



**Original Article**

**Assessment of the Competence of Veterinary Laboratory Staff Involved in the Diagnosis of Highly Pathogenic Avian Influenza in Nigeria**

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**ABSTRACT**

The study was designed to assess the competence of the Veterinary laboratory staff involved in Highly Pathogenic Avian Influenza (HPAI) diagnosis in Nigeria with particular focus on the Nigerian Veterinary Research Institute Vom, Jos (NVRI) and the five designated Nigerian Veterinary Teaching Hospitals for the diagnosis of HPAI using a structured questionnaire. Each of these laboratories should have the capacity to carry out screening direct antigen detection tests, immunofluorescence test and serological tests for antibody detection. The NVRI is expected to carry out virus isolation and identification and any other isolate characterization. Out of the 69 respondents involved in the diagnosis of HPAI, 15 (21.7%) were Senior Veterinary Research Officers while 19 (27.5%), 3(4.3%), 4(5.8%), 14(20.3%), and 2(2.9%) were Veterinary Research Officers, Chief Technologists, Assistant Chief Technologists and Technologists respectively. Holders of Doctor of Veterinary Medicine Degree (DVM) accounted for 47.8% while those with Higher National Diplomas (HNDs) and Ordinary National Diplomas (ONDs) accounted for 24.6% with few Bachelor of Science Degree (B.Sc.) holders. Results also revealed that, 59.4% of the respondents were only involved with HPAI diagnosis in the last four years while only 18.8% indicated involvement during the last five years and beyond. Also, only 53.6% of the staff ever attended Laboratory training while 46.4% did not. It was concluded that many Veterinary laboratory staff in Nigeria lacked the necessary qualification and experience to carry out effective HPAI diagnosis.

**Keywords:** Competence, Diagnosis, Highly Pathogenic Avian Influenza, Veterinary Laboratory Staff.

## INTRODUCTION

The key to a successful control of avian influenza depends heavily on rapid laboratory diagnosis. If the disease can be detected early, the possibility is that it can be contained before it spreads and inflict economic and public health damages (WHO, 2005). New molecular techniques promise to improve the speed and accuracy of disease diagnostics and pathogen detection. Widespread adoption of standard operating procedures and diagnostic laboratory accreditation serve to build trust and confidence among institutions and countries especially in the areas of international trade of animals, vaccines and biological used in animal health (WHO, 2005).

Many factors should be considered in deciding which tests to be used for diagnosis. Tests sensitivity, specificity, turns around time, repeatability, ease of performance and costs are all taken into account. Reverse transcription polymerase chain reaction (RT-PCR) is generally more sensitive than serology and culture and the combination of RT-PCR with serology more sensitive than the combination of any other two methods (Julkunen *et al.*, 1985; OIE, 2008; 2009). The sensitivity of culture is largely dependent on the laboratory where it is performed. Serology tends to be less expensive than RT-PCR, although serological diagnosis is only retrospective and subjective. Serology can however, be used to determine the response to influenza vaccination (Prince, 2003).

The selected laboratories that have been earmarked to carry out diagnosis of HPAI in the country were: NVRI, Veterinary Teaching Hospitals (VTH) at Zaria, Ibadan, Maiduguri, Nsukka and Sokoto. Each of these laboratories should have the capacity to carry out screening direct antigen detection tests, immunofluorescence test and serological tests for antibody detection. The NVRI is expected to carry out virus isolation and identification and any other isolate characterization. Samples screened at NVRI, are also expected to be sent to the Regional and World Reference laboratories for HPAI as part of the prescribed global laboratory networking for HPAI diagnosis and control. It is therefore pertinent to inquire whether Veterinary laboratory staffs are adequately trained to diagnose HPAI in the event of future challenge.

Therefore, the main objective of the study was to determine the level of qualification, training and experience of the Veterinary laboratory staff involved in HPAI diagnosis with a view to proffer recommendations aimed at strengthening the diagnostic capability of Veterinary laboratory staff for effective HPAI diagnosis in the country.

## MATERIALS AND METHODS

A structured questionnaire was designed and tested for validity and reliability; it was administered to all those Veterinary staff that was involved in the diagnosis of HPAI at NVRI and Veterinary Teaching Hospitals at Universities of Ibadan, Nsukka, Maiduguri, Ahmadu Bello University Zaria and Usmanu Danfodio University Sokoto. The result was analysed using descriptive statistics and presented in tables and graphs.

## RESULTS AND DISCUSSION

The competence of the staff was assessed based on their rank, qualification, training and diagnostic experience.

### **A. Position/Rank of Veterinary Laboratory Staff involved in the Diagnosis of HPAI in Nigeria**

The data showed that, majority of the staff involved in HPAI diagnosis are Veterinary Research officers (49.3%) and not Laboratory Technologists (30.4%) with a considerable

percentage being neither veterinary officers nor technologists (20.3%) as summarized in Table 1.

**Table 1: Position/Rank of Veterinary Laboratory Staff involved in the Diagnosis of HPAI in Nigeria**

Position	Frequency	Percentage	Cumulative Percentage
Senior veterinary research officer	15	21.7	21.7
Veterinary research officer	19	27.5	49.3
Chief technologist	3	4.3	53.6
Assistant chief technologist	4	5.8	59.4
Technologist	14	20.3	79.7
Lab. Assistant	2	2.9	82.6
Others	12	17.4	100.0
Total	69	100.0	

## B. Qualification of Veterinary Laboratory Staff involved in the diagnosis of HPAI in Nigeria

Table 2 summarized the data on the qualification of the staff involved in HPAI diagnosis. The data revealed that, Doctor of Veterinary Medicine Degree (DVM) holders account for 47.8% while those with Higher National Diplomas (HNDs) and Ordinary National Diplomas (ONDs) accounted for 24.6% with few Bachelor of Science Degree (BSc) holders. This showed that majority of the staff involved are Veterinary Doctors by training and not Laboratory Technologists. Sadly, however, Veterinary Doctors are not adequately trained for laboratory diagnosis especially in the event of disease epidemics.

**Table 2: Qualification of Veterinary Laboratory staff Involved in the Diagnosis of HPAI in Nigeria**

Responses	Frequency	Percentage	Cumulative Percentage
DVM	33	47.8	47.8
BSC	6	8.7	56.5
HND	16	23.2	79.7
OND	1	1.4	81.2
SSCE	4	5.8	87.0
Others	6	8.7	95.7
Not Indicated	3	4.3	100.0
Total	69	100.0	

## C. Length of Involvement of Staff in Diagnosis of HPAI

On the lengths of involvement of staff in HPAI diagnosis, the data indicated that a large percentage of the staff was not involved in HPAI diagnosis prior to the outbreak of the disease in Nigeria. 59.4% of the respondents were only involved in the last four years while only 18.8% indicated involvement during the last five years and beyond (Table 3).

**Table 3: The Length of Involvement of Staff in Diagnosis of HPAI**

Responses	Frequency	Percentage	Cumulative Percentage
Less than one year	5	7.2	7.2
1 year	3	4.3	11.6
2 years	6	8.7	20.3
3 years	9	13.0	33.3
4 years	18	26.1	59.4
Five years and above	13	18.8	78.3
Not Indicated	15	21.7	100.0
Total	69	100.0	

### D. Staff Special Training on Laboratory Diagnosis of HPAI

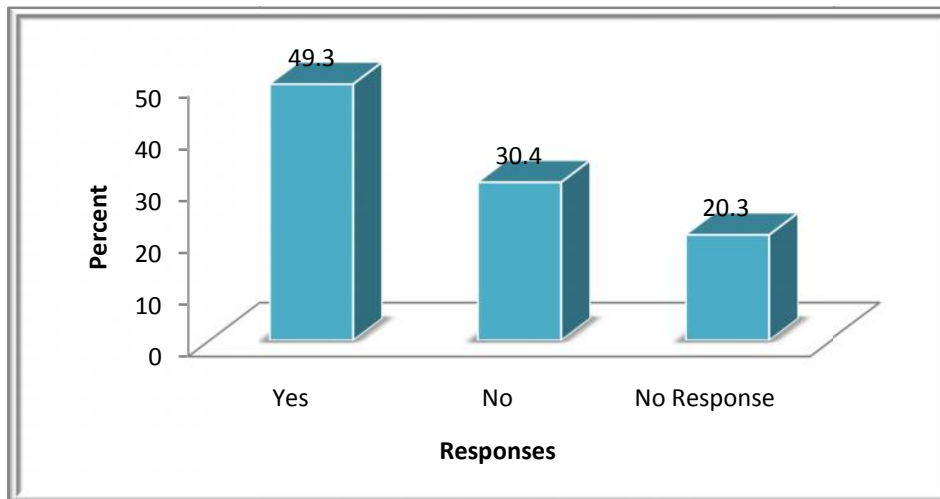
As for special HPAI diagnostic training, the data indicated that 53.6% of the staff attended training while 46.4% did not (Table 4). However, of the staff that attended the training, majority of the staff attended only once (35.1%) or twice (27.0%) of such trainings constituting over 62%. The institutions that mostly organized the training attended by the staff were NVRI (24.3%) and FAO (21.6%) with considerable percentage organized by the USAID (18.9%) and CDC (10.8%). The VTHs showed very low level of training activity (8.1%). The overseas training accounted for 35.1%, NVRI 32.4% while the one conducted at VTHs accounted for only 13.5%. This showed that majority of the staff attended the training at the right organizations where facilities and expertise were available.

**Table 4: Staff Special Training on Laboratory Diagnosis of HPAI**

Responses	Frequency	Percentage	Cumulative Percentage
Yes	37	53.6	53.6
No	32	46.4	100.0
Total	69	100.0	

### E. Previous Experience of HPAI Diagnosis by Laboratory Staff

The data on the previous experience of HPAI diagnosis by laboratory staff indicate that 49.3% had diagnosed HPAI before in their laboratory, while 30.4% did not with 20.3% non-respondent (Fig. 1). This indicates that, majority of the staff had experienced the diagnosis of HPAI. When the staff were asked to indicate the rank of other staff involved in the diagnosis of HPAI in their station, majority indicated that veterinary research officers (37.7%) were mainly the ones conducting HPAI diagnosis whereas the technologist accounted for only 11.5% (data not shown).



**Figure 1: Previous Experience of HPAI Diagnosis by Laboratory Staff**

## CONCLUSION AND RECOMMENDATION

It is evident in the present study that, a significant number of the Veterinary laboratory staff in Nigeria were found not to have the required competence and experience in the diagnosis of HPAI. This deficiency is to be rectified by a systematic training programme for all those who, in their professional capacity, may be the first to come into contact with an incursion or outbreak of HPAI.

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