

# RESPONSE AND CONTROL MEASURES AGAINST THE OUTBREAK OF THE HIGHLY PATHOGENIC AVIAN INFLUENZA IN NIGERIA

Bello, M. K., Joannis, T. M., Kujul, N., Okpara, J., Bwala S.Ogo, M., Ularamu, H. G. , Shittu, I. A., Egbuji, A. N., Suleiman, L. K., Woma, T. Y., (Shaibu, S. J., Dalis, J., Sati, N., Zwandor, N. J., Oyetunde, I. L., Cole , T. A., Makinde, A. A. and Lombin, L. H.

*National Veterinary Research Institute Vom, Nigeria*

## SUMMARY

In the face of the outbreak of the Highly Pathogenic Avian Influenza (HPAI), caused by virus sub-type H5N1 in 2006, the Government of Nigeria responded effectively and put some control measures in place. The response from the states, veterinary Teaching Hospitals poultry producers, law enforcement agencies and all Nigerians was encouraging. Out of 297 cases(samples) received from affected states of the country from January to July, 2006, 124 were positive constituting 41.8% of all the cases.

The control measures put in place by the Government and its agencies which included stamping out and bio-security measures against HPAI in no small way helped in arresting the spread of the disease in Nigeria and keeping it out of many commercial poultry farms nation wide. Bio-security as the first line of defense against all AI viruses was put in place.

**Keywords:** Highly Pathogenic, Avian Influenza, H5N1, Response, Control Measures.

## INTRODUCTION:

Highly Pathogenic Avian Influenza is a disease of poultry caused by a type A influenza virus in the family orthomyxoviridae, characterized by lethargy, respiratory signs, cyanotic combs and wattles and high mortality. Type A influenza viruses are serologically characterized into:-

16 haemagglutinins (H1-H16) 9 neuraminidase (N1-N9) subtypes.

These subtypes are based on antigenicity of these surface projections called haemagglutinin (H) and neuraminidase (N) (7, 5). All the subtypes have been detected in birds and are widespread worldwide (3), particularly in migratory waterfowls and imported pet birds. Most infections are subclinical. There has been serological evidence of Influenza A virus (Subtypes H1N1 and H5N1) in chickens in Nigeria (6). Influenza virus H1 antibodies in chicken sera was also demonstrated in Nigeria, though the specific subtype was not described (1).

In domestic poultry, such as chickens, influenza virus can be clinical though the severity depends on the virus strain (H5 and H7 are highly pathogenic), host and breed, concurrent infections and environmental factors. Pathogenic avian influenza is a list A disease of the Office International des Epizootics (OIE) and is subject to international reporting (8).

Waterfowl and shorebirds (wild and domesticated) are the major natural reservoirs of influenza viruses. Influenza virus has been recovered directly from lake and pond water utilized by infected wild ducks. Contact between these birds and free-range commercial flocks is an important factors in some outbreaks (5). Another reservoir is the live poultry markets which enhance the opportunity for viruses to be carried back to susceptible poultry flocks. A.I can be transmitted from farm to farm by direct and indirect contact, by movement of poultry products and manure, contaminated shoes, clothing, crates and other equipments.

Control of HPAI is achieved by reducing the amount of virus circulating in poultry and on farms. Measures such as stamping-out, cleaning, disinfection and vaccination are implemented to reduce the amount of virus present (4). Additional measures, such as movement controls, enhanced bio-security and, as appropriate vaccination are implemented to create barriers between uninfected poultry and foci of infection. According to FAO surveillance and monitoring are key to the prevention and control of HPAI (4). Facilities must be available to provide rapid and accurate diagnosis of disease and detection of infection. FAO, OIE and WHO work with countries to enhance veterinary infrastructure and the capacity to prevent and control HPAI. There should be active disease surveillance and timely reporting to OIE. While the official Veterinary Services are critical other agencies of government, such as those responsible for finance, international borders, environmental control, public health and emergency services must be closely involved and coordinated for successful disease management.

There should be emergency response to (and contingency planning for) HPAI virus incursion. Emergency preparedness planning aims to develop capacities for early warning and early response to the disease epizootic and other animal health emergencies. According to FAO (4), the following are the prevention, control, and eradication measures for HPAI:

1. Effective disease surveillance for early detection and reporting of outbreaks
2. Enhanced bio-security of poultry farms and associated premises
3. Control of movement of birds and products that may contain virus, including controls at the interface of infected and uninfected areas.
4. Changes to industry practices to reduce risk
5. Rapid, humane destruction of infected poultry and poultry at high risk of infection
6. Disposal of carcasses and potentially infective material in a bio-secure and environmentally acceptable manner

7. The proper use of vaccination.

8. Separation of poultry species into "compartments"

### **AIMS AND OBJECTIVES**

The aim and objective of this study is to highlight the response and the control and preventive measures put in place by the government of Nigeria and other stake holders against the outbreak of HPAI caused by H5N1 virus. It is also to evaluate the effectiveness of such response and control measures.

### **RESPONSE TO THE HPAI OUTBREAK IN NIGERIA**

#### **Pre-outbreak measures**

- There was some level of preparedness on the part of government and its agencies in anticipation of possible outbreak of HPAI in the country which included:

Pre-outbreak serological surveillance and monitoring carried out by National Veterinary Research Institute.

The Federal Government set up a Committee on the HPAI headed by the Minister of Health.

### **CONTROL MEASURES PUT IN PLACE BY THE GOVERNMENT AND ITS AGENCIES**

In February 2006, HPAI caused by H5N1 was confirmed in a commercial poultry flock in Kaduna State of Northern Nigeria (WHO, 2006) marking the first report of the disease in Africa. The source of the disease is not clear, although the country lies along a flight route for birds migrating from central Asia. Fifteen states of Nigeria were affected from January to July, 2006. The affected States were Kaduna, Kano, Plateau, Anambra, Bauchi, Benue, Enugu, Federal Capital Territory, Jigawa, Lagos, Rivers, Yobe, Nassarawa, Oyo, and Taraba.

During the outbreaks, the government embarked on mass education of poultry farmers, consumers of poultry products and the general populace through the mass media such as newspapers, radio and television.

Government Agencies held workshops all over the nation to sensitize stake holders on the outbreaks.

The National Veterinary Research Institute set up A.I. hotline (0806) for prompt response to suspected HPAI cases. The Institute was involved in collection and analysis of samples and offering recommendations. Diagnosis of suspected HPAI cases was and is still being done free of charge to poultry owners. The government ordered registration of poultry farms and census of poultry birds in the country.

All out-breaks of HPAI were ordered to be reported to the Director of Veterinary Services of each state of Nigeria who should then report to the Minister of Agriculture and Water Resources. The government agreed to pay compensation to affected poultry farms at the rate of N250 per chick (\$1.92), N10,000 / ostrich, (\$ 76.2).

The following stamping-out measures were also put in place by the government:

- Rapid destruction of infected chickens by suffocation and shooting of large birds such as ostriches
- Deep burial of carcasses (4-6ft deep) sprayed with chemicals
- Disinfection of poultry premises and equipments
- Disinfection of clothings and protective wears
- Disinfection of vehicles in and out of poultry farms
- Restriction of vehicular and human movement in and out of poultry farms
- Bio-security of poultry farms and associated premises
- Prevention of poultry farming within residential areas and vaccine production facilities by individuals
- Construction of disinfectant dips at entrances of poultry farms
- Screening of poultry birds from wild birds

### **Moratorium on Restocking**

The government permitted poultry farmers to restock premises after 3 weeks following completion of cleaning and disinfection of affected premises.

### **SUCCESS OF THE RESPONSE AND CONTROL MEASURES**

In view of the above response and control measures put in place by the Government agencies and international organization the spread of the disease to other parts of the country was greatly reduced .(Table 1)

### **Limitations Of The Control Measures**

Ignorance on the part of the poultry farmers and the public as to the mode of transmission of the HPAI from birds to birds and from birds to human

Dissemination of wrong information to the public by unqualified persons untrained for such assignment.

Bureaucratic bottlenecks on the part of the government especially in prompt release of funds.

Wrong implementation of control measures such as overzealousness of law enforcement-agents e.g. in Benue State of Nigeria where a whole truckload of eggs on the way to the South were destroyed without any suspicion of being infected or spreading the HPAI.

Certain FAO recommendations as they pertain to pre-outbreak measures were not put in place. These included simulating an outbreak, instruction to take in the face of an outbreak and setting up a chain of commands.

### **DISCUSSIONS**

The pre-outbreak response and control measures put in place included, pre-outbreak serological surveillance of commercial poultry birds and wild migratory birds in wetlands. Stamping out measures included diagnosis and mass destruction and deep burial of infected and in- contact birds all agree with FAO Recommendations on the Prevention, Control and Eradication of HPAI(4).Bio-

security being the first line of defence against all avian influenza infections was instituted in the control of HPAI outbreak in Nigeria as recommended by (2). It also included disinfection of premises, poultry equipments and vehicles.

Stamping-out (destruction of infected and at-risk poultry) long accepted method of control of HPAI was adopted in the Nigerian case (4). All these measures led to the reduction of positive HPAI cases. From 43.8% in January, 2006 and peaking in April (81.3%), there was reduction in May (32.0%), June (23.3%) and July (26.5%).

### CONCLUSION

To maintain the gain made in the control of HPAI caused by H5N1 virus in Nigeria all the afore-mentioned response and control measures must be sustained and even built upon.

Control measures adopted can be said to be adequate and successful as they have reduced the spread of the disease. Control measures have been adjudged adequate based on statistics on the epidemiology of the disease (See Table 1)

### REFERENCES

Adeniji, J.A., Adu, F.D., Baba, S.S., G.O. Ayoade., Owoade, A.A. and Tomori, O. (1993): Influenza A and B antibodies in pigs and chicken population in Ibadan metropolis, Nigeria. *Trop. Vet.* 11, 39-45

Beard, C.W. (1981): Immunization approaches to Avian influenza. *Proceedings of the First*

*International Symposium on Avian Influenza* (pp 172-177). Betsville, MD, USA

Easterday, B.C. and Tumova B. (1992): Avian Influenza. In: *Diseases of Poultry* (6<sup>th</sup> Edition) by M.S. Hofstad, B.W. Caalnek, C.F. Helmboldt, W.M. Reid and H.W. Yoder Jr. Iowa State University Press, Ames (pp 670-700)

FAO (Food and Agricultural Organization) (2004): *Recommendations on the prevention, control and eradication of Highly Pathogenic Avian Influenza (HPAI) in Asia* (Proposed with the support of OIE)

Halvoson, D. A. (2002): The control of H5 or H7 mildly pathogenic avian influenza: A role for inactivated vaccine. *Avian Pathology* (Pp 3, 5-12)

Owoade, A.A., Adeniji, J.A. and Olatunji, M.O. (2002): Serological evidence of Influenza A virus serotypes H1N1 and H5N1 in chicken in Nigeria. *Trop. Vet.* 20(3), 159-161

World Health Organization Expert Committee (1980): A revision of the system of nomenclature for influenza viruses: A WHO Memorandum. *Bull. WHO*, 58, 585-591

World Health Organization for Animal Health (OIE) (2005). Chapter 2.7.12. Avian Influenza In: *Terrestrial Animal Health Code*, Fourteenth Edition. OIE, Paris, France (In Press)

WHO (World Health Organization): *Avian Influenza: Situation (birds) in Nigeria*. February 8, 2006.

**TABLE 1: MONTHLY OUTBREAK OF HPAI IN NIGERIA FROM JANUARY-JULY, 2006**

<b>Samples</b>	<b>January</b>	<b>February</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Total</b>
Test samples	16	95	35	32	25	60	34	297
No positive	7	49	14	26	8	14	9	124
%positive	43.8	51.6	40.0	81.3	32.0	23.3	26.5	41.8