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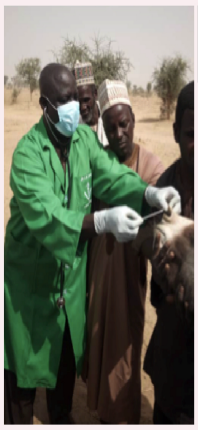

DEPARTMENT OF VETERINARY AND PEST CONTROL SERVICES

AFRICAN UNION
INTERAFRICAN BUREAU FOR ANIMAL RESOURCES

NATIONAL EQUINE INFLUENZA CONTINGENCY PLAN IN NIGERIA

NOVEMBER, 2019.

FORWARD

It is indeed my pleasure to write the foreword on this National Contingency Plan for the control of Equine Influenza in Nigeria.I am aware that the disease though not new in the country, caught us almost unprepared. It is heart-warming to note that we were able to quickly contain it like we have done in a number of such novel outbreaks in the past. However, we know that there is a possibility of the disease rearing up its ugly head again in the near future if adequate measures are not put in place. This necessitated the production of this Contingency Plan that will serve as a working guideline or protocol.

Recently, there have been increasing activities revolving around donkeys involving increased number of illegal slaughter points and illegal trade/movement of donkeys due to porous borders. This might increase the likelihood of re-incursion and spread of the disease. In the last quarter of 2018 (December, 2018), Nigeria recorded an outbreak of Equine influenza disease in Sokoto State, which later spread to Kaduna, Kebbi, Bauchi and Zamfara States. The disease which majorly affects horses, mules and donkeys affected a number of donkeys in these States and resulted in significant losses, thereby affecting the socioeconomic and livelihoods of these rural farmers.

As part of her response, the Federal Ministry of Agriculture and Rural Development, through the Department of Veterinary and Pest control Services approached the African Union-Inter Bureau for Animal resources (AU-IBAR), for technical and financial support to facilitate the development of a Contingency Plan for the prevention and control of the disease in Nigeria in order to avert or effectively contain future outbreak of the disease.

I would like to therefore express my profound gratitude to the Director (AU-IBAR) who graciously facilitated both the technical and stakeholders' meeting for the development of this all important document.It is my conviction that this document will adequately serve as a good reference material to be used during outbreaks or suspected outbreaks of this disease. I therefore urge all professionals and non professionals alike in the equine industry to avail themselves of the rich resource embedded in this Contingency Plan to know and play their expected roles towards the preservation ofthe equine species nationwide and indeed in the entire African continent.

The National Equine Influenza Contingency Plan for Nigeria (EI-CPN) is an importantdocument that signals the Federal Government's determination toprevent further outbreak of Equine Influenza and readiness to tackle any further incidents of EI in the country.The document was compiled by a Technical Committee composed of experienced stakeholders using the international standards as set by OIE, OIE and AU-IBAR. The EI-CPNis an elaborate document in which highlights all the human andmaterial resources required to control Equine Influenza and other diseases of equine species.

Finally, I wish to assure particularly our rural farmers and indeed all stakeholders that the Federal Government of Nigeria is highly committed in the timely control and eradication of animal and zoonotic diseases including Equine Influenza thereby preserving the nation's livestock resource, ensuring food security and improving the livelihood of our people. We shall ensure that this important document remains evergreen and updated when necessary by the relevant experts.

Alhaji Mohammed Sabo Nanono
Honourable Minister of Agriculture and Rural Development
December, 2019

ACKNOWLEDGEMENTS

I wish to express my profound gratitude to those who contributed in one way or the order towards the realization of the laudable objective of producing a National Contingency Plan for the prevention and control of Equine Influenza in Nigeria.

Firstly, our appreciation goes to the Honourable Minister of Agriculture and Rural Development Alhaji Mohammed Sabo Nanono**,** Honourable Minister of State, Alh. Mustapha Baba Shehuri and Permanent Secretary, Dr. Mohammed Bello Umar for providing the desired leadership and support in our national efforts for the prevention, control and eradication of zoonotic and Transboundary animal diseases in Nigeria. Also, the African Union Inter-African Bureau for Animal Resources for the technical, logistic and financial assistance provided, members of the technical committee for painstakingly collating and analyzing available information that culminated in the production of the draft document. Finally, I appreciate all stakeholders from both the public and private sectors notably the Directors of State Veterinary Services, Management and Staff of the Federal Department of Veterinary and Pest Control Services, Veterinary Council of Nigeria, the academia and Nigeria Veterinary Medical Association for validating and adopting this Emergency Preparedness Plan for dealing with the incursion of the Equine Influenza and other equine diseases into the Nigeria. It is my hope that posterity will judge us fairly for the continuous support and collaboration with the Federal Government in particularly responding to national animal disease emergencies.

Dr. Olaniran Alabi
Director/Chief Veterinary Officer of Nigeria.

December, 2019

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Terms of Reference

1. Develop strategies for the prevention of introduction of Equine Influenza into the country
2. Develop Standard Operating Procedure in the event of an outbreak of the disease in the country

LIST OF ABBREVIATIONS AND ACRONYMS

ARIS	Animal Resources Information System
AU-IBAR	African Union Inter-African Bureau for Animal Resources
AVOs	Area Veterinary Officers
CAHW	Community Animal Health Workers
CRF	Consolidated Revenue Fund
CVON	Chief Veterinary Officer of Nigeria
DHIS2	District Health Information System 2
DNAQS	Director, Nigeria Agricultural Quarantine Service
DVS	Director of Veterinary Services
EAD	Emergency Animal Disease
ECOWAS	Economic Community of West African States
EI	Equine Influenza
EIV	Equine Influenza Virus
ELISA	Enzyme-Linked Immunosorbent Assay
EODF	Emergency Outbreak Disease Funds
FAO	Food and Agriculture Organization
FDVPCS	Federal Department of Veterinary and Pest Control Services
FGD	Focus Group Discussions
FMARD	Federal Ministry of Agriculture and Rural Development
FGN	Federal Government of Nigeria
FVO	Field Veterinary Officers

JIB	Joint Intelligence Board
LGA	Local Government Area
LGVOs	Local Government Veterinary Officers
NAQS	Nigeria Agricultural Quarantine Service
NADCMC	National Animal Disease Crises Management Center
NDA	Nigeria Defense Academy
NGOs	Non-Governmental Organizations
NPP	National Preparedness Plan
NTC	National Technical Committee
NURTW	National Union of Road Transport Workers
NVRI	National Veterinary Research Institute
NVMA	Nigerian Veterinary Medical Association
OIE	International Office of Epizootics/World Organization forAnimal Health
DCT	Disease Containment Team
PANVAC	Pan Africa Veterinary Vaccine Center
PCR	Polymerase Chain Reaction
PPE	Personal Protective Equipment
RMT	Risk Management Team
RTEAN	Road Transport Employers Association of Nigeria
SADC	Southern African Development Community
SADCMC	State Animal Disease Crises Management Center
SDCT	State Disease Containment Team
SOPs	Standard Operating Procedures

STC	State Technical Committee
TAD	Trans-boundary Animal Disease
VCN	Veterinary Council of Nigeria
VTH	Veterinary Teaching Hospitals
VTM	Viral Transport Media
WAHIS	World Animal Health Information System
WAHO	West Africa Health Organization
ZVOs	Zonal Veterinary Officers

Executive Summary

The Technical Committee on the Equine Influenza ContingencyPlan in Nigeria, which was inaugurated on November 18th, 2019, deliberated extensively on the nature, the global spread of the disease, and its potential impact in the wake of the current outbreak in late December 2018. Equine Influenza which occurred in Wamakko LGA of Sokoto State spread to other neighbouring States. In Nigeria, Equine Influenza is recognized as an emergency animal disease following its trans-boundary nature and its ability to spread quickly leading to high levels of morbidity and mortality, especially among donkeys. The most common clinical signs of EIV infection in equids are fever, lethargy, anorexia, nasal discharge, and a nonproductive dry cough. Death is most common among donkeys, foals or equids with preexisting poor health. EIV can result in secondary bacterial bronchopneumonia, which can be fatal, particularly in young horses. The equine influenza virus is believed to have originated from avian influenza strains. Two subtypes, H7N7 and H3N8, historically have infected horses. EIV H3N8 has 2 lineages, Eurasian and American.

The disease was introduced from Chad and Niger as a result of the trade and movements of animals and animal products into the country. Chad and Niger Republic share an important border with Nigeria with livestock markets linked into the road networks and settlement patterns which makes it easier to transport animals within and across Nigeria. The implication is that, if this trend continues unabated without a ContingencyPlan in place, the country will be at risk of re-introduction of the disease, thereby causing the disease to cycle on an endemic basis. Nigeria has a robust equine culture that spans hundreds of years and has recorded a tremendous growth in the population of working donkeys and horses. Donkeys support livelihoods; they are an important link in the production chain of significant businesses and a source of power for the rural populace in Nigeria. Meaningful interventions on Equine Influenza can transform not only the lives of donkeys and horses but people who depend on them. Therefore, this document provides a strategic approach that will set out specific actions to be taken for the prevention and control of Equine Influenza in Nigeria. It also provides details of the resources required in terms of human capital, financial and institutional capacities and how these resources will be deployed efficiently and promptly for containment and elimination of EI virus. These provisions and procedures outlined in this ContingencyPlan are in line with the guidelines of the Food and Agriculture Organization

(FAO), World Organization for Animal Health (OIE) as well as the AU-IBAR Animal Health Strategy for Africa.

Equine Influenza (EI) is a disease of horses, donkeys, mules and other equine species which is highly contagious. As a result of this, a case definition for EI suspicion was established to enable field officers/clinicians take immediate action even before laboratory confirmation is made. This ContingencyPlan recommends that suspicion of EI disease in an equine species should be made upon encountering the following signs, history of exposure within the last 3-days, Pyrexia, High morbidity among 1-5-year-old donkeys/horses, dry harsh cough, nasal discharge, conjunctivitis, vaccination history.

The following risk factors were identified- equine population density, frequency of manure removal, lack of vaccination, free movements of many infected equine populations across porous borders, insufficient biosecurity measures, inadequate veterinary quarantine facilities and manpower in Nigeria, inefficient disease surveillance and reporting systems in the veterinary governance structure in Nigeria. In order to minimize the risk of introduction, establishment and spread of EI in Nigeria, measures like strengthening the border through empowerment of NAQS in checking animal movement coming into the country, improve the Veterinary disease surveillance and reporting system in the country, proper legislation.

Strategies for prevention and control of EI was identified which includes, ban on importation of equine and its products from countries where the disease is endemic or has been reported. An effective animal disease surveillance involving high-risk areas such as slaughter points, donkey and other equine species markets and Polo/turf clubs. Improved and functional National Agriculture Quarantine Services (NAQS). They will be sustained active disease surveillance to supplement and improve on passive monitoring based on close coordination among equine owners, field and laboratory/epidemiology and veterinary services.

Zoning of a geographical area in which specific disease control in the event of an outbreak will be carried out. The zones will include infected zone, surveillance zone and free zone. Also, simulation exercises will be carried out for testing and refining ContingencyPlans of any disease emergency.

The financial Plan will contain details of cash flow, insurance policies etc. that prioritizes and maps out clear strategies for the achievements of set goals. Also, the resource Plan will take into

cognizance all resources needed to respond to the Equine influenza outbreak and other high-priority diseases of equine species.

The National Animal Disease Crisis Management Centre (NADCMC) will serve as a national coordination hub for timely implementation of disease containment activities in all the 36 States and the FCT. The Centre will serve as a secretariat for the technical committee (NTC) and shall be chaired by the CVON.

The action Plan outlines responsibilities for the implementation of activities before, during and after disease outbreaks. This also includes command chains and communication channels and deployment of resources with phases which includes, Investigation phase, Alert phase, Operational phase and Stand-down phase.

Funding for diagnosis, surveillance and control measures against the disease should be provided by the Government, while exploring avenues like AU-IBAR, FAO, OIE. Similarly, local and international collaborative linkages with institutions will be sought.

Finally, based on the risk factors of EI in Nigeria, it is recommended that our policy for prevention will be vaccination. Also, the safe disposal of dead carcasses, adequate disinfection and decontamination, and appropriate disease surveillance to determine the origin and extent of the disease was proposed.

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CHAPTER 1

INTRODUCTION

Adequate preparedness and response is necessary for rapid and effective action in case of an emergency animal disease (EAD) incursion into the country. This is to minimize adverse consequences such as financial losses, trade-restrictions and social impact. EADs are diseases which are likely to result in significant production losses, deaths and in some cases impacts on human health and the environment. (1)

In Nigeria, Equine Influenza is recognized as an EAD following its trans-boundary nature and its ability to spread quickly leading to high levels of morbidity and mortality especially among donkeys. In December 2018, an outbreak of suspected Equine Influenza which occurred in Wamakko LGA of Sokoto State was reported. The outbreak spread to affect other LGAs and adjoining states of Kebbi, Kaduna, Bauchi and Zamfara. Appropriate samples were collected and sent to NVRI for Laboratory confirmation and the result was positive for Equine influenza as communicated by the Chief Veterinary Officer of Nigeria on 07/01//2019. This is the first confirmed and reported outbreak of EIV in Nigeria. The disease is suspected to have been introduced from the neighboring countries like Chad and Niger as a result of trade and movements of animals and animal products into the country. However, some literature have it that the disease had occurred in 1991, among horses from different parts of the country congregated at the Ibadan polo tournament in South West Nigeria (2).

The implication is that, if this trend continues unabated without ContingencyPlan in place, the country will be at risk of re-introduction of the disease, thereby causing the disease to become endemic in the country. Therefore, this document intends to provide strategic approach that will clearly set out specific actions to be taken for prevention and control of Equine Influenza in Nigeria. It also provides details of the resources required in terms of human capital, financial and institutional capacities and how these resources will be deployed efficiently and promptly for the purpose of containment and elimination of EI virus. These provisions and procedures outlined in this ContingencyPlan are in line with the guidelines of the Food and Agriculture Organization (FAO), World Organization for Animal Health (OIE) as well as the AU-IBAR Animal Health Strategy for Africa (3).

CHAPTER 2

NATURE OF DISEASE

2.0 INTRODUCTION

Equine Influenza (EI) is a disease of horses, donkeys, mules and other equine species. It is highly contagious and a rarely fatal respiratory disease (4). In rural communities where horses and donkeys are used as draft animals, an outbreak of Equine Influenza could have adverse effects on the livelihood and socio-economic well being of the farmers in these communities. Social and economic activities surrounding theequine industry is at risk of regression in the event of any EI outbreak.

EI is an OIE-listed disease and must be reported to the relevant Nigerian authorities and the OIE as indicated in its Terrestrial Animal Health Code (5).

2.1GLOBAL DISTRIBUTION

Equine Influenza Virus (EIV) has a global distribution; it is endemic in many countries. The first outbreak was reported in 1956 in Europe and North America. Sporadic occurrence has been reported in Argentina, Chile, France, Germany, Ireland, South Africa, Hong Kong, China, Nigeria etc. Not until 2007, Australia was considered free of the disease (6).

2.2EI OCCURRENCE IN NIGERIA

In Nigeria, Equine Influenza was first reported in December, 2018 in Sokoto State Nigeria, in donkeys and horses. The disease spread to Kaduna, Kebbi, Bauchi and Zamfara States and lasted until about April, 2019 when it was effectively controlled.

2.1 GEOSPATIAL DISTRIBUTION OF EQUINE INFLUENZA OUTBREAKS IN NIGERIA

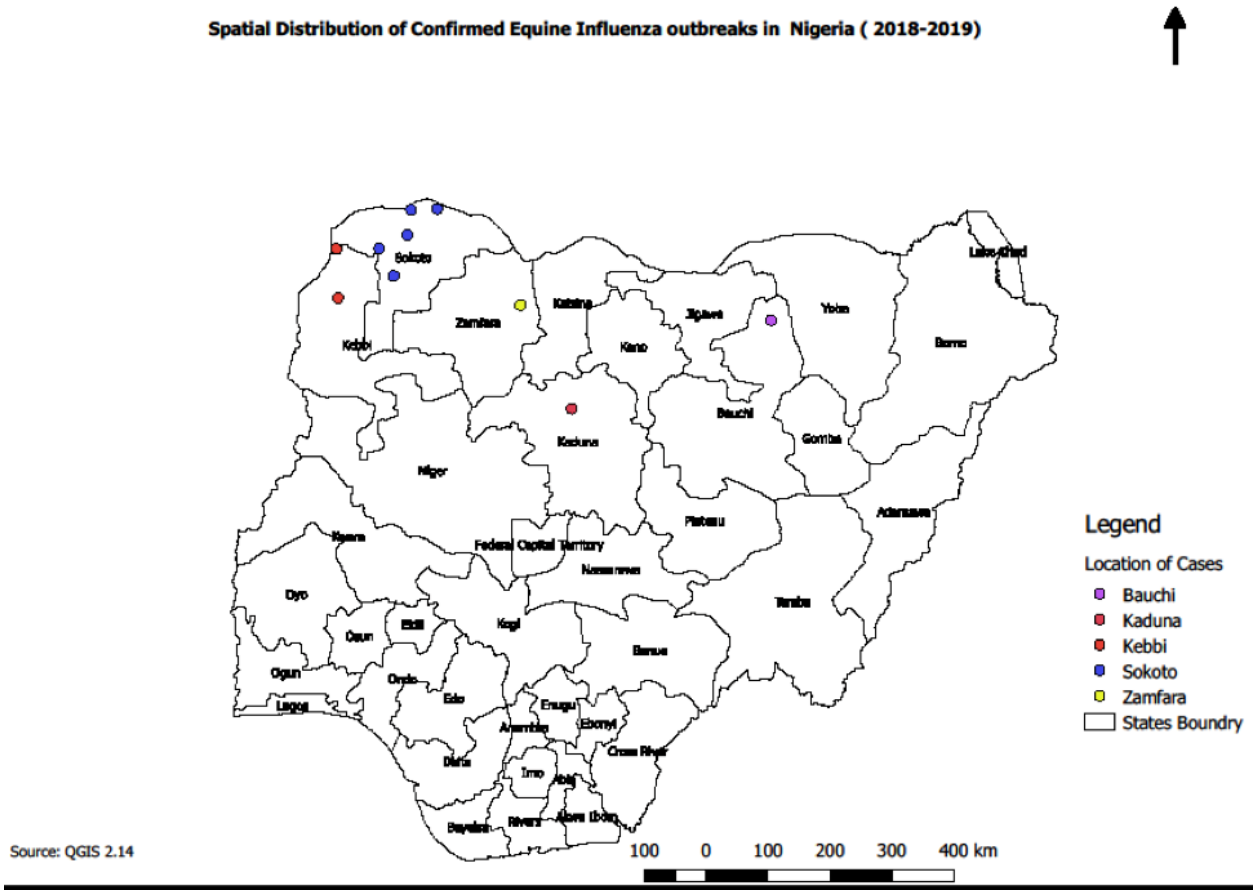

Figure 2.1 the Geospatial spread of EI in Nigeria

2.3ETIOLOGY

EI is caused by two subtypes of influenza A virus: H7N7 and H3N8, of the family *Orthomyxoviridae*. They are related to, but distinct from the viruses that cause human and avian influenza. The circulating H3N8 American lineage Clade 1predominates in the Americas, Clade 2 in Europe.

Equine Influenza is one of the most common infectious diseases of respiratory tract of horses, donkeys and other equine species. The strain, H7N7 appears to have been extinct in nature for many years as this strain has not been isolated for over twenty years (7). The virus spreads rapidly through groups of horses in aerosolized droplets dispersed by coughing.

2.4EPIDEMIOLOGICAL FEATURES

2.4.1 Susceptible Species

Equine Influenza (EI) is a highly contagious respiratory disease of horses, donkeys, mules and other equine species,though rarely fatalin horses. Some literatures have reported that dogs have been infected by the Equine Influenza virus following consumption of carcass infected by the virus (8). This was the case as reported during the outbreak of EI in Wamakko Local Government Area of Sokoto State where some dogs died a few days after consuming carcass of a dead donkey.

2.4.2 Viral Survival

The equine influenza virus is a lipid enveloped virus and does not survive for long outside the horse. It is fragile and easily inactivated on exposure to ultraviolet light for 30 minutes, by heating at 50^{o}C for 30 minutes, by ether and acid (pH 3). Exposure to sunlight for 15 minutes at 15^{o}C also inactivates the virus. The virus will not survive long in the environment in conditions of high humidity and can survive on skin, fabrics and equipment for quite some time.

2.4.3 Disease Transmission

Equine influenza is a highly contagious virus disease that spreads rapidly especially in an outbreak situation partly due to its very short incubation period of 1 - 3 days. It is transmitted through the following means:

- Contact of susceptible animals with secretions from infected animals
- Susceptible animals coming in contact with contaminated fomites'
- Aerosol medium especially during the harmattan season when susceptible animals easily come in contact with airborne droplets of respiratory secretions from infected animals (9).
- Scavenging animals feeding on carcass of infected animals and later coming in contact with susceptible animals. Researchers have found an influenza virus that has been transmitted from horses to dogs (10).

Plate 2.1 Involvement of scavengers in transmission of EI

2.5Clinical Signs

The first indication of the disease is fever (up to 41°C), accompanied by high morbidity. Other signs of the disease include ocular and nasal discharges which begins from serous and progresses through mucous to purulent forms. There is also laboured breathing (Dypsnoea) - Less than 8 - 15 breaths/minute, dry harsh intermittent cough, inappetance (anorexia), conjuctivitis, weakness of the limbs leading to recumbency, inflammation of the lower jaw, lymphadenopathy and death if untreated (11,12).

Plate 2.2(A) Clinical Signs observed in cases of EI

Plate 2.2(B)Clinical Signs observed in cases of EI

2.6PATHOLOGY

Equine Influenza is characterized by an incubation period of 5 days a maximum and infective period of 14 days. An incubation period of 1-3 days has been observed in susceptible horse populations during severe epidemics in the field. In horses without prior exposure, the incubation period can be less than 24 hours. EIV shedding occurs in the early stages of clinical disease when coughing is most pronounced.

Atpost mortem examination, the lesions observed were:

- Congestion of the lungs
- Mucus accumulation in the internal organs (Heart, liver, lungs etc)
- Haemorrhages in internal organs
- Whitish exudates in the lungs
- Presence of fluids in the thoracic region

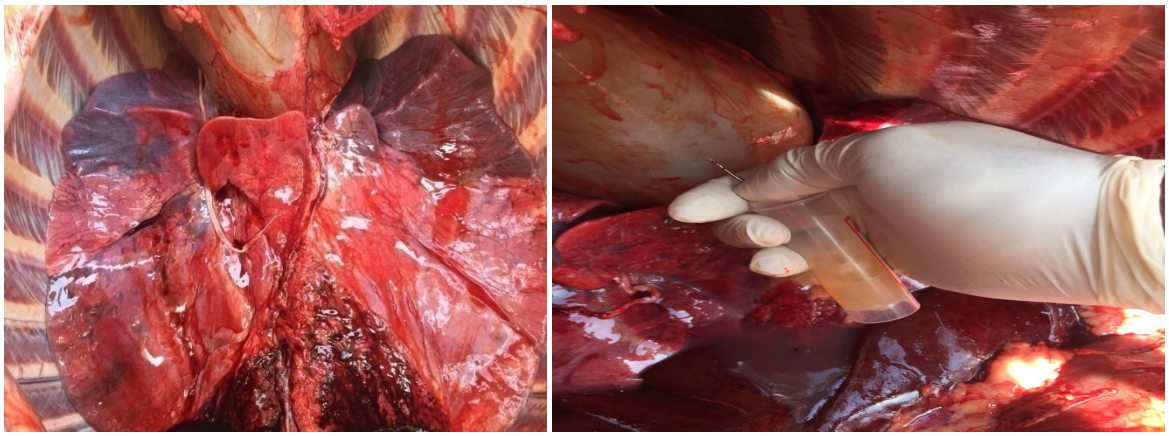

Plate2.3PM Lesions observed in cases of EI

2.7DIAGNOSIS

The diagnosis of equine influenza is based on the clinical signs and laboratory confirmation.

2.7.1 Field diagnosis:

Field diagnosis is based on:

1. clinical signs suchas cough, conjunctivitis, fever, nasal discharge, loss of appetite with high morbidity
2. gross pathological lesions

2.7.2 Case definition:

A case definition for EI suspicion is established to enable field officers/clinicians take immediate action even before laboratory confirmation is made. This ContingencyPlan recommends that a suspicion of EI disease in an equine species should be made upon encountering any four of the following signs or scenarios namely:

- History of exposure within the last 3-days
- Pyrexia
- High morbidity among 1-5 year old donkeys/horses
- Drycough(unproductive)
- Nasal discharge
- Conjunctivitis
- Vaccination history

2.7.3 Differential diagnosis

The disease has to be differentiated from diseases with similar clinical and pathological features such as Glanders, African horse sickness, Hendra virus infection and Equine rhinotracheitis.

2.7.4 Laboratory diagnosis

Laboratory diagnosis of acute equine influenza virus infection is based on virus detection in nasal swabs collected from horses/donkeys with acute respiratory illness. Alternatively, the demonstration of a serological response to infection may be attempted with paired serum samples. Ideally, both methods are used.

It is important to obtain samples as soon as possible after the onset of clinical signs, preferably within 3–5 days. These samples include nasopharyngeal swabs and nasal or tracheal washings, the latter taken by endoscopy. Swabs should be placed into a tube containing viral transport medium immediately. The following recommendations are made to achieve prompt laboratory diagnosis and effective control:

- Provision of RNA-Later followed by VTM for transportation of sample to the laboratory
- Triple packaging of samples under cold chain
- Proper and timely mode of transportation (e.g NURTW, RTEAN)
- Logistic officer in NVRI should be identified
- Liaising with closest NVRI outstation office for transportation of samples
- Stakeholder meeting/capacity building with transport unions

PCR technique is used for virus detection and characterization while ELISA technique is used for serological testing for the presence of EI antibodies.

2.8PREVENTION AND CONTROL

In order to minimize the risk of introduction, establishment and spread of EI in Nigeria, taking into account the assessed risks of introduction and the available strategies for reducing these risks through the control of Transboundary livestock movements and management of imported animals must be put in place. The following measures are recommended:

- Prompt turnaround time of laboratory findings (feedback)
- Biosecurity and animal movement restrictions

- Disease Investigation (Rapid response Team)
- Case management – symptomatic treatment
- Reactivation of animal Control Posts
- Awareness creation and risk communication
- Enhanced surveillance system
- Enforcement of quarantine regulations
- Vaccination
- Improved border security by ensuring observance of ECOWAS protocol on movement of animals and animal products
- Capacity building in disease reporting/School curricula should capture and emphasize disease reporting.

CHAPTER 3

EQUINE INFLUENZA STAKEHOLDERS AND DECISION TREE ANALYSES

3.0 STAKEHOLDERS ANALYSIS

TABLE 3.1 Showing Stakeholders analysis

Key stakeholder	What is their interest	Level of interest	Power of influence	Action
Peasant Farmers	Survival of their animals/means of livelihood	High	Low	Reporting to appropriate authorities
Traditional Institutions	To have healthy animals for the maintenance of culture	Very High	High	Lobby Policy makers
Polo/Race/Durbar	Prevention and/or control of EI	Very High	Very High	Lobby/Provision of Logistics
Public Veterinary Services	Prevention &Control of EI	Very High	Medium	Lobby, advocacy, capacity building
Private Vets	Control of EI/Economic	High	Medium	Good working relationship and collaboration with public sector in disease reporting.
Other stakeholders	**What is their interest**	**Level of interest**	**Power of influence**	**Action**
National Quarantine Service (NQS)	Control of EI	Very High	Very High	Enforcement of Legislation, lobby

				and advocacy
Horses/Donkey Merchants & Traders	To have healthy animals	High	Medium	Lobby policy makers
Security Agencies - Police, Army, Civil Defence	To have healthy animals	High	Very High	Lobby and advocacy.
Research Institutes & Academia	Research	High	High	Source for grants and collaboration with international research institutes

Table 3.2 Equine Influenza Problem Tree Analysis, Nigeria

Problem Tree	Objective Tree	Result Chain
Effect Equine Influenza (EI) outbreaks	**General objective** Prevention and control of EI in the country	**Impact** • Reduced disease outbreaks in Nigeria • Prompt response in disease outbreaks
Core problem • Weak disease surveillance and reporting system	**Specific Objective** • Strengthen EI surveillance • Prompt EI detection (highly specific diagnosis) • Balanced EI reporting system	**Outcome** • Implementation of EI ContingencyPlan
Cause	**Strategies**	**Outputs**

• Inadequate human resources • Insufficient logistic provision • Lack of synergy between animal service providers • Poor collaboration between public and private animal service providers	Improving collaboration between private and public animal health practitioners Facilitating budget implementation	• Contingency against EI in Nigeria developed
Why Cause • Poor political will • Abysmal budget implementation pattern • Lack of motivation for private veterinary practitioners	**Activities** • Strategic lobbying of political offices, relevant policy makers and influential stakeholders • Targeted awareness creation • Development of a national working document on EI	**Activities**

CHAPTER 4

RISK ANALYSIS

4.0 DEFINITION

Risk analysis is the process of identifying and analyzing potential issues associated with equine influenza that could negatively impact on the health of equine population, in order to help avoid or mitigate those risks.

4.1 IDENTIFIED RISK FACTORS

- Equine population density
- Frequency of manure removal
- Lack of vaccination
- Free movements of many infected equine population across porous Nigerian borders
- Insufficient biosecurity measures
- Inadequate veterinary quarantine facilities and manpower in Nigeria
- Inefficient disease surveillance and reporting systems in the veterinary governance structure in Nigeria
- Poor/Inadequate awareness of the disease in Nigeria
- Uncontrolled donkey and horse slaughter points and markets

4.2 RISK ASSESSMENT

Risk assessment is the methodology used to identify, assess and prioritize risks associated with equine influenza in Nigeria. Such risks include:

- Indiscriminate trans border free equine movement
- Socio-economic impact due to equine losses on the farmer and equine industry.
- Legal and illegal equine importation from endemic countries
- Increase in the unauthorized number of donkey and other equine species markets and slaughter points due to demand in meat consumption and hides for international trade

4.3 RISK MITIGATION AND MANAGEMENT

It is a process of identifying, documenting and implementing measures to reduce identified risks and their consequences. The risk posed by EI cannot be completely eliminated. The aim is to adopt procedures that will reduce the level of risk to an acceptable level.The Federal/States and Local Government authorities should set up Committees/task forces to carry out the following tasks:

- Strengthening the Nigerian border through empowerment of NAQS in checking animal movement coming into the country
- Improve the Veterinary disease surveillance and reporting system in the country
- Proper legislation be put in place through advocacy to the national and State assemblies
- Proper regulation of donkey markets

4.4 CONSTITUTION OF A RISK MANAGEMENT TEAM(RMT)

There is need to constitute a risk management team for the analysis of risks that could lead to outbreak of Equine Influenza in Nigeria

4.5 COMPOSITION OF THE RMT AT NATIONAL AND STATE LEVELS

The RMT at federal and State levels respectively shall be composed of the following:

1. Veterinary Epidemiologist
2. Veterinary Clinician
3. Laboratory scientist
4. Environmental health officer
5. Sociologist
6. Health Communication officer

Note:

1. The team should be activated whenever there is strong suspicion of equine influenza outbreak and should work hand in hand with community leaders.
2. Team composition and activities should be under the supervision of the CVON/DVS as the case may be
3. Team should develop and test run questionnaire for risk assessment
4. Develop risk communication strategies based on communities involved.
5. Team should on regular basis be re-orientated and trained during EIoutbreaks.

6. Weekly review meetings with stakeholders to review the progress of activities.

4.6RISK COMMUNICATION

The Health Communication Officer who is a member of the risk management team should be a well trained professional who is knowledgeable in the art of communication.

Information about EI is to be managed in such a way as not to cause panic among horse/donkey owners or the general public. To this effect, only authorized persons are to make statements to the public on EI, namely, the DVSs & commissioners in charge of animal health, CVON or Minister of Agriculture and Rural Development. The media needs to be adequately briefed in cases of EI outbreak in the country. EI Committee should establish links with both the electronic and print media and the source of information must be credible and up to date, emanating from a person in authority (13).

CHAPTER5

PREVENTION STRATEGIES

5.0 INTRODUCTION

Equine Influenza is one of the most serious Transboundary Animal Diseases (TADs). It is a highly contagious viral disease, and may have rapid and unanticipated national and international spread. It can cause crippling socio-economic consequences through low productivityand trade losses. TADs are those diseases that are of significant economic, trade and/or food security importance for a considerable number of countries; which can easily spread to other countries and reach epidemic proportions; and where control/management, including exclusion, requires cooperation among several countries. The International Office of Epizootics (OIE) in its International Animal Health Code includes EI diseases as “communicable diseases which has the potential for serious and rapid spread, irrespective of national borders (14).

5.1 STRATEGIES FOR PREVENTION AND CONTROL

1. Ban on importation of equine and its products from countries where the disease is endemic or has been reported in the last six months.

2. An effective animal disease surveillance involving high risk areas such as slaughter points, donkey and other equine speciesmarkets and Poloclubs. Results obtained may then be used to assess the need for a complete nationwide EI active disease surveillance to determine epidemiological status of the disease in the country.

3. Improved and functional National Agriculture Quarantine Service (NAQS) including immediate rehabilitation and revitalization 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 germ plasm trade.

4. The NAQS 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 inEI surveillance at the ports. (Membership of JIB includes DSS, The Nigeria Police, Immigration and Customs Services)

5. Training of Veterinarians, para-Veterinarians, grooms and other categories of people that work equine practice/industry, for recognitionand control of EI, including biosecurity measures.

6. Enforcement of the requirement for import permits for equine and equine products issued by the FDVPCS.

7. Development of a traceability mechanism for animals and strict monitoring of movement of equine and equine products through registration and licensing.

8. Comprehensive public enlightenment and awareness programs on the disease.

5.2 BIOSECURITY MEASURES

These are basic measures that safeguard the horses, donkeys and other equine species population within an establishment

1. **Source of animals:**The CVON shall be in charge of authorization when importation of equine and equine products are to be made from EI free countries or zones while the Joint Intelligence Board (JIB) comprising NAQS, Immigration and Customs shall be in charge of new arrivals and if any animal is suspected of disease, it should be quarantined for a minimum of 7 days.Only horses, donkeys, and other equine species with a known health status should be introduced into the country. State DVSs should pay special attention to equine species coming from competitions, markets and during transportation.
2. **Vaccination:**Vaccination status of new arrivals should be verified by the officer designated by the CVON/DVS.
3. **Record keeping**: Records of horse, donkeys and other equine species should be kept by veterinary surgeons for easy trace back and trace forward in cases of disease outbreak to ascertain the source of the infection.
4. **Decontamination and disinfection:** Clean and disinfect stables and other equipment such as lead ropes, sponges, twitches,bits, saddles and reinsregularly.
5. **Perimeter fencing**: Animal owners should control access for vehicles, visitors and other animals into where horses and donkeys are kept.
6. **Hygiene protocol:** Visitors and service providers should wash hands, change shoes and use footwears provided by the owner, such as, rubber boots that can be disinfected.

7. **Handling sick horses, donkeys and other equine species**: Isolate sick ones until a contagious or infectious disease is confirmed or ruled out. Also sick ones should be treated last.
8. **Water source:** Drinking water from the same source should be discouraged;specific equipment should be clearly marked as belonging to individual horses, donkeys and other equine species and should be so used.
9. **Isolation/quarantine area:** Have a changing area for staff so that clothing and foot wears for staff are worn in the restricted area.
10. **Carcass disposal**: All carcasses should be properly disposed by burial, burning or incineration.
11. **Disinfectants**: Always follow the instructions by the manufacturers and select the disinfectants that are approved by the Nigeria's National Veterinary Authority.

5.3 CONTAINMENT OF EI IN LIVESTOCK MARKETS

The presence of large numbers of poorly controlled donkeys and donkey markets as well as slaughter points in Nigeria constitutes a high risk for the entry and rapid spread of EI and other emerging animal diseases. Regulatory authorities at both the Federal and the State levels should ensure that relevant laws are followed to avoid outbreak of Equine Influenza.

5.4 ROLE OF PRIVATE VETERINARIANS IN EI PREVENTION AND CONTROL

Majority of equine diseases are handled by private Veterinarians in Nigeria. Thus, they are in a position to play a pivotal role in equine disease surveillance and reporting.

Currently, records have shown that there are no reports coming from the private Veterinarians. To bridge this gap, an enabling environment should be created to ensure that reports gets to the appropriate authority as at when due.

Therefore, there is immediate need for a working synergy between the Private and Public Veterinarians to effectively promote collaboration.

Private Veterinarians should be included in disease surveillance, prevention and control activities at all tiers - namely, Federal, State and Local Government levels.

Any veterinary surgeon in charge of any equine species is under obligation to report any suspicion of Equine Influenza to the Director of Veterinary Services of the State.

5.5ROLE OF NON-GOVERNMENTAL ORGANIZATIONS (NGOS) IN EI AND OTHER EQUINE DISEASES PREVENTION AND CONTROL

NGOs play a vital role in equine health and welfare in Nigeria. Thus, they can also play a vital or pivotal role in equine disease surveillance and reporting during their outreach Programmes. Examples of NGOs involved with Equine species health and welfare in Nigeria include:

- Donkey Sanctuary
- Diamond Equine Network (Dequinet)
- Lagos Urban Forest and Animal Sanctuary Initiatives (LUFASI)
- Hope Interactive (HI)

CHAPTER 6

VACCINE DEVELOPMENT AND PRODUCTION

6.0 INTRODUCTION

Equine Influenza Virus (EIV) does not typically circulate asymptomatically within large groups of horses or other equine species sporadic outbreaks of EIV result from the introduction of an infected animal. This epidemiologic finding and the elimination of the virus by the equine immune response suggest that infection can be avoided by preventing entry of the virus into an equine population by the quarantine of newly introduced horses for at least 14 days, and by appropriate vaccination before exposure15, 16 These control measures against EI have proven to be very effective in the EI-free countries namely Iceland, New Zealand and Australia (which regained its EI-free status two years after the outbreak in 2007 (17)

EI vaccination remains the most effective way to reduce the impact of the disease, especially in high risk groups. This requires a continuous vaccination regimen with the most current recommended strains.

It is therefore recommended that in Nigeria, susceptible equine species be vaccinated; but vaccine to be used should be procured through the approval of the CVON with technical advice from NVRI and such vaccine should contain the local strain of EI-virus or such as is responsible for the most recent outbreak in the country and PANVAC certified for use in Africa.

In view of the lapses of border control in Nigeria and inadequate quarantine services, absence of a well-coordinated and structured infectious animal disease prevention and control Programme generally and the perennial paucity of funds, vaccination is recommended to be a practical control measure against pre-and post-exposure situations. It should be noted that in as much as vaccination does not produce sterile immunity because vaccinated horses and other equine speciesmay shed virus and contribute silently to the spread of EI, economic losses due to EI can be minimized through vaccination Programme in endemic countries (18). However, adequate risk management strategies to deal with possibilities of vaccinated animals facilitating spread of infection should be put in place.

6.1 SOURCING OF VACCINES

Initial outsourcing of vaccines could be made from existing vaccine producing countries by FMARD, while efforts are intensified towards local production by the NVRI. Local vaccine production should be preceded by nationwide active surveillance of the disease by the FDV&PCSand State Veterinary Departments in collaboration with NVRI, in order to isolate and characterize the prevalent virus strain. Hence, vaccine production will be based on the identified circulating field strains and lineages of the EIV.

6.1.1 Vaccine Specified

EquilisPrequenzaTe®(route of administration should be as specified by the Manufacturer)

Table 6.1 EI Vaccine Procurement

S/N	Description	Quantity	Unit Cost (₦)	Total Cost (₦)
1.	Estimated number of horses in Nigeria	300,000	------	------
2.	Estimated number of donkeys in Nigeria	900,000	------	-------
	Total	1,200,000	-------	--------
3.	Vaccination Target of 80% coverage	960,000	-------	--------
4.	Estimated cost of vaccine for first dose	960,000	6,583	6,320,000,000
5.	Estimated cost of vaccine for second dose	960,000	6,583	6,320,000,000
6.	Estimated cost of vaccine for third dose	960,000	6,583	6,320,000,000
7.	Transportation and Handling			948,000,000
	Total			**19,908,000,000**

(Nineteen Billion, Nine Hundred and Eight Million Naira Only)

6.1.3 Support for Vaccine Production

Table 6.2: Estimated cost required to support NVRI for local production.

S/N	Items	Duration	Unit Cost (₦)	Total Cost (₦)
1.	Research	3Yrs	50,000,000.00	150,000,000.00
2.	Equipment & Consumables			
	a) Biosafety Cabinet		50,000,000.00	50,000,000.00
	b) Glass wares		25,000,000.00	25,000,000.00
	c) Plastic wares		25,000,000.00	25,000,000.00
	d) Chemical/reagents/media		50,000,000.00	50,000,000.00
3.	Logistics		50,000,000.00	50,000,000.00
4.	Contingency		17,500,000.00	17,500,000.00
	Grand- Total			**367,500,000.00**

(Three Hundred and sixty seven Million, Five Hundred Million Naira Only)

6.2 VACCINATION CAMPAIGN

Animal vaccination unfortunately is still carried out in a haphazard manner in Nigeria, resulting in diseases remaining endemic for long periods. It is preferable that vaccination programmes be carefully planned and then systematically implemented across all level of government to achieve specified goals. A designated time for EI vaccination campaign would take cognizance of the epidemiologic seasonal pattern of the disease. As a result of this fact, a vaccination timeline for the nationwide vaccination campaign advocated is before the dry cold harmattan season. (Late October to mid-November). The two following vaccination schedules are hereby proposed:

i.) OIE vaccination scheduled for EI at 0, 1, 6 months of age

ii.) Annual booster (in the form of annual vaccination campaign mentioned earlier)

iii.) Manufacturer's recommendations should be followed in vaccination schedules.

iv.) Every vaccinated horse/donkey should have a valid certificate/equine passport.

6.2.1 Essential Prerequisites for EI Vaccination Campaign

- Nationwide identification and sensitization of major stakeholders (polo associations, traditional institutions and donkey owners/traders) and synergy with private Veterinarians/animal health service providers
- Commitment of all stakeholders to a comprehensive vaccination programme applied consistently
- Political and community support
- Planning and implementation would be based on sound epidemiological evidence (passive and active surveillance to update knowledge of circulating field strains)
- Availability of sufficient, safe and potent vaccines
- Availability of adequate "cold chains"
- Accessibility of target livestock populations to vaccination.
- Well-trained vaccination teams
- Monitoring and evaluation of the effectiveness of vaccination which would detect the remaining pockets of infection

6.3 INACTIVATED VACCINES

These have been shown to be efficacious in providing protection against clinical disease and viral shedding. Inactivated vaccine frequently includes multiple strains of equine influenza virus. This vaccine requires three-dose priming regimens and is suitable for pre-foaling boosters designed to increase colostral antibody levels against influenza virus.

6.3.1 Vaccination Schedules

a. Adult horses, previously vaccinated*:* Mature polo, race, or leisure horses (use for durbar) constantly at risk of exposure should be revaccinated at 6-month intervals. Other adult horses could be vaccinated as infrequently as once a year.

b. Adult horses, unvaccinated or having an unknown vaccination history: A primary series of 3 doses of the inactivated-virus vaccines is recommended. The ideal intervals between these vaccinations are three to four weeks between the first and the second vaccination, followed by an interval of three to six months before the third vaccination. Subsequent revaccination should be at intervals of 6 to 12 months, depending on the age of the horse as well as the degree and duration of risk of acquiring infection.

c. Pregnant broodmares previously vaccinated: Vaccinate 4 to 6 weeks before foaling using an inactivated-virus vaccine.

d. Pregnant broodmares, unvaccinated or having an unknown vaccination history: Use a 3-dose series of the inactivated-virus vaccines, with the second dose administered 4 to 6 weeks after the first dose and the third dose administered 4 to 6 weeks pre-partum.

e. Foals of vaccinated mares: Administer a 3-dose series of inactivated-virus vaccine beginning at 6 months of age. The recommended intervals between these vaccinations with an inactivated-virus vaccine are 4 to 6 weeks between the first and the second vaccinations. The third dose should be administered between 10 and 12 months of age.

f. Foals of nonvaccinated mares: Administer a 3-dose series of inactivated virus vaccine at 6 months of age, unless there is an unusual threat that warrants earlier vaccination. Because some maternal anti-influenza antibody is still likely to be present, a complete series of primary vaccinations should still be given after 6 months of age.

h. Outbreak Mitigation:

Vaccination to boost immunity in the face of an outbreak may be a valuable strategy if the outbreak is detected early. In previously vaccinated horses, any of the 3 available vaccines can be used for this purpose. In unvaccinated horses, or horses with an unknown vaccination the use of a canary pox vectored vaccine or modified-life Modified-live (MLV) cold-adapted equine influenza /A2 vaccinecould be used for this purpose.

6.4 CAPACITY BUILDING OF CENTRAL LABORATORY

- Strengthening of existing diagnostic capacity
- Research in various aspect of EI.
- Training of laboratory personnel in modern vaccine technology

CHAPTER 7

EARLY WARNING PLAN FOR EQUINE INFLUENZA

7.0 INTRODUCTION

Early warning mechanisms enables prompt detection of the introduction of or sudden increase in the incidence of a serious disease such as EI before it reaches epidemic proportions and cause serious negative socio-economic impact. The mechanisms embrace all initiatives mainly based on disease surveillance, reporting and epidemiological analysis. This leads to improved awareness and knowledge of the distribution and pattern of disease outbreaks (and of infection). Consequently, forecasting of the source and evolution of disease outbreaks and monitoring of the effectiveness of disease control campaigns is achieved.

The success of the nation's capability for rapid detection of introduction or increased incidence of EI depends on the following:

- Level of awareness for equine owners and other stakeholders by NGOs, States and FGN.
- Training of Field Veterinary Officers (FVOs), Para-veterinarians, Private Veterinarians, Agricultural Extension Officers, Local Authorities and Equine Owners in the clinical and gross pathological recognition of EI and other serious epidemic equine diseases; collection and transportation of diagnostic specimens (in the case of veterinary staff); and the need for prompt action. These activities shall be undertaken by States, Research Institutes and the Federal Government.
- Periodic active disease surveillance (to be facilitated by FGN and development partners) to supplement and improve on passive monitoring (to be facilitated by State Government) based on close coordination among equine owners, field and laboratory/epidemiologyand Veterinary Services.
- Dependable, rapid emergency disease reporting mechanisms to Federal and regional veterinary authorities using available communication platform (e.g ARIS). This shall be facilitatedby States Government and other relevant stakeholders.
- Implementation of a digitalized emergency disease information system to be coordinated by Private Veterinarians and States.

- Enhancement of laboratory diagnostic capabilities, sample collection, and dispatch for EI within zonal/regional and national veterinary laboratories.The States and Federal Government shall undertake these activities.
- Establishment of strong linkages between national laboratories, regional and world Reference Laboratories to be facilitated by Federal Government.
- Strengthening of national epidemiological capabilities to support emergency preparedness and disease management strategies especially with regards to logistics and supply of necessary inputsto be undertaken Federal Government.
- Prompt and comprehensive disease reporting to OIE and particularly to regional animal health organizations to be done by the CVON.

7.1AWARENESS/EDUCATION FOR EQUINE OWNERS AND TRADERS

These programmes form part of the most critical, but sometimes neglected, aspects of preparedness planning for emergency diseases. Communication strategies are aimed at making stakeholders aware of the nature and potential consequences of EI. Meanwhile, enlightenment on other important equine diseases and the benefits to be derived from their prevention and eradication should also be addressed. Public awareness campaigns such as advocacy visits/sensitization workshops should be directed towards equine species owners/traders, polo association and traditional leaders. In EI awareness campaign emphasis should be placed on the importance of doing the "right thing" about sourcing animals from disease-free areas where possible; not buying any sick stock; following rules about quarantine, vaccination, testing or identification of animals and record keeping.

7.2 TRAINING OF VETERINARIANS AND OTHER ANIMAL HEALTH SERVICE PROVIDERS IN EARLY RECOGNITION OF EI, COLLECTION AND SHIPMENT OF DIAGNOSTIC SPECIMEN.

A number of training possibilities may be selected, as appropriate. These include:

- Sending field laboratory staff to institutions or partner countries to gain first-hand experience in EI outbreak or making use of any other opportunities offered for field and laboratory staff to profit from the experience of countries in the process of controlling an outbreak (e.g. by attending workshops).

- International and local training opportunities.This includes collaboration with other countries with relevant advanced laboratory services.
- Periodic training workshops targeted at surveillance agents, laboratory veterinary officers, public health and quarantine Veterinarians (including those stationed at abattoirs, markets, border posts, airports and seaports), and veterinary practitioners.

7.3 SPECIALIST DIAGNOSTIC TEAM

It is recommended that a Rapid Respond Team for EI should be constituted for immediate mobilization when there is a report of suspected outbreak(s). These arrangements should be made well in advance of any emergency. Members should be available, prepared and equipped to travel to disease outbreak sites at short notice. The team should have all the equipment needed for the preliminary investigation of a disease, for collection and transport of diagnostic specimens, and for rapid and immediate communications. The composition of the diagnostic team will include:

- Veterinary virologists/Veterinary clinicians
- Veterinary epidemiologists
- Equine specialists
- Veterinary pathologists
- Laboratory diagnosticians

7.4 SAMPLE COLLECTION, PACKAGING AND TRANSPORTATION

7.4.1 Samples to be collected

- Nasopharyngeal swab in virus transport medium
- Nasal/Tracheal washings in virus transport medium
- Tissues (lungs, trachea, liver and spleen) in sterile sample bottles.
- Samples should be properly labeled

Plate 7.4: Sample collection from a suspected case of EI inhorse

Plate 7.4: A member of Sokoto Disease Investigation Team conducting interview with a donkey owner

7.4.2 Packaging and Labeling

Samples should be well packaged to prevent spillage – triple packaging as follows: Specimens are placed in vials/specimen bottles, this is in turn placed in a leak proof plastic bag, and then in a cooler packed with ice. In addition, all samples must be properly labelled.

7.4.3 Sample Transportation

- Through National Union of Road Transport Worker (NURTW), Road Transport Employers association of Nigeria (RTEAN), Transport by air.
- Maintain cold chain

7.5 LABORATORY DIAGNOSTIC CAPABILITIES

The existing laboratories that have been specified to carry out confirmatory diagnosis of EI are:

- National Veterinary Research Institute (NVRI)
- Veterinary Teaching Hospitals in Zaria, Ibadan, Maiduguri, Nsukka and Sokoto

The NVRI shall carry out agent identification, virus isolation and characterization. It is highly desirable for samples to be sent to the regional and world reference laboratories for EI as part of the prescribed global laboratory networking for EI diagnosis and control. The VTHs shall screen samples and forward same to NVRI for confirmation.

7.5.1Recommended action on laboratories:

The following interventions are needed

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

7.6 TRAINING/MOTIVATION OF PRIVATE VETERINARIANS

- Invitation to international and local workshops/meetings of veterinary importance with full sponsorship
- Training of private Veterinarians on EI early recognition
- Award of excellence by the CVON/DVS for disease reporting and other activities
- liaise with private Veterinarians to execute national programs

CHAPTER 8

EARLY RESPONSE PLAN

8.0 INTRODUCTION

In any disease outbreak situation there is need for early detection and prompt response to control the spread of the disease because once the initial cases are missed, it becomes very difficult to control the outbreak as more susceptible animals are affected and this is especially true in disease agents that have very short incubation period like the equine influenza virus. The above scenario thus calls for the country to have a ContingencyPlan that responds promptly towards containment of equine influenza outbreaks within 24 hours of confirmation.

8.1 ZONING

Zoning is the proclamation of a geographical area in which specific disease control actions are to be carried out. The actual size and shape of the zone may be determined by administrative boundaries or geographical barriers.

8.2 TYPES OF ZONING

8.2.1 Infected Zone(s)

The infected zone encompasses the area immediately surrounding one or more infected farms, premises or villages. While its size and shape are influenced by topographical features, physical barriers, administrative borders, epidemiological considerations (including the likelihood and possible direction of windborne spread), and this zone should be at least a 10-km radius around disease foci. Movement control and ring vaccination of all equines in the State and active surveillance in the immediate border States and activation of the National EI Management Team.

8.2.2 Surveillance zone(s)

The surveillance zone is larger than the infected zone and can include more than one infected zone. It acts as a buffer zone between infected and EI-free zones. Known equine species movement

patterns should be taken into account when defining surveillance zones, which may cover a whole province or administrative region and, in some cases, the whole country.

8.2.3 EI-free zone(s)

These zones encompass the rest of the country. However, because of the potential of EI for wide dissemination, it would be unwise to regard any part of a country in the throes of a new outbreak as not requiring a high level of surveillance. The emphasis in free zones should be on strict quarantine measures to prevent entry of the disease from infected zones and continuing surveillance to provide confidence of continuing freedom.

With the foregoing, whenever there is an outbreak of Equine Influenza in a given State, the infected State/zone should be quarantined while adjoining or neighbouring States should be placed under surveillance and the rest of the country (free zone) should be notified and sensitized to create awareness about the disease and how to prevent it.

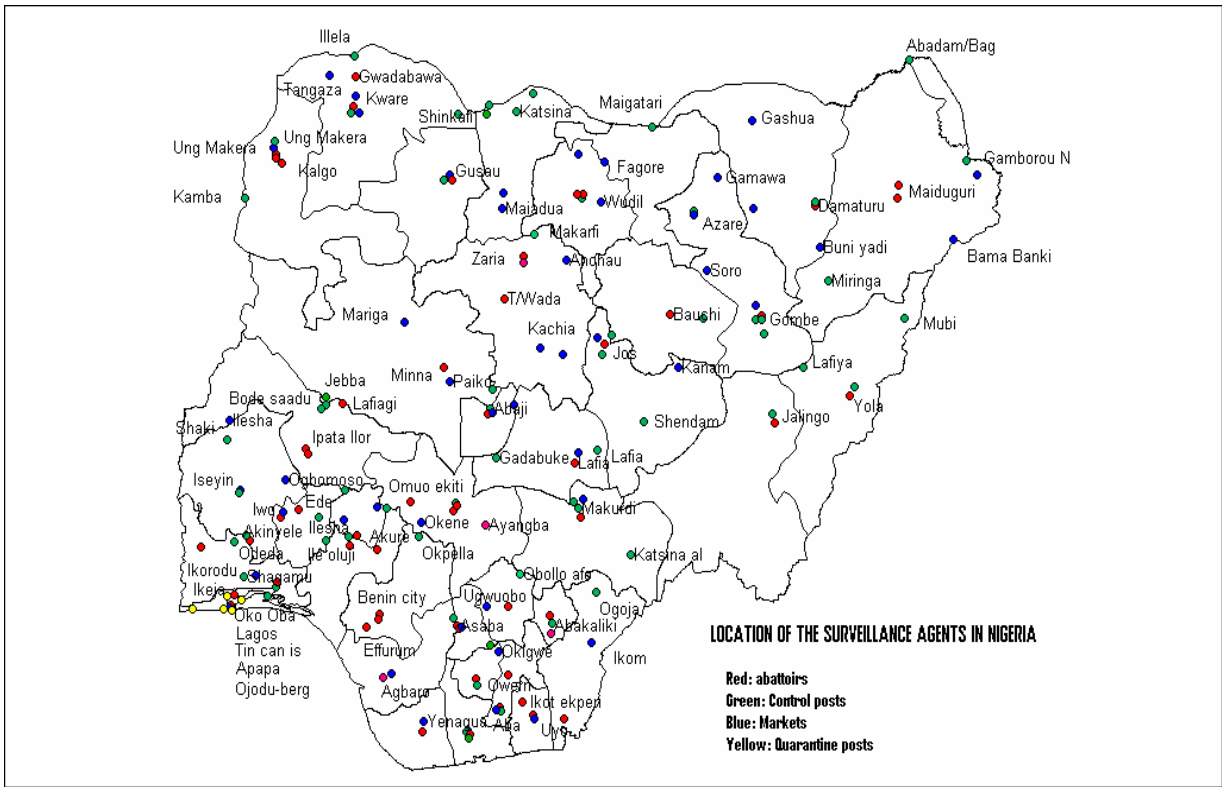

Figure 8.1 location of Surveillance Agents in Nigeria

8.3 VACCINATION IN EARLY RESPONSE

EI vaccination, though very costly, remains the most effective way to reduce the impact of the disease, especially in high risk groups. This requires a continuous vaccination regimen with the most current recommended strains (19). It is therefore recommended that in Nigeria, susceptible equine species be vaccinated; but vaccine to be used should be procured through the approval of the CVON/DVS with technical advice from NVRI as well as approval of PANVAC. The vaccine should contain the local strain of EI-virus that is responsible for the most recent outbreak in the country. The animals should be revaccinated as prescribed by the vaccine manufacturers. The vaccine to be administered for prophylaxis is different from the one used in control.

8.4 OTHER ANIMAL SPECIES SUCEPTIBLE TO EI INFECTION

Dogs, Pigs, Cats, Camels and Poultry can be sources of EI virus and therefore should not be allowed to mix freely with equine species.

8.5 PUBLIC EDUCATION AND AWARENESS CAMPAIGNS

Public education and awareness campaigns should be conducted in order to carry along relevant stakeholders on control and preventive measures. These stakeholders will include:

a. Polo Clubs - Advocacy visits should be paid and public lectures held for them by the Office of the CVON/DVS especially during outbreaks.

b. Traditional Institutions - Advocacy visits, fliers and Jingles on EI preventive and control measures.

Plate 8.1: Advocacy visit to the Emir of Zazzau by the Kaduna EI Response Team

(Courtesy of DVS, Kaduna State with permission of His Royal Highness, The Emir of Zazzau)

c. Peasant Farmers who depend on donkeys as their means of transport and carriage of farm inputs and produce - Focus Group Discussions (FGDs) and radio announcements/jingles should be organized to sensitize this group about Equine Influenza and its preventive/control measures.

d.Veterinary and allied Professionals - Continuing education, updating school curricula to contain relevant information on current protocols (by the VCN) for prevention, detection and control of EI in the country.

Plate 8.2 Disease investigation team on advocacy visit to the Nigeria Defence Academy Equitation Wing Kaduna.

8.6 ROLE OF UNIVERSITIES AND RESEARCH INSTITUTES

Universities (Faculties of Veterinary Medicine) and Research Institutes like NVRI should regularly report diagnosis of EI in their activities to the CVON through the Directors of Veterinary Services of the States where they are domiciled

8.7 ROLE OF PRIVATE VETERINARIANS

Most times, private veterinarians are the first point of contact with farmers/animal owners and are the first to detect and diagnose disease situations in animals including Equine Influenza. They should therefore be encouraged to report suspected cases of equine influenza to the State veterinary authorities for proper investigation and control. This will go a long way is aiding early confirmation and timely deployment of control measures. The Private Veterinarians should report any suspected case of EI to the DVS in the State who will then report to the national level (CVON).

.8.8INTERNATIONAL COLLABORATIONS

Since most communicable diseases are no longer confined within the borders of a particular country, it therefore becomes expedient that in the control of equine influenza virus/outbreaks, Nigeria should collaborate with, ECOWAS, AU-IBAR, OIE, FAO, neighbouring countries and international equestrian societies through timely disease reporting and information sharing on equine influenza as

well as most current developments on prevention and control of the disease. This will be facilitated by the Federal Department of Veterinary and Pest Control Services (FDV&PCS).

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CHAPTER 9

ORGANISATIONAL ARRANGEMENTS DURING AN EI EMERGENCY CAMPAIGN

9.0 STRUCTURE OF VETERINARY SERVICES

9.1Federal Department of Veterinary and Pest Control Services

9.1.1Mission

- To ensure the protection of health and welfare of animals & humans through an efficient and effective Veterinary and Pest Control Services. The policy adviser to the Government on all animal health, veterinary public health matters as well as safety and wholesomeness of food of animal origin for human consumption and Pest Control Services.
- Prevention, control and eradication of Transboundary Animal Diseases and pests to ensure healthy national herds and flocks of livestock and improve the economic well-being of the livestock farmers.
- Formulating policies on animal health, pest control services as well as safety of foods of animal origin in the country.

9.1.2Functions of the Department

- To build a strong herd-health that will guarantee increased productivity and output of all species of livestock in Nigeria.
- To guarantee the provision of wholesome food of animal origin to meet local demands and for export.
- Ensuring optimum utilization of the ecosystem for livestock production with nominal damage.
- To Carry out effective surveillance on animal diseases and develop early warning early reaction system.
- Encouraging private sector participation in all aspects of animal health services including marketing.
- Developing manpower and vocational skills for all stakeholders in the Animal Health sub-sector

- Effective control and management vectors of animal diseases and Transboundary animal pests

9.1.3 FDV&PCS Organogram

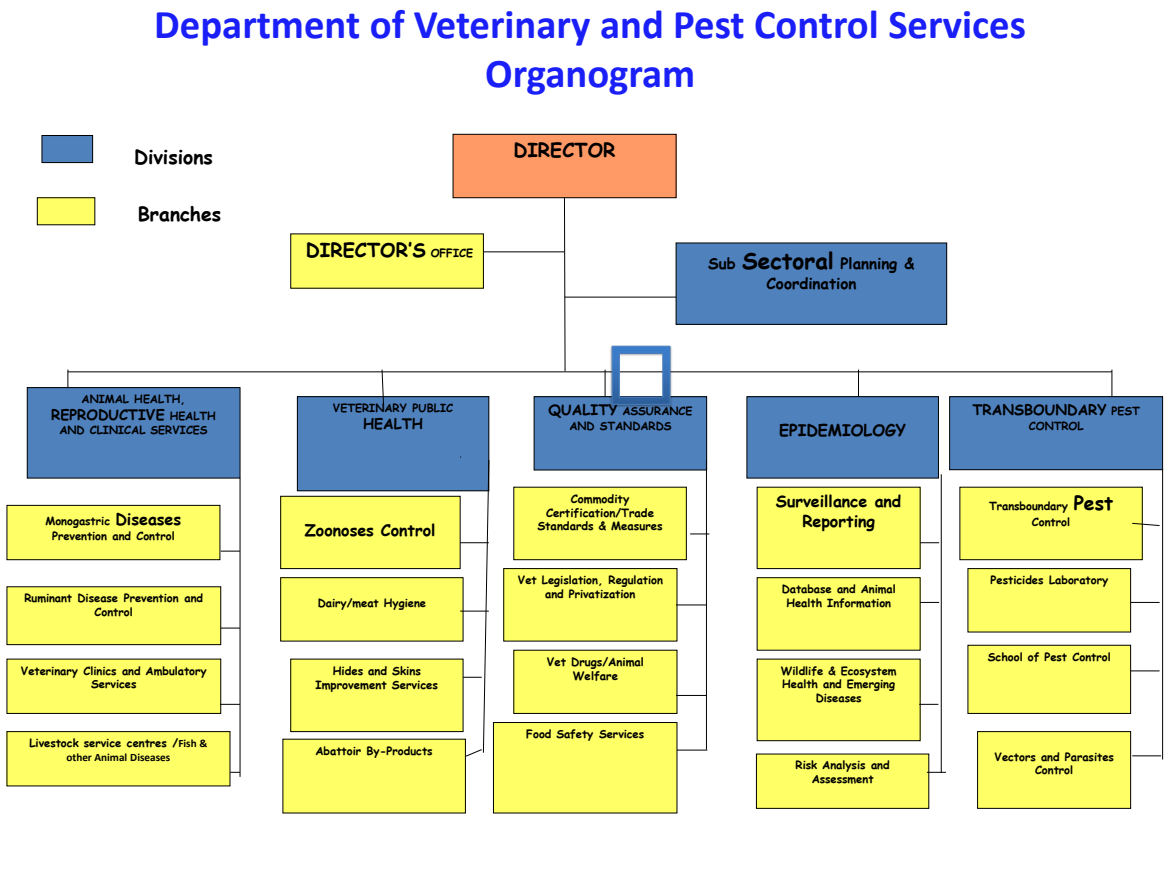

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Figure 8.3 Organogram of the FDV&PCS

9.2 THE STRUCTURE OF VETERINARY SERVICES IN NIGERIA

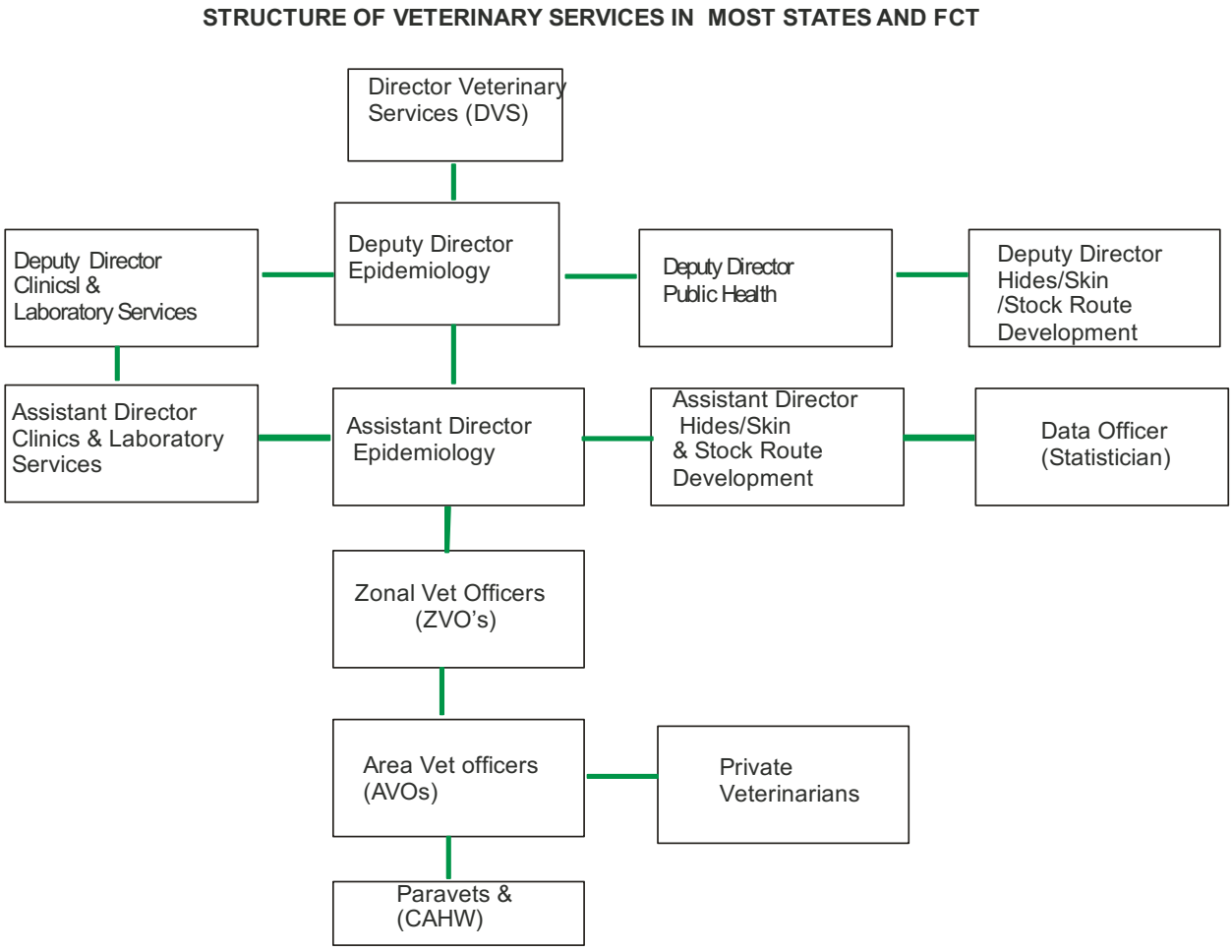

Figure 9.1 The structure of the Veterinary Services in most States in Nigeriaand FCT

9.3 RESPONSIBILITIES OF VETERINARY OFFICERS

9.3.1 Federal Level (CVON)

Formulate policies on animal diseases including equine influenza and is responsible for reporting any outbreak of EI to the government of Nigeria through the Minister of Agriculture& Rural Development and to international organizations namely ECOWAS, AU-IBAR, OIE and FAO.

9.3.2 State Level (DVSs)

They are responsible for collecting and collating disease reports in their States of jurisdiction and forward same to the CVON and also receives further directives from the Federal level in cases of vaccination or other means of disease control as the case may be.

9.3.3 LGA Level (AVOs/LGVOs/ZVOs)

These are responsible for collecting and collating EI disease reports from the equine owners/traders and private Veterinarians and forwarding same to the State/Federal epidemiology officers who then direct such reports to the DVS and from there to the CVON.

9.3.4 Private Veterinarians

They report to the Area Veterinary Officers and in cases of emergency/outbreak of EI they can report directly to the DVS or the CVON

9.3.5 Institutional Veterinary Services/Clinics

Institutional Veterinary Hospitals/Clinics should report to the respective DVSs of the states where they are domiciled e.g Army/Police Mounted Troops, Colleges of Agriculture etc.

9.4 NATIONAL TECHNICAL COMMITTEE ON EQUINE INFLUENZA

There shall be a national Technical Committee on the control of Equine Influenza which shall be composed of the following:

a. Chief Veterinary Officer of Nigeria (CVON) - Chairman

b. Head of Division, Animal Health & Clinical ServicesFDV&PCS

c. Head of Division, Epidemiology

d. Head of Division, Veterinary Public Health

e. Head Planning Unit, FDV&PCS

f. Executive Director of NVRI

g.Representative (Nos.6) State Directors of Veterinary Services (DVSs)

h.Director General, Nigeria Agricultural Quarantine Service (NAQS)

i.Representatives of Directors of VTHs

j.President of NVMA

k. Representative of Police Mounted Troops

l.Representatives (No.2) of Private equine practitioners

m. Representative of the Media

9.5 ROLE OF THE NATIONAL TECHNICAL COMMITTEE

The National Technical Committee shall be convened in an EI emergency and other equine disease outbreaks and they can meet regularly during the course of the emergency to carry out the following functions:

a. To review EI epidemiologicaldynamics and other disease control information

b. To recommend the activation of National EI ContingencyPlan in all the States simultaneously

c. TO Provide advisory role tothe CVON on the containment and future action on EI outbreak including National annual vaccination campaign and holistic and timely implementation of the Plan.(20).

d. To make recommendation to the FMARD on the provision of inputs, logistics, Veterinary Stockpiles, basic biosecurity and surveillance materials, as the need arises, for the containment and control of EI and other major diseases of equine species..

9.6 STATE EI MONITORING UNIT

Membership of the EI monitoring Unit at the State level shall comprise:

a. DVS - Chairman

b. State Epidemiology Officer

C. Area Veterinary Officer

d. Surveillance Agents

e. Representative of Traditional institution/Polo Clubs/ Horse race

f. Representative of Private Veterinarians

9.7 LGA EI MONITORING UNIT

Membership of the EI monitoring Unit at the Local Government level shall comprise:

a. Zonal Veterinary Officer (ZVO) (where applicable)

b. Area Veterinary Officer (AVO)

c. Surveillance agents

d. Representative of Private Veterinarians

e. Representative of Horse/Donkey Owner

9.8 **CHANNELS OF DISEASE REPORTING**

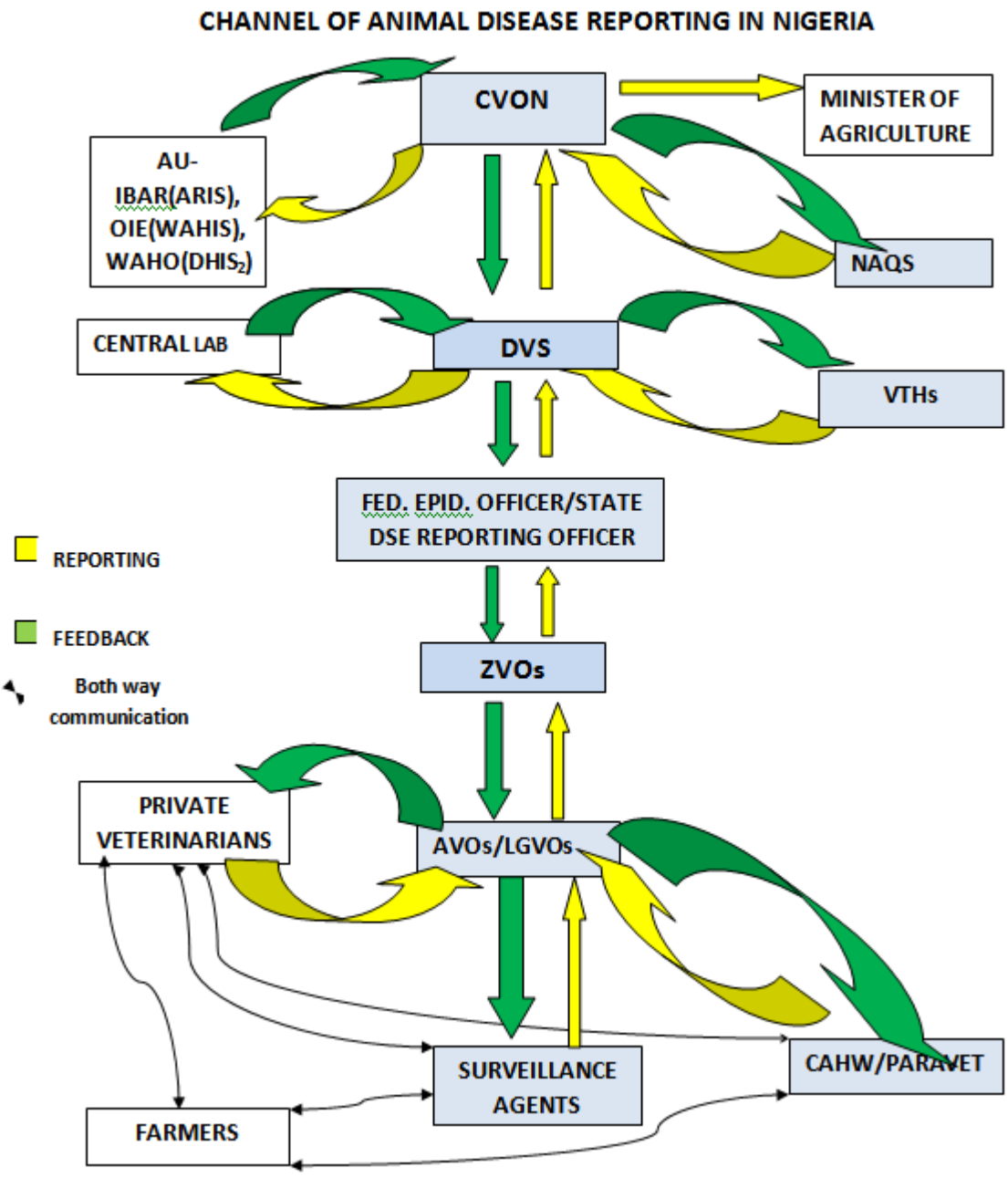

Figure 9.2 Channels of Animal Disease Reporting in Nigeria

The above is a flow chart showing the animal disease reporting system in Nigeria (including Equine Influenza). Yellow arrow depicts sending of disease report/sample for laboratory testing while the green arrow depicts feedback for further action if necessary.

CHAPTER 10

TRAINING AND SIMULATION EXERCISES ON THE EI CONTINGENCYPLAN

10.1TRAINING

Capacity building of Team members, and other technical staff (as back up) that will be involved in a simulation exercise, disease outbreak investigation and implementation of any aspect of the ContingencyPlan shall be carried out continually by the FGN in collaboration with the States, Faculties of Veterinary Medicine, NVRI, and Development Partners.

10.2Simulation Exercises

Simulation exercises are extremely useful for testing and refining ContingencyPlans in advance of any disease emergency. There are also valuable ways of building teams for emergency disease responses and training individual staff. Realistic disease outbreak scenarios should be devised for the exercises, using real data where possible (e.g. for livestock locations, populations and trading routes). A scenario may cover one or more time phases during the outbreak, with a range of possible outcomes. However, neither the scenario nor the exercise should be too complicated or too long. It is best to test just one system at a time (e.g. operation of a Local Animal Disease Control Centre). The Simulation exercises shall be undertaken as a mockactivities.The simulation exercise shall be an exclusive activity of the disease containment team for the purpose of instituting appropriate corrective measures where necessary before the activation of the NPP on EI and other diseases of equine species. However, neighboring countries and the OIE may be notified by the CVON. At the completion of the exercise relevant portions of the ContingencyPlan shall be adjusted as may be desired. Such a review will identify areas where Plans have to be modified as well as further training needs.

10.3UPDATING OF CONTINGENCYPLAN FOR EQUINE INFLUENZA

The National ContingencyPlan, shall be reviewed and updated as dictated by dynamics of the disease status, improvement in technological advancement in vaccines, diagnostic methods, livestock production systems, changes in national legislations/policiesand for the purposes of

attaining disease infection freedom. This activity shall be undertaken by the National Technical committee under the leadership of the CVON.

CHAPTER 11

SUPPORT PLANS

11.0 FINANCIAL PLAN

Is a comprehensive document that contains details of cash flow, insurance policies etc that prioritizes and maps out clear strategies for theachievements of set goals.

Financial Plans need to be developed for the immediate provision of Contingency funds to respond to EI emergencies. These funds are required over and above normal operating costs for government veterinary services. The National Animal Health Policy Radar 2020 - 2030 has a provision for advocacy to be strengthenedfor the policy makers in the three tiers of Government to make adequate annual budgetary allocation to fund animal health initiatives. There is need for a robust collaboration between the 3 tiers of Government and other stakeholders in the area of finance. In that regard, the Federal, States and LGAs should each have a budget line for animal disease emergencies, including EI. Horse owners, traders and equine stakeholders are to mobilize resources towards Contingency Plan for EI.

11.1 RESOURCE PLAN

This is a listing of all the resources needed to respond to EI outbreak and other high-priority disease of equinespecies. The Plan includes personnel,logistics, equipment, laboratory consumables, and other veterinary infrastructures. There is appreciable resource pool of Veterinarians in Nigeria. However, limited national capacity in equine practice coupled with the prevailing poor surveillance system make early detection ofincursion of EI and other major diseases of equine speciesdifficult. There is therefore a need for continuing education and specialization in Equine practice to be facilitated by VCN in collaboration with the Faculties of Veterinary Medicine.

11.1.1 National Animal Disease Crisis Management Centre(NADCMC)

This centre will serve as a national coordination hub for timely implementation of disease containment activities in all the 36 States and the FCT. The Centre will serve as a secretariat for the technical committee (NTC) and shall be chaired by the CVON

11.1.2 State Animal Disease Crisis Management Centres(SADCMC)

This centre will serve as State coordination hub for timely implementation of disease containment activities in each State of the federation and the FCT. The Centre will serve as a secretariat for the technical committee (STC) and shall be chaired by the DVS.

11.1.3 Roles of the National/State Animal Disease Crisis Management Centre (NADCMC)

The roles of the National Animal Disease Crisis Management Centre will include the following:

a. Collect and collate information from within and outside the country on Equine Influenza and other equine diseases

b. Keep records and manage same for information generation and early warning against EI outbreaks.

c. Collaborate with research institutions within and outside Nigeria on EI and other equine diseases

d. The NADCMC should conduct capacity building and other trainings for Veterinarians and other animal workers in prevention and control strategies for EI and other equine diseases.

e. The Centre will continue to operate even in the absence of outbreak of EI.

11.1.4 Recourse Needs for Diagnostic laboratories

Early confirmatory diagnosis is critical in the effective control of EI, other diseases of equine specie and indeed other Transboundary Animal Diseases (TADs). To achieve this, there is the need for veterinary laboratory networking in the country, which is to be coordinated by the NVRI. This requires the provision of adequate laboratory consumables, diagnostic kits and reagents, ICT infrastructure and internet facilities by the Federal Government, State Governments, Development Partners and donor Agencies.

11.1.5 Resource Needs for Proper disposal burial, environmental decontamination and disinfection

Supervising Veterinarian, Environmental Sanitation Officer and other safe burial team; transport; protective clothing; front-end loaders and earthmoving equipment (depending upon local availability); approved disinfectants, soaps and detergents; shovels and scrapers; and high-pressure spraying equipment.

11.1.6 Resource Needs for Vaccination

Supervising Veterinarian and personnel; vaccines; transport; cold storage during transport; syringes and needles; animal restraint equipment; markers as other means of identifying vaccinated animals; protective clothing; disinfectants and disinfection equipment.

11.1.7 Resource Needs for Quarantine and livestock movement controls

Enforcement teams; transport; roadblocks (if necessary); signs and posters.The next step is to prepare a list of existing resources and their specifications, quantities and locations. A register should be maintained of specialist staff together with their qualifications, expertise/experience with EI and contact details. These resource lists and staff registers should be maintained at the National Animal Disease Crisis Management Centre and, where appropriate, at the State Offices. Comparison of the inventory lists of needed and available resources will inevitably highlight many deficiencies and the resource Plan shall identify how these deficiencies will be rectified.

The following are options for accessing the necessary extra resources:

- A list of where essential equipment and stores may be purchased at discounted prices, hired or borrowed
- Arrangements for the supply of personnel and equipment from other government agencies, e.g. earth-moving equipment from the Department of Works, and transport and communication equipment
- Arrangements through veterinary associations for the temporary employment or secondment of veterinary practitioners, retired Veterinarians and ancillary field and laboratory staff in an emergency.
- Consultations with international reference laboratories for EI about sourcing of reliable diagnostic reagents and laboratories should routinely perform basic tests on specimens of known and unknown status to ensure diagnostic proficiency and competence, and should send test samples to reference laboratories from time to time to cross-check results even when they are negative.
- The resource Plan and associated inventory lists need to be regularly updated.

11.2 CURRICULUM DEVELOPMENT ON DISEASE REPORTING

- There is need to review existing curriculum in our institutions to emphasize on disease reporting and capacity building of those on the field. Veterinary Council of Nigeria should be responsible Authority for this.
- Quarterly joint seminar with clinicians and other stakeholders to share information and review field cases of EI by VCN/Universities
- Training of clinicians and other private equine practitioners

11.3 INTERNATIONAL COLLABORATIONS – IN BORDER CONTROLS, TRAININGS AND LABORATORY SERVICES

Considerable mutual benefits can be derived when countries cooperate in their emergency animal disease preparedness Planning, particularly neighbouring countries or those within the same geographic region. Such countries often have similar socio-economic, environmental, epidemiological and agricultural production profiles and thus similar livestock disease risks, needs and approaches to preparedness Planning.

These countries may consider pooling resources in their emergency animal disease preparedness planning, either through informal networking or formally through existing regional organizations such as, AU-IBAR or WAHO in Africa. This will ease the burden for all and, more importantly, result in harmonized Plans for prevention and response to animal disease emergencies. This is particularly significant in the case of Transboundary Animal Diseases which, by definition, spread rapidly across national borders.

Potential avenues for collaboration include:

- joint risk assessments leading to harmonization of import quarantine policies and other disease prevention strategies
- joint development by neighboring countries of strategies and programmes to reduce the risk of epidemic diseases being spread by the movement across common borders of potentially infected animals, achieved through coordination of disease surveillance, quarantine, vaccination and other methods

- development of compatible disease reporting and information systems
- exchanging information on disease occurrences at a national level and at a local level near shared borders
- dividing responsibilities for preparing ContingencyPlans for shared high-threat diseases or at least exchanging ideas and draft Plans
- reciprocal arrangements for development of laboratory diagnostic capabilities
- establishment of international vaccine banks
- Joint training exercises, workshops and other programmes.

There are compelling reasons why countries should be cooperating in their control and eradication campaigns for shared epidemic equine diseases. A regional approach with coordinated campaigns in all countries is more likely to succeed and will reduce the subsequent risk for all countries to a greater extent than if countries act alone. Future export opportunities for countries in the region will be enhanced if EI and other Transboundary Animal Diseasesare eradicated on a regional basis.

CHAPTER 12

ACTION PLAN

12.0 INTRODUCTION

The action Plan is a set of instructions covering most aspects of the controls to be implemented and actions to be taken during an EI emergency, from when the disease is first suspected up to its final eradication. This chapter provides only a guideline of the actions to be carried out during each phase of an EI outbreak. The action Plan outlines responsibilities for implementation of activities before, during and after disease outbreaks. This also includes command chains and communication channels and deployment of resources. The success of implementation of the action Plan depends on each link in the command chain functioning timely as specified in the Plan. In addition, it is expected that the Technical Committee will continually review and update relevantstandard operating procedures (SOPs)and case definition,as may be determined by the changing status of the disease in Nigeria.

12.1 INVESTIGATION PHASE

All suspicions and/or reported cases of EI and other diseases of equine species shall be promptly investigated by the State Disease ContainmentTeam (SDCT).The report of the disease outbreak investigation shall be evaluated by the DVS who would initiate immediate disease containment measure and forward the report to the CVON who would convene the meeting of the National Technical Committee to consider the recommendations therein for further necessary action.

12.2 ALERT PHASE

In the event of laboratory outbreak of EI and other diseases of equine species, the following actions shall be taken:

- The CVON shall notify all the States of the Federation and the FCT, the OIE, AU-IBAR, ECOWAS, Development Partners,Directors of VTHs, National Park& Game Reserve Authorities, NVMA and Police Mounted Troops.
- The CVON shall articulate and communicate the risk of the disease to relevant stakeholders and the general public

- DVSs to notify owners of equine species in communities, Security Agencies that keep equine species, and other relevant stakeholders
- Simultaneous activation of the preparedness Plan at all levels
- Restriction of movement, isolation, quarantine and treatment of sick animals as well as delineation of epidemiological units (Zones- Infected, Surveillance and Free)
- Mobilization and deployment of resources by the Federal Government, States and Donor Agencies
- The CVON appoint and dispatch the EI expert team, which should include an epidemiologist, a laboratory diagnostician and a control officer, with such technical support as they may require

12.3 OPERATIONAL PHASE

The alert phase shall be followed immediately by the operational phase which will include the following:

- Quarantine, isolation and treatment of sick animals by the States (DVSs) and at the borders and ports of entry by NAQS.
- Environmentally friendly and safe disposal of carcasses of dead animal by the State disease containment team and national experts on EI
- Deployment of resources by the State to affected Local Governments
- Continual risk communication and advocacy by the States
- Continual evaluation of the disease status and effectiveness of implementation of containment measures through disease surveillance by the FGN in collaboration with the States.
- Mobilization and deployment of resources by the Federal Government, States and Donor Agencies.
- Instituting Psycho-social support for affected animal owners by the State Governments (DVSs)
- Replenishment of Veterinary Stockpiles and laboratory consumables by the FGN and Development Partners

12.4 STAND-DOWN PHASE

When EI has been confirmed, contained and controlled, the stand-down phase commences when intensive disease surveillance indicates that the control and elimination programmehas been successful and there have been no reports of clinical EI over a period of at least two to three months. In this case the following actions shall be taken:

- Continuous implementation of Psycho-social support for affected animal owners by the State Governments (DVSs).
- Support animal owners torestock
- Obtaining verifiable scientific evidence, including the results of clinical and serological surveillance, that the disease has indeed been eliminated from an area or the whole country
- Preparing documentation for self freedom from the disease to OIE by the FGN
- Instituting programmes to prevent the reintroduction of EI to free zones or the whole country by the FGN in collaboration with the States.
- Reviewing the control and elimination programme with all stakeholders - FGN and States
- Revising and update the ContingencyPlan on EI in the light of the above

CHAPTER 13

MAJOR NATIONAL POLICY CONSIDERATIONS ON EI AND OTHER DISEASES OF EQUINE SPECIES

13.0 INTRODUCTION

There is the need for Nigeria to create a policy on the control and prevention of EI which has devastating effects on the equine species population, and consequently means oflivelihoods. The disease, in donkeys, impacts the socioeconomic dynamics of rural communities in terms of draught power and traction, transportation, commerce and communication. Its impact on the ever-growing elite vocation and heavy investments in the importation of horses, polo and horseracing, traditional recreational ceremonies (Durbar) and consumption of horse and donkey meat in some parts of Nigeria has also been established. As such, EI has significant socioeconomic impact through the disruption of employment and stability of trade and commerce related to this sector.

13.1 POLICY ISSUES

Policies on EI shall ensure the following:

i. Strict observance of the relevant guidelines and quarantine laws of Nigeria under the auspices of the Federal Department of Veterinary and Pest Control Services (FDV & PS) and National Agricultural and Quarantine Services (NAQS) concerning importation of animals into the country and controlled movement within the country.
ii. Re-classification of EI in the disease reporting index of the country
iii. Provision of necessary funds for the implementation of control programmes
iv. Mandate the implementation of periodic vaccination against EI
v. Encourage the adoption of insurance policy on high price value animals

13.2 ENFORCEMENT OF RELEVANT LEGISLATION AND POLICIES

The CVON or his delegated representatives shall collaborate with the VCN, DVSs, law enforcement agencies and other relevant agencies enforce all relevant legislation and policies on EI and other major animal diseases

13.3 CARCASS DISPOSAL FOR EI.

Based on the results of risk analysis of EI in Nigeria, it is recommended that carcasses are safely disposed by deep burialand/or incineration/burning followed by adequate disinfection and decontamination.

13.3.1 Safe disposal of carcasses

This is the removal of carcasses of all animals that have died of EI. Carcasses that died of EI shall be disposed as quickly as possible (preferably within 24 hours). This is mostly done by deep burial covered by quicklime (depending on factors such as the nature of the terrain, closeness of water tables to the surface, and availability of earth-moving equipment). If in situ disposal is not practicable, it may be possible to transport carcasses to a common disposal point in sealed vehicles. This should be done within the infected zone wherever possible.

13.4 DECONTAMINATION AND DISINFECTION

This involves the thorough cleaning and disinfection of the environment of infected premises, with particular attention to where animals have congregated, including animal houses, sheds, stables, yards, water troughs, and so on. Potentially contaminated materials such as manure, bedding, straw and feedstuffs should be removed and disposed of in the same way as for carcasses. It may also be simpler to burn very poorly constructed stables. Preliminary thorough cleaning should be undertaken with copious water to which soaps and detergents may be added. Appropriate disinfectants for EI include sodium hydroxide (2 percent w/v in water), sodium carbonate (4 percent w/v in water) and citric acid (0.2 percent w/v). Sodium carbonate is preferred to sodium hydroxide as it is less corrosive.

13.5 VACCINATION

Nigeria shall vaccinate against EI and the vaccine to be used shall be the one approved by PANVAC for Africa in conformity with the circulating strain(s) of the virus in the country. The annual vaccination coverage of susceptible species shall be targeted at 75%. Vaccines shall be made available by the FGN, State Governments and development Partners that will be enough for the

targeted vaccine coverage. Vaccination programs should be carefully planned and then systematically implemented to achieve desired goals.

13.6 BARRIER AND BORDER QUARANTINE POLICY

Attention should be paid to the provision of adequate quarantine services to intercept equine and equine products brought into Nigeria at international airports and seaports and through border crossing-points. Any confiscated quarantine risk materials should be disposed of safely by deep burial or preferably incineration to ensure that such products are not carried off by unauthorized personnel or disinterred by humans or scavengers such as dogs. The uncontrolled movement of equine and equine products across national borders presents a particular problem for Nigeria as a country from the equine health perspective. This often occurs through trading when there is a price difference between Nigeria and neighboring countries for donkeys and its products. It may also be a consequence of nomadism, transhumance, civil disruptions or inflow of refugees. The problem is compounded when borders are in difficult terrain or are relatively inaccessible. While efforts should be made to ensure that appropriate quarantine measures are applied to equine and its products, a degree of sensitivity is required. It is recommended that close collaborations be developed between Veterinarians, donkey traders and those who are likely to bring donkeys and other Equine species across borders. Education campaign on the dangers of EI and other serious Transboundary Animal Diseases is advocated. Cooperation leading to simple, practical quarantine and disease surveillance procedures should be encouraged. In addition, good working relationship should be developed with animal health authorities in neighboring countries, both at the national and local levels for cooperation on EI ContingencyPlans. This will enhance exchange of early warning information on disease occurrences near mutual borders.

13.7 COMPENSATION

Following international best practice, as Nigeria has opted for vaccination, compensation for losses due to EI becomes untenable. However, State Governments may assist vulnerable owners of equine species and individuals in restocking to cushion the effect of the disease on them. The government in collaboration with animal owners and relevant international Bodies are to intensify effort towards

achieving high coverage of vaccination (75%) of horses and donkeys in Nigeria. Compensation is therefore not recommended.

REFERENCES

1. 1 Schemann, K., Gillespie, J. A., Toribio, J. A., Ward, M. P., & Dhand, N. K. (2014). Controlling Equine Influenza: Policy Networks and Decision-Making during the 2007 Australian Equine Influenza Outbreak. *Transboundary and emerging diseases*, *61*(5), 449-463.
2. Adeyefa, C. A. O and McCaulay, J. W. (1994). Outbreak of Equine Influenza in Polo Horses in Ibadan, Nigeria: Virus Isolation, Clinical Manifestation and Diagnosis. *Veterinary Records*, 134: 683 – 684
3. AU-IBAR Animal Health Strategy for Africa (2018 - 2023). BAHPA Volume 67 No. 2, June 2019, P. 1- 6.
4. OIE, 2019, Equine Influenza. https://www.oie.int/en/animal-health-in-the-world/animal-diseases/Equine-influenza
5. OIE,Terrestrial Animal Health code Chapter 12.6. Infection with Equine Influenza Virus. https://www.oie.int.index.php?id=169&L=0&htmfile
6. Rush, B. R (2019). Equine Influenza. MSD Veterinary Manual, Merck, Sharp &Dohme Corporation, a subsidiary of Merck& Co Inc. Kentworth, NJ, USA
7. Romain, P (2014). A systematic review of recent advances in equine influenza vaccination. Vaccine (Basel) 2 (4): 797 - 831.
8. Rivailler, P, Perry, I. A, Jang, Y; Davis C.T, Chen, L. M, Dubovi, E, and Donis, R.O (2010).Evolution of Canine Influenza (H3N8) Viruses Co-Circulating between 2005 and 2008, Science direct.Virology 408 (1): 71 - 79.
9. Equine Influenza: An Overview, 2017 (https://www.sciencedirect.com/topics/veterinary-science-and-veterinary-medicine/equine-influenza.)
10. Equine flu jumps to dogs. (http://dx.doi.org/10.1136/vr.157.16.459)
11. vanMaanen, C. ; Cullinane, A. (2002). Equine Influenza virus infestation: an update. Vet. Q.24 79 - 94 (Pub. Med).
12. OIE Terrestrial Animal Health Code. www.oie.int/en/international-standard-setting/terrestrial-code/access-online/.
13. Saliou, P. (1994). Crisis Communication in the event of a flu pandemic. Epidemiol. 10: 515-517

14. OIE. International Animal Health Code.https://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2019/
15. Cullinane, A. (2017). A guide to evidence-based equine influenza vaccination. Retrieved from: https://www.magonlinelibrary.com
16. AAEP. American Association of Equine Practitioners. (2019). Infectious disease control guidelines on influenza. Retrieved from: https://aaep.org
17. Cowled, B., Ward, M. P., Hamilton, S. and Garner, G. (2009). The equine influenza epidemic in Australia: Spatial and temporal descriptive analyses of a large propagating epidemic. *Preventive Veterinary Medicine,* 92: 60–70. doi: 10.1016/j.prevetmed.2009.08.006
18. OIE. Office Internationale de Epizootics. (2019). Equine influenza (infection with equine influenza virus).In:Manual of diagnostic tests and vaccines for terrestrial animals, chapter 3.5.7. Retrieved from: oie.int/fileadmin/Home/eng/Health_standards/tahm/3.05.07_EQ_IN.pdf
19. Centres for Disease Control and Prevention. Pandemic Influenza: A Planning Guide for State and Local Officials (Draft 2.1). http://www.cdc.gov/od/nvpo/pandemicflu.htm
20. FAO Animal Health Manual: ISSN 1020-5187: Preparation of Foot-and-Mouth disease contingency plans, Pg. 65; VialedelleTerme di Caracalla, 00100 Rome, Italy, 2002.

APPENDICES

APPENDIX I: BUDGETS*

A. BUDGET FOR NATIONAL EQUINE INFLUENZA CONTIGENCY PLAN FOR NIGERIA (PRE-OUTBREAK ACTIVITIES)				
S/N	**Activity**	**When**	**Quantity/Unit Price (₦)**	**AMOUNT (₦)**
A1	Training of Response Teams	March - September	6/State @150,000	900,000
A2	Training of Laboratory staff in EI diagnosis	N/A	N/A	N/A
A3	Strengthening VTHs and NVRI Labs	March - Sept	6/5000,000	40,000,000
A4	International & Regional collaboration Meetings	March - Sept	75 Persons@455,000	34,125,000
A5	Awareness Creation for horse/donkey owners and Advocacy visits to relevant stakeholders	March - Sept	10/255,000	2,550,000
A6	Surveillance Operations	March - Sept	17 States@ 50,000	850,000
A7	Veterinary Stockpiles	March - Sept	17States/2,175,000	36,975,000
A8	Field Operational Vehicles	March - Sept	17 States/17,000,000	289,000,000
A9	Strengthening Federal Epid Unit	March - Sept	10,000,000	10,000,0000
A10	Simulation Exercises	March - Sept	17 States@131,571	2,236,707

Sub Total for Pre - Outbreak Period				**416,636,707**

B. BUDGET FOR NATIONAL EQUINE INFLUENZA CONTIGENCY PLAN FOR NIGERIA - DURING OUTBREAK				
S/N	**Activities**	**When**	**Resource**	**AMOUNT (₦)**
B1	Facilitate DVS Investigation and Notification	Day 1	EODF: **Emergency Outbreak Disease Fund**	230,000
B2	Facilitate OIT General operations	Day 2-4	EODF	124,000
B3	Facilitate OIT Destruction and Disposal	Day 3-4	EODF	185,000
B4	Facilitate OIT Cleansing and Disinfection	Day 5	EODF	244,000
B5	Facilitate OIT emergency vaccinations	Day 2-4	EODF	160,615,000
B6	Public awareness	Day 6	EODF	500,000

	campaigns			
B7	Strengthen NAQS staff at Entry and Exit points	Day 1-2	EODF	50,000
B8	Facilitate Veterinary Surveillance officers field operations	Day 7	EODF	50,000
B9	Facilitate OIT field operations	Day 8-12	EODF	50,000
B10	Facilitate OIT meetings	Day 13	EODF	24,000
B11	Public Awareness Campaigns	Day 14	EODF	500,000
TOTAL FOR 1 STATES				162,482,000
TOTAL FOR 17 STATES				**2,762,194,000.00**

C. BUDGET OF EQUINE INFLUENZA CONTIGENCY PLAN FOR NIGERIA (POST - OUTBREAK ACTIVITIES)				
S/N	**Activities**	**When**	**Resource**	**AMOUNT**

			Quantity/Unit Price (₦)	**(₦)**
C1	Equine Husbandry Extension	March - September	150 Person/25,000	3,750,000
C2	Facilitate Restocking	N/A	N/A	N/A
C3	Research	March - Sept	5 No/4,000,000	20,000,000
C4	Specialized Training for DVSs on Contingency Planning & Containment	March - Sept	17 Pers/174,470	3,136,000
C5	Long Term training of 3 young vets for MSc in Vet Epidemiology	2 Years	3/4,000,000	12,000,000
C6	Long Term training of a young vet for MSc & PhD in Vet Epidemiology	5 Years	1 Pers/12,000,000	12,000,000
C7	Long Term training of 1 young vet for MSc & PhD in Vet Virology	5 Years	1 Pers/12,000,000	12,000,000
C8	Long Term training of 2 young vet for MSc & PhD in Vet Pathology	5 Years	2 Pers/12,000,000	24,000,000
C9	Long Term training of 1 young vets for MSc in Laboratory Technology	2 Years	1Pers/4,000,000	4,000,000
C10	Short Term training of Senior Vets on EI and Risk Management	3 Months	111/5,534,100	614,285,100
Sub Total for Post Outbreak Period				**705,171,100.00**

Grand Total (A+B+C)	**(416,636,707, + 2,762,194,000 + 705,171,100)**			**3,884, 001, 807. 00**

***** Adapted from the United Republic of Tanzanian Contingency Plan for Avian Influenza, 2006.

APPENDIX II: STANDARD OPERATING PROCEDURES (SOPs)

Case Definition Form for Equine Influenza

Attn: The investigation team leader for Equine influenza

Subject: decision tool for tentative diagnosis of EI

Variable	**Value**	**Variable**	**Value**
State		**LGA**	
Village		**Stable**	
Date of first death		**Owner's name**	
Address:			
Telephone		**Cell phone**	

For each of the following simple statements, check the column when the statement is 'True'

S/N	**CLINICAL SIGNS/SYMPTOMS**	**TRUE**
1	History of exposure in the last 1-3 days	
2	High morbidity	
3	Pyrexia	
4	Presence of dry harsh cough	
5	Nasal discharge	
6	Conjunctivitis	
7	Vaccination history	
Total "Trues"		

If up 5 of the above are true, you may give a tentative diagnosis of EI and begin necessary actions outlined for cases of EI outbreak. If the number of "Trues" is less than 5, then keep the stable or suspicion site in quarantine until the laboratory result is out before further actions.

Investigation Team Leader **Date:**

Name	
Signature	

APPENDIX II: STANDARD OPERATING PROCEDURES (SOPs)

Equine influenza 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 animals in the site: _____Type: _____Breed: _____

Production system: _____Age of animal: _____Date of purchase: _____

Date of arrival on stable/site: _____Source/place of purchase_____

Outbreak information:
Disease suspected: _____Signs observed: _____

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

Treatment carried out: _____N° deaths _____

N° recovered: _____

Control
measures_____

Nature of the diagnosis: suspicio☐ cl☐cal post-m☐em labor☐ory

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_____

APPENDIX II: STANDARD OPERATING PROCEDURES (SOPs)

Specific Control Measures

Vaccination Guideline for Equine Influenza

- A "standard" vaccination program for all horses does not exist.
- This vaccination guideline is adopted to suit our peculiar situation.
- While annual vaccination is currently recommended, more frequent vaccination is recommended for young horses and specific equestrian facilities and organizations that require more frequent (biannual) vaccination

Vaccination Schedule for Equine Influenza

Vaccine type	Category of Horse	Duration of Immunity	Comment
Canary pox vectored vaccine	Foals as young as four months of age	At least 6 months	• A 2 dose priming regimen is recommended • Boosters at a 6 month interval
	Adult horses, previously vaccinated		• Horses constantly at risk of exposure should be revaccinated at 6 month intervals. • Other adult horses could be vaccinated as infrequently as once a year.
	Adult horses, unvaccinated or having an unknown vaccination history		• 2-dose series of canary pox vector vaccine at a 4 to 6 week interval (revaccinate semi-annually)
	Pregnant broodmares, previously vaccinated		• Vaccinate 4 to 6 weeks before foaling.
	Pregnant broodmares, unvaccinated or having an unknown vaccination history		• A 2-dose series is recommended with the second dose administered 4 to 6 weeks after the first dose but no later than 4 weeks pre-partum.
	Foals of vaccinated mares		• A primary series of 2 doses of canary pox vector vaccine at a 5 week intervalbeginning at 6 months of age.

Foals of non-vaccinated mares	• Primary series of 2 doses of canary pox vector vaccine at a 5 week interval or a 3-dose series of inactivated virus vaccine at 6 months of age.

N.B.:

- The ideal intervals between these vaccinations are three to four weeks between the first and the second vaccination, followed by an interval ideally as long as three to six months before the third vaccination.
- This regimen generally induces higher and more persistent antibody titers than those induced by use of the previously recommended 2-dose initial series.
- Subsequent revaccination should be at intervals of 6 to 12 months, depending on the age of the horse as well as the degree and duration of risk of acquiring infection.

Outbreak Mitigation

- Vaccination using the canary pox vectored vaccineto boost immunity in the face of an outbreak may be a valuable strategy if the outbreak is detected early enough.
- In unvaccinated horses, or horses with an unknown vaccination history, the use of canary pox vectored vaccine is recommended.

APPENDIX II: STANDARD OPERATING PROCEDURES (SOPs)

Case management of equine influenza

- Isolation and rest in dust free stalls/boxes
- Symptomatic and supportive therapy
    - Antibiotics
    - Anti-inflammatories (NSAIDs)
    - Multivitamins (Vitamins B complex and Vitamin C)
    - Bronchiolitis