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Veterinary Laboratory Diagnosis: A Missed Opportunity in the Continuum of Care for Veterinarians in Selected Countries in Sub-Sahara Africa

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Abstract

In Africa, sustainable livestock production must address food security, as well as animal disease concerns simultaneously in addition to social aspects. Livestock disease challenges seem to be increasing with one of them being lack of good animal diagnostics services with notable emerging zoonotic diseases which if not correctly diagnosed in animals pose risks to humans. The major livestock hubs in sub-Sahara Africa (SSA) include Uganda, Ethiopia, Tanzania and Nigeria and utilization of diagnostic services by veterinarians in these countries could inform further action by different stakeholders in the SSA region. A cross sectional survey with veterinarians was conducted between January 2022 and February 2022 to determine the number of veterinarians who have submitted samples for veterinary diagnosis, laboratory utilization rates and challenges faced by veterinarians using veterinary labs in sub-Sahara Africa between the period of 2018 and 2022. **Methods:** This was a cross sectional study, where an online questionnaire was shared with veterinarians through their online social group networks in different countries and data was captured and analyzed. **Results:** 74% (64/87) of veterinarians reported having submitted a sample to a lab, Government labs were the most utilized at 54%, followed by private labs at 37% and the human health labs recorded 9% utilization rate. The most faced challenge by veterinarians was failing to get samples to the lab because the labs where far (52%) with the least challenge reported being failure to understand the lab results at 3%. **Conclusion:** Government labs were the most utilized in this period, however notable challenges like failing to get samples to the lab still exist. Veterinary diagnosis is still an underutilized service in sub-Sahara Africa and more measures need to be worked on in terms of sample logistics, capacity building and trainings of both lab personnel and veterinarians in interpretation of re-

sults to ensure improved utilization of veterinary diagnostics services.

Keywords

Veterinary Diagnosis, Sub-Sahara Africa (SSA), Laboratory, Livestock

1. Introduction

Improved veterinary diagnosis is a requirement for effective control and management of endemic cattle diseases in sub-Saharan Africa (SSA), however this is currently constrained due to different factors such as limited availability of suitably trained professional staff, field based diagnostic tests and a general lack of knowledge about disease among livestock farmers [1]. Veterinary Laboratories that rapidly identify, respond to and control rapidly spreading and emerging (or re-emerging) infectious and zoonotic diseases are critical to: 1) The financial performance of animal agriculture and international trade; 2) livelihoods of animal related industries; 3) Nutritional status, food security, and the socio-economic well-being of a country [2]. In Nigeria, majority of the private veterinary diagnostic laboratories are owned by veterinary drugs and biologics companies who offer the diagnostic services to their customers on a complimentary basis, only few private laboratories are operated by private veterinarians or biomedical scientists engaged in for-profit services [3]. Although different governments in Sub-Sahara and development partners like Food and Agriculture Organization (FAO) have over the last decade invested in supporting disease control and strengthening animal disease diagnostics through establishment and support of veterinary laboratories, most of these laboratories continue to struggle to provide diagnostic services to their clients while others have collapsed or have remained dormant due to underutilization. An online questionnaire surveillance with veterinarians in 4 selected countries of sub-Sahara Africa (Uganda, Tanzania, Nigeria and Ethiopia) was undertaken in order to assess the status of utilization of veterinary diagnostic services and challenges faced in utilization. The objectives of the study where to identify the number of veterinarians who submitted samples for veterinary diagnosis, the rate of utilization of labs for veterinary diagnosis and the challenges faced in utilizing labs for veterinary diagnosis.

2. Methods

2.1. Study Area

Nigeria, Uganda, Tanzania and Ethiopia were selected from other sub-Sahara countries because they form important livestock hubs in sub-Sahara Africa and with increasing livestock productivity and investments made in the livestock sector by the governments and development partners, a study in these countries would give important feedback on the veterinary diagnosis utilization in these

countries for the period of January, 2018 to January, 2022.

2.2. Study Approach and Population

A qualitative study using an online questionnaire was used to collect data from the different animal health practitioners predominantly veterinarians in these countries. The questionnaire was shared through the different social group networks of veterinarians in the selected countries. Local veterinarians helped in sharing the questionnaire. The questions were structured to capture the data relevant for the objectives of the study, thereafter, it was used in a cross-sectional survey designed to measure qualitative and quantitative responses,

2.3. Data Collection and Analysis

Data was collected through a cross sectional online survey, analysed, and presented in form of frequency tables, and graphs.

2.4. Ethical Consideration

A consent note highlighting the purpose of the study was included in the questionnaire and this was first consented to by the veterinarian before going ahead to fill in the online questionnaire. All participants who consented first, took part in the study and their details where anonymized in the analysis.

3. Results

3.1. Veterinarians Who Submitted Samples for Lab Diagnosis between January 2018 and January 2022

Out of the 87% respondents from the 4 countries who consented to the study (51 respondents from Uganda, 17 respondents from Tanzania, 11 respondents where from Nigeria, while 8 respondents where from Ethiopia), 74% (64/87) responded to having submitted a sample in the period of January 2018 to January 2022 (**Figure 1**). The significant difference could refer to the fact that diagnosis is indeed a service utilized by many veterinarians in the SSA region.

3.2. Laboratories Used for Veterinary Diagnosis between January, 2018 and January, 2022

The labs that were utilized with in the period of January 2018 and January 2022 were government labs (54%), private veterinary labs (37%) and human health labs (9%) (**Figure 2**). Government labs being the most utilized in this study, could highlight the fact they offer free services and hence the veterinarians find it easy to send samples to these labs compared to private veterinary and human health labs.

3.3. Challenges Faced by Veterinarians Utilizing Labs between January 2018 and January 2022

The challenges faced by veterinarians utilizing the labs were failure to submit

samples to a lab as it was far (52%), Results did not match the clinical condition (29%), Failed to get my results back (16%) and those that did not understand the results (3%) (Figure 3). The regions where farms are in the SSA region are far from the government labs as well as other private labs. Therefore, this could explain the reason why the most reported challenges was failure to submit samples because of the distance.

4. Discussion

The number of veterinarians who submitted samples in this study was higher compared to those who never submitted samples despite the low number of respondents from selected countries. This finding was higher compared to that reported in a single state of Mississippi on 55% (12/22) of licensed practioners who submitted a sample for veterinary diagnosis [4]. The finding in this study could be explained by the fact that veterinary diagnosis is a need for veterinarians

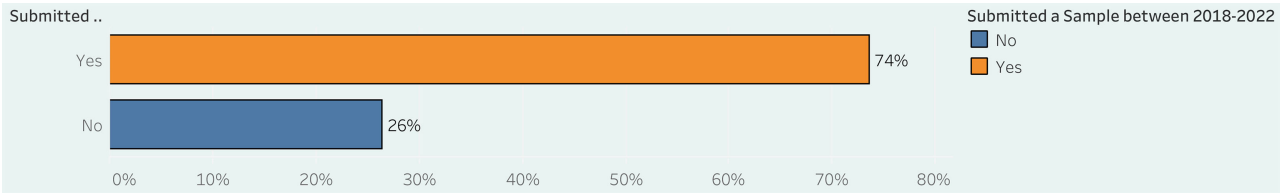

Figure 1. Number of veterinarians who submitted a sample to a lab between 2018 and 2022.

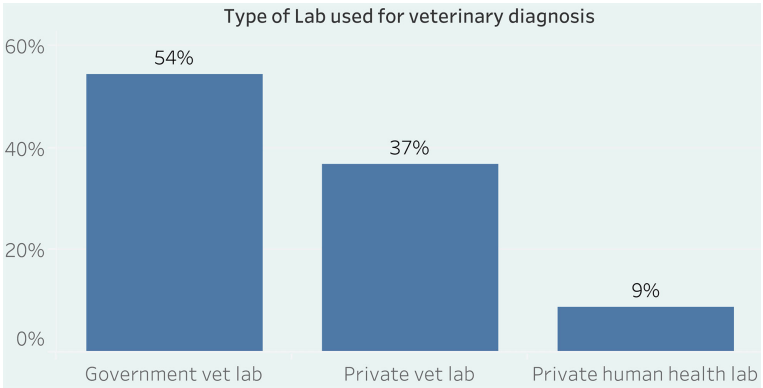

Figure 2. Rate of utilization of labs by veterinarians in selected countries in sub-Sahara Africa between January, 2018 and January, 2022.

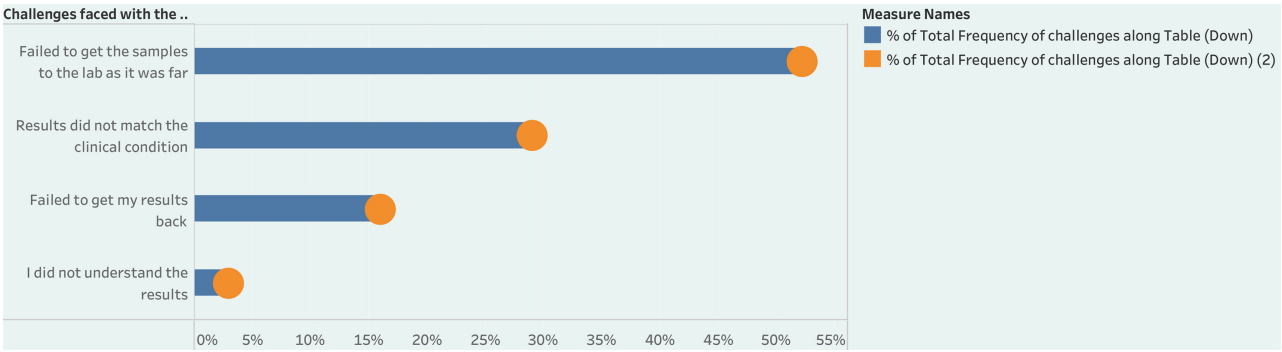

Figure 3. Challenges faced by veterinarians utilizing labs in the selected sub-Sahara countries.

in SSA and it contributes to the continuum of care in the day-to-day activities of veterinarians. The number of respondents was low compared to the many field practicing veterinarians in the selected SSA countries and this could be explained by the fact that despite the need of diagnosis not many utilize the need to practice it in their daily activities but as well the low turn up could be explained by the fact that the period of study involved a global covid-19 pandemic that could have slowed down the service by most veterinarians hence hesitation to consent to the study. Determining the reasons that influence sample submission and value proposition of sample submission by veterinarians in sub-Sahara Africa is important to strengthen disease monitoring in the livestock hubs of sub-Sahara Africa with the bigger aim of improving communication with and use of laboratories by veterinarians.

The government veterinary labs are the most utilized for diagnosis and this is because most governments in SSA have invested in setting up lab infrastructure in different regions of their countries. Most of these set ups have been facilitated by development partners like FAO. The government labs to some extent face challenges of sustainability in some of the countries like Uganda but if well facilitated could play a big role in upscaling diagnostic services [5]. The rate of utilization of private labs signifies the need for continual public-private partnerships in improving the livestock industry in selected countries in SSA. The private players through different initiatives have set up labs in the selected countries most notably the Zoetis ALPHA initiative which has contributed to funding of 16 laboratories in the different selected SSA countries [6]. Such initiatives will continue a long way to support and improve veterinary diagnosis in sub-Sahara Africa. The utilization of human health labs in this study demonstrates the exodus of one health collaborative approaches and this should not be taken lightly by different stakeholders in the livestock industry. Human health labs have faced and learnt from challenges of utilization by health practioners in the past and could use these learnings to improve or extend services of veterinary diagnosis in sub-Sahara countries. The utilization of human health labs in this study could also be explained by the fact that the human health labs where mostly active in the covid pandemic which happened in the time frame of this study. Further studies on the integration of veterinary diagnosis in human health labs need to be studied so as to develop a clear framework for support on veterinary diagnosis in sub-Sahara Africa.

This study reported that the biggest challenge faced by veterinarians in utilizing labs was that they are located far, and they face issues in submitting samples. This could be explained by the geographical location of the agro ecological zones or cattle corridors in the selected countries where most farms are located far from the field labs and some countries have national reference labs as the active ones, where sending a sample to such labs is limiting because of the distance. Active logistical infrastructure needs to be set up in such countries to aid the movement of samples or one health collaborations with human labs could be a

possible solution to such challenges in some countries. Digital solutions to facilitate results sharing could solve challenges of failing to get results back from some labs and different development partners have developed animal health digital tools but very few like lab cards [7] digital tool have been developed to facilitate lab result sharing. Other challenges such as failure to understand results or result-condition mismatch could be addressed by more trainings like result interpretation, reasons, or indications for sampling for veterinarians and also lab personnel. A number of these trainings have been facilitated by development partners like FAO and private players like Zoetis in the selected countries.

5. Conclusion and Recommendations

Veterinary diagnosis is still underutilized in sub-Sahara Africa and therefore a missed opportunity in Sub-Sahara Africa despite the different approaches by different stakeholders and the challenges seem to be eminent. This study concludes that veterinary diagnosis is needed by veterinarians in the day-to-day continuum of care, the governments have also ensured that government labs are set up and used by veterinarians but with the challenges of location where most labs are set up far from practicing vets and farms, sample logistics networks have to be set up to ensure sample in flows into the labs. As well, more studies on factors for sample submission, public private partnerships as well as one health collaborative approaches need to be studied further to ensure sustainable veterinary diagnosis in the livestock industry. Trainings of veterinarians on laboratory results interpretation and sampling could also improve the utilization of labs in sub-Sahara Africa.

Author's Contributions

Francis Kalule: Conceptualization, methodology, investigation, formal analysis, writing original draft, writing review and editing

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upscale diagnostic services.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

[1] Machila, N., Wanyangu, SW., McDermott, J., Welburn, S.C., Maudlin, I., *et al.* (2003) Cattle Owners' Perception of African Bovine Trypanosomosis and Its Control in Busia and Kwale Districts of Kenya. *Acta Tropica*, **86**, 25-34. https://doi.org/10.1016/S0001-706X(02)00288-7

[2] Schulz, L.L., Hayes, D.J., Holtkamp, D.J. and Swenson, D.A. (2018) Economic Impact of University Veterinary Diagnostic Laboratories: A Case Study. *Preventive Veterinary Medicine*, **151**, 5-12. https://doi.org/10.1016/j.prevetmed.2017.12.018

[3] Adamu, A., Alimi, Y., Akefe, I., Wunti, Z., Mohammed, K., *et al.* (2018) Veterinary Diagnostic Services for the Future: Nigeria's Pathway to Progress. *Biomedical Journal of Scientific & Technical Research*, **6**, 5486-5488. http://doi.org/10.26717/BJSTR.2018.06.001402 https://biomedres.us/pdfs/BJSTR.MS.ID.001402.pdf

[4] Robinson, P.A., Epperson, W.B., Huston, C.L., Pace, L.W., Wills, R.W. and Cosby, A.G. (2012) Factors Influencing Diagnostic Sample Submission by Food Animal Veterinarians in Mississippi. *Veterinaria Italiana*, **48**, 31-39.

[5] Nakayima, J., Nerima, B., Sebikali, C. and Magona, J.W. (2016) An Assessment of Veterinary Diagnostic Services Needs in Uganda. *Journal of Veterinary Medicine and Animal Health*, **8**, 50-55. https://doi.org/10.5897/JVMAH2016.0462

[6] Zoetis Press (28 June, 2022) Zoetis Celebrates A.L.P.H.A. Initiative's Five-Year Anniversary and Progress toward Improved Livestock Health and Farmers' Livelihoods in Sub-Saharan Africa. https://news.zoetis.com/press-releases/press-release-details/2022/Zoetis-Celebrates-A.L.P.H.A.-Initiatives-Five-Year-Anniversary-and-Progress-Toward-Improved-Livestock-Health-and-Farmers-Livelihoods-in-Sub-Saharan-Africa/default.aspx

[7] Synappz Mobile Health (2019) Labcards Provides Veterinarians and Lab Technicians Digital Tools to Work in Sample Management. https://www.labcards.io/