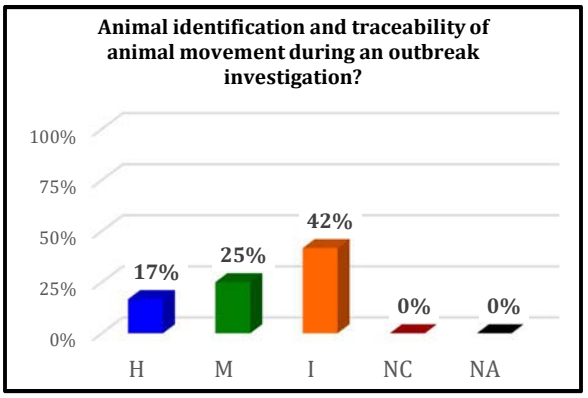


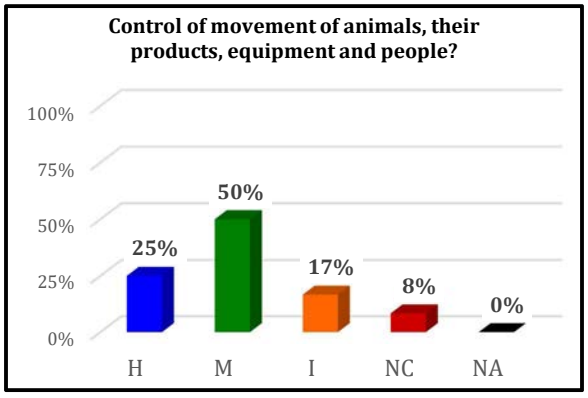
Appendix 3.3 – Management of Contagious Diseases

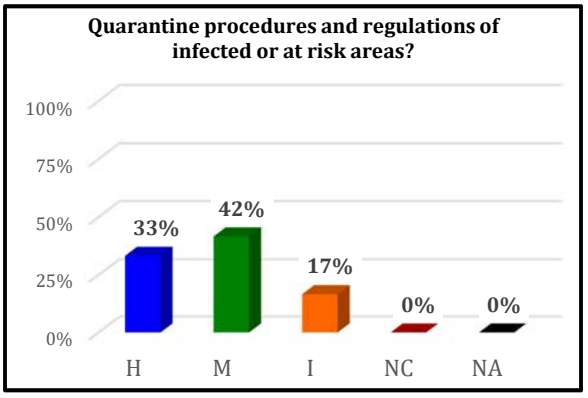


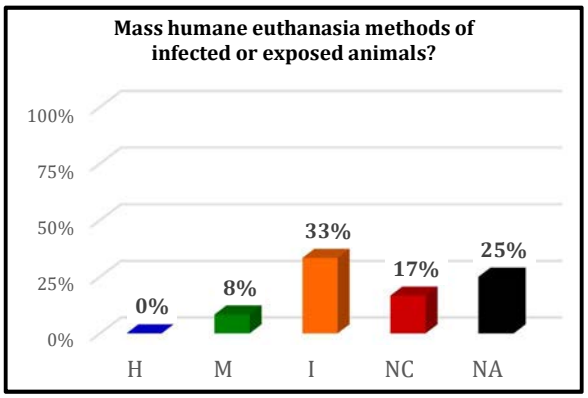


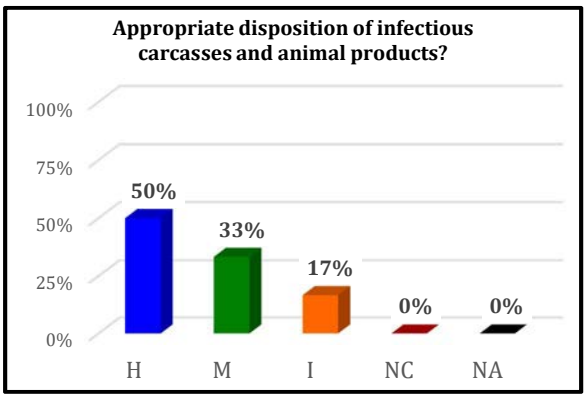


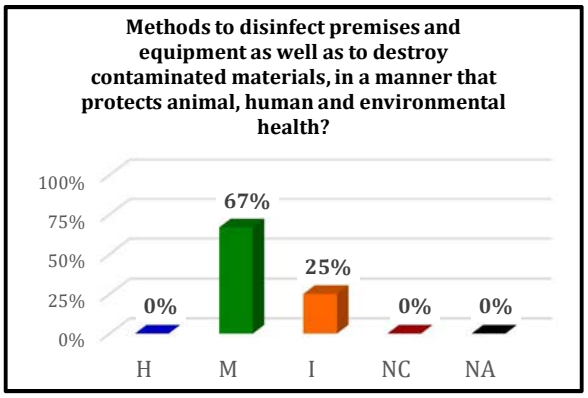


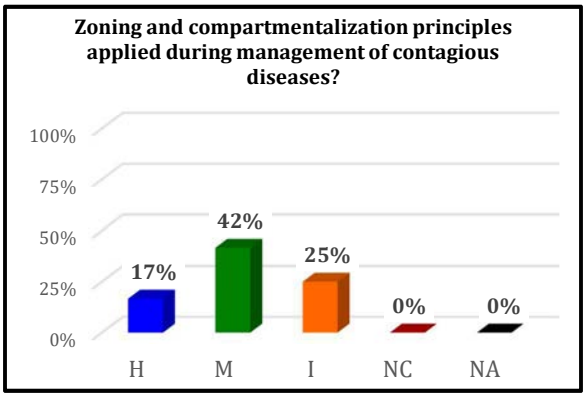




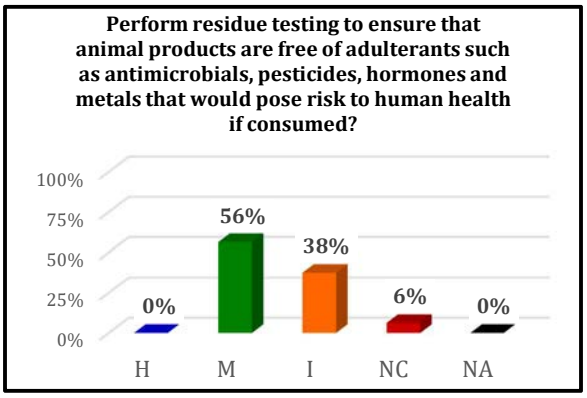


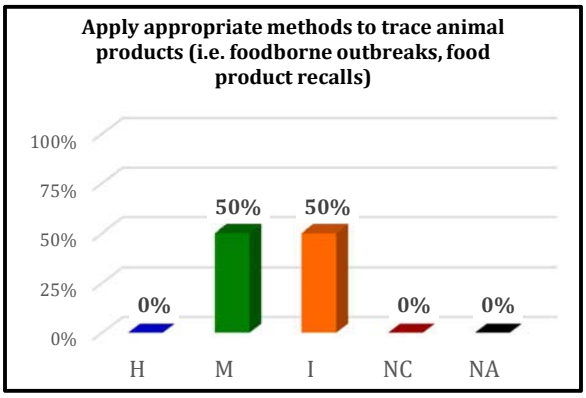


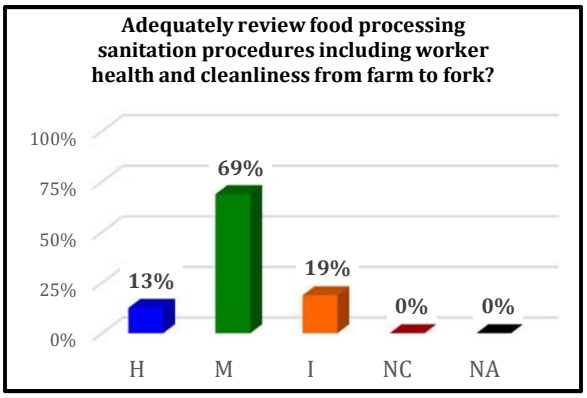

Methods to disinfect premises and equipment as well as to destroy contaminated materials, in a manner that protects animal, human and environmental health?
100%
75%
50%
25%
0%
0%
67%
25%
0%
0%
H
M
I
NC
NA

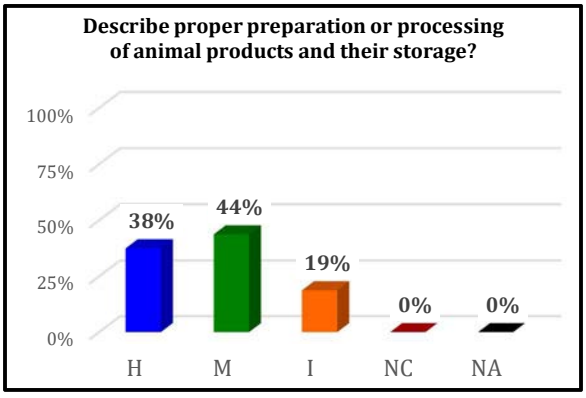

Zoning and compartmentalization principles applied during management of contagious diseases?
100%
75%
50%
25%
0%
17%
42%
25%
0%
0%
H
M
I
NC
NA

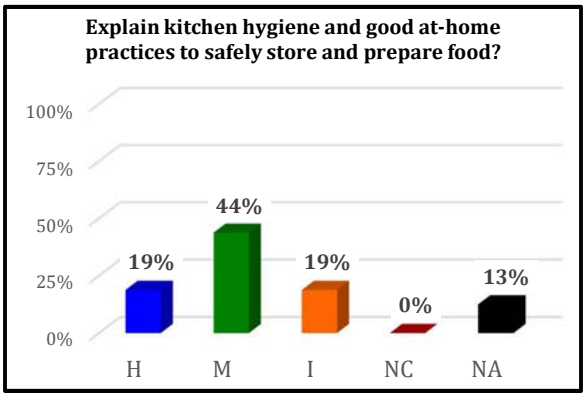
Appendix 3.4 – Advanced Food Hygiene



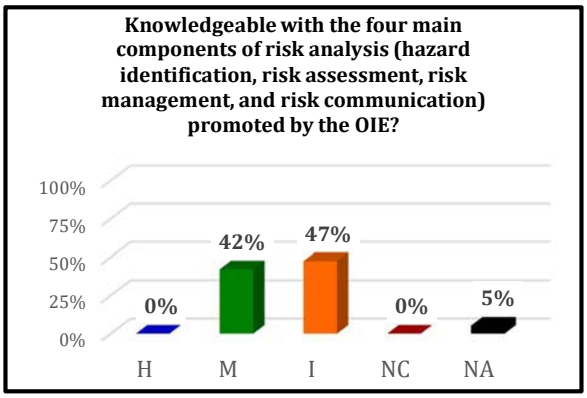


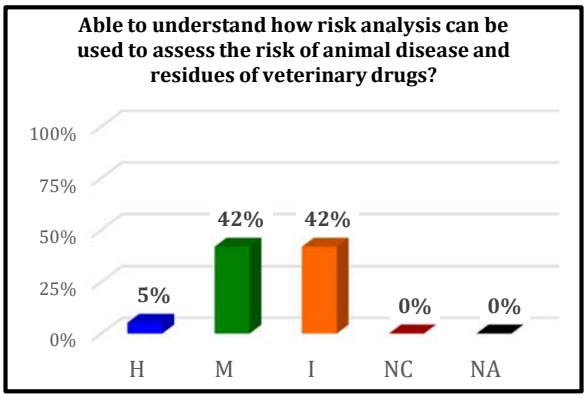


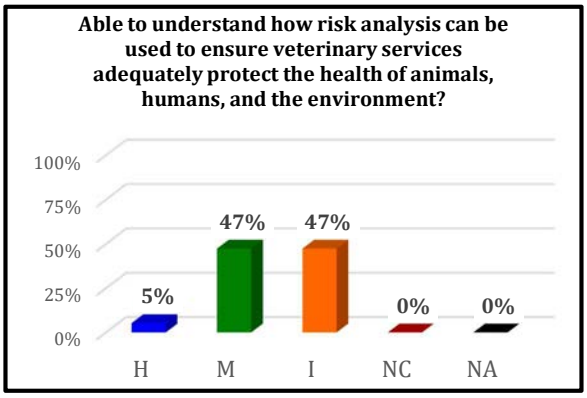


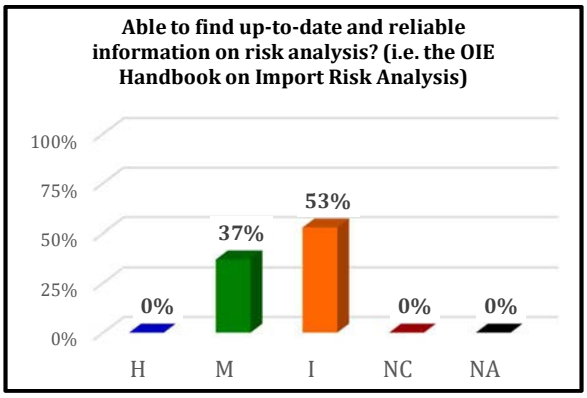


Appendix 3.5 – Application of Risk Analysis

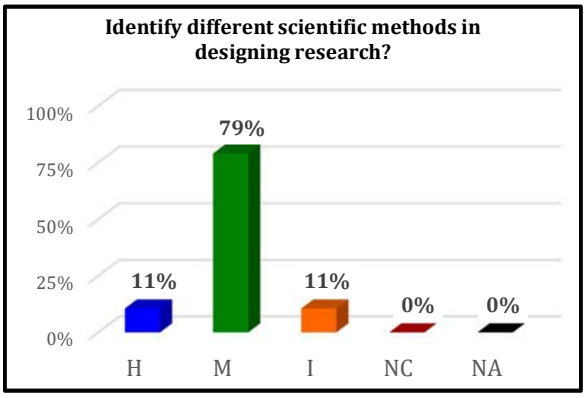


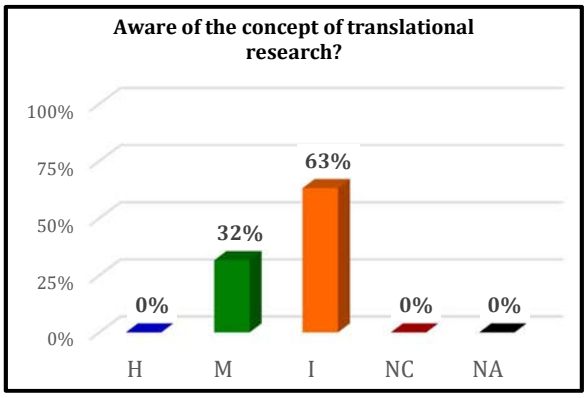


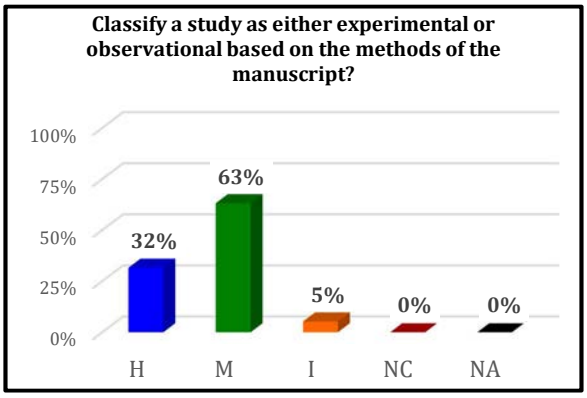


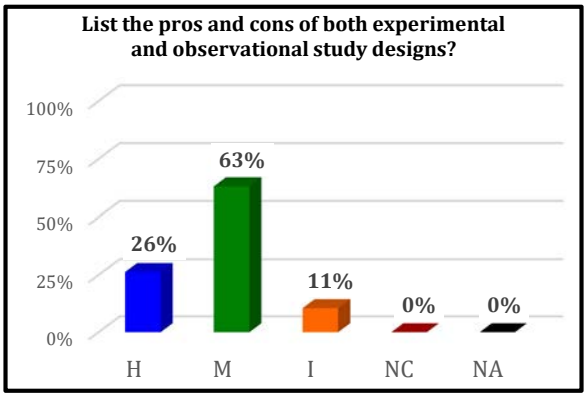


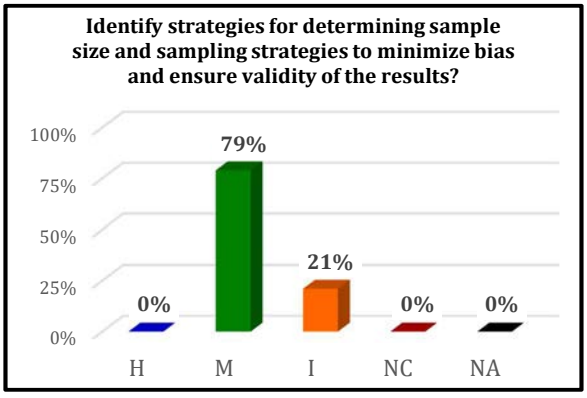
Appendix 3.6 – Research

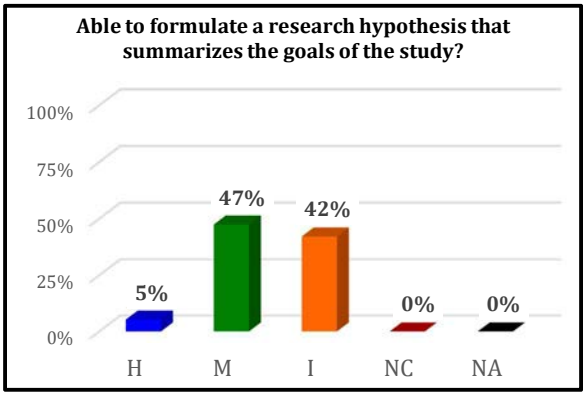


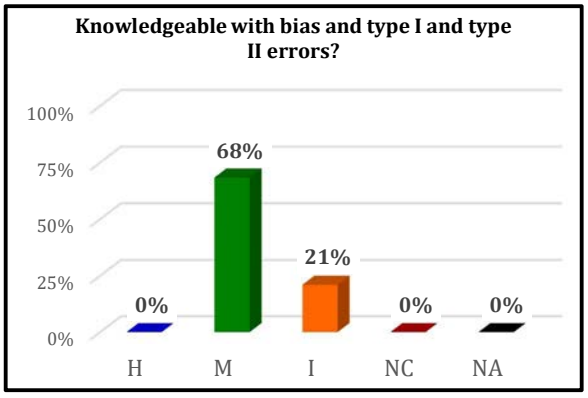


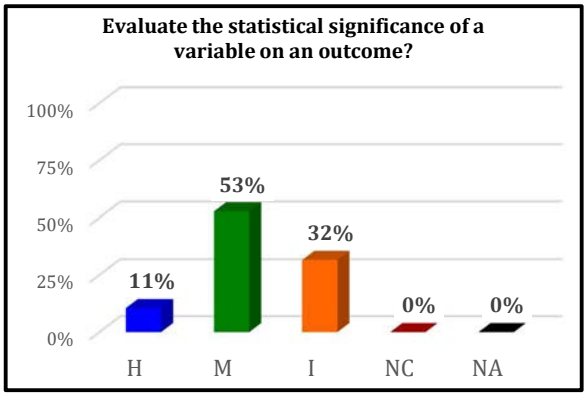


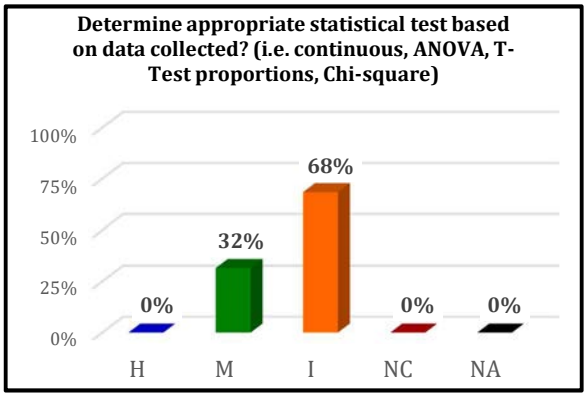


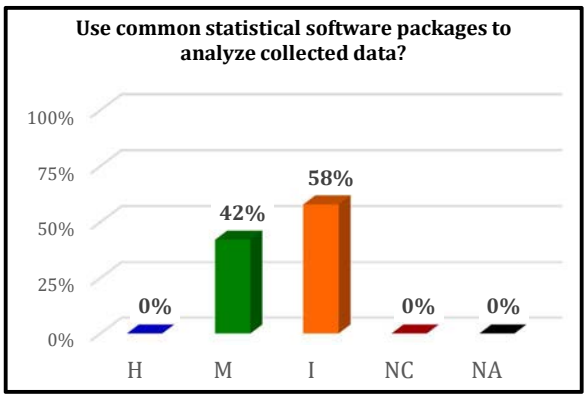


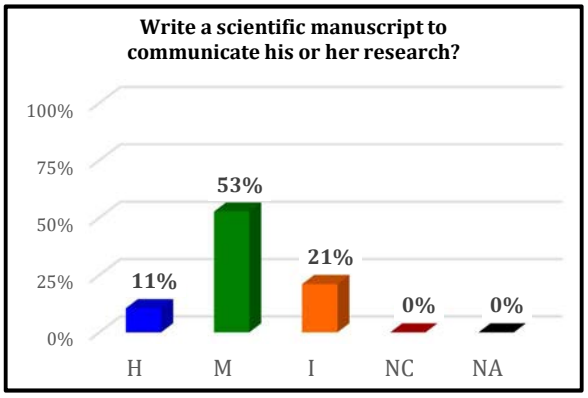


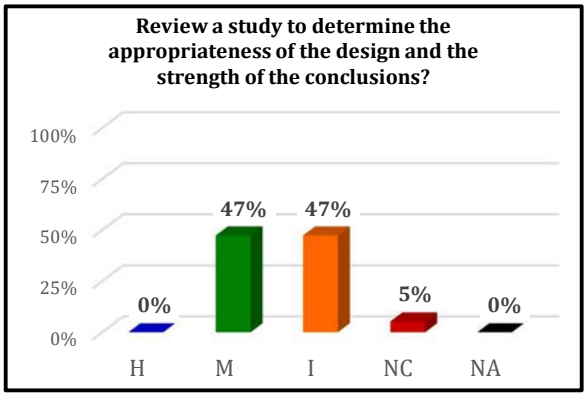




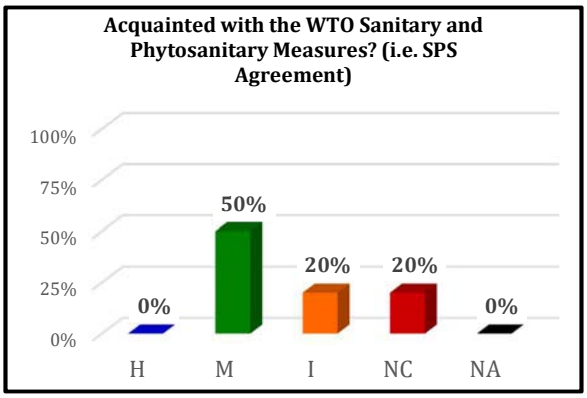

Determine appropriate statistical test based on data collected? (i.e. continuous, ANOVA, T-Test proportions, Chi-square)
100%
75%
50%
25%
0%
0%
32%
68%
0%
0%
H
M
I
NC
NA

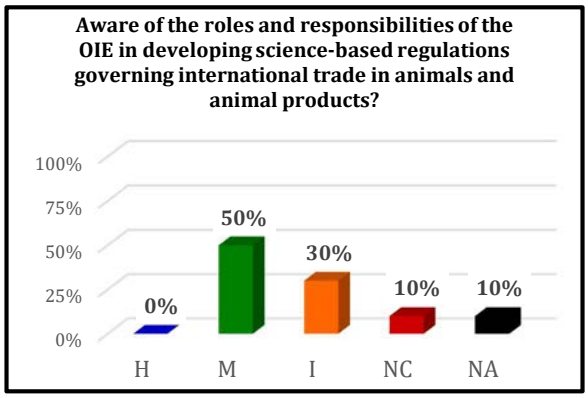

Use common statistical software packages to analyze collected data?
100%
75%
50%
25%
0%
0%
42%
58%
0%
0%
H
M
I
NC
NA

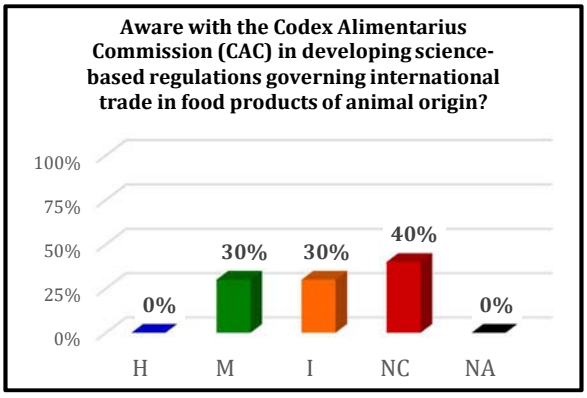

Write a scientific manuscript to communicate his or her research?
100%
75%
50%
25%
0%
11%
53%
21%
0%
0%
H
M
I
NC
NA

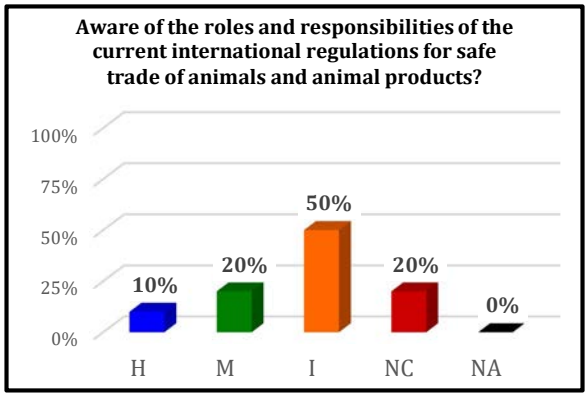

Review a study to determine the appropriateness of the design and the strength of the conclusions?
100%
75%
50%
25%
0%
0%
47%
47%
5%
0%
H
M
I
NC
NA

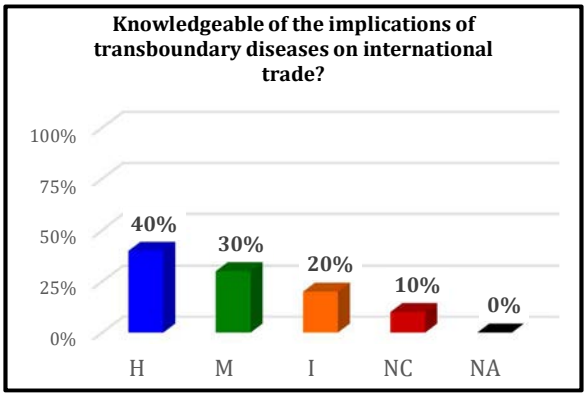
Appendix 3.7 – International Trade Framework

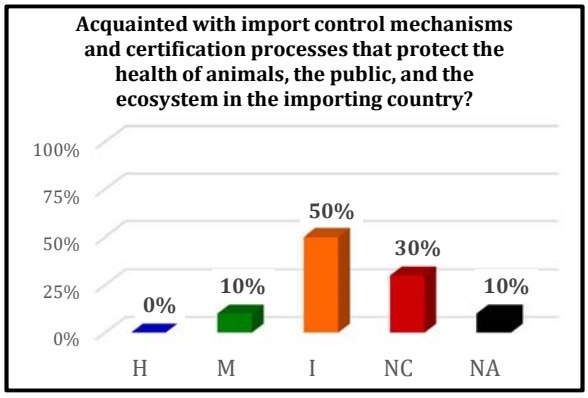


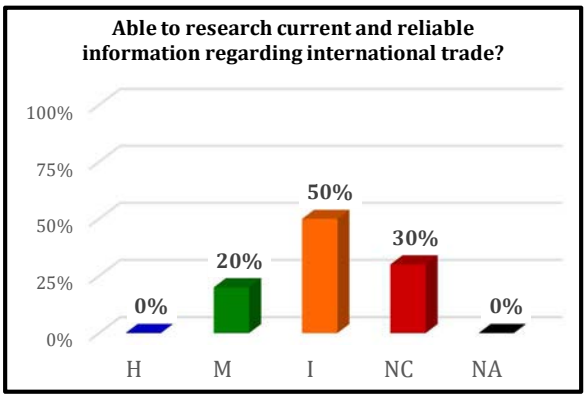




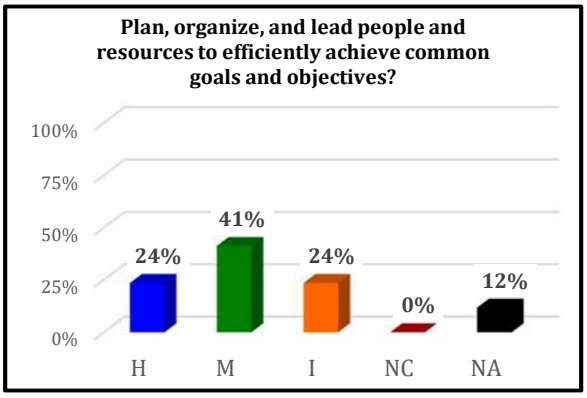


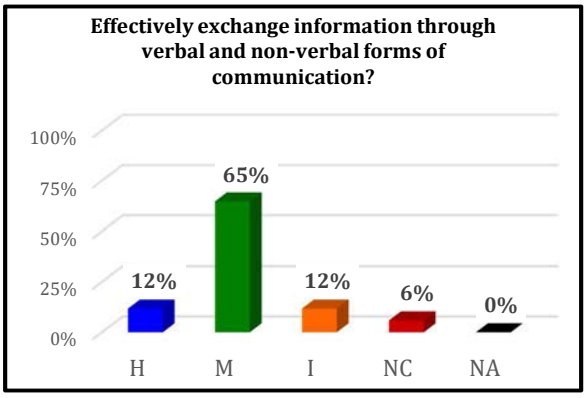


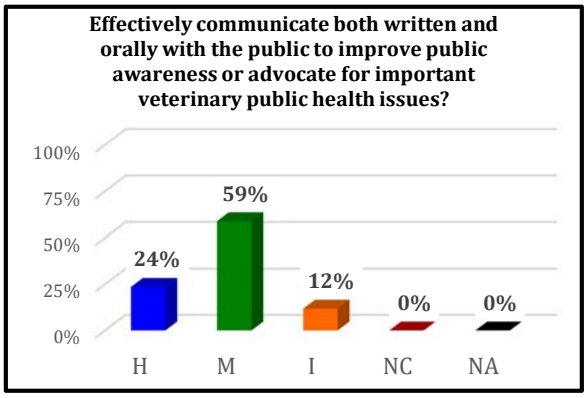


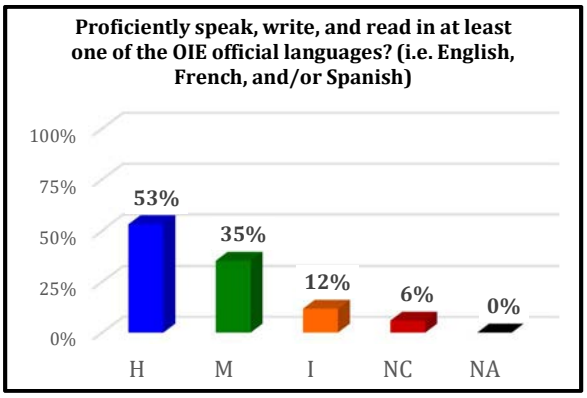


Appendix 3.8 – Administration and Management









Report prepared by
UoG Team

Dr. Tsegaw Fentie

Dr. Achenef Melaku

Dr. Seleshe Nigatu

OSU Team

Dr. Armando Hoet*

Dr. Suzanne Tomasi

Dr. Wondwossen Gebreyes

Dr. Jeanette O'Quin

Dr. Jason Stull

Dr. Lonnie King

WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future