

Veterinary Diagnostic Services for the Future: Nigeria's Pathway to Progress



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Abstract

The relevance of effective and efficient veterinary diagnostic services cannot be over emphasized in animal welfare and public health, as well as in food safety. Some of the major functions served by accurate and prompt diagnosis of animal diseases include the prevention of exotic livestock diseases from spreading into the country; control and/or eradication of endemic diseases; the assurance of standard pre-import/export testing which conforms to World Trade Organization (WTO) requirements; and the promotion of public health and food safety. This review examines the current state of veterinary diagnostics in Nigeria, including existing capabilities, constraints, opportunities and future potentials. A vision for the improvement of Nigerian veterinary services over the next twenty-five years is also briefly outlined, as well as recommendations aimed at shifting the current status quo towards global best practices.

Keywords: Veterinary Diagnostics; Services; Nigeria; Future

Introduction

Nigeria is located in tropical western Africa, on the Gulf of Guinea. It lies between latitudes 4° and 14°N, and longitudes 2° and 15°E. About 10% of Nigerians are employed in the livestock and as such, animal health continues to be a vital part of socio-economic welfare and well-being WPP [1]. Effective and efficient veterinary diagnostic services play an unequivocal role in animal and human health Ariane et al. [2], particularly with the growing emphasis on food safety more than ever in our present-day highly globalized world [3-5]. Some of the major functions served by accurate and prompt diagnosis of animal diseases include the prevention of exotic livestock diseases from entering into the country Ariane et al. [2]; control and/or eradication of endemic diseases Isaac et al. [6]. The assurance of standard import/export testing which conforms to World Trade Organization (WTO) requirements Pearson [7] and the promotion of public health and food safety.

The different veterinary diagnostic techniques commonly used in Nigeria include haematological analysis, tissue cultures, X-rays, biopsies, serum chemistry, ultrasound, explorative surgeries and physical examination Daguma [8]. This review highlights the current state of the Nigerian veterinary diagnostic sector, including existing capabilities, constraints, opportunities and future

potentials. A vision for the improvement of Nigerian veterinary services over the next twenty five years is also briefly outlined, as well as recommendations aimed at shifting the current status quo towards global best practices.

In order to better understand this subject, the following premises are considered:

- What is the current status of Nigeria's veterinary diagnostic services?
- How can we make it better; vis-a-vis newer diagnostic approaches and policies?
- What are the future projections, visions?

The Status Quo: Existing Capabilities and Constraints

The Nigerian veterinary diagnostic services as currently constituted can be majorly divided into the public-sector laboratories (owned and operated by government and manned by public sector veterinarians) and private sector laboratories (mostly owned by private veterinarians/veterinary companies). Even though the last decade has witnessed the sprouting up of quite a handful of private veterinary laboratories across the country, it

must be emphasized that the private diagnostic industry in Nigeria is still at its infancy and hence quite limited in terms of the range of diagnostic tests that can be undertaken, availability of standard diagnostic equipment, reagents, personnel and patronage. In addition, some existing infrastructural problems such as erratic power supply, lack of water supply and lack of good road network still continue to discourage many stakeholders from investing in the industry.

At present, the reality is that majority of the private veterinary diagnostic laboratories are owned by veterinary drugs and biologics companies who offer these 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. The National Veterinary Research Institute (NVRI) is the flagship Veterinary laboratory in the country and it is located in Vom, Plateau State. This institute was founded in 1924 in Zaria, initially as the Veterinary Department of Northern Nigeria. Today, the NVRI has grown to become a well-respected Veterinary institute in West Africa. Among its mandate include: conducting research into animal diseases; vaccine production; surveillance, diagnostics, extension services and training.

Presently, the institute hosts the FAO/OIE regional laboratory (West Africa) for transboundary animal diseases (TADs) and zoonoses [9,10]. Furthermore, the institute has witnessed a lot of improvements and upgrading in recent times as a result of increased concern for disease surveillance aroused by recent outbreaks of disease such as avian influenza and African swine fever [11,12]. Aside from the NVRI, there are also other state veterinary diagnostic laboratories in Nigeria, in addition to Veterinary Teaching Hospital (VTH) laboratories in all the nine accredited veterinary colleges. However, most of the state laboratories are in varying states of functionality, while the VTH laboratories have also been recently upgraded by various disease control project funding bodies. Problems facing veterinary diagnostic laboratories in the developing world have been outlined by Robinson and Jeggo [13] and these problems also apply classically to the Nigerian scenario.

They include but are not limited to: insufficient funding for equipment purchase and maintenance, supplies, reagents or training; designing and specifying proper sample collection methods for disease surveillance and appraising the performance characteristics of novel diagnostic techniques Robinson and Jeggo [13]. In addition to these, in the Nigerian context, it is also important to highlight infrastructural challenges such as lack of basic amenities which hinder diagnostic capabilities of laboratories. In a report in 1998 on the NVRI's diagnostic capacity to respond to an outbreak of African swine fever, a private consultant to the FAO, I.D. Gumm, remarked that some of the problems he found on ground in NVRI included occasional lack of water, power cuts, and antiquated equipment Gumm [11].

Specific Strategies for Transformation of the Veterinary Diagnostic Service in Nigeria

It is our opinion that a number of opportunities presently abound for the improvement of veterinary diagnostic services in Nigeria (both public and private services). These opportunities can however only be harnessed by taking the right steps. Some of the

key steps that would need to be taken include both long term goals and short term goals such as:

- a) Instituting a paradigm shift in the policy towards veterinary services delivery nationwide which will emphasize encouraging private veterinary professionals to set up laboratories across the country particularly in rural areas to so as to be able to provide direct services to livestock farmers in their settlements. This may entail public-private partnerships and giving of soft loans for establishment of these laboratories. In addition, this should lead to a cross-country network of private and public veterinary laboratories collaborating together for public good Nakayima et al. [14].
- b) Improved funding for government veterinary laboratories particularly the NVRI, state and VTH laboratories. These will facilitate the provision of reagents, upgrading of facilities and equipment and training and retraining of personnel Ilukor et al. [15].
- c) Adoption of new diagnostic technologies while not discarding the classical techniques: In recent years, there has been a drive towards molecular-based techniques such as Polymerase chain reaction (PCR) based techniques Ariane et al. [2]. In addition, biotechnology applications have also been employed to add more value to existing assays Schmitt [5]. A cursory look at what is currently happening in Sub-Saharan Africa shows that most countries are beginning to join the band-wagon towards the increased utilization of molecular techniques for animal disease diagnoses. Several publications detailing scientific investigations using molecular methods have been published so far. In Nigeria, the last few years has seen a keen interest among animal health experts toward rapid diagnostic tests which can be performed both in veterinary clinics and on the farm. The major areas of focus should include field-based molecular based techniques and rapid pen-side diagnostics which offer very fast and relatively affordable opportunities for diagnosing animal diseases Nakayima et al [14].

A 25-Year Advancement Vision

In 25 years, it is envisaged that the Nigerian veterinary diagnostic services will have become a well-respected and globally recognized service. The NVRI as the foremost national veterinary laboratory will have achieved globally accepted quality assurance measures and diagnostic capabilities and will also be playing an active role in disease surveillance both nationally and regionally across West Africa and Africa as a whole. It is also envisaged that the network of veterinary laboratories proposed would have been actualized and would be active in early response to disease outbreaks across the length and breadth of the country. In addition to this, it is anticipated that Nigeria will have become a major player in the international livestock and animal products industry. To achieve this would imply that the country has put under control (in-part or completely) the major TADs currently endemic within its geographical space.

While classical laboratory diagnostic techniques which depend on direct demonstration of the pathogenic organism like

microscopy Ariane et al. [2], bacterial culture and viral isolation will continue to remain relevant as gold standards of disease diagnosis globally; it is envisaged that rapid pen-side diagnosis based on serological and molecular methods will bring about a revolution in diagnostic services across the length and breadth of the country and is therefore worth the investment. In addition to this, other more practical field based molecular techniques like loop mediated isothermal amplification (LAMP) [16,17] have a secured place in the future and hence the government of Nigeria should try to develop capacity in these areas. Finally, it is our opinion that if the right steps are taken, in 25 years to come, the animal disease diagnostic services in Nigeria, and the veterinary service as a whole, will be robustly and strategically positioned to deliver cutting-edge disease surveillance, diagnosis and control services.

Conclusion

In conclusion, although veterinary diagnostic laboratories are undoubtedly the “backbone” and/ “cornerstone” of animal disease control programmes of any nation, however, at the moment, the status of veterinary diagnostic services in Nigeria has unarguably become a source of concern for stakeholders owing to the above associated problems. There is no doubt that these concerns need to be addressed in a timely manner by setting short and long term goals and actualizing them. The political will is very important for the actualization of this vision, just as the training and retraining of manpower, provision of well-equipped laboratories and a new government policy geared towards augmented inclusion of the private sector in veterinary diagnostic services.

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