FEDERAL REPUBLIC OF NIGERIA

FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

FEDERAL DEPARTMENT OF LIVESTOCK AND PEST CONTROL SERVICES

Comprehensive Emergency Preparedness and Differentiated Action Plan for the Surveillance and Control of Highly Pathogenic Avian Influenza in Nigeria.

Version 1.4.
September 2006

National Animal Diseases Information System (NADIS)
Pan-African Programme for the Control of Epizootics (PACE)
Block 4, Flat 1, Oron Close, Wuse Zone 1, PMB 135, Garki, Abuja
Nigeria

National Animal Diseases Information System
09-523 44 61; 524 01 26 (Fax)
pacenigeria@microaccess.com
nadisnigeria@yahoo.com
Bird Flu Hotlines: 24/7 – 08067713880;080505777340

FEDERAL REPUBLIC OF NIGERIA

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> Disclaimer

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This is edition 1.4. This document is subject to regular review.

September 2006.

List of Acronyms

ABU	Ahmadu Bello University
AFDB	African Development Bank
AGID	Agar Gel Immunodiffusion test
AI	Avian Influenza (bird flu)
AIV	Avian Influenza virus
AU	African Union
AU-IBAR	African Union-Inter-African Bureau for Animal Resources
AUSVETPLAN	Australian Veterinary Plan
APHIS	Animal and Plant Health Inspection Service (USDA)
AVO	Area Veterinary Officer
CAHW	Community-based Animal Health Worker
c-ELISA	Competitive Enzyme linked Immunosorbent Assay
CDC	Centre for Disease Control
CIDA	Canadian International Development Agency
DFDL&PCS	Director Federal Department of Livestock and Pest Control Services
DFID	Department For International Development
DG-SSS	Director General State Security Services
DIVA system	Differentiating Infected from Vaccinated Animals
DVSs	Director of Veterinary Services
EC	European Commission
ECOWAS	Economic Community of West African States
EDF	European Development Fund
ELISA	Enzyme linked Immunosorbent Assay
EMPRES	Emergency Prevention System for plant and animal pests and diseases (FAO)
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FDL&PCS	Federal Department of Livestock and Pest Control Services
FMARD	Federal Ministry of Agriculture and Rural Development
FMF	Federal Ministry of Finance
FMH	Federal Ministry of Health
FMS&T	Federal Ministry of Science and Technology
H	Haemagglutinin
HIT	Haemagglutination Inhibition Test
HPAI	Highly Pathogenic Avian Influenza
IAEA	International Atomic Energy Agency
IB	Infectious bronchitis
IC	Infectious coryza
ILT	Infectious Laryngotracheatis
JIB	Joint Intelligence Board
LADC	Local Animal Disease Control Centre
LGA	Local Government Area
LGVO	Local Government Veterinary Officer
N	Neuraminidase
NADC	National Animal Disease Control Centre
NADCU	National Animal Diseases Coordinating Unit
NADEC	National Animal Disease Emergency Committee
NADIS	National Animal Disease Information and Surveillance System
NAIC	National Agricultural Insurance Corporation
NAPRI	National Animal Production Research Institute, Zaria
NEMA	National Emergency Management Agency
NEPAD	New Partnership for Africa's Development
NLPD	National Livestock Projects Division
NSPFS	National Special Programme for Food Security.
NVQS	National Veterinary Quarantine Services
NVRI	National Veterinary Research Institute Vom
OIE	International Office of Epizootics
PACE	Pan-African Programme for the Control of Epizootics

PAN	Poultry Association of Nigeria
PPE	Personnel Protection Equipment
RT-PCR	Reverse Transcriptase-Polymerase Chain Reaction
SADCU	State Animal Disease Control Unit
SDT HPAI	Specialist Diagnostic Team
SDVS	State Director of Veterinary Services
SOP	Standard Operating Procedure
TAD	Transboundary Animal Disease
TCP	Technical Cooperation Project
UN	United Nations
UNDP	United Nations Development Programme
USA	United States of America
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VCN	Veterinary Council of Nigeria
VTH	Veterinary Teaching Hospital
VVND	Viscerotropic Velogenic Newcastle Disease
WHO	World Health Organization

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Acknowledgements

The Technical Committee of Experts on Prevention and Control of Avian Influenza in Nigeria wishes to thank the Honourable Minister of Agriculture and Rural Development and the Director, Federal Department of Livestock and Pest Control Services for the opportunity to contribute in the on-going efforts to prevent the introduction of Highly Pathogenic Avian Influenza (HPAI) into the country and to develop emergency preparedness plans for dealing with any incursion of the disease into Nigeria.

Membership

1.	Prof. T. U. Obi	University of Ibadan, Ibadan (Chairman).
2.	Dr. K. A. Majiyagbe	FAO-NSPFS, Abuja
3.	Dr. P. A. Abdu	VTH, Ahmadu Bello University, Zaria.
4.	Dr T. M. Joannis	NVRI, Vom.
5.	Mr S. O. Akpa	Poultry Association of Nigeria.
6.	Dr M. Magaji	Vet. Quarantine Services Division, FDL&PCS, Abuja
7.	Dr I. G. Ahmed	PACE Project, FDL&PCS, Abuja.
8.	Dr P.A. Okewole	NVRI, Vom.
9.	Dr A. Jambalang	NVRI, Vom
10.	Dr G. M. Muhammed	Animal Health Division, FDL&PCS, Abuja

Terms of Reference

1. Develop strategies towards prevention of the introduction of Avian Influenza into Nigeria.
2. To develop surveillance network against the disease and
3. To prepare an emergency preparedness plan for the disease in Nigeria.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Technical Committee of Experts on the prevention and control of Highly Pathogenic Avian Influenza (HPAI) in Nigeria which was inaugurated by the on December 12th, 2005, deliberated extensively on the nature, the global spread of the disease and its potential risks to Nigeria. The strategies for the prevention and control of the disease were discussed as well as its surveillance network. The developed contingency plan which is for the prevention and control of the Highly Pathogenic Avian Influenza (HPAI) in Nigeria contains details of resources required for rapid and efficient mobilization of human and material resources for the containment and eradication of the infection. The preparation of the document is based on the Food and Agricultural Organisation (FAO) format for preparing National Emergency Preparedness and Contingency plans for Transboundary Animal Diseases (TADs) and the Australian Veterinary Plan (AUSVETPLAN). The HPAI disease could be a disaster to the poultry industry (which through government supportive policies has shown positive signs of recovery) including other livestock and a major threat to public health. Consequently, the prevention and control of HPAI requires National, Regional and International as well as multi-sectoral collaboration.

The HPAI is a viral disease that affects the digestive, nervous and respiratory systems of all domestic and wild birds with high morbidity and mortality. It is a highly infectious and contagious disease which can be fatal in humans.

The Avian Influenza Viruses are classified as types A, B and C with 15 subtypes of the type A. To date, all Highly Pathogenic AI Viruses that cause the disease belong to H5 or H7 subtypes. The HPAI viruses affects pigs and humans with the pigs serving as a mixing vehicle for re-assortment of the virus while domestic ducks get infected without showing clinical signs hence serve as a source of infection for domestic poultry.

It has been reported that the distribution of outbreaks of HPAI in Europe, Asia and Turkey has been associated with the presence of wetlands and lakes where migratory birds rest. In Nigeria, such wetlands exist with free flying wild birds and domestic ducks visiting and resting. The possible source of introduction of the disease into Nigeria could be through importation or smuggling of infected poultry and poultry products across the borders and through migratory birds that fly through identified pathways. However the status of HPAI in Nigeria needs to be investigated.
Therefore measures to be taken to prevent introduction of the disease into the country should include ban on importation of poultry and poultry products from high risk countries, effective disease surveillance, functional National Veterinary services and Quarantine facilities, and community based participatory epidemiological system for HPAI surveillance and control.

In order to enhance our capacity and capability for HPAI diagnosis, a laboratory diagnostic network comprising of the NVRI and five designated laboratories at Zaria, Ibadan, Nsukka, Maiduguri and Sokoto with strong linkage to the FAO, OIE, WHO Regional and World Reference laboratories is being advocated. It is envisaged that there would be collaboration with laboratories working on human Influenza in the various areas of Influenza diagnosis and research.

It is pertinent to note that the threat to human health will persist as long as the problem persists in livestock and poultry flocks. It is thus obvious that the primary focus of attention in the prevention of the introduction and perpetuation of the virus in the country should be from the animal health perspective. The measures outlined in this report therefore require urgent attention and implementation to forestall any eventuality.

Funding for diagnosis, surveillance and control measures against the disease should be provided by the Government, while exploring the possibility of TCP on HPAI from FAO, IAEA, WHO, OIE. Similarly collaborative linkages with Federal Ministry of Health and other related Institutions are emphasized.

Based on the results of risk analysis of HPAI in Nigeria, it is recommended that our overall policy should be modified stamping out involving slaughter of clinically affected poultry with full compensation, safe disposal of dead carcasses, adequate disinfection and decontamination and appropriate disease surveillance to determine the origin and extent of the disease. An action plan dealing with HPAI emergency which defines the command chain from the rural setting through the state veterinary services to the national veterinary service was proposed. In addition, Public awareness campaigns would be emphasized in the programme.

STRATEGIES FOR THE PREVENTION OF INTRODUCTION OF HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI) INTO NIGERIA

The technical committee of experts on the prevention and control of HPAI after deliberations in a meeting held at the Veterinary Council of Nigeria (VCN) conference hall, Abuja on December 12 – 14, 2005 recommended the under listed strategies for the prevention of introduction of HPAI into the country.

1. Ban on importation of poultry and poultry products from countries where the disease (HPAI) is known to exist. At present, there is an existing total ban on importation of live birds, poultry products including fertile eggs into the country which needs to be re-examined from time to time with a view to ameliorating the negative impact on the fragile poultry industry without compromising the present HPAI status in the country.

2. An effective animal disease surveillance, both passive and active (including random and targeted surveillance) in domestic and wild birds country wide involving areas such as poultry markets, wet lands and poultry located along known migratory birds routes, poultry abattoirs, borders, targeted farms and rural poultry should be carried out. Results obtained may then be used to assess the need for a complete nationwide HPAI active disease, virus and sero-surveillance to determine epidemiological status of the disease in the country.

3. Improved and functional National Veterinary Quarantine Services (NVQS) including immediate rehabilitation and revitalisation of existing veterinary quarantine infrastructure, control posts and enhanced manpower capabilities. This is to enable a sustained surveillance of animal diseases at the ports of entry in the course of animal/animal products, biologics and germplasm trade. The NVQS service staff should maintain continuous presence at the ports of entry into the country and constitute part of the Joint Intelligence Board (JIB) which should play an active role in HPAI surveillance at the ports.

4. Targeted community based training of rural backyard poultry farmers in various aspects of HPAI recognition and control including biosecurity procedures applicable to rural small scale poultry enterprises and the role of animal disease vigilante in the control of HPAI.

5. Enforcement of the requirement for Import permits for poultry and poultry products issued by the FDLPCS.

6. Development of a traceability mechanism for animals and strict monitoring of movement of poultry and poultry products through registration and licensing of poultry farms, hatcheries and other poultry enterprises.

7. Development of a community based, participatory rural livestock and poultry disease surveillance system and integrating it into the existing epidemio-surveillance network.

8. Training of veterinarians, auxiliaries, other categories of poultry farmers on HPAI prevention and control strategies including aspects of biosecurity.

9. Effective public enlightenment and awareness programmes on HPAI.

HIGHLY PATHOGENIC AVIAN INFLUENZA SURVEILLANCE NETWORKING

With regard to HPAI disease surveillance networking, the committee recommended as follows:

1. Establishing a diagnostic laboratory network involving the National Veterinary Research Institute (NVRI) at the centre, the designated laboratories in the Veterinary Teaching Hospitals (VTH) in the Faculties of Veterinary Medicine in Zaria, Ibadan, Nsukka, Maiduguri and Sokoto as well as the OIE/FAO/WHO regional and world reference laboratories for HPAI.

2. That collaboration between the animal and human laboratory diagnostic networks should be enhanced for purposes of HPAI diagnosis, surveillance and control.

3. Considering the present void in information and knowledge on HPAI epidemiology in Nigeria, there is need for a coordinated approach to research on Influenza viruses including development of vaccine, monitoring of antigenic drift and shift and development and validation of diagnostic tests. This initiative should be supported by proper funding including assistance from WHO, FAO and IAEA.

4. That the national animal disease information and surveillance network (NADIS) covering the rural communities up to the animal health services headquarters should be linked to the human epidemiology network particularly at the rural community level for the purpose of information sharing and coordination of response to HPAI emergency.

5. Integration of the wild life surveillance system with the NADIS network with reference to HPAI diagnosis and control

6. Regional and International cooperation and networking for surveillance

CONTINGENCY PLAN

INTRODUCTION

A Highly Pathogenic Avian Influenza (HPAI) contingency plan should be a well articulated strategy document that defines the actions to be taken in the event of HPAI emergency. It should contain details of the resources required to meet such an emergency and action plan for rapid and efficient deployment of human and material resources for containment of the disease and elimination of infection. This document was prepared in conformity with the Food and Agricultural Organisation (FAO) of the United Nations format for preparing National Animal Disease Emergency Preparedness and Contingency Plans for major Transboundary Animal Diseases (TADs) and the Australian Veterinary plan (AUSVETPLAN).

This plan has been prepared within a limited period of time and should be considered as an interim report that should be upgraded and fine tuned as time goes on. Annexes consisting mainly of the resource plans, both material and human as well as Standard Operating Procedures (SOPs) are being prepared separately.

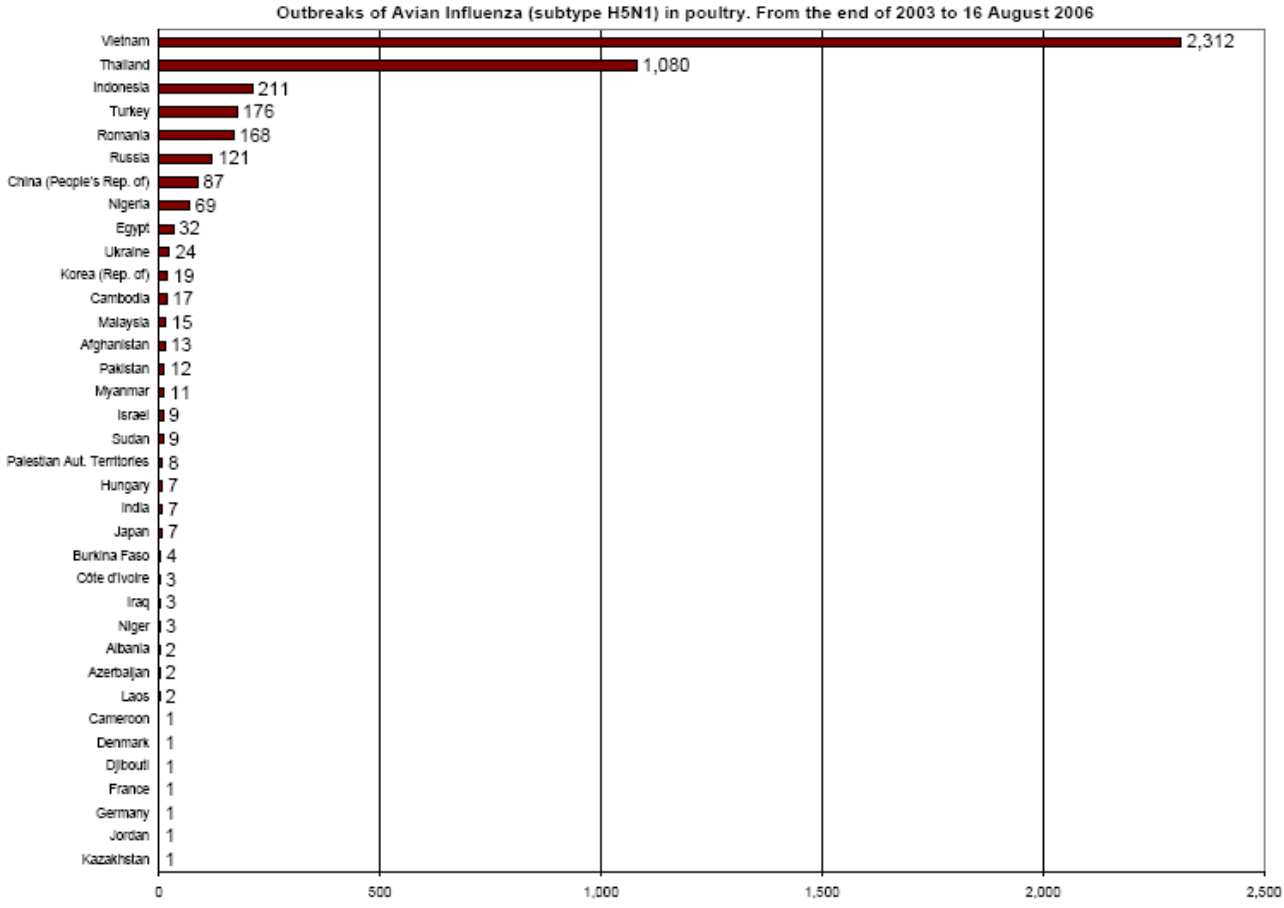
NATURE OF THE DISEASE

Definition

Highly Pathogenic Avian Influenza is a viral disease affecting the digestive, nervous and respiratory systems of all domestic and wild birds that is characterised by respiratory, reproductive, digestive and/or nervous signs with high morbidity and mortality with an incubation period of few hours to few days. It is highly contagious and infectious and may be fatal in humans. The disease affects all ages, but is more serious in the young.

World Distribution

HPAI was first reported in Italy 1878, South Africa 1961, USA 1971, Australia 1975, England 1979, Ireland 1983, Mexico 1994 and Pakistan 1994. In recent years HPAI has become topical in Asia including Peoples Republic of China 1996, Hong Kong 1997, 2001, 2002 and 2003, Cambodia, Indonesia, Japan, Malaysia, Republic of Korea, Laos, Taiwan, Thailand, Vietnam, Turkey and Romania 2005 (OIE 2005). The most serious epidemic in recent times was in Hong Kong 1997-1998 and 2003, the Netherlands 2003 and South-Korea 2003.
Avian Influenza viruses (AIVs) are probably ubiquitous in wild water birds. Pathogenic strains could emerge and cause disease in domestic poultry in any country at any time without warning. In fact, outbreaks have occurred at irregular intervals in many continents.


Outbreaks of Avian Influenza (subtype H5N1) in poultry. From the end of 2003 to 16 August 2006
Vietnam 2,312
Thailand 1,080
Indonesia 211
Turkey 176
Romania 168
Russia 121
China (People's Rep. of) 87
Nigeria 69
Egypt 32
Ukraine 24
Korea (Rep. of) 19
Cambodia 17
Malaysia 15
Afghanistan 13
Pakistan 12
Myanmar 11
Israel 9
Sudan 9
Palestian Aut. Territories 8
Hungary 7
India 7
Japan 7
Burkina Faso 4
Côte d'Ivoire 3
Iraq 3
Niger 3
Albania 2
Azerbaijan 2
Laos 2
Cameroon 1
Denmark 1
Djibouti 1
France 1
Germany 1
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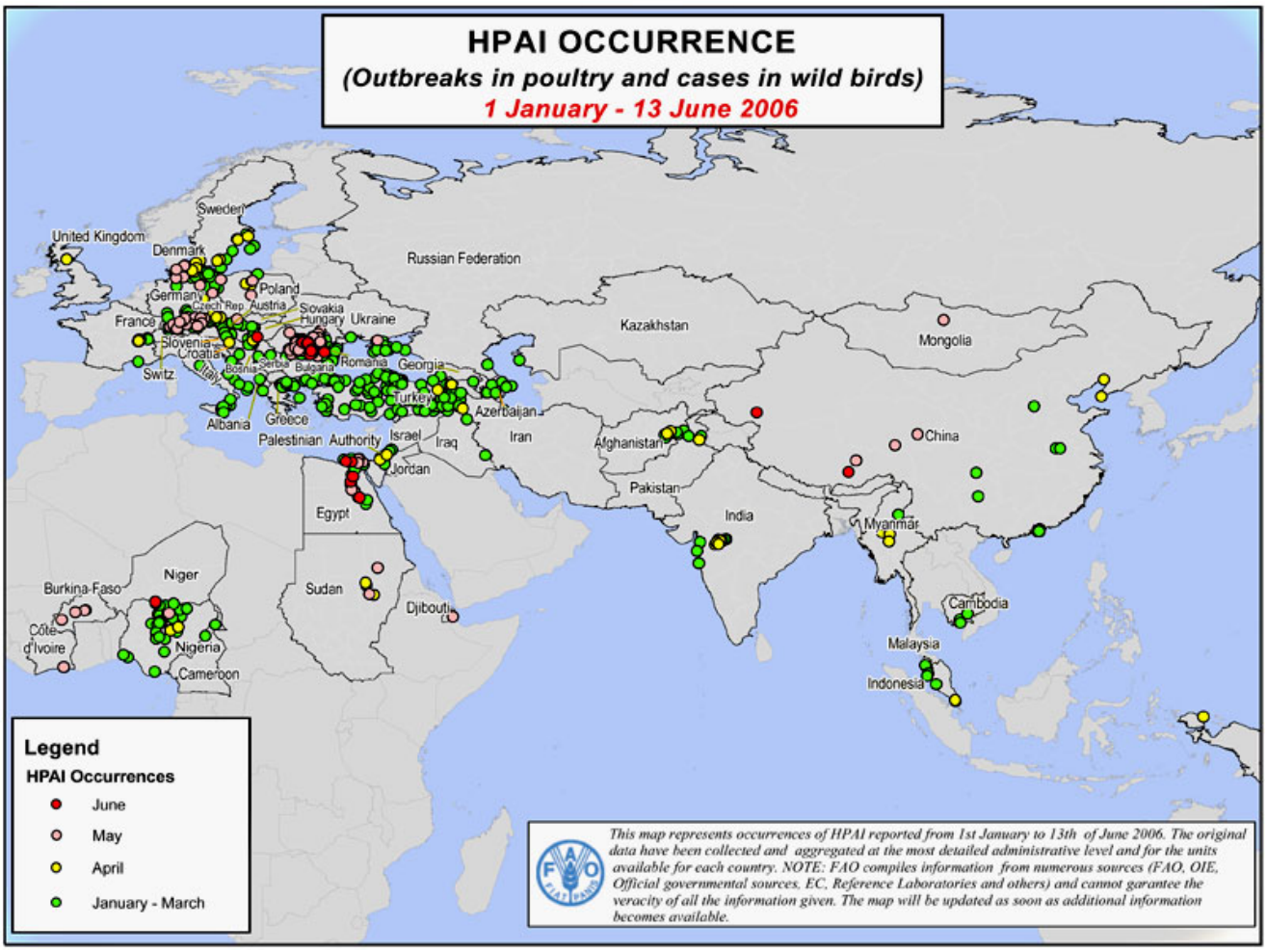


H5N1 outbreaks between December 12, 2003 and July 4, 2006 according to the OIE report are indicated below.

S/NO	COUNTRY	DATE
1	Korea (Rep Of)	12/12/03
2	Vietnam	8/1/2004
3	China (People's Rep of	4/2/2004
4	Hong Kong (SARPRC)	28/1/2004
5	Indonesia	2/2/2004
6	Japan	12/1/2004
7	Malaysia (Peninsular)	19/8/2004
8	Cambodia	24/1/2005
9	Kazakhstan	2/8/2005
10	Mongolia	10/8/2005
11	Russia	24/7/2005

12	Thailand	1/2004
13	Turkey	10/10/2005
14	Ukraine	5/12/2005
15	Croatia	21/10/05
16	Cameroon	12/3/2006
17	Albania	7/03/2006
18	Cote d'Ivoire	25/4/2006
19	Czech Republic	29/3/2006
20	Denmark	15/3/2006
21	Djibouti	27/5/2006
22	Egypt	18/2/2006
23	France	21/2/2006
24	Georgia	27/3/2006
25	Germany	16/2//2006
26	Greece	13/2/2006
27	Austria	20/2/2006
28	Hungary	1/3/2006
29	United Kingdom	13/4/2006
30	India	18/2/2006
31	Azerbaijan	15/2/2006
32	Afghanistan	20/3/2006
33	Iran	15/7/2006
34	Israel	18/3/2006
35	Italy	14/2/2006
36	Bosnia and Herzegovina	20/2/2006
37	Jordan	27/3/2006
38	Bulgaria	12/2/2006
39	Myanmar	13/3/2006
40	Niger	28/2/2006
41	Nigeria	8/2/2006
42	Palestinian Auton.Territories	11/4/2006
43	Pakistan	3/3/2006
44	Poland	8/3/2006
45	Romania	7/10/2006
46	Serbia and Montenegro	2/03/2006
47	Slovakia	24/2/2006
48	Slovenia	19/4/2006
49	Sudan	19/4/2006
50	Sweden	16/3/2006
51	Switzerland	27/2/2006
52	Burkina Faso	04/4/2006

Aetiology

AIVs are members of the family *Orthomyxoviridae* and genus Influenza A. The influenza viruses that constitute this family are classified into types A, B or C based on differences between their nucleoprotein and matrix protein antigens. AIVs belong to type A. Influenza viruses are further categorised into subtypes according to the antigens of the haemagglutinin (H) and neuraminidase (N) projections on their surfaces. There are 15 haemagglutinin subtypes and 9 neuraminidase subtypes of influenza A viruses, and AIVs viruses have representatives in all of these subtypes. However, to date all highly pathogenic AI viruses that cause generalised rather than respiratory disease belong to either the H5 or H7 subtypes. For example, the classical fowl plague virus is H7N7 and the virus responsible for the major epidemic in the eastern United States in 1983/84 was H5N2. However, not all H5 and H7 viruses are virulent for poultry.

Epidemiological features

Susceptible species

AIVs virus is infective for almost all commercial, domestic and wild avian species, Chickens and turkeys are highly susceptible to infection and clinical disease, and ducks and geese although susceptible to infection with all AI virus strains suffer clinical disease from only highly virulent strains. Ostriches, rhea, emus, quails, muscovy ducks, guinea fowls, chukars, partridges, pheasants, pets, sea and shore birds are susceptible to AI to varying degrees. Pigs and humans are equally susceptible to infection by the HPAI virus and the potential of pigs serving as a mixing vehicle for re-assortment (mutation) of the virus should be borne in mind. Reports of infection and mortality in domestic and wild cats have occurred in Thailand. Interspecies infection with AIV, for example between chickens, turkeys, pigs and humans has been reported. It may be pertinent to note that domestic ducks can be infected without showing clinical signs and may serve as a source of infection for domestic poultry.

Figure 2: Affected domestic bird-species (USDA/Henzler)

Reports from USA show a rather high percentage of infection with AI in mallard ducks. The recent popularity of mallard ducks in Nigerian villages, most likely attributable to their persistence in egg laying and of geese as ornamental and pet birds among the elites, may have implication for AI infection and disease in the country. Therefore the possible role of ducks and geese in the transmission of AIV in Nigeria needs to be investigated.

Virus survival

In general AIVs are not hardy and are susceptible to warm environmental conditions but may remain viable in cold and humid conditions. The virus can survive for 35 - 44 days in faeces at 40C but for only 4 days at 250c. Within the poultry house environment the virus can survive for up to 35 days, and some reports indicate that it is possible to recover the virus from houses even after more than100 days.

Short term exposure to ultraviolet radiation, desiccation and common detergents and disinfectants such as calcium and sodium hypochlorite and Virkon(R) can readily inactivate the virus. Provided adequate and suitable decontamination of poultry houses, equipment and personnel is carried out as detailed in the standard operating procedure, restocking could be done 21 days thereafter.

AIV can be isolated from lake water and the virus has been known to persist and retain infectivity in water for more than 30days at 00c and for up to 4days at 220c. The distribution of outbreaks in Europe including Turkey has been associated with the presence of wetlands and lakes where migratory wild birds.

In Nigeria the sources of water for poultry in the rural areas include slow flowing rivers, open wells, stagnant waters which are often visited by free flying wild birds and domestic ducks. The survival of the AIV in these sources of water needs to be investigated.

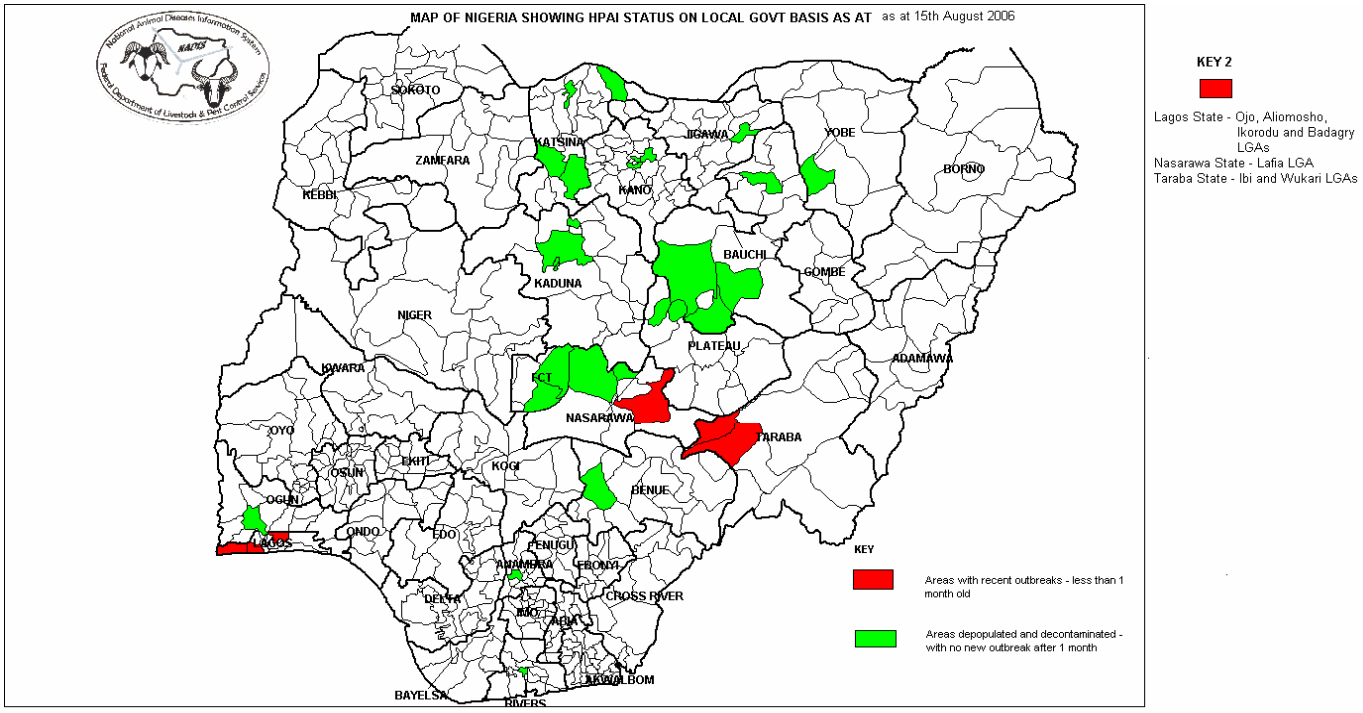
AI virus can be shed in faeces and respiratory tract for at least 14 days and can be recovered from refrigerated carcases for 23 days. Birds processed during the viraemic stage will contaminate other carcases with blood and faeces containing the virus. Virus can persist in poultry meat products. Based on the Australian recommendation the minimum condition for inactivation of the virus is 70Oc for a minimum of 30mins, 750c for a minimum of 5mins and 800c for a minimum of 1min. In Nigeria the possibility of meeting this minimum requirement is difficult and therefore the existing ban on the importation of live or processed birds and other poultry products is justifiable. Eggs laid in the early stages of AI infection could contain the virus on the egg yolk, albumen and the egg shell. The virus can also penetrate cracked or even intact egg shells.

Current pasteurisation procedures on products such as liquid whole egg, liquid yolk, and dried whole or dried yolk are not sufficient to inactivate the HPAI virus. HPAI virus has been isolated from eggs laid by infected breeding hens. Therefore importation of fertile eggs from HPAI endemic zones should be prohibited. HPAI virus can persist in waste products from hatcheries, laboratories, dead birds, farms, egg marketing establishments as well as chicken manure and litter; and therefore could be disseminated by vehicles, foot ware, clothing, equipment, formites, including cages and egg crates, unless these products have been decontaminated.

Incidence (with reference to Nigeria)

Although limited serological studies showed the presence of Influenza Virus Type A antibodies in Nigeria, there was no evidence of clinical disease from HPAI in Nigeria until 22nd January 2006 when the disease was first reported in SAMBAWA farms, Kaduna and confirmed by the OIE World Reference Laboratory, Padova, Italy on 7th Febuary, 2006. Since then, the HPAI has been confirmed in 14 States and the Federal Capital Territory (FCT) with a total of 35 Local Government Areas out of the 774 Local Government Areas in

the country. The States, the FCT and corresponding Local Government areas where Avian Influenza (AI) was reported as at 26th July,2006 are **Kaduna State**(Igabi,Kaduna North,Kaduna South ,Sabongari and Chikun), **Kano State**(Kumbotso, Janguza,Nasarrawa,Gezawa), **Jigawa State**(Hadejia), **Plateau State**(Jos North, Jos South), **Bauchi State** (Toro ,Katagum,Bauchi,Tafawa Balewa), **Katsina State**(katsina,malumfashi,Daura,Kankara), **FCT**(Kuje,Muncipal,Bwari),**Nasarrawa State** (Kokona,Akwanga), **BenueState** (Oturkpo), **Anambra State** (Idemili South), **Lagos State** (Agege,Ojo,Ikorodu,Alimosho), **Taraba state** (Ibi), **Rivers State**(Portharcourt), **Ogun State** (Ifo) and **Yobe State** (Nangere)



Over 800,000 birds have either died from the disease or have been culled as a result of the modified stamping out operation embarked upon by the Government to contain the disease. Consequently, Over N107million has been paid out to over 300 farmers whose birds were culled as a relief.

However, there is an urgent need to carry out active disease, virus and sero-surveillance for HPAI in both domesticated poultry and wild avian species including ducks, geese, turkeys and wild birds. Emphasis should be placed on disease search at wet lands and known wild birds' migratory routes, back yard and commercial poultry establishments in the country.

In addition, research should be made to ascertain the effect correlation of climate Vis-à-vis the migration of the wild birds with the AI outbreaks in Nigeria.

Disease transmission

HPAI virus is present in all secretions and excretions of infected birds. Transmission may be by direct inhalation of contaminated aerosol, dust or indirectly via ingestion of contaminated water, feeds or infected carcasses. Transmission of HPAI between flocks is primarily attributed to movement of infected birds and action of humans through movement of feeds/personnel, equipment and vehicles into or out of contaminated premises. In addition direct or indirect contact with migratory birds such as the water fowl is a likely source of infection in poultry.

Spread of the disease into the country could be through importation or smuggling of infected poultry and poultry products across the border and through migratory birds.

Eggs laid in the early stages of AI infection could contain the virus on the egg yolk, albumen and the egg shell. The virus can also penetrate cracked or even intact egg shells. However vertical transmission via infected eggs has not been proven to date.

Clinical signs

The clinical signs are very variable and are influenced by factors such as the virulence of the infecting virus strain, species affected, age, sex, concurrent diseases and environment.

Figure 3: Depression in layers (left) and egg deformations (right) (USDA/Henzler)


Figure 4: blue-coloured shanks (left) and comb, swollen eyes (right). USDA/Henzler

In virulent (or highly pathogenic) AI of the type traditionally associated with fowl plague, the disease appears suddenly in a flock and many birds die either without premonitory signs or with minimal signs of depression, inappetence, ruffled feathers and fever.

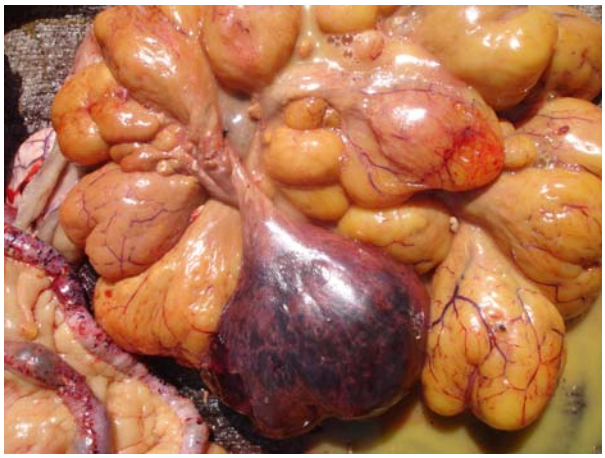
Other birds show weakness and a staggering gait. Hens may at first lay soft-shelled eggs, but soon stop laying. Sick birds often sit or stand in a semi-comatose state with their heads touching the ground. Combs and wattles are cyanotic and oedematous, and may have petechial or ecchymotic haemorrhages at their tips. Profuse watery diarrhoea is frequently present and birds are excessively thirsty. Respiration may be laboured. Haemorrhages may occur on unfeathered areas of skin. The mortality rate varies from 50 to 100%.


Figure 5: Affected hen with nervous symptoms and affected ostrich (NVRI-Joannis).

In broilers, the signs of disease are frequently less obvious with severe depression, inappetence, and a marked increase in mortality being the first abnormalities observed. oedema of the face and neck and neurological signs such as torticollis and ataxia may also be seen.

The disease in turkeys is similar to that seen in layers, but it lasts 2 or 3 days longer and is occasionally accompanied by swollen sinuses. In domestic ducks and geese the signs of depression, inappetence, and diarrhea are similar to those in layers, though frequently with swollen sinuses. Younger birds may exhibit neurological signs.

Pathology



Birds that die of peracute disease may show minimal gross lesions, consisting of dehydration and congestion of viscera and muscles. In birds that die after a prolonged clinical course, petechial and ecchymotic haemorrhages occur throughout the body, particularly in the larynx, trachea, proventriculus and epicardial fat, and on serosal surfaces adjacent to the sternum. There is extensive subcutaneous oedema, particularly around the head and hocks.

Figure 6: Hemorrhagic ovaries (USDA - Henzler)

The carcass may be dehydrated. Yellow or grey necrotic foci may be present in the spleen, liver, kidneys and lungs. The air sacs may contain exudates. The spleen may be enlarged and haemorrhagic.

HPAI is characterised histologically by vascular disturbances leading to oedema, haemorrhages and perivascular cuffing, especially in the myocardium, spleen, lungs, brain and wattles. Necrotic foci are present in the lungs, liver and kidneys. Gliosis, vascular proliferation and neuronal degeneration may be present in the brain.

Figure 7: Point-hemorrhages in the intestines (USDA/Henzler)

Diagnosis

Diagnosis is based on the clinical signs of the disease and laboratory analysis.

Field diagnosis

Field diagnosis is based on clinical signs and gross pathological lesions such as sudden death, severe depression, sudden egg drop, respiratory symptoms, facial subcutaneous oedema, swollen and cyanotic combs, wattles, and shanks

Differential diagnosis

However, the disease has to be differentiated from diseases with similar clinical and pathological features such as viscerotropic velogenic Newcastle disease (VVND), Mycoplasmosis, Acute Fowl cholera, infectious laryngotracheatis (ILT), infectious coryza (IC), infectious bronchitis (IB), Pulmonary aspergilosis and Chlamydiosis.

The clinical and pathological features of these diseases are:-

(1) Viscerotropic Velogenic Newcastle Disease (VVND).
This is a form of Newcastle Disease that is highly pathogenic and easily transmitted with clinic signs such as watery greenish diarrhea, swelling of the wattles & neck .Onset of the disease is sudden, respiratory signs include gasping ,coughing, sneezing while the nervous signs include dropping of wings, twisting of neck and circling. Depression, inappettence, drop in egg production, abnormality in shape and colour of eggs. Mortality is high in young birds but could reach 100% in Adults too. The common lesions include haemorrhages of the proventricular mucosa, congestion and mucoid exudates in respiratory tracts.

(2) Mycoplasmosis
The clinical signs include respiratory distress, coughing, sneezing, difficulty in breathing, morbidity is high but mortality may be low if not complicated. Reduction in egg production. The disease is more severe in turkeys than chickens. Lesions include mild sinusitis, tracheitis and airsacculitis if not complicated.

(3) Acute Fowl Cholera
The clinical signs and lesions include sudden death,fever, depression,mucoid discharge from the mouth, ruffled feathers, diarrhea and increased

respiratory rates. The lesions such as petechial & ecchymotic haemorrhage of the epicardium, swollen liver with necrotic foci are usually manifested.

(4) Infectious laryngotracheitis
Clinical signs include respiratory distress such as gasping, coughing, extension of the neck, reduced egg production in laying chickens. Poor appetence, mouth & beak become bloodstained. Mortality may reach 50% in adults.

(5) Infectious Coryza
Acute respiratory disease of chickens with nasal discharge, sneezing, swelling of the face & wattle .Chronically ill & healthy flocks are the reservoir of infection. In severe form, the swelling of eyelids (closing the eyes) and wattles is common. Egg production is severely reduced, diarrhea & inappetence. Lesions include tenacious and copious grayish exudates, conjuctivitis, tracheitis, Bronchitis and airsacculitis.

(6) Infectious Bronchitis.
Morbidity could reach 100%. The severity of the disease is influenzed by age, immune status of the flock and virulence of the strain. Coughing, Sneezing manifest as respiratory signs. Occasional facial and head swelling can be noticed .Egg production in laying birds drop and eggs are misshapen. The lesions include mucoid exudates in trachea and bronchi. The trachea may have caseous plug with airsacs thickened and opaque.

(7) Pulmonary aspergilosis
Bronchopulmonary in nature with dyspnea, gasping, anorexia, emaciation. Torticollis, increased thirst, cream coloured plaques maybe seen in air passages, air sacs, liver & intestine.

(8) Chlamydiosis.
The signs seen in clinically infected birds include nasal and ocular discharges, conjunctivitis, greenish yellow faeces, ruffled feathers, weakness, inappetence. High mortality occurs in very virulent strains with reduced egg production among layers. The lesions in acute infections manifest include airsacculitis, pericarditis, perihepatitis, peritonitis, pneumonia, hepatomegaly & splenomegaly.

In general, there is marked similarity in the clinical signs and gross lesions among all the differential diagnosis especially between the Viscerotropic

Velogenic Newcastle Disease (VVND) and the Highly Pathogenic Avian Influenza. These include swelling of the head and wattles, sudden death, marked reduction in egg production and quality, nervous, enteric and respiratory signs. Gross lesions include haemorrhages and/or necrotic lesions in the gastro-intestinal tract and the respiratory system.
Consequently, confirmatory diagnosis for the HPAI is based primarily on laboratory tests. In view of the socio-economic & public health importance of HPAI, it is advisable that HPAI should be suspected in any flock of poultry that shows respiratory, nervous signs, diarrhea with sudden onset, marked reduction in egg production and high mortality. Bio-security measures therefore should immediately be instituted and samples taken for confirmatory laboratory diagnosis.

Laboratory diagnosis

As clinical signs and pathological lesions are not definitive for HPAI, there is need for confirmatory laboratory diagnosis. This can be achieved by a rapid antigen detection test such as the Immunoflourescence and DirectigenTM FluA tests (Becton Dickinson Diagnostics systems USA). Confirmatory tests include virus isolation and identification, reverse transcriptase polymerase chain reaction (RT - PCR), virus characterisation, haemaglutinin typing, neuraminidase typing, gene sequence detection and live bird challenges.

Serological diagnosis may be achieved through Haemaglutination Inhibition Test (HIT), Agar Gel Immunodiffusion test (AGID), and competitive Enzyme Linked Immunosorbent Assay (c-ELISA). Serological tests that could differentiate between infected and vaccinated animals known as “Differentiating Infected from Vaccinated Animal” (DIVA) system are also available.

In Nigeria the recommended screening tests would be the DirectigenTM FluA test, and the Immunofluorescence test. It is expected that each of the six designated laboratories should have capacity to conduct the two tests. The confirmatory tests on the other hand include virus isolation and gene sequence detection. It is expected that this should be carried out at the National Veterinary Research Institute (NVRI). The capacity of four other laboratories at ABU, Ibadan, Maiduguri and Nsukka to conduct these tests should equally be strengthened. Further characterisation of AI isolates would be done by Haemaglutinin and neuraminidase typing as well as gene sequence detection and analysis. It is recommended that this would be carried out at the NVRI as well as other Regional and World Reference laboratories.

Serological assays which would be useful in sero-surveillance of HPAI include HIT, AGID test and c-ELISA. It is expected that each of the designated HPAI laboratory in the country should have the capacity to carry out these tests.

Samples required for laboratory diagnosis

The recommended samples required for laboratory diagnosis include tracheal and cloacal swabs, as well as faecal samples and paired sera from live birds.

In addition intestinal contents, cloacal swabs or nasal swabs, samples of the trachea, lungs, air sacs, intestine, spleen, kidneys, brain, liver, pancreas and heart may be collected from dead birds. Other samples that could be taken for analysis include water from wetlands and ponds where there are high concentrations of migratory birds.

RISK ASSESSMENT OF HPAI IN NIGERIA

Risk factors:

a) Risk of Introduction into the country.

While the source of infection into Nigeria has not yet been determined, the risk factors that may have aided introduction of HPAI into Nigeria include:

- Through Migratory birds – Nigeria lies in the East Africa/West Asia fly ways and the North Atlantic flyway of the migratory birds (see map)
- Presence of HPAI in South East Asia, East and Western Europe and increased trade and human traffic with Nigeria
- The present expansion of infection zone of AI due to globalization and relative ease of movement and transportation.
- Nigeria's long porous borders and informal livestock movement/trading across the border especially at border markets
- Smuggling/illegal movement of poultry and poultry products into Nigeria from infected countries.
- Inadequate veterinary quarantine facilities and manpower

b) Risk of Sustenance and maintenance of HPAI in Nigeria.

With the introduction of HPAI into the country, the factors that may aid sustenance and maintenance of the disease include:

- Structure of poultry industry in Nigeria consisting predominantly of backyard poultry with little or no biosecurity and peri-urban and urban commercial poultry production with minimum to moderate biosecurity and constant introduction of new birds from relatively unknown and unverifiable sources.
- The rearing of flocks of different species of poultry and different ages together
- Uncontrolled livestock and poultry movement within the country as a result of lack of enforcement of animal disease control laws and regulations in the country.
- Increased close contact between poultry and human.

- Lack of organised poultry marketing and existence of open live poultry markets characterised by interspecies mixing and poor sanitary conditions.
- Lack of registration and licensing of poultry farms, hatcheries and establishments as provided by the law.
- Inadequate early warning and early reaction capabilities including inadequate experience of most animal health workers in the recognition and diagnosis of HPAI
- Deteriorating animal health delivery services due to inadequate funding and inefficient restructuring programme of the veterinary services.
- Poor communication facilities for dissemination of information on HPAI and other TADs.
- Inadequate and occasional delay in compensation of livestock/flock owners in the event of slaughter of their animals for purposes of disease containment thereby discouraging reporting of outbreaks. This results in late detection of outbreaks which increases the risk of the virus becoming endemic.
- Improper disposal facilities
- Sale and consumption of sick and dead birds.
- Lack of efficient quarantine and movement control of birds from infected to non-infected areas.
- The presence of domestic ducks in close contact with free range poultry whereby the ducks acting as 'Silent Reservoir' of the virus perpetuate transmission to other domestic birds through the secretion of virus .Backyard flocks often mingle freely with wildbirds. Most of such flocks scavenge for food sharing outdoor areas where children play.
- The nutrition of backyard flocks is poor and with seasonal or occasional high mortality (usually Newcastle) increases the likelihood that outbreaks of H5N1 may be missed
- Poor biosecurity measures result in secondary infections of HPAI.
- Inadequate publicity and motivation of the public minimizes the likelihood of early reporting of the disease outbreaks.

Despite the risk factors identified above certain factors that may reduce the above risk factors are presented below

ORGANISATION OF THE ANIMAL HEALTH SERVICES

The Veterinary service in Nigeria is headed at the federal level by the Director of the *Federal Department of Livestock and Pest Control Services* (FDL&PCS) of the Ministry of Agriculture and Natural Resources and at state level by the Director of State Veterinary Services. The FDL&PCS is divided into eight Divisions, namely: the Animal Health, Quarantine Services, the Veterinary Public Health, Livestock Development, the Planning and Research, Pastoral resources, NLPD as well as the Pest Control Division. The FDL&PCS has field offices at the various state capitals while each state veterinary service has area offices at the local government headquarters. This present setup is designed to enable efficient and early collection of information on TADs including HPAI. Although by law the state Directors of Veterinary Services are in-charge of animal disease control, emergencies arising from major transboundary animal diseases such as HPAI should be under the overall command of the DFDL&PCS.

Human and other resources for HPAI diagnosis and control

The country has five University veterinary faculties that produce graduate veterinarians and at present there are about 4,586 registered veterinarians in addition to 7,810 livestock scientists, laboratory technologists and animal health auxiliaries in the country. The country therefore has sufficient number of manpower to be able to detect and control most TADs. However the fact that most of these have no first hand experience with AI being an emerging disease, would make early detection of AI incursion in the country rather difficult. There is therefore a need for continuing education and specialization in poultry disease recognition, diagnosis and control.
At present, the only laboratory statutorily charged with livestock disease diagnosis is the NVRI, Vom. With the emergence of new TADs such as HPAI it is unlikely that this laboratory will be able to cope in the event of the introduction and spread of the disease in Nigeria.

There is therefore the need to strengthen the diagnostic capabilities that exist in NVRI as well as the suggested designated laboratories in selected veterinary teaching hospitals in the universities.

An Act to establish a National Veterinary Quarantine Service is being proposed to the National Assembly. When operational, the service would be expected to make fresh provisions to control and prevent the introduction and spread of infectious diseases among animals, poultries, hatcheries and other breeding facilities in Nigeria, to regulate the importation and exportation, sale, distribution and movement of trade animals, biologics and animal products of biotechnology. This service would be very relevant to the control of AI in the country. At present the existing quarantine infrastructure and manpower are grossly inadequate to handle its statutory responsibilities and therefore needs immediate attention at the highest level.

In conclusion the risk of HPAI being introduced into the country may be considered as moderate to high while the risk of its establishment and spread within the country may be rated as very high. In addition the probable socio-economic as well as the public health consequences may be considered as very severe should the disease be introduced into Nigeria.

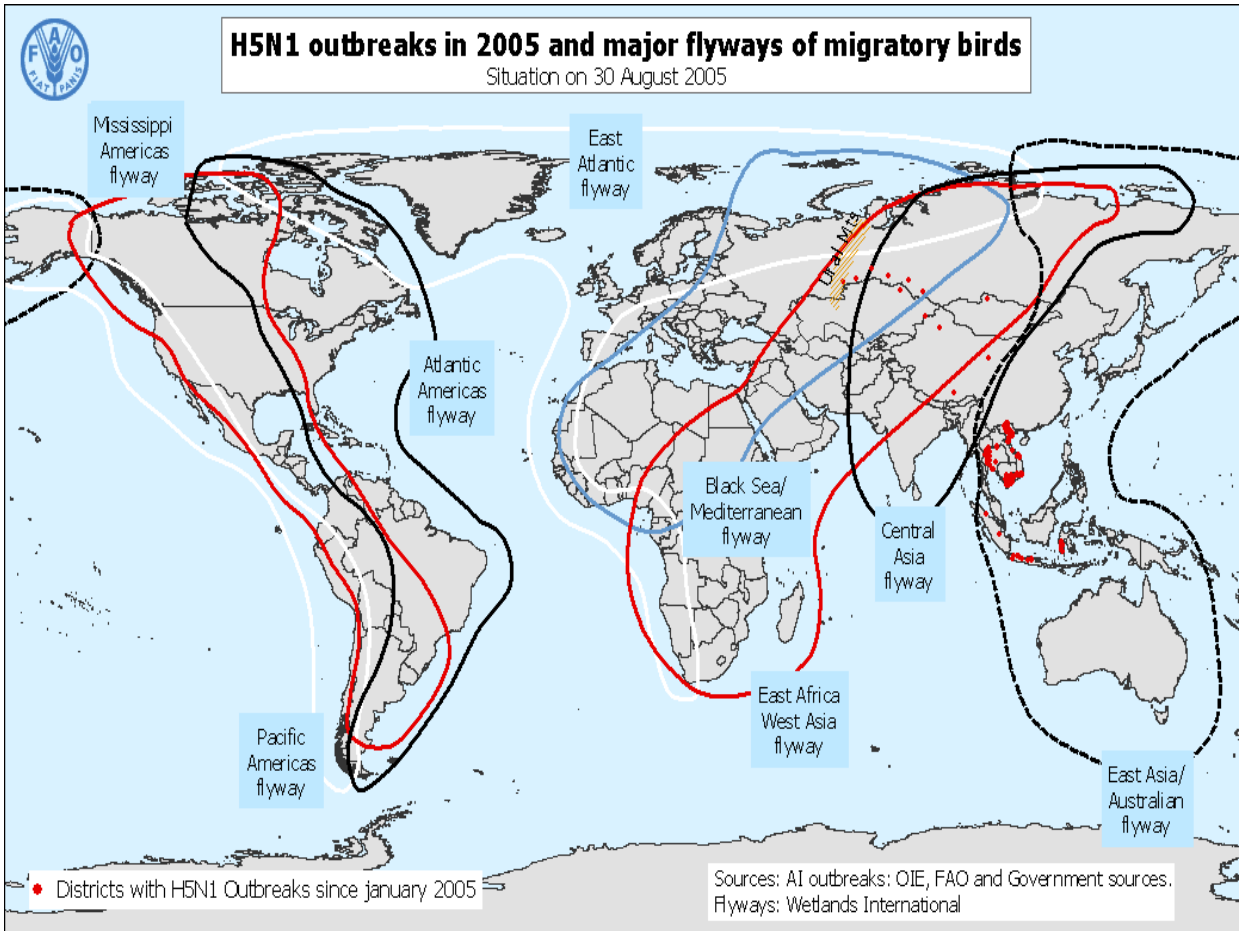


Figure 8: HPAI outbreaks in 2005 and major flyways of migratory birds (FAO)

1.Abia
2.Adamwa
3.Akwa Ibom
4.Anambra
5.Bauchi
6.Bayelsa
7.Benue
8.Borno
9.Cross River
10.Delta
11.Ebonyi
12.Edo
13.Ekiti
14.Enugu
15.Gombe
16.Imo
17.Jigawa
18.Kaduna
19.Kano
20.Katsina
21.Kebbi
22.Kogi
23.Kwara
24.Lagos
25.Nassarawa
26.Niger
27.Ogun
28.Ondo
29.Osun
30.Oyo
31.Plateau
32.Rivers
33.Sokoto
34. Taraba
35.Yobe
36.Zamfara
37.Abuja FCT

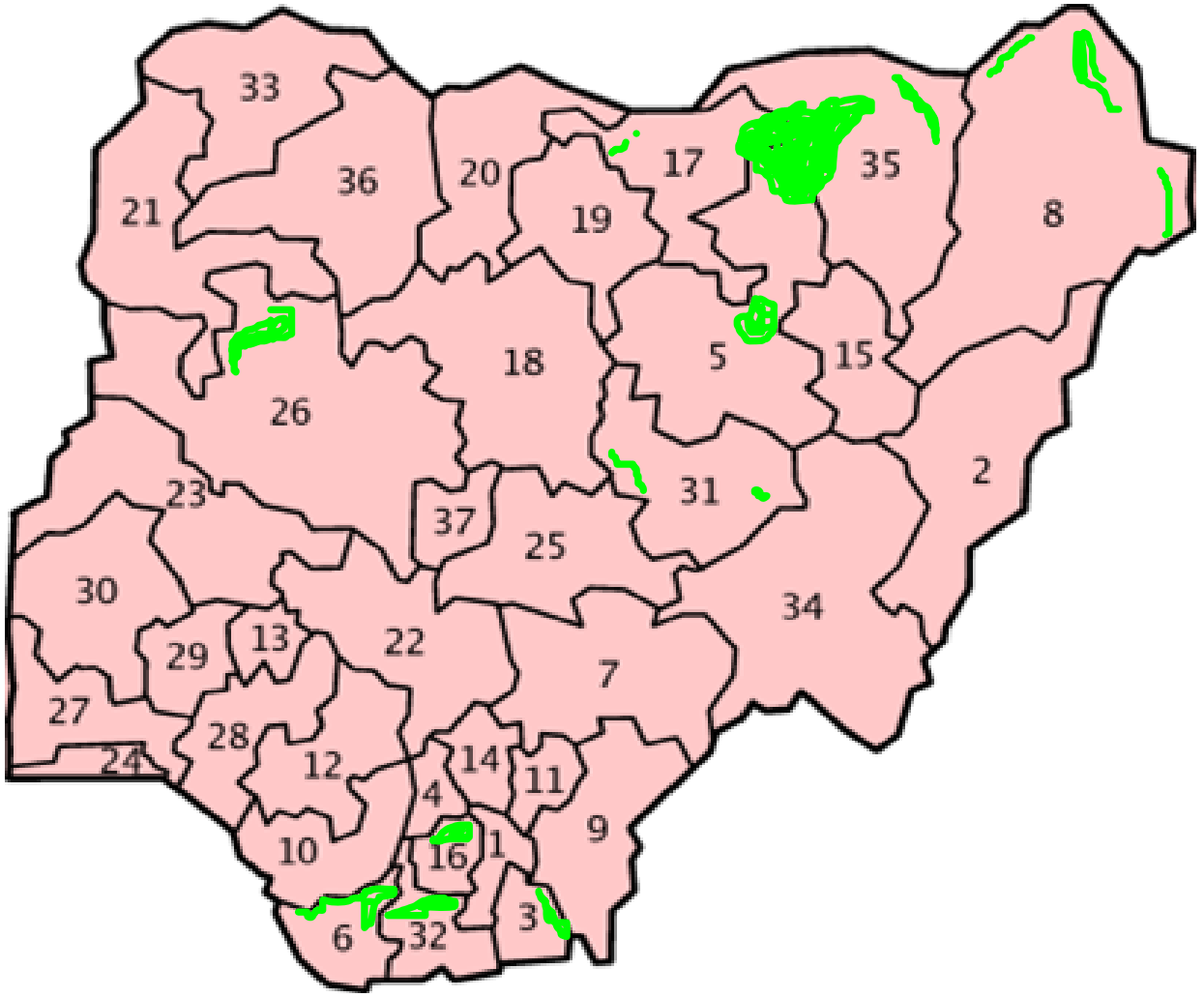


Figure 9: Map of Nigeria showing identified wetlands possible nesting sites of Migratory birds) in the country (FDLPCS)

Figure 10: Picture of a dead migratory bird of prey from Germany found at Makurdi, Benue State.

Figure 11: A picture of a migratory falcon from Finland caught at Sokoto showing leg tags

STRATEGIES FOR THE PREVENTION OF INTRODUCTION OF HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI) INTO NIGERIA

1. Ban on importation of poultry and poultry products from countries where the disease (HPAI) is known to exist. At present, there is an existing total ban on importation of live birds, poultry products including fertile eggs into the country which needs to be re-examined from time to time with a view to ameliorating the negative impact on the fragile poultry industry without compromising the present HPAI status in the country.

2. An effective animal disease surveillance involving high risk areas such as poultry markets, wet lands and poultry located along known migratory birds routes, poultry abattoirs, borders and targeted farms should be carried out. Results obtained may then be used to assess the need for a complete nationwide HPAI active disease, virus and sero-surveillance to determine epidemiological status of the disease in the country.

3. Improved and functional National Veterinary Quarantine Services (NVQS) including immediate rehabilitation and revitalisation of existing veterinary quarantine infrastructure, control posts and enhanced manpower capabilities. This is to enable a sustained surveillance of animal diseases at the ports of entry in the course of animal/animal products, biologics and germplasm trade. The NVQS service staff should maintain continuous presence at the ports of entry into the country and constitute part of the Joint Intelligence Board (JIB) which should play an active role in HPAI surveillance at the ports.

4. Targeted community based training of rural backyard poultry farmers in various aspects of HPAI recognition and control including biosecurity procedures applicable to rural small scale poultry enterprises and the role of animal disease vigilante in the control of HPAI.

5. Enforcement of the requirement for Import permits for poultry and poultry products issued by the FDLPCS.

6. Development of a traceability mechanism for animals and strict monitoring of movement of poultry and poultry products through registration and licensing of poultry farms, hatcheries and other poultry enterprises.

7. Development of a community based, participatory rural livestock and poultry disease surveillance system and integrating it into the existing epidemio-surveillance network.

8. Training of veterinarians, auxiliaries, other categories of poultry farmers on HPAI prevention and control strategies including aspects of biosecurity.

9. Effective public enlightenment and awareness programmes on HPAI.

EARLY WARNING CONTINGENCY PLANNING FOR HPAI IN NIGERIA

Early warning mechanisms enable rapid detection of the introduction of or sudden increase of the incidence of HPAI before it develops to epidemic proportions and causing serious socio-economic consequences. The mechanisms embrace all initiatives, mainly based on disease surveillance reporting and epidemiological analysis that would lead to improved awareness and knowledge of the distribution and behaviour of HPAI and that allow for both forward and back tracing of HPAI outbreaks and monitoring of the effectiveness of disease control campaigns.

Case definition:
A case definition for HPAI suspicion is established to enable field officers to take immediate action even before laboratory confirmation is made (refer to Annex below). This is based on 6 criteria as follows:

- the mortality rate in poultry and the speed with which animals die
- the mortality of other farm birds at the same time
- the mortality of wild birds and water fowl in the neighbourhood
- the vaccination status with regard to Newcastle disease
- the appearance of similar cases in neighbouring farms
- the sanitary status (infected or not) of the State with regard to HPAI.

HPAI SPECIALIST DIAGNOSTIC TEAMS (SDT)

Six groups of HPAI expert diagnostic teams based at NVRI, VTHs at ABU, Ibadan Maiduguri, Sokoto and Nsukka would be charged with investigating reported suspected cases of HPAI. Each team would comprise of poultry/veterinary virologist, poultry/veterinary epidemiologist poultry/veterinary pathologist, experienced poultry clinician as well as an experienced veterinary laboratory diagnostician.

The specialist diagnostic team (SDT) would be expected to:
· Make clinical examinations
· Collect histories
· Make preliminary investigations
· Collect a range of diagnostic specimens both specifically for HPAI and for any other diseases that might be included in the differential diagnosis.

The team will travel to the site of the suspected outbreak with the representative of the DVS and/or the local veterinary officer. The team should also have the authority in consultation with the field veterinarian to take immediate disease control actions that are necessary at the outbreak site. They should also be empowered to provide any immediate instructions to the local animal health official.

Samples for laboratory examinations should be collected in sufficient quantities to enable the designated laboratory to send some of the samples to the NVRI who when required would be expected to send some of these to the Regional and World Reference laboratories for confirmation. It is highly recommended that the final confirmatory laboratory result be released through the Executive Director NVRI to the Director FDLPCS.

National Animal Disease Surveillance and Information system

A national animal disease surveillance system is being developed by the Pan-African Programme for the Control of Epizootics (PACE) project and the National Special Programme for Food Security (NSPFS). Under the PACE, an active Epidemio-surveillance network has been established with trained agents located at 170 points all over the country including Livestock markets, control posts and abattoirs (see map). The project has also enhanced and streamlined passive surveillance disease reporting through state veterinary services. In addition 109 NSPFS animal health service providers, mainly paraveterinary and some professional veterinarians one at each site are involved in disease surveillance and reporting. These networks would be involved in HPAI surveillance and reporting and plans are being made to increase the capacities of these reporting systems. It is being recommended therefore that HPAI diagnosis and control should feature prominently and with adequate funding in the animal diseases and transboundary pest control programme of the NSPFS.

The possibility of TCP on HPAI surveillance and control in Nigeria should be explored from relevant bodies such as FAO, IAEA, WHO and OIE. Collaborative linkages with Federal Ministry of Health should be strengthened in line with the current global trends.

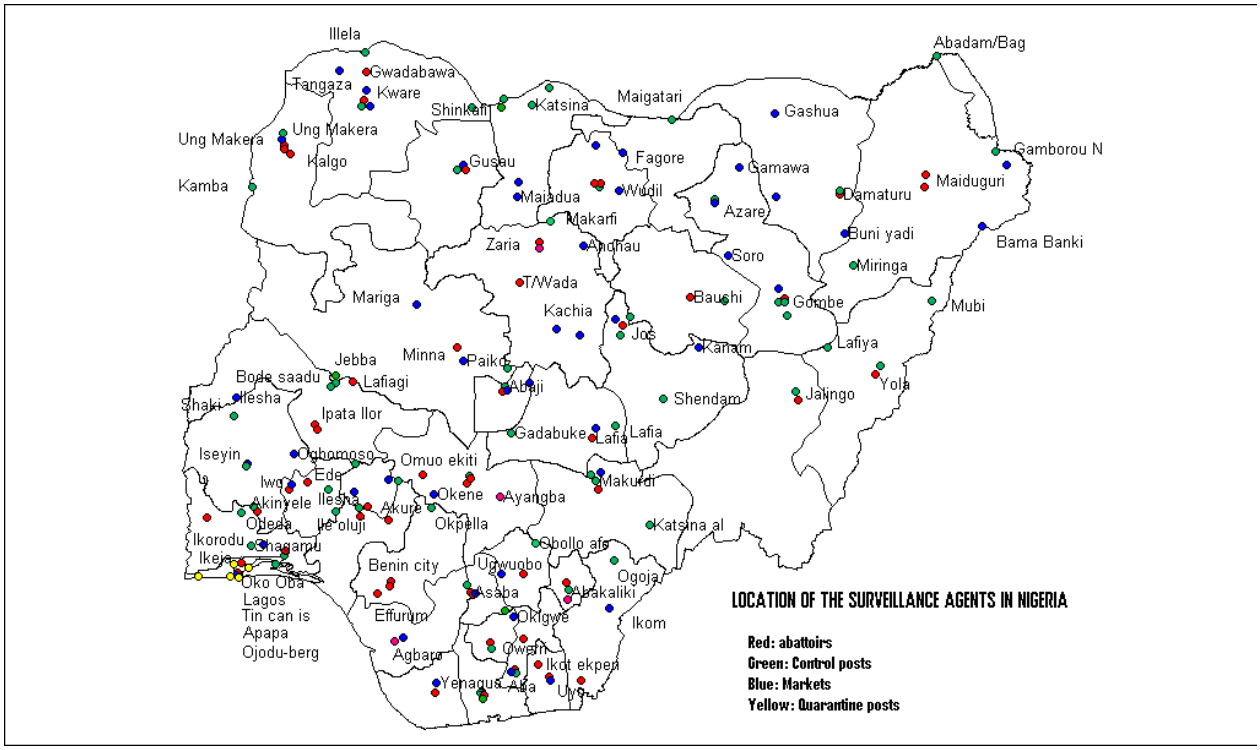


Figure 12: Map of Nigeria showing the locations of the NADIS epidemio-surveillance agents

EARLY REACTION CONTINGENCY PLANNING FOR HPAI IN NIGERIA

LABORATORY DIAGNOSTIC CAPABILITIES

The existing laboratories that have been earmarked to carry out diagnosis of HPAI in the country are: NVRI, VTHs at Zaria, Ibadan, Maiduguri, Nsukka and Sokoto. Each of these laboratories should have the capacity to carry out screening direct antigen detection tests, immunoflourescence test and serological tests for antibody detection. The NVRI would be expected to carry out virus isolation and identification and any other isolate characterisation. It is also highly desirable for samples 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. Other suggested laboratory diagnostic networking should include laboratories in neighbouring countries and the West African sub region.

The prospect for Technical Cooperation Project (TCP) to enhance our HPAI diagnostic capacity should be explored with both FAO, WHO, IAEA and OIE.

Table 1: Suggested testing protocols for HPAI diagnosis for laboratories in Nigeria:

Test	NVRI	ABU	Ibadan	Nsukka	Sokoto	Maiduguri
Screening tests						
Immunoflourescence	+	N	N	N	N	N
Directigen™ FluA	+	N	N	N	N	N
Confirmatory tests						
Virus isolation and identification	+	N	N	N	N	N
Reverse Transcriptase Polymerase Chain Reaction (RT-PCR)	+	+	+	+	+	+
Virus characterisation						
Haemaglutinin typing	+	N	N	N	N	N
Neuraminidase typing	+	N	N	N	N	N
Gene sequence, detection and analysis	+	N	N	N	N	N
Serological tests						
HIT	+	+	+	+	+	+
AGID	+	+	+	+	+	+
c-ELISA	+	+	+	+	+	+
DIVA	+	+	+	+	+	+

Key: + = Recommended
N= Not recommended

Recommended action on laboratories:

The following interventions are needed based on the recommendations above to enable the laboratories discharge their assigned duties:

- Upgrading the diagnostic capacity of the six designated laboratories
- Procurement of diagnostic reagents and kits ahead of any outbreak
- Standardisation of tests and interpretation of results
- Training for laboratory staff in diagnosis of HPAI (may require international cooperation) – training should involve neighbouring countries
- Networking with designated laboratories in the West African sub region and other World reference laboratories.

RESOURCE PLAN FOR HPAI CONTROL IN NIGERIA

AVIAN INFLUENZA CRISIS MANAGEMENT CENTRE

An Avian Influenza Crisis Management Centre was established to coordinate and disseminate information regarding the HPAI. The center is jointly supervised by the Federal Ministry of Agriculture and Rural Development, Federal Ministry of Health and Federal Ministry of Information and National Orientation.

THE MULTI-SECTORAL STEERING COMMITTEEE ON AVIAN INFLUENZA.

MEMBERSHIP

.

- Minister of Health — Chairman
- Minister of Agriculture & Rural Development — Co-Chairman
- Minister of Information and National Orientation
- Minister of State for Agriculture
- Minister of State for Health
- State Security Service
- Minister of Finance
- Minister of Culture & Tourism
- Minister of Science & Technology
- Minister of Environment
- Minister of Foreign Affairs
- Minister of Education
- DG NEMA
- Representative of major Development Partners:-WHO, FAO, implementation of the integrated P&C plan EU, USG/USAID, DFID, UNICEF, UNDP, World Bank, ADB

- Representative of Poultry Association of Nigeria
- Representative of Civil Society

TERMS OF REFERENCE

1. To develop a national integrated plan and strategies for effective control of the outbreak.
2. To ensure the successful implementation of the integrated plan by monitoring its implementation and reviewing the plan as may be necessary.
3. To establish liaison with development partners and to coordinate national and international efforts to contain the outbreak of Avian Influenza
4. To raise funds and other support for the prevention and control activities.
5. To provide leadership at the highest level of government for an early resolution of the Avian Influenza crisis in the country.
6. To manage all outbreaks-related information in a timely manner in consultation with the Communication and Technical Committees.
7. To provide technical assistance to neighbouring countries as directed by Mr. President.
8. To report back regularly to Mr.President and the FEC on the implementation of the integrated P & C plan.

TECHNICAL COMMITTEE ON AVIAN INFLUENZA

MEMBERSHIP.

- Hon. Minister of State for Agriculture and Rural Development Chairman
- Hon. Minister of State for Health Co-Chairman
- Director of Livestock and Pest Control Services
- Director of Special Projects Ministry of Health
- NSPFS/Trans-boundary Animal Diseases and Pest
- NVRI, Vom
- VTH ABU, Zaria
- University of Ibadan/Vet Department
- FAO/ OIE/AU/IBAR
- WHO
- UNDP
- PAN
- WHO Reference Laboratory, Ibadan
- WHO Reference Laboratory, Maiduguri

TERMS OF REFERENCE

The Committee is responsible for the coordination and implementation of the emergency action plan and strategy prepared for the prevention and control of outbreaks of Avian Influenza in collaboration with the Steering Committee. Specifically the Committee is to:

1. Supervise the intensification of surveillance against the disease all over the country.
2. Provide technical support to all government efforts aimed at containment of the outbreak including stamping out of the affected poultry population.
3. Coordinate the activities of the field investigation teams and to receive regular feedback from them and report promptly to the Inter-Ministerial Steering Committee.
4. Collaborate with the Communication Committee for effective dissemination of information on the status of the outbreak and its management.
5. Interact with international technical teams for cross fertilization of scientific information.
6. Provide other technical inputs and expertise on the outbreak as may be required from time to time.
7. Review and prepare technical information and documentation.

STATE TECHNICAL COMMITTEE ON AVIAN INFLUENZA

MEMEBERSHIP

- Commissioner of the State Ministry of Agriculture & Natural Resources (Chairman)
- Commissioner of the State Ministry of Health co-chairman
- Director of Veterinary Service.
- Field officer,Federal Department of Livestock and Pest control services.

TERMS OF REFERENCE

- Assess progress of implementation.
- Review and approve work plans & budgets.

LOCAL GOVERNMENT TECHNICAL COMMITTEE ON AVIAN INFLUENZA

MEMBERSHIP

- Chairperson of the Local Government Council or His/Her representative (Chairman)

- Traditional or Community Leader – Deputy Chairperson
- Community Thematic Association (CTA's).
- Civil Society
- Private Sector group.

TERMS OF REFERENCE

- The LGTC will discuss, seek to authenticate claim & approves community proposals in the context of available resources.
- Review and approve advisory service activity proposals.
- Monitor community mobilization efforts.

OVERALL POLICY FOR HPAI EMERGENCY IN NIGERIA

The HPAI was confirmed in Nigeria at Sambawa Farm, Kaduna by the OIE reference Laboratory, Padova, Italy on 7th February, 2006.
The epidemiological features of the disease mentioned earlier coupled with the fact that the risk of introduction was considered as moderate to high while the risk of sustenance and maintenance may be ranked as very high. Therefore the overall policy for HPAI emergency in Nigeria should be to restrict the disease to the primary foci, eradicate the disease in the shortest possible period and limit the economic and public health impact using a combination of measures.

These include two possible scenarios:

1. Where the disease is discovered in limited populations and has not spread beyond the immediate vicinity.

The recommended action should be:

- Modified stamping out which involves quarantine and slaughter of infected poultry with full compensation;
- Sanitary disposal of destroyed poultry and contaminated poultry products according to **standard operating procedures** (refer to annex for details);
- Quarantine and movement control on poultry and poultry products in the infected areas or zone;
- Decontamination of facilities, products and equipment to eliminate the virus on infected premises and prevent spread to other areas;
- Active disease surveillance to determine the source and extent of the infection;
- Effective public awareness campaign to elicit cooperation from large scale commercial and back yard poultry owners.

2. Where modified stamping out failed and HPAI becomes established in the country, a different policy involving the under listed would be adopted:

- Movement restriction of poultry and poultry products;
- Depopulation of clinically infected farms with payment of compensation;
- Sanitary disposal of dead and destroyed poultry and contaminated poultry products according to **standard operating procedures**;
- Disinfection and decontamination of affected premises according to the standard operating procedures;
- Active disease surveillance to determine the source and extent of the infection;
- Effective public awareness campaign to elicit cooperation from large scale commercial and back yard poultry owners.
- Ring or Mass Vaccination of poultry, as the case may be, may be considered as an option if found to be necessary;

COMPENSATION AND RESTOCKING:

It is recommended that a policy of payment of compensation be instituted to compensated farmers whose poultry are destroyed under the modified stamping out policy proposed above. Therefore payment of compensation would be made only to farmers whose birds were killed in order to control the HPAI outbreak. However, it is also recommended that poultry farmers should be assisted to re-stock in the event of heavy losses as result of a widespread outbreak of the disease.

Figure 13: Depopulation of commercial farms (left). Use of CO_2 for euthanasia (gassing) of poultry (USDA/Henzler)

Figure 14: Disposal of eggs and trays (left) and final disposal of contaminated material in a lined container-bin. (USDA/Henzler)

ACTION PLAN FOR HPAI CONTROL IN NIGERIA

This action plan is a set of instructions covering various aspects of the control to be implemented and actions to be taken during HPAI emergency in Nigeria from when the disease is first suspected up to its final control. It identifies lines of communication between poultry farmers/owners and field and government veterinary services and tries to ensure a short command chain with regard to reactions during HPAI emergency.

With the confirmation of the HPAI in Nigeria on 7th February, 2006, capacity building of all Animal Health Workers, farmers and other stakeholders was identified as a major limiting factor in the control of the HPAI being a new emerging disease.

Consequently PACE-Nigeria which has a unit called National Animal Disease Information & Surveillance System -NADIS (an Epidemiological unit of Federal Department of Livestock & Pest Control Services) conducted several trainings and advocacy meeting with the objective of sensitizing and building the capacity of all stakeholders to handle Livestock disease emergencies particularly the HPAI. The trainings were held in Ibadan, Minna, Bauchi with the financial support from the Development Partners such as the French Embassy, USAID, FAO and IFAD. A total of 865 stakeholders including 170 PACE Surveillance Agents, Animal Health Officers, State PACE desk Officers, Poultry farmers, members of the Nigerian Veterinary Medical Association, Private Veterinary Practitioners and community based Agricultural and Rural Development Officers participated. Advocacy workshops are also being conducted at each state under the PACE project to further expand the scope of participants.

The NADIS has 7 zonal structures with 170 Surveillance Agents that are strategically located at the ports of entry, International control posts, cattle markets, Abattoirs etc Each of the zones is headed by a zonal coordinator while each state has a Desk Officer.

Rumour/Suspicion Phase

Rumour phase is said to exist when the farmer observes high mortality in his flock and reports the situation to an animal health officer or when a surveillance agent during the course of routine visit encounters such a situation, and suspects that AI might be involved. The farmer or the agent is expected to report this finding to the nearest Veterinary officer; and/or where appropriate, the agent should institute movement control measures and proceed immediately to investigate the situation.

NADIS Epidemiosurveillance network

An effective disease surveillance network has already been put in place by the PACE project. The network operates both passive disease reporting and a continuous active disease search at 170 points in the country (figure 6). The agents trained under this network would be expected to on a continuous basis examine animals at their various surveillance points and declare suspicions through out the various phases of an emergency. They would also participate in sample collection, and in public enlightenment programmes as part of their normal schedules

Investigation Phase

The investigation phase is said to exist when a report with low probability of being HPAI is received by the Veterinary Services. It should be a legal obligation of any citizen suspecting the presence of HPAI to report that suspicion to a member of the Local Government/State Veterinary or Animal Health Services.

In essence, a suspicious index case is most likely to be reported to the Veterinary Services by:

- private veterinary practitioner,
- poultry farmer/ owner,
- wildlife or park rangers,
- animal health/ extension officers,
- surveillance agents/animal health service provider,
- community leader.

The Local Government Veterinary Officer (LGVO).

On receipt of such information, the LGVO should immediately carry out investigations and collect such necessary information as:

- location of index case/cases,
- clinical and epidemiological features,
- collect specimens that may aid diagnosis,
- impose such immediate movement restrictions as are within his power if there are sufficient grounds to suspect HPAI
- inform the State Director of Veterinary Services (SDVS) and the PACE Zonal Coordinating Officer who should similarly inform the Director, Federal Department of Livestock and Pest Control Services (DFDL&PCS) and the PACE/NADIS Coordination officer.
- dispatch any collected samples to the nearest designated National Laboratory for HPAI diagnosis.

On receipt of information from the LGVO, the SDVS should:

- analyze the information provided by the LGVO and carry out further investigations,
- take further steps to limit possible spread,
- advise DFDL&PCS on the outcome of investigation and likelihood of confirmation of HPAI
- advise the LGVO to declare false alarm and therefore winding-down of operations or progression to the Alert phase.

Alert phase

If clinical and epidemiological results are highly indicative of HPAI,

The Director Federal Department of Livestock and Pest Control Services (DFDL&PCS) should:

- instruct the SDVS to coordinate all control activities during the emergency period.
- inform the Director, National Veterinary Research Institute and request dispatch of the HPAI Specialist Diagnostic team,
- inform the Minister of Health Police, Customs, Immigrations and the Army about the suspected HPAI disease, and in consultation with the FMA convene meeting of the National animal disease emergency committee

The State Director of Veterinary Services (SDVS) should:

- instruct the LGVO to monitor the farm/premises and enforce live poultry and susceptible animal movement restrictions,
- ensure that the equipment and materials needed by various teams are available,
- delineate the various control zones on the advice of the LGVO.

The Local Government Veterinary Officer (LGVO) should:

- accompany the HPAI Specialist Diagnostic team to the infected site/s for detailed investigations,
- secure adequate supplies for the team to carry out all necessary investigations,
- brief the HPAI Specialist Diagnostic team in advance, providing as much detailed information as may be needed by the team,
- supervise disinfection of personnel and materials after investigations before leaving the infected premises.
- take steps to immediately carry out safe disposal of dead poultry and decontamination,

Figure 15: Disinfection of vehicles (tires) when leaving the farm (USDA/Henzler).

The HPAI Specialist Diagnostic Team

Following adequate briefing by the LGVO, the Specialist Diagnostic team should:

- proceed to the infected area/premises,
- conduct detailed clinical examination of as many affected poultry as would be needed to arrive at clinical diagnosis,
- collect epidemiological information and carry out forward and backward tracing to determine possible origin of the disease,
- collect as many specimens as possible, package, label and dispatch the samples to the relevant national and/or the nearest designated laboratory for HPAI diagnosis,
- report findings to the Executive Director NVRI and the DFDL&PCS.

The epidemiological report from a primary outbreak by the Specialist Diagnostic team should describe:

- the situation on the infected premises,
- the number, type and species of poultry and other susceptible animals;
- the method of husbandry;
- the number of dead and clinically affected poultry,
- the size and location of the premises/flock, and its relationships with other poultry farms as well as poultry markets;
- the recent movements (live poultry, poultry products, equipment and personnel) on and off the farm;
- the possible origin and the date of the introduction of infection,
- the likely duration of infection on the premises/flock;
- the farms/poultry enterprises most at risk from spread by movements;
- any other information that the team may find relevant.

Figure 16: Disposal of carcasses and contaminated material by burying (left) and burning (right). USDA/Henzler.

Operational phase

The operational phase is initiated when HPAI occurrence has been confirmed and the Director Federal Department of Livestock and Pest Control Services (DFDL&PCS) declares HPAI emergency and activates the HPAI emergency plans. This information should then be sent to the Directors of Veterinary services of neighbouring countries, and global authorities such as the OIE, FAO-EMPRES, AU-IBAR and relevant regional HPAI control organization.

Various teams in the state veterinary services would be expected to go into operation as listed below:

Stamping out, safe disposal of carcasses and decontamination.

Infected premises Team

This team will be expected to carry out proper disposal of carcasses of dead poultry that died of the disease as well as decontamination in the infected zone.

Disposal of carcasses will be in accordance with standard operating procedures.

Figure 17: All persons entering infected premises must be properly kitted with personnel protective equipment (PPE). (PACE/Winnifred)

Decontamination of vehicles, equipment and animal houses should equally be carried out according to the standard operating procedures.

Disease surveillance teams

At least, two teams would be required for repeated active disease search and sero-surveillance one in the infected and the other team in the surveillance zone.

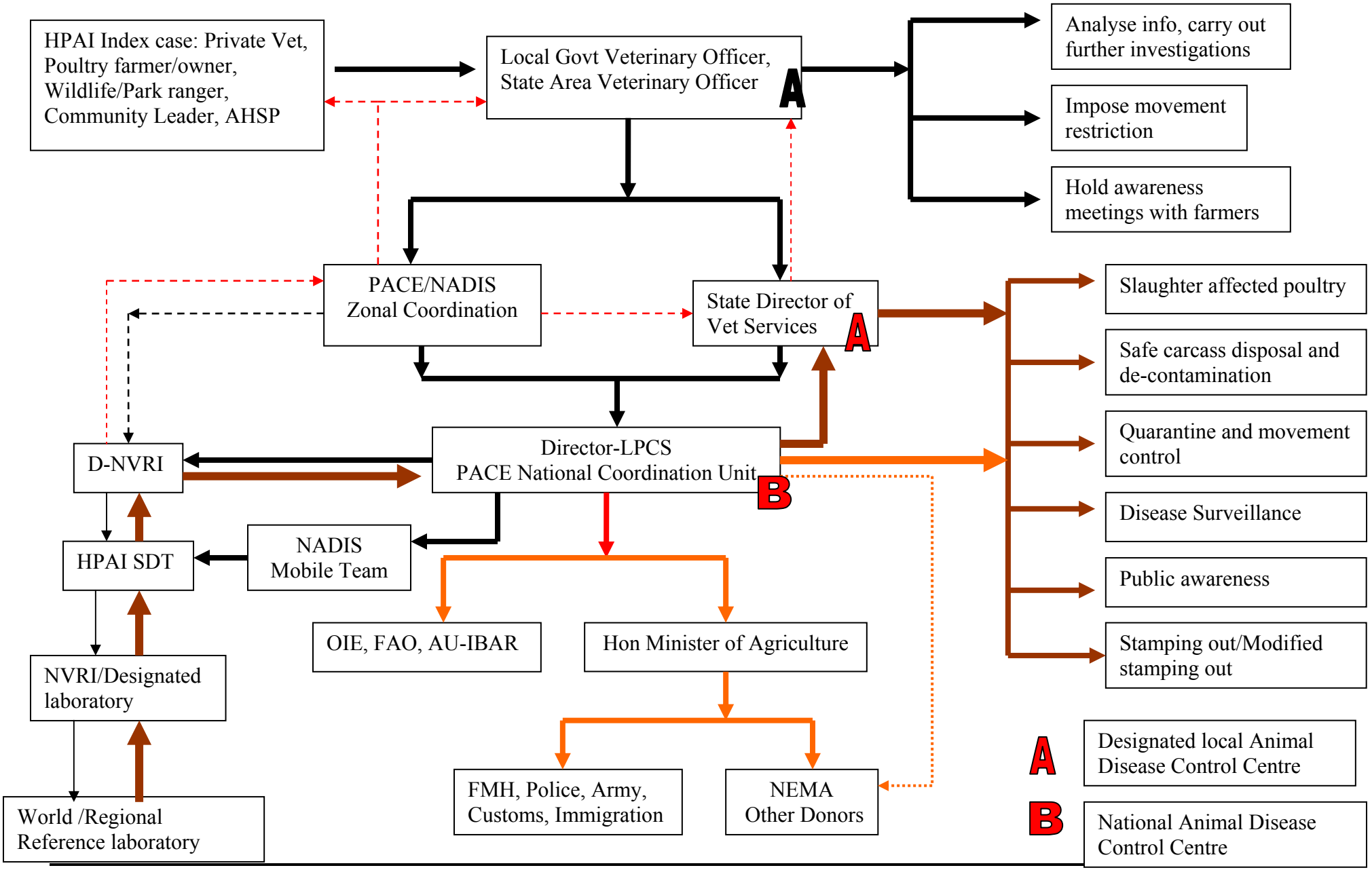
Stand-down phase

This phase may exist when HPAI is not confirmed as well as when the disease is confirmed. When investigations carried out during the alert phase fail to confirm the disease, the LGVO on the instructions of the SDVS must notify all organizations and persons who had been informed of suspected HPAI occurrence and possible emergency that the situation had ceased to exist.

On the other hand, if HPAI was confirmed, stand-down phase begins as soon as all necessary operations for containment, control and elimination are completed to the satisfaction of the DFDL&PCS. Winding-down operations should not be unduly delayed but must be systematic, gradual and supervised by the State Government Veterinary Officers.

Notes:

Next page: **action plan against highly pathogenic avian influenza (HPAI)**


HPAI Index case: Private Vet, Poultry farmer/owner, Wildlife/Park ranger, Community Leader, AHSP
Local Govt Veterinary Officer, State Area Veterinary Officer
A
Analyse info, carry out further investigations
Impose movement restriction
Hold awareness meetings with farmers
PACE/NADIS Zonal Coordination
State Director of Vet Services
A
Slaughter affected poultry
Safe carcass disposal and de-contamination
Quarantine and movement control
Disease Surveillance
Public awareness
Stamping out/Modified stamping out
D-NVRI
Director-LPCS PACE National Coordination Unit
B
HPAI SDT
NADIS Mobile Team
OIE, FAO, AU-IBAR
Hon Minister of Agriculture
NVRI/Designated laboratory
FMH, Police, Army, Customs, Immigration
NEMA Other Donors
World /Regional Reference laboratory
A
Designated local Animal Disease Control Centre
B
National Animal Disease Control Centre

ANNEX : List of members of the Specialist Diagnostic Teams

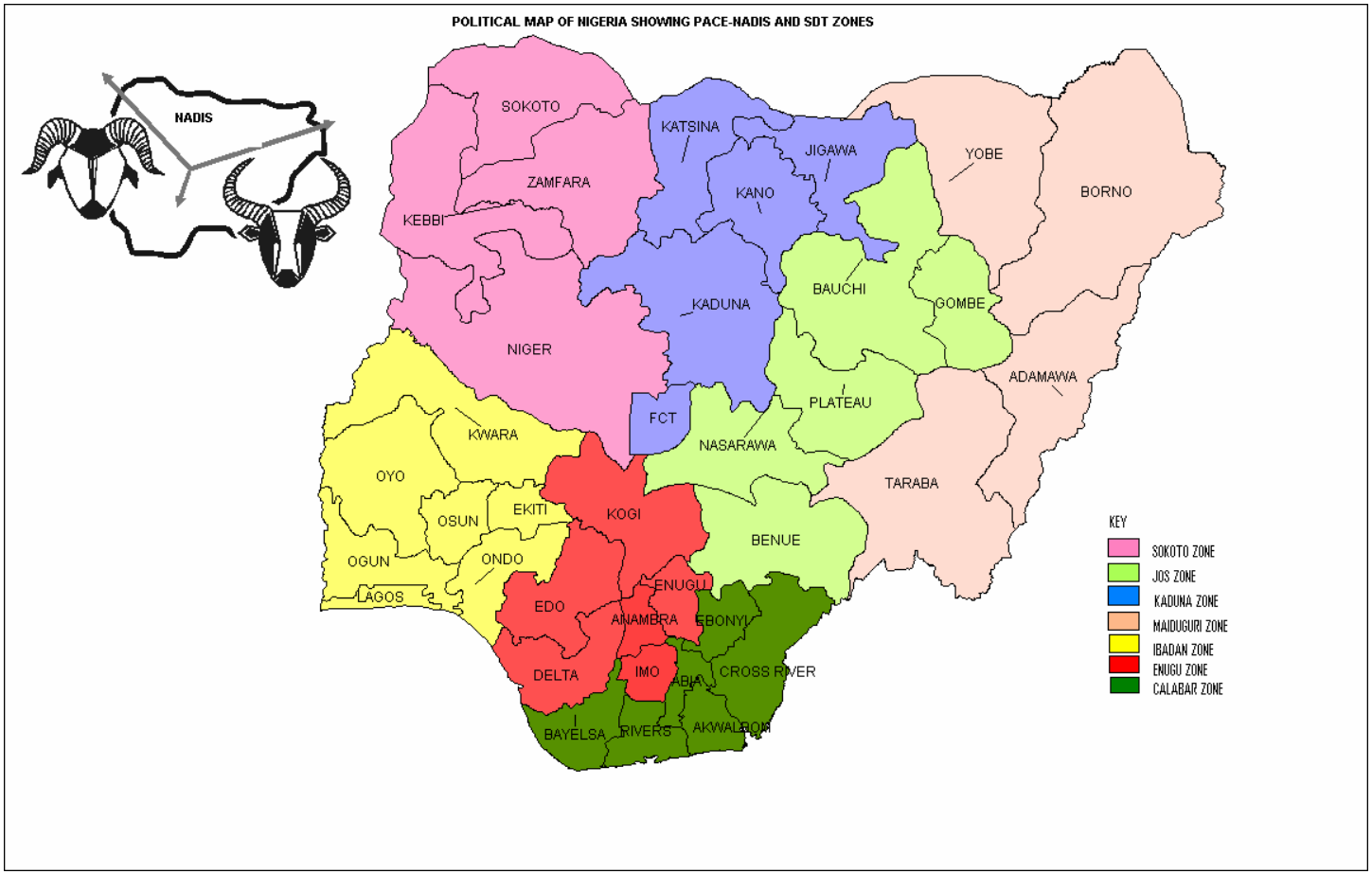
	TEAM A: Kaduna, Kano, Jigawa and Katsina States				
	Name	**Institution**	**Contact Addresses**	**Tel Nos.**	**E-MAIL**
	Prof. Paul Abdu	VTH Zaria			
	Dr Ibrahim I. Dakat	FDLPCS	FDL & PCS,Mando,Kaduna	08065733993	pacezcokadunaA@yahoo.com
		NVRI	NVRI Kaduna		nvril924@yahoo.com
		MANR Kaduna			
		MANR Kano			
		MANR Jigawa			
		MANR Katsina			
	TEAM B: FCT, Plateau, Nasarawa, Niger, Kogi, Bauchi				
	Dr T. M. Joannis	NVRI	NVRI, Vom via jos,plateau State	08052734204	tmjoannis@yahoo.com
	Dr Adamu El-Oji	FDLPCS	FDL & PCS,Jos	08036843929	pacezcojos@yahoo.com
		FCT			
		MANR Plateau			
		MANR Nasarawa			
		MANR Niger			
		MANR Kogi			
		MANR Bauchi			
	TEAM C: Taraba, Benue, Enugu, Anambra, Ebonyi				
		VTH Nsukka			
	Dr B. N. U. Chima	FDLPCS	FDL & PCS, Enugu	08035763884	pacezcoenugu@yahoo.com
		NVRI			
		MANR Taraba			
		MANR Benue			
		MANR Enugu			

		MANR Anambra			
		MANR Ebonyi			
	TEAM D: Abia, Cross River, Akwa Ibom, Rivers, Bayelsa, Imo, Delta, Edo				
		VTH Nsukka			
		NVRI			
	Dr M. C. Dimpkagu	FDLPCS	FDL &PCS, Calabar	08055164474	Pacezcocalabar@yahoo.com
		MANR, Abia			
		MANR, C/Rivers			
		MANR, A/Ibom			
		MANR, Rivers			
		MANR, Bayelsa			
		MANR, Imo			
		MANR, Delta			
		MANR, Edo			
	TEAM E: Lagos, Ogun, Oyo, Ondo, Ekiti, Kwara, Osun				
		VTH Ibadan			
		NVRI	NVRI, Lagos		
	Dr B.B Anakhu	FDLPCS	FDL &PCS, Ibadan	08033708858	pacezcoibadan@yahoo.com
		MANR, Lagos			
		MANR, Ogun			
		MANR, Oyo			
		MANR, Ondo			
		MANR, Ekiti			
		MANR, Kwara			
		MANR, Osun			

	TEAM F: Sokoto, Kebbi, Zamfara				
		VTH Sokoto			
		NVRI			
	Dr T. S. Ahamed	FDLPCS	FDL & PCS, Sokoto	08036063112	pacezcosokoto@yahoo.com
		MANR Sokoto			
		MANR Kebbi			
		MANR Zamfara			
	TEAM G: Borno, Yobe, Adamawa, Gombe				
	Prof S. S. Baba	VTH Maiduguri			
		NVRI			
	Dr O. G. Garba	FDLPCS		08028261640	pacezcomaiduguri@yahoo.com
		MANR Borno			
		MANR Yobe			
		MANR Adamawa			
		MANR Gombe			
	APEX COMMITTEE				
	Prof. T. U. Obi	Univ of Ibadan	University of Ibadan, Ibadan	08051707167	
	Prof. J. Umoh	ABU Zaria	ABU, Zaria		
	Prof. D. F. Adene	Univ of Ibadan	ABU, Zaria		
	Prof. Adeyefa	Univ of Ibadan	University of Ibadan		
	Prof O. Tomori	Redeemers Univ.	Km 46, lagos-Ibadan Express way	08034996524	oyewaletomori@yahoo.com
	Dr I. G. Ahmed	FDLPCS	FDL & PCS	08033309541	pacenigeria@microaccess.com

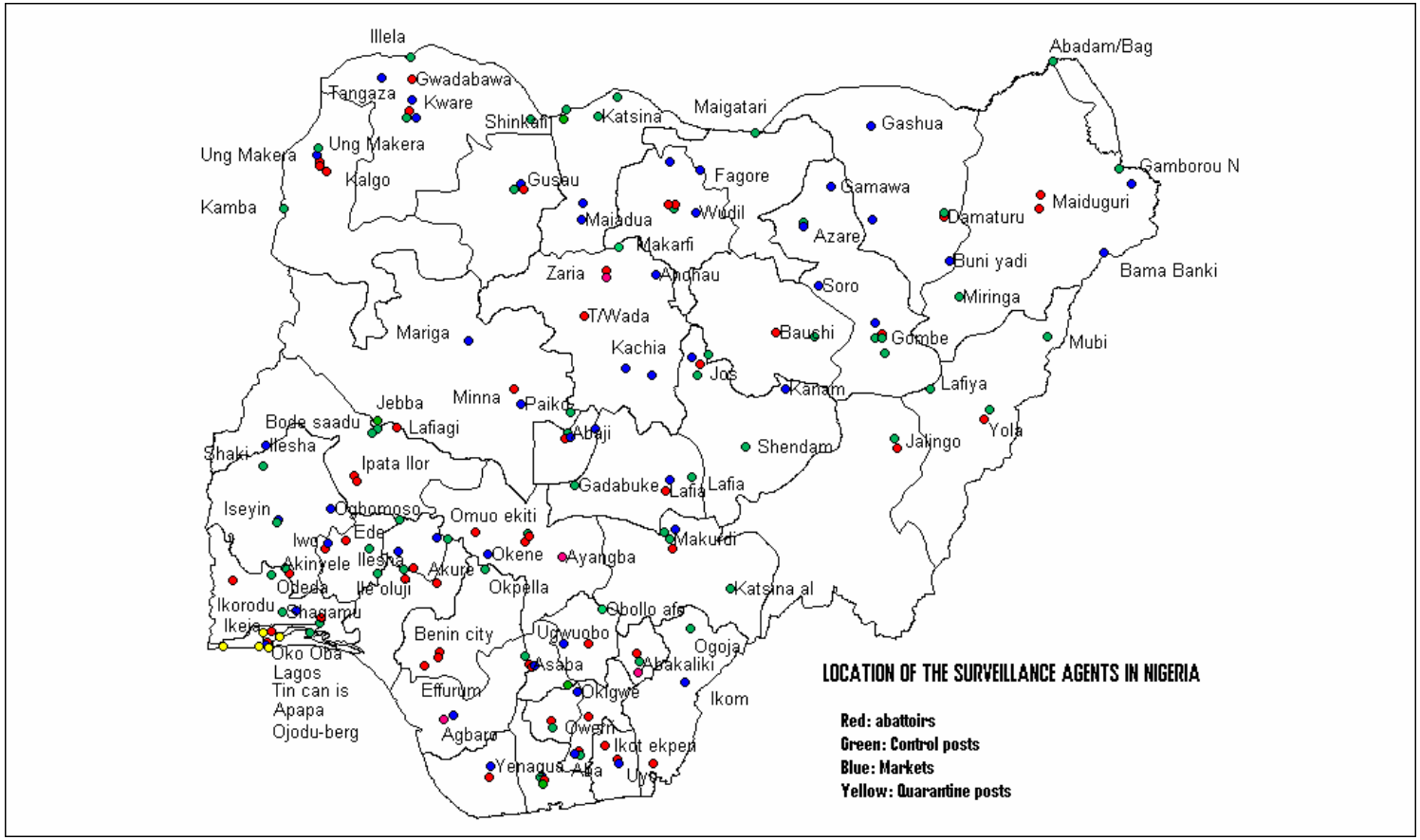
> mapping resources

NIGERIA POLITICAL MAP



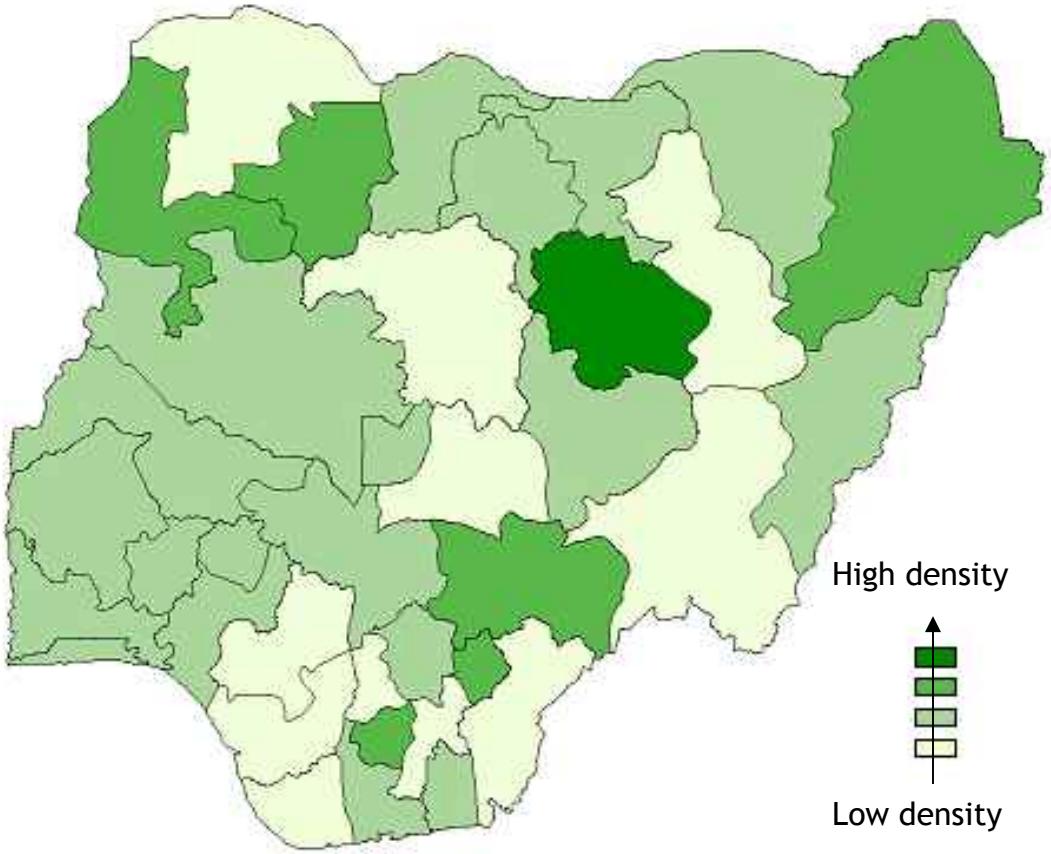
> mapping resources

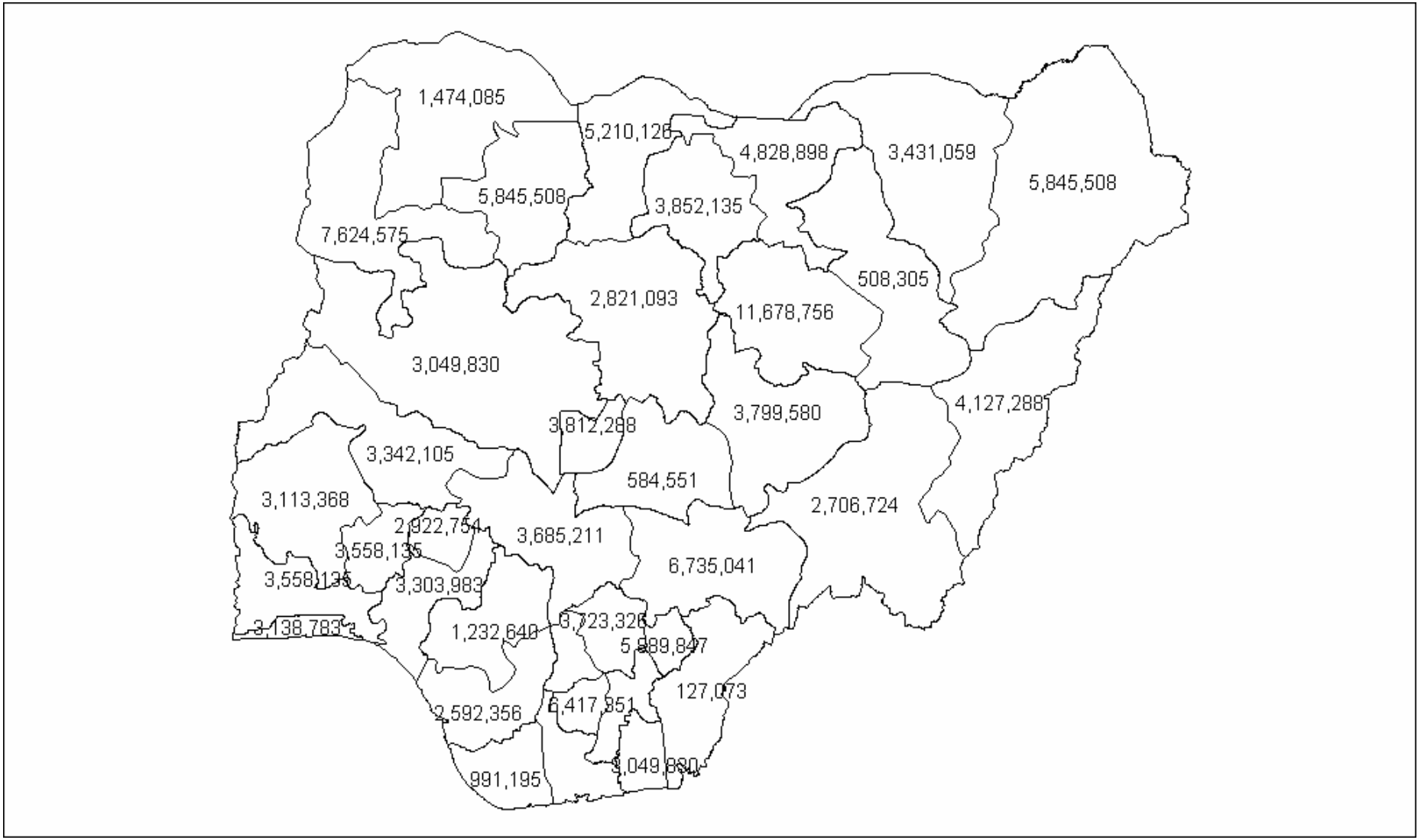
NAT. ANIMAL DISEASE INFORMATION SYST.



> mapping resources

NIGERIA POULTRY DENSITY

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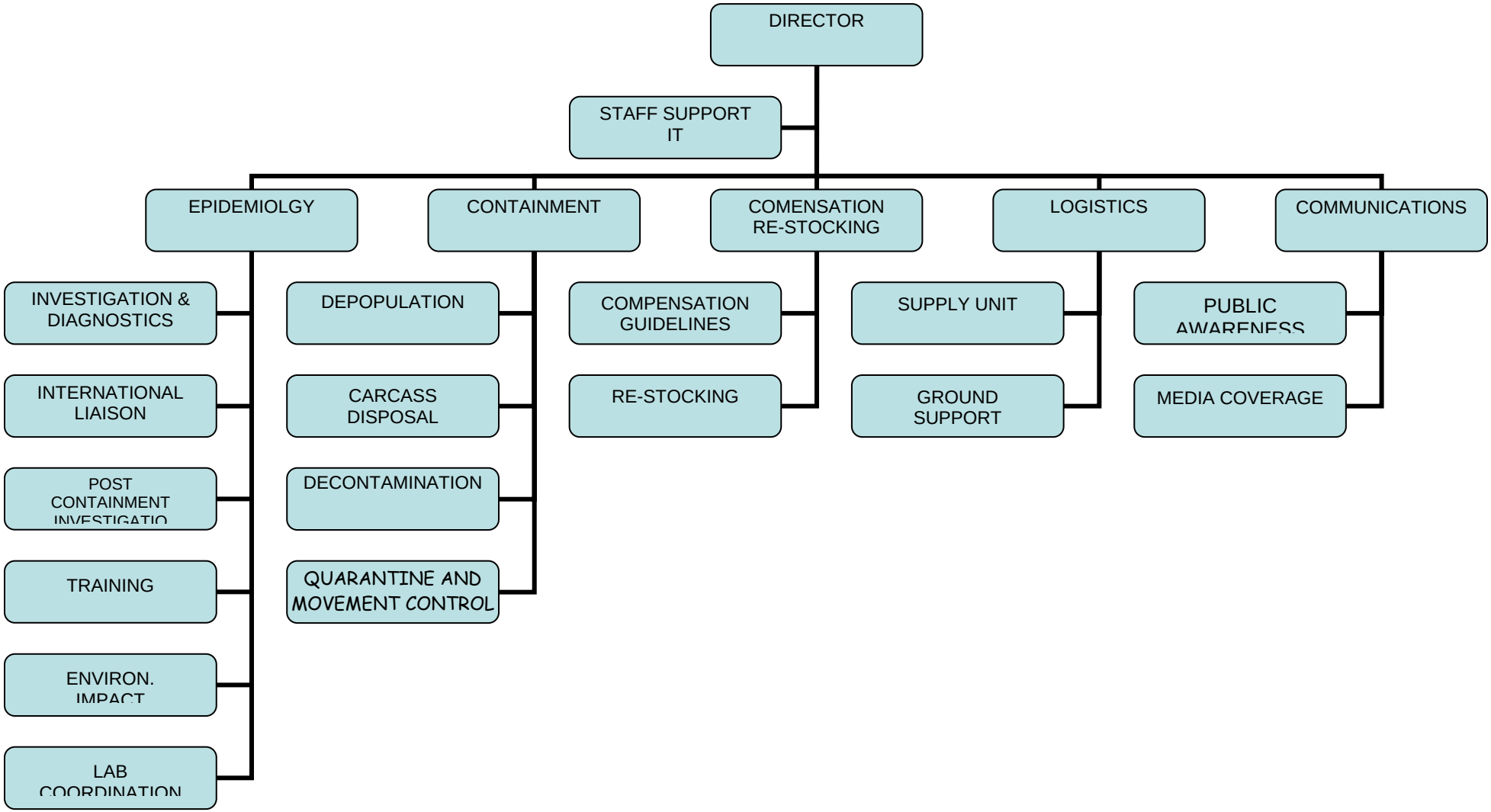
584,551
3,113,368
2,706,724
2,922,754
3,685,211
3,558,135
6,735,041
3,558,135
3,303,983
3,138,783
1,232,640
3,723,326
5,889,847
127,073
2,592,356
6,417,351
3,049,880
991,195

> statistical resources

NIGERIA POULTRY POPULATION

Farming system :	Backyard poultry	Exotic poultry	Grand total
Year :	2 003	2 003	2 003
States :			
A/IBOM	2 772 000	277 830	3 049 830
ABIA	1 282 050	127 339	1 409 389
ADAMAWA	3 780 000	347 288	4 127 288
ANAMBRA	2 483 250	248 889	2 732 139
BAUCHI	5 832 750	5 846 006	11 678 756
BAYELSA	900 900	90 295	991 195
BENUE	6 121 500	613 541	6 735 041
BORNO	5 313 000	532 508	5 845 508
C/RIVER	1 155 000	115 763	1 270 763
DELTA	2 356 200	236 156	2 592 356
EBONYI	2 347 514	3 542 333	5 889 847
EDO	1 120 350	112 290	1 232 640
EKITI	2 656 500	266 254	2 922 754
ENUGU	1 859 550	1 863 776	3 723 326
FCT	3 465 000	347 288	3 812 288
GOMBE	462 000	46 305	508 305
IMO	5 832 750	584 601	6 417 351
JIGAWA	4 389 000	439 898	4 828 898
KADUNA	2 564 100	256 993	2 821 093
KANO	3 528 000	324 135	3 852 135
KATSINA	4 735 500	474 626	5 210 126
KEBBI	6 930 000	694 575	7 624 575
KOGI	3 349 500	335 711	3 685 211
KWARA	3 037 650	304 455	3 342 105
LAGOS	2 852 850	285 933	3 138 783
NASARAWA	531 300	53 251	584 551
NIGER	2 772 000	277 830	3 049 830
OGUN	3 234 000	324 135	3 558 135
ONDO	3 003 000	300 983	3 303 983
OSUN	3 234 000	324 135	3 558 135
OYO	2 829 750	283 618	3 113 368
PLATEAU	3 453 450	346 130	3 799 580
RIVERS	3 465 000	347 288	3 812 288
SOKOTO	1 339 800	134 285	1 474 085
TARABA	2 460 150	246 574	2 706 724
YOBE	3 118 500	312 559	3 431 059
ZAMFARA	5 313 000	532 508	5 845 508
National Total	115 880 864	21 798 079	137 678 943
%	84%	16%	

> organisational set-up



> standard operating procedures

BIOSECURITY FOR BIRD FLU

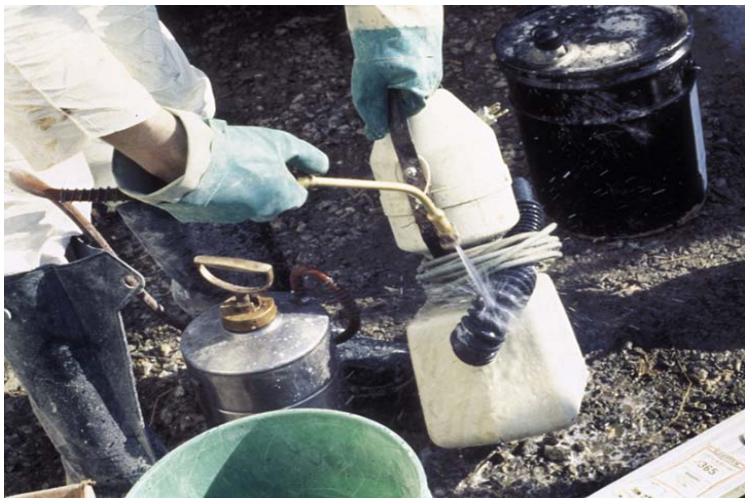
What is good biosecurity ?

Biosecurity is what you do to reduce the chances of a disease being carried onto your farm or to your backyard by people, animals, equipment or vehicles. Good biosecurity helps keep diseases from spreading to your poultry or birds.

- Restrict Access to poultry through the use of fences and enclosures - creates a barrier between clean areas where the poultry are kept.
- Wild birds, resident fowl or migratory birds should not be allowed contact with the poultry flock through the use of screens or overline nets
- New birds should be separated from the general flock for 7-14 days
    - Practice good sanitation procedures before working with other flocks, wash hands, disinfect boots
- Visitors that wish to see poultry should wash their hands, change shoes use footwear provided by the owner such as rubber boots that can be disinfected
- Keep the are of the flock clean from trash and garbage
- Clothes and boots should be disinfected upon exiting poultry areas
- Wash hands with soap before and after entering poultry houses
- All equipment used with poultry should be cleaned and disinfected
- Sick or dead chickens must be removed quickly, and the community animal health workers or veterinarians should be informed of such illness or deaths
    - Dead birds should be burned and buried
- Egg crates/trays, cages, shovels should not be shared between family and neighbours.
- Early reporting of all bird disease is important

Personal protection equipment (PPE)

Disinfecting of pick-up and truck tires with detergents, disinfectants or plain soapy water.



Disinfecting equipment used on the farm (left: back sprayer) and disinfecting shoes with spray or thorough cleaning with water and soap.

> standard operating procedures

CASE DEFINITION BIRD FLU

Faced with a presumed avian influenza outbreak, you, as an investigation team leader, will take the necessary precautions, visit the farm or area, impose quarantine measures and take samples. Thereafter you need to decide immediately whether to recommend de-stocking the remaining sick and healthy poultry within the same quarantine area.

To conduct this depopulation in absence of laboratory results, you will have to take a decision, based on a **case definition**, which will enable you beyond reasonable doubt to conclude this is a likely avian influenza outbreak.

This case definition is based on 6 statements which help you reach your verdict. These statements are related to:

a) the mortality rate in poultry and the speed with which animals die
b) the mortality of other farm birds at the same time
c) the mortality of wild birds and water fowl in the neighbourhood
d) the vaccination status with regard to Newcastle disease
e) the appearance of similar cases in neighbouring farms
f) the sanitary status (infected or not) of the State with regard to HPAI.

This system applies to depopulation in poultry only.

Notes :

Case definition form :

Attn . **The investigation team leader for avian influenza.**
Subject : **Decision-tool for depopulation of poultry farms.**

State :		LGA :	
Village :		Farm :	
Date of the first deaths		Owner's name :	
Address :			
Telephone :		Cell phone :	

For each of the following 6 simple statements, check the column when the statement is **'true'** ↓

	CASE DEFINITION : Statement	True
♦	**The mortality rate in poultry is higher than 50% in two days.**	
♦	**Other bird species on the farm have died too (geese, ducks, pigeon, guinea fowl, turkeys,…)**	
♦	**Several wild birds or water fowl have been found dead in the neighbourhood over the past week**	
♦	**The chickens that died had been vaccinated against Newcastle disease over the last 6 months**	
♦	**There have been other cases of mortality in chickens in the same village over the past week**	
♦	**The disease has already been declared in my State**	
Total		

Whenever **3 or more** statements are **'true'**, you may take the decision to hand the responsibility for de-stocking (depopulation), decontamination (disinfection) and compensation to the appropriate State veterinary officer. If only one or two statements are 'true', you may **not** request to depopulate the farm. You will keep the farm in quarantine until laboratory results are received or until further notice.

Investigation team leader Date :

Name :	
Signature :	

> standard operating procedures

QUARANTINE BIRD FLU

Provisions are made in the animal disease control decree 1998 to control the movement & marketing of animals in the presence of a disease situation

State and federal animal health official should ensure that when a farm or poultry house is under quarantine:

- posted notices of quarantine easily read from a distance of 20-30 meters at the gate and on the fences

- the number of persons entering the quarantine area should be limited to essential personnel
  - > only farm laborers should be allowed access
  - > no children , old people or sick people should be allowed access
  - > under no circumstances should egg vendors/sellers enter the quarantine zone
  - > anyone allowed to enter the poultry house should take precautions; avoid contact with live or dead birds; if possible protective clothing, mask and boots should be worn
  - > thoroughly clean and disinfect hands after every entry into the quarantine area.

Use of appropriate personal protective equipment (PPE) and disinfection at entry and exit of premises is compulsory for animal health personnel.

- dead birds, litter, feed, equipment, drinking water, cleaning water may not leave the quarantined area and must be burned, buried, or otherwise destroyed on the premises.

- all persons leaving the quarantined area should clean and disinfect their shoes and all equipment

- all vehicles/transport are prohibited within the quarantine area

- if vehicles leave the quarantine area they should be disinfected with a non corrosive disinfectant

  > a solution of bleach and soapy water can be used to inactivate the AI virus if a commercial disinfectant is not available

- quarantine will be maintained until a written order is received from state officials

General information

> avian influenza can be spread through direct contact between healthy and sick birds
> the avian influenza virus can be excreted from infected but apparently healthy birds
> avian influenza can be spread through contact with contaminated equipment, supplies, vehicles, poultry food, egg crates, eggs, etc.
> people can spread avian influenza to poultry by wearing clothing, shoes contaminated by sick birds

..... STATE

STATE DEPARTMENT OF VETERINARY SERVICES

Bird Flu

QUARANTINE AREA

ENTRY PROHIBITED

ALL ENTRY OF PERSONS, ANIMALS, VEHICLES AND MERCHANDISE IS PROHIBITED.

Animal Disease (Control) Decree 10 (1988)

> standard operating procedures

SAMPLING FOR BIRD FLU

Personal protection must be considered **at all times**. Use personal protective equipment (PPE) if possible

Accurately identify samples (name of owner, village, LGA, state, zone)

- **Dead birds** that have no sign of de-composition
  - **If not trained to take samples** place in labeled sealed plastic bag and submit as soon as possible to local veterinary office
  - Use refrigerant packs or wet ice for shipping
    > Disinfect outside of container or place swab in plastic bag and disinfect outside of bag
  - Deliver to laboratory within 24 hours
  - Wash hands with soap and water immediately

- **Necropsy** on dead birds
  - Infected birds contain high concentrations of virus. Precautions must be taken (PPE). Perform necropsies in secure area or send whole birds to the lab
    > Secure area: record lesions, collect spleen, kidney, lung, trachea, heart ovary brain, terminal intestine, pancreas and any obvious lesions, 2 to 3 ml of whole blood.

- **Live** birds
  - Cloacae or throat swabs
    > Samples from 5 birds can be pooled (placed in one sample container)
  - Place swab in transport media, mix with media, leave swabs in the media
  - Keep samples cool
  - Deliver to laboratory within 24 hours

POULTRY DISEASE SUSPICION/OUTBREAK REPORT FORM

Type of report : Immediate notification ☐ Follow-up : ☐

Name of officer sending report : _____ Designation/rank : _____

Location of outbreak :

State : _____ LGA : _____ Town/village : _____

Latitude : _____ Longitude : _____

General information :

Name of owner : _____ Address : _____

Number of birds on the farms : _____ Type : _____ Breed : _____

Production system : _____ Age of birds : _____ Date of purchase : _____

Date of arrival on farms : _____ Source/place of purchase : _____

Outbreak information :

Disease suspected : _____ Signs observed : _____

_____

Date occurred : _____ N° susceptible : _____ N° cases : _____

Treatment carried out : _____ N° deaths : _____

N° slaughtered : _____ N° recovered : _____ N° culled : _____

Control measures : _____

_____

Nature of the diagnosis : suspicion ☐ clinical ☐ post-mortem ☐ laboratory ☐

Vaccination records :

Prophylactic vaccination (type) : _____ Date : _____ Source : _____ Batch n° / expiry date : _____

Control vaccination (type) : _____ Date : _____ Source : _____ Batch n° / expiry date : _____

Samples collected :

Type(s) of samples collected : _____

Date sample(s) collected : _____ Date sent to lab : _____

Sample collected by : _____ Final lab analysis : _____

Signature / date : _____

> standard operating procedures

AREA WIDE STAMPING OUT

Total depopulations strategy for infected zones :

- Public Health personnel should be available to monitor people involved in stamping out procedures
    - To be contacted by Depopulation Team leader

> Case study

Infected Zone (*Kano Municipality Area*)

- Large commercial (250 and above)
- Backyard (50-250 birds)
- Free range

Operations for Commercial and Backyard facilities:

- Stamping out team (depopulation & burial) 2-3
    - State Veterinarian leading a team composed of (State Min. of Health , Representative of Federal Dept of Livestock and Pest Control Services, legal representative and local government officials)
    - State federal rep of international organization
    - Compensation : Federal officer responsible for completion (signed by farmer)
    - Labor done by farm laborers and hired labor
        - Allowances to be provided for labor (catching, killing, digging, burial, burning)

- Decontamination team (5 people)
  - State Min. of Agriculture, FDLPCS,
  - 5-6 farms per day

Operations for Free Range birds:

- Stamping out teams at the ward level (5-10 teams based on wards composed of 2-3 people)
  - Local government personnel, traditional institutions, security
    - Announcement of confinement of poultry for depopulation
      - Roving teams go to poultry
    - For residual poultry encourage individuals to capture and bring to central location
    - Immediate compensation payment
  - Roving teams go to poultry

Before depopulation activities commence, State environmental authority-officials must indicate alternative sites for burial or disposal.

Buffer Zone (1-2 km):

- Strict Movement Control
- Passive surveillance

Surveillance zone (2-5km) (outside the buffer zone)

- Active surveillance
  - Active surveillance (disease reporting, physical taking of samples)
    - State Veterinarian leading a team composed of (State MoH, Representative of Federal Dept of Livestock and Pest Control Services and local government officials, WHO)
    - Sample taking will be done by NVRI and other properly trained animal health personnel

> standard operating procedures

CULLING / DEPOPULATION

- The depopulation process must be conducted under the supervision of a state or federal veterinarian
    - The owner of the poultry will receive order to depopulate
- Personnel should ensure all animal welfare aspects are implemented
    - Ensure that all poultry are dead
      Demonstrated by the cessation of cardiac and respiratory movements
- A slaughter/culling /depopulation plan needs to be developed for each new affected or suspected farm
    - Ensure depopulation assessment forms and compensation forms are completed and submitted to the federal authorities
    - Arrange for appropriate equipment for burning/burial
    - Burn/bury depopulated poultry/birds, along with contaminated materials
      (litter/droppings/manure/feed/bags/sacks
      in a burial pit
- Minimise the handling of poultry/birds
- Slaughter poultry/birds on the affected farm
    - Do not transport to other location if possible
    - Do not slaughter in public view where possible

      Slaughter infected birds first, then the birds in contact with infected birds, followed by remaining birds in flock.

- Methods for killing/euthanasia
  - Inhalation agents
    - Most humane method of slaughter
    - Preferable for large scale depopulation
    - Carbon dioxide ($C0_2$), carbon monoxide (CO, car exhaust fumes)

  - Physical methods
    - Cervical dislocation, decapitation,

- Personal safety
  - Personnel protective equipment should be used
    - Mask, goggles, coveralls, boots, gloves

  - Carbon monoxide is toxic to humans and should be used in a well ventilated area.

- Quarantine should stay in force until released by state/federal authorities.

Notes :

FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
Federal Department of Livestock and Pest Control Services

Notice of depopulation

Dear Madam, Sir,

You are herewith informed that the poultry (all hens, cocks, chicks and pullets, but also parrots, pigeons, ducks, geese, turkeys, emus, ostriches) on your premises will have to be culled, as part of the ongoing measures to control avian influenza in Nigeria.

As part of these measures, contaminated materials, such as feed, manure, litter and dirt will also be destroyed

The depopulation of your premises will take place on …… 2006 under the authority of the Federal and State Veterinary Services.

You are requested to contain all birds in a closed housing to facilitate the work of the culling and depopulation teams

You are eligible for compensation for all birds that were culled under the present depopulation measures, provided you sign the inventory report which will be established by the depopulation team leader, listing the number of birds culled on your premises.

Yours,

The Director of Veterinary Services,

_____
[name, signature and seal]

> standard operating procedures

DISINFECTING FOR BIRD FLU

FDLPCS recommends the use of the disinfectant _____ 

Procedures for cleaning and disinfecting:

Personal Protective Equipment should be worn at all times during cleaning and disinfecting

- WEAR a Mask to prevent the inhalation of AI virus particles
- WEAR Eye protection (glasses, goggles) to prevent splashing of contaminated liquids in the eye
- WEAR Boots which can be cleaned and disinfected or disposable boots to prevent carrying the AI virus off the affected farm
- WEAR Coveralls or clothing which can be destroyed or cleaned appropriately before leaving the affected premises (can be placed in clean plastic bag on farm and then placed in another clean plastic bag and disinfect outside of bag)

Manufacturers instructions for using the disinfectant should be followed

- Feed
  - Burned and (or) buried

- Manure/litter
  - Burned and (or) buried

Remove as much dirt and debris as possible before treating surfaces with the disinfectant. Dirt and debris must be removed to allow proper use of the disinfectant

Spray with appropriate disinfectant (allow a minimum of 20 minutes contact time or allow to remain until dry)

- All equipment associated with the poultry facility must be cleaned and disinfected or destroyed
  - Vehicles
  - Cages
  - Feeders
  - Wheelbarrows
  - Egg crates
  - Sacks/bags
  - Feed, manure, etc.

  (It is best when possible not to share equipment between farms)

- WEAR mask when cleaning litter and manure. Wet the litter/manure slightly to **avoid dust which contains viral particles**.

- Nothing should be removed from the quarantined/affected facility without the proper authorization of State/Federal officials

  - Authorization will be given by _____

  - Please contact the local veterinary office _____

- If the recommended disinfectant is not readily available (bleach is also a good disinfectant if available and the surfaces are free of debris and visibly clean) mix 30 ml per liter of water of bleach for proper end use- straight bleach is not needed and is a human health risk)

Soapy water and detergents may be used, such as

OMO, DETTOL, VIM, BIOGARD, MORIGARD and _____

The avian influenza virus is simpler to destroy than many viruses since it is very sensitive to detergents which destroy the fat containing outer layer of the virus. This layer is needed to enter cells of animals and therefore destroys the infectivity.

The virus survives well in water and simple washing may assist the virus to enter into areas where it is picked up by other birds.

Therefore any washing to remove contamination should always be with detergents (soapy water) or specific disinfectants. Waste water should not leave the quarantine area and should never end up in the public sewage system.

The biggest danger is bird droppings -the virus likes moist, dirty conditions so it is essential to thoroughly disinfect items that have been in contact with bird droppings - cages, shoes, clothes before working with poultry/entry to a place where poultry are kept.

Simple hygienic measures can reduce risk

CONTACT FDLPCS OR STATE VETERINARY SERVICES FOR MORE INFORMATION

Items and procedures (source AUSVETPLAN Operational Procedures Manual, Decontamination - http://www.aahc.com.au/ausvetplan/decfnl2.pdf)

Item	Disinfectant/chemical/procedure
Dead birds/Carcases	Bury or burn
Animal housing/equipment/cages	1, 2a, 2b, 2c, 3
Humans	1
Electrical equipment	5c
Water tanks	Drain to pasture if possible
Ponds used by poultry/ducks	Drain to pasture if possible
Feed	Bury
Effluent, manure	Bury or burn, 4, 3
Human housing	1, 2a, 2b, 2c
Machinery, vehicles	1,3
Clothing	1,2a,2b,2c,3
Aircraft	1,2c

Key	Form and final concentration	Contact time and notes
1. Soaps and detergents		Leave in contact 10 minutes
2. Oxidising agents		
2a. Sodium hypochlorite	Liquid, dilute to final 2-3% available chlorine	Not good for organic materials. 10-30 minutes contact.
2b. Calcium hypochlorite	Solid or powder , dilute 2-3% available chlorine (20 g/litre powder, 30g/l solid)	Not good for organic materials. 10-30 minutes contact.
2c. Virkon¨	2% (20 g/litre)	10 minutes. Excellent disinfectant
3. Alkalis		
3a. Sodium hydroxide (caustic soda)(NaOH). Do not use with aluminium and like alloys	2% (= 20 g/litre)	10 mins. Do not use in presence of aluminium
3b. Sodium carbonate anhydrous (washing soda) (Na2CO3. 10 H20)	4% (=40 g/litre) from powder 100 g/l from crystals	10 mins. Recommended for use in presence of organic materials as above. 30 mins
4. Acids		
4a. Hydrochloric	2% (20 ml/litre)	Corrosive, use only when better not available.
4b. Citric	0.2% (2 g/l)	30 mins, safe for clothes and body decontamination
5c. Formaldehyde gas	Special generation required	15-24 hrs. Toxic, only if others cannot be used.

Notes :

DAILY DEPOPULATION SHEET BY STATE OR LGA

MONTH_____ DAY_____

	DEPOPULATION INFORMATION						
NUMBER OF TEAMS____	**Scheduled time for depopul.**	**Farm/owner information: Name, Address, Telephone**	**Date Infected by case definition**	**Date notice of depopulation delivered**	**Total birds depopu-lated**	**Date of Deconta-mination**	**COMMENTS**
TEAM #1							
TEAM # 2							
TEAM #3							
TEAM #4							
TEAM #5							
Total							

> standard operating procedures

COMPENSATING FARMERS

Compensation is of particular interest in the context of HPAI, or any other major infectious disease. Arguments for providing compensation are either:

- To encourage compliance with culling regulations. Farmers are more likely to comply with regulations if they know that they will recover the cost of culled birds from the government. Without compensation, they may decide to sell birds on suspicion of sickness.

- To avert a livelihoods crisis. Farmers whose birds are culled or die during an epidemic may suffer heavy financial losses and be unable to finance the cost of restocking.

When estimating the cost of compensation, a decision needs to be made about whether to compensate only for the market value of the birds or to include also the value of lost production. It is rare in any country or for any disease that farmers receive full compensation for losses including "down time" in the production system. More commonly they receive the market value of the lost animal or bird, or a proportion of its value.

In Nigeria, the Federal Government has decided to pay compensation to farmers, based on the market value for local poultry, therefore usually insufficient in respect of the market-value of improved breeds, such as layer hens.

The agreed compensation package is :

Species	**Compensation paid per animal**
Chickens, parrots, pigeons and guinea fowl	₦ 250
Ducks and geese	₦ 1,000
Turkeys	₦ 2,500
Emus	₦ 10,000
Ostriches	₦ 20,000

Accurate records of the age and type of birds killed and, as appropriate, records of valuation, should be kept to facilitate payment of compensation in situations where this may be required. These requirements apply to all farms on which poultry are being destroyed.

FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

Federal Department of Livestock and Pest Control Services Serial n° _ _ _ _ _ _

Avian influenza depopulation and farmer compensation report

I, the undersigned : (name of the official) : _____

(first name) : _____

Position of the team leader	Team	State

Declares having proceeded today to the depopulation of all birds belonging to :

Name of the owner of the birds : _____

First name : _____

Address :

Locality (zone)	Municipality	State
(Georeferenced coordinates)	Longitude	Latitude

Other information enabling to identify the owner (ID card nr) of his/her farm :

In particular the following number of bird species :

Species	Hens, cocks and chicks	Ducks	Guinea fowl	Turkeys	Others : (specify)
Total number					

Date of the depopulation (dd/mm/yy) : _ _ / _ _ / _ _ **Signatures :**

Name of the team leader	Name of the owner of the poultry
The legal representative of the local authority (specify)	The paying agent (specify) + date of payment

FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

Federal Department of Livestock
and Pest Control Services Serial n° _____

Avian influenza depopulation and smallholder compensation report

I, the undersigned : (name of the official) : _____

(first name) : _____

Position of the team leader	Team	State

Declares having proceeded today to the depopulation of all birds belonging to and having paid compensation to :

Locality (zone)	Municipality	State

Name and first name	CH	DU	TU	EM	OS	Amount paid	Signature

Name and first name	CH	DU	TU	EM	OS	Amount paid	Signature

Date of the depopulation (dd/mm/yy) : _ _ / _ _ / _ _

Name of the team leader	The paying agent (specify) + date of payment
Signature :	Signature :

CH : Chickens, parrots, guinea fowl, pigeons (250 ₦), DU : Ducks, geese (1.000 ₦),
TU : Turkeys (2,500 ₦), EM : Emus (10.000 ₦), OS : Ostriches (20.000 ₦).

> federal edict

NATION-WIDE ZONING AND MOVEMENT CONTROL

FEDERAL GAZETTE No: 1/2006

NAME: Control of Movement of Poultry and Poultry products Gazette No 1 of 2006.

PUBLISHED BY: THE FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

EFFECTIVE DATE: 20th February 2006

By the power conferred on the Hon. Minister of Agriculture and Rural Development by Animal Diseases (control) Act No 10 of 1988:

The Hon. Minister of Agriculture and Rural Development of the Federal Republic of Nigeria makes regulations as follows:

1. Declaration of zones of infection of the Highly Pathogenic Avian Influenza –

   a)Infected zone: refers to all the States of the Federation where the HPAI infection has been diagnosed by the National Veterinary Research Institute or the World reference laboratory for Avian Influenza; and all in-contact and contiguous States. For the purpose of enforcement, the southern limits for the infected zone are the boundaries of the River Niger and Benue.
   b)Surveillance zone: - refers to the remaining Northern states where no suspicion of the disease has been reported. For the purpose of enforcement, the Northern limit of the surveillance zone are the boundaries of the River Niger and Benue.
   c)Free zone: refers to all states to the South of the surveillance zone.

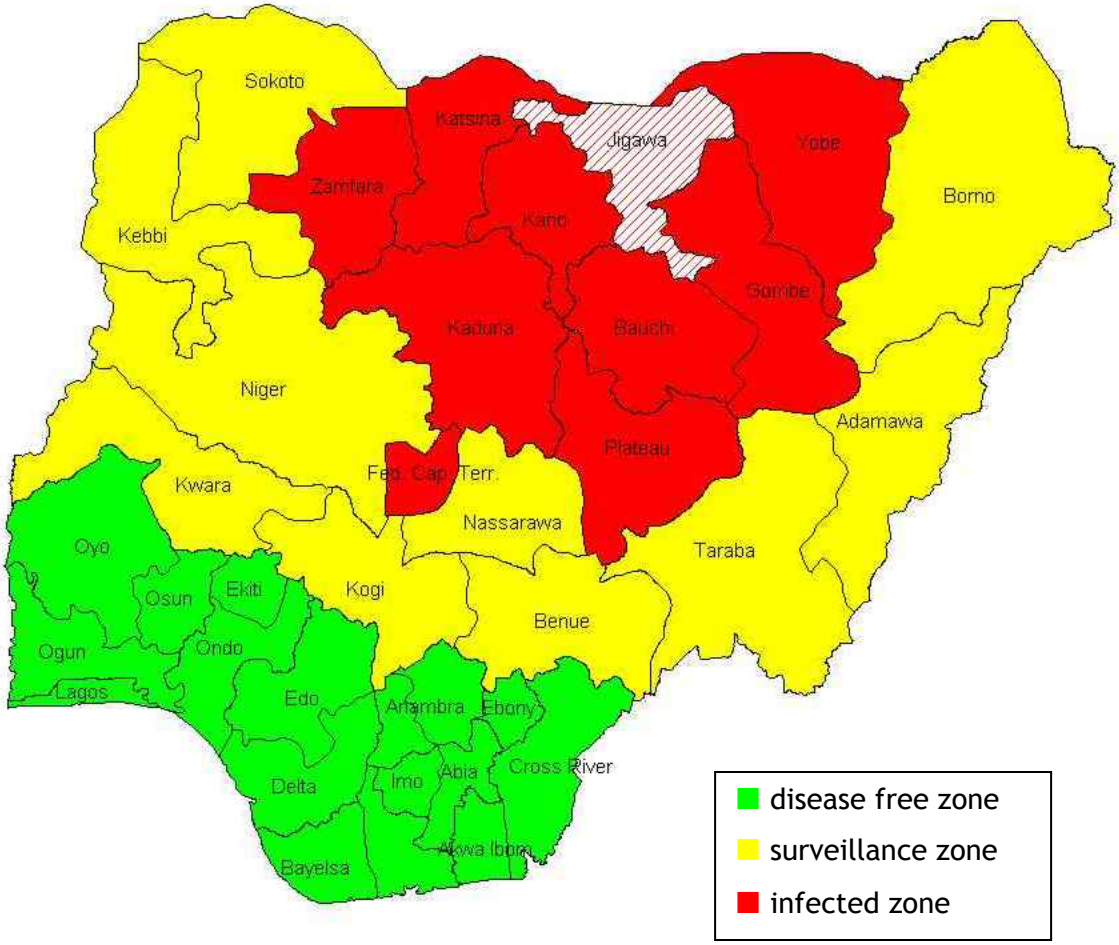
2. Imposes control of movement of poultry and poultry products as follows:
   a)Movement of live birds and poultry products, egg trays and contaminated or exposed feed bags from the infected to the surveillance or free zone is banned;
   b)Movement of live birds and poultry products from the surveillance zone to the free zone is allowed with a veterinary permit;
   c)Movement of birds from the free zone to the surveillance zone and the infected zone; and movement of birds from the surveillance zone to the infected zone is allowed without permit;
   d)Interstate movement of live birds within the infected zone is banned for the moment;
   e)Interstate movement within the surveillance zone is allowed with a permit;
   f)Interstate movement within the free zone is allowed without permit;
   g)All live bird markets within states where infection has been confirmed are hereby closed until further notice.

MADE at Abuja this 20th day of February 2006.

Mal Adamu Bello
Hon. Minister of Agriculture and Rural Development
Federal Republic of Nigeria.

> updates : 24.02.2006

NATION-WIDE ZONING AND MOVEMENT CONTROL



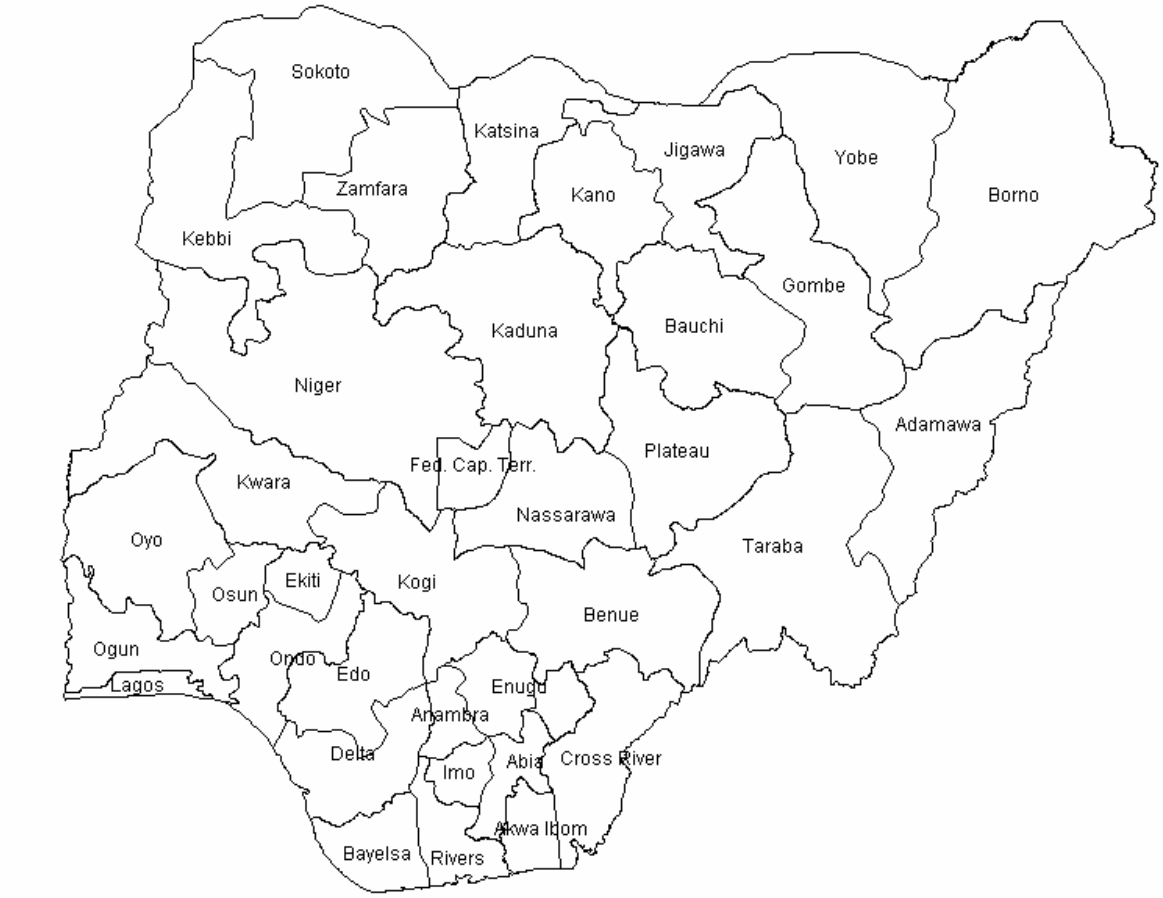
Notes :

My State is : _____

My State is part of the : ☐ disease free zone ☐ surveillance zone ☐ infected zone

> updates : …… [date]

NATION-WIDE ZONING AND MOVEMENT CONTROL



Notes :

My State is :

My State is part of the : ☐ disease free zone ☐ surveillance zone ☐ infected zone

Table 2: COSTINGS AND BUDGET PROPOSAL FOR HPAI EMERGENCY PREPAREDNESS AND RESPONSE (Prevention and Alert phase)

	ACTIVITY	RESPONSIBLE	EXPECTED OUTPUT/OUTCOME	TIME FRAME (2006/07)					COST
				Q1	Q2	Q3	Q4	Q1	
1.	International and regional initiatives, travels and technical exchange programmes	FMARD, FAO, OIE, NEPAD, AU, ECOWAS	Harmonization of global plan of action Technical and manpower development Exchange of information		X	X	X	X	N 10.0m
2	Establishment and meetings of inter- ministerial committee and intersectoral linkages	FMARD, FMOH, FMST, FMF and other stakeholders	Development of national policy and integration of intersectoral plan of action	X	X			X	N 1.5m
3	Establishment and meetings of Livestock sector expert committee on HPAI, and Coordination meetings with stakeholders.	FDL&PCS, NVRI NAPRI, PAN, VCN NSPFS and other stakeholders	National Animal Disease Emergency Committee established Technical committee of experts on HPAI established; strategy action plan on HPAI developed.	X	X	X	X	X	N 5.0m

4	Development of technical guidelines	FDLPCS, FAO	Operational guidelines/procedures standardized and mass produced.	X	X				N 7.0m
5	Training for AH staff, Poultry farmers and public awareness programmes on HPAI	FDLPCS, NEMA, FAO, USAID, DFID, OIE, EU, PAN	Improved capacity for HPAI recognition and control; Participatory rural epidemiology established	X	X	X	X	X	N 20.0m
6	Targeted disease, virus and sero-surveillance livestock/poultry	FDLPCS, NVRI, designated VTHs, FAO, SDVS, LGAs, WHO	Status of HPAI in Nigeria defined	X	X	X	X	X	N 80m
7	Strengthening of designated diagnostic laboratories *******	FDLPCS, NVRI, USAID,FAO, OIE, EU, IAEA, Private sector partners	Improved capacity and capability for designated laboratories for HPAI surveillance and diagnosis.	X	X	X	X	X	N 400.0m
8	Research on HPAI virus and disease including vaccine development	FDLPCS, NVRI, IAEA, OIE, Vet Faculties, FMST, WHO, FAO, USAID, CIDA, DFID, EU, World Bank, (PAN) & other private sector partners	Scientific information needed for the prevention and effective control of avian influenza provided	X	X	X	X	X	N 100.0m

9	Strengthening of Veterinary quarantine infrastructure including manpower	FDLPCS,FAO, NSPFS, World Bank, OIE, WHO	Improved and functional animal diseases quarantine services for prevention of HPAI and other TADs incursion	X	X	X	X	X	N 100.0m
10	Vaccine procurement (20,000 doses/annum)	FDLPCS, FAO, OIE, AU-IBAR, PAN.	Regional Vaccine Bank established and easy access by the country assured in any emergency		X	X	X	X	$400,000.0
11	Simulation exercises and drills	FDLPCS, Tech expert Committee on HPAI	Functional HPAI emergency plan achieved	X	X	X	X	X	N 2.0m
12	Stamping out of affected poultry population with compensation	FDLPCS, SDVS, PAN, NAIC, NEMA.	HPAI disease and infection eliminated.	X	X	X	X	X	N 200.0m
	TOTAL	**LOCAL CONTENT = ~~₦~~905.5 MILLION** **FOREIGN CONTENT = $400,000 USD**							

***** Funding from government and donor agencies.**

TENTATIVE BUDGET FOR HPAI CONTROL IN NIGERIA
(Operational Phase)

SN	DESCRIPTION	UNITS	COST ESTIMATE			REMARKS
			TOTAL COST (Millions)	IMMEDIATE	SUBSEQUENT	
1.	**STAMPING OUT**					
	a) Personnel Protective Equipment (PPE)	2008	N.A.	N. A.		Pledged
	b) Decontamination					
	• Disinfectants	Lump	100.00	20.00	80.00	
	• Motorised atomizer	37	74.00	74.00	-	
	• Motorised Hand sprayer	1000	150.00	150.00	-	
	• Knapsack sprayers	5000	75.00	75.00	-	
	c) Killing of infected birds					
	• Gas chamber (large garbage bins- Skips)	7400	37.00	37.00	-	
	• Polythene bags	50000	25.00	25.00	-	
	• CO_2, Formalin and other chemicals	Lump	10.00	2.00	8.00	
	d) Burning and Incineration facilities					
	• Fuel	Lump	2.00	0.50	1.50	
	• Hire of digging machinery and manual Labour	Lump	5.00	1.00	4.00	
	Sub-Total (1)		**478.00**	**384.50**	**93.50**	
2	**PUBLICITY AND AWARENESS CAMPAIGNS**	Lump				
	a) Radio & TV programmes		150.00	50.00	100.00	
	b) Stakeholders meetings		20.00	5.00	15.00	
	c) Meeting with community leaders and local authorities		15.00	5.00	10.00	
	d) Production of Posters, pamphlets and extension guides		200.00	120.00	80.00	
	e) Meeting with law enforcement agents		5.00	2.00	3.00	
	f) International and regional initiatives, meetings and technical exchange programmes		10.00	5.00	5.00	

	Sub-Total (2)		**400.00**	**187.00**	**213.00**	
3	**STRENGTHENING OF SURVEILLANCE** (Routine Epidemiosurveillance network, disease search teams, tracing teams etc) a) Development and production of standard operation procedures, technical manuals, guidelines, report forms etc. b) Sampling equipment c) Cold chain facilities d) Sample transportation facilities/kits e) Logistics (refer to No 6 below) f) Transportation of samples to lab and to reference labs g) Training/briefing of field staff **Sub-Total (3)**	Lump	**400.00**	**100.00**	**300.00**	
4	**STRENGTHENING LABORATORIES** a) Upgrading of NVRI to P3 standard (central lab) b) Upgrading of 5 VTHs to P2 standard (regional labs) c) Laboratory consumables, Reagents and Kits **Sub-Total (4)**	 1 5 Lump	 N. A. 500.00 500.00 **1,000.00**	 N. A. - 300.00 **300.00**	 N. A. 500.00 200.00 **700.00**	 Pledged
5	**COMMUNICATIONS (**IT and Communications facilities) • V-Sat (for central unit) • Internet connectivity for Federal and State field offices ✓ Federal field offices – 37 ✓ State DVS - 37 ✓ VTHs - 5 ✓ PACE ZCO - 7 • Computers (Desktop and Notebook): ✓ Federal Field offices - 37	 1 86	 3.00 8.60	 3.00 8.60	 - -	

	✓ State DVSs - 37 ✓ Federal (central unit) - 10 ✓ NVRI (central unit) - 2 ✓ NVRI (regional labs) - 10 ✓ VTHs - 5 **Sub-Total (5)**	101	20.20 **31.80**	20.20 **31.80**	- -	
6	**LOGISTIC SUPPORT** a) 4WD vehicles for: • State DVSs - 37 (double cabin pickup) • Federal field offices - 37 (Double cabin pickup) • Federal - central unit - 5 (Station wagon) • NVRI – central unit - 2 (Station wagon) • NVRI – regional offices - 10 (Double cabin pickup) • VTHs - 5 (Double cabin pickup) b) Motor cycles • Area veterinary offices - 774 • Surveillance agents - 170 • Vet quarantine & Fed field offices - 56 c) Field Operations, vehicle running costs and maintenance **Sub-Total (9)**	 (96) (1000) Lump	 155.40 155.40 37.50 15.00 42.00 21.00 130.00 100.00 **656.30**	 - - 37.50 15.00 - 21.00 130.00 30.00 **233.50**	 155.40 155.40 - - 42.00 - - 70.00 **422.80**	
7	**STRENGTHENING OF VETERINARY QUARANTINE SERVICES AND MOVEMENT CONTROL** a) Enforcement of movement control (including facilitation of law enforcement agents) b) Veterinary quarantine services • Renovation of quarantine facilities at Air and Sea Ports •Establishment of new quarantine stations **Sub – Total (8)**	 Lump Lump Lump	 5.00 50.00 20.00 **75.00**	 2.00 - - **2.00**	 3.00 50.00 20.00 **73.00**	

8	**TRAINING** a) Briefing and meetings of field operation staff and investigation teams b) Short term training of field staff, surveillance agents and laboratory staff) c) Medium and long term training (including detailed epidemiological research) **Sub-Total (8)**	 Lump Lump Lump	 10.00 20.00 20.00 **50.00**	 5.00 - - **5.00**	 5.00 20.00 20.00 **45.00**	
9	**RESEARCH** (on HPAI and TADs) a) NVRI b) VTHs **Sub-Total (9)**	 	 100.00 100.00 **200.00**	 - - **-**	 100.00 100.00 **200.00**	
10	**FUND FOR COMPENSATION AND RESTOCKING** a) Compensation b) Re-stocking assistance fund **Sub-Total (10)**	 Lump Lump 	 2,000.00 1,500.00 **3,500.00**	 - - **-**	 2,000.00 1,500.00 **3,500.00**	
11	**PRODUCTION AND PROCUREMENT OF VACCINES** a) Immediate procurement of vaccines b) Development and Production of vaccines **Sub-Total (11)**	 Lump Lump 	 100.00 200.00 **300.00**	 - - **-**	 100.00 200.00 **300.00**	
	GRAND TOTAL		**N7,091.10**	**1,243.80**	**5,847.30**	

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