SRI LANKA EXOTIC DISEASE EMERGENCY PLAN

SEDEP

2009

HIGHLY PATHOGENIC AVIAN INFLUENZA

CONTROL PROGRAMME

Part I

SEDEP is a series of technical guidelines developed by the Department of Animal Production and Health, Sri Lanka describing the emergency approach to an exotic animal disease introduction.

Preface

The control of HPAI in Sri Lanka requires an understanding of the epidemiology of influenza viruses and particularly the sub-type H5N1. It is also important to understand the local poultry production and marketing systems and how these affect the development and cause of HPAI. Without proper understanding these factors, attempts to control and eradicate this disease will be hardly successful.

The strategy to control and eradication of HPAI is an integral part of the Sri Lanka Exotic Disease Emergency Plan (SEDEP). This strategy sets out the disease control principles that have been approved by the Animal Health Committee of the Department of Animal Production and Health, considering the recommendations of the OIE, FAO and WHO.

The purpose of this document is to provide guiding principles and minimum requirement for surveillance, diagnosis and management of an outbreak of HPAI. This document also summarizes the risk associated with HPAI and cost estimation in combating the disease. Although effective surveillance and diagnosis are critical to the control of HPAI, other important measures include;

- Rapid humane culling of infected and in contact poultry and destruction/disposal of high risk poultry products
- Disposal of carcasses and potentially infective materials safely and environmentally sustainable way
- Enhance biosecurity at poultry farms and associated premises including movement control of personnel
- Control of movement of birds and products that may contain viruses
- Changing the industry practices of risk on introduction and spread of HPAI

A concise summary of activities, which should be implemented before, during and after the outbreak is given in the form of annexures. This document will be updated periodically with new findings and recommendations.

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Abbreviations

AD	Assistant Director
AI	Avian Influenza
AQO	Animal Quarantine Officer
BOI	Board of Investments
CA	Control Area
C.I.	Confidence Interval
DAPH	Department of Animal Production and Health
DDT	Depopulation and Disposal Team
DET	District Emergency Team
DG	Director General
DVIC	District Veterinary Investigation Centre
ELISA	Enzyme Linked Immuno-absorbent Assay
FAO	Food & Agriculture Organization of the United Nations
HA	Haemaglutination (test)
HI	Haemaglutination Inhibition (test)
HPAI	Highly Pathogenic Avian Influenza
IP	Infected Premises
IVPI	Intra-Venous Pathogenicity Index
LPAI	Low Pathogenic Avian Influenza
NAI	Notifiable Avian Influenza
NWP	North Western Province
OIE	World Organization for Animal Health (*Office International des Epizooties*)
PCR	Polymerase Chain Reaction
PPE	Personal Protective Equipment
RA	Restricted Area
RVS	Range Veterinary Surgeon
Rt-PCR	Reverse Transcriptase Polymerase Chain Reaction
VIC	Veterinary Investigation Centre
VIO	Veterinary Investigation Officer
VRI	Veterinary Research Institute
VS	Field Veterinary Surgeon
UNDP	United Nations Development Program
WHO	World Health Organization of the United Nations
WP	Western Province

Contents

1 Introduction

1.1 About this Document

This document replaces the Sri Lanka Exotic Disease Emergency Plan for Highly Pathogenic Avian Influenza prepared by the Department of Animal Production and Health in August 2006.

1.2 Objectives

The overall objective of this document is to present an overview of avian influenza and to outline the response to be undertaken by the Department of Animal Production and Health when there is a suspicion of a developing outbreak of Notifiable Avian Influenza (NAI) or when an outbreak actually occurs. It provides the information necessary for the control and eradication of NAI to the different responders, both within the DAPH system as well as to those outside, who are required to be engaged in an emergency situation due to NAI.

The strategies in this document are not a set of standalone strategies solely for NAI, but are components of the overall management plan used by the DAPH to respond to an incursion of any animal disease which requires an emergency response.

1.3 Amendments and Revisions

As new knowledge is added continuously about the control and management of avian influenza, the Emergency Response Plan for Notifiable Avian Influenza outlined in this document is to be reviewed periodically and updated accordingly with new information. The strategies for control of the disease thus needs revisions periodically based on technological developments and new scientific evidence.

1.4 Structure of the Document

Unlike in the case of the previous version of the Sri Lanka Exotic Disease Emergency Plan, the present document is prepared in two parts for easy reference and usage. Also, a new section is added which outlines the activities on Public Relations and Communication aspects which needs to be taken care of in dealing with a control program on NAI.

Part I of the document describes the nature of the disease, the structure of the local poultry industry and the associated risk of introduction of the disease, and outlines the policy and strategy on prevention and control of NAI. It also spells out the emergency response plan and the actions to be taken before restocking of the affected areas with poultry.

The second part of the document presents detail procedures of the main tasks connected with the prevention and control of NAI. Accordingly, it contains Standard Operating Procedures for the following tasks;

- undertaking a full clinical examination of affected poultry, including the completion of a standard form describing the findings
- undertaking a full pathological necropsy examination of affected poultry, including the completion of a standard form describing the findings
- collection, packaging and transporting appropriate specimens for submission to the Veterinary Research Institute for confirmatory diagnosis
- performing the rapid antigen detection test and interpreting the results
- performing the ELISA test and interpreting the results
- performing egg inoculation techniques
- performing the HA and HI test and interpreting the results
- performing real-time Polymerase Reaction tests and interpreting the results
- quarantining an infected premises
- humane destruction of sick and at-risk poultry
- environment friendly methods for the disposal of infected/suspected poultry, poultry products and feed
- cleaning and disinfection of affected places
- re-stocking of affected places and the use of sentinel birds

2 An Overview of Avian Influenza

2.1 General

Avian influenza (AI) is a highly contagious viral infection, primarily affecting all avian species. Clinical manifestations range from an inapparent form in waterfowl to a rapidly fatal condition characterized by gastrointestinal, respiratory and/or nervous signs in chickens and turkeys. The severity of the disease changes with the strain of virus and the avian species affected.

The disease, originally known as 'fowl plague', was first reported from Italy in 1878. Two forms of the disease are observed in avian species. From 1984, the name Highly Pathogenic Avian Influenza (HPAI) was used to describe the most pathogenic form of the infection. The milder form of infection is known as the Low Pathogenic Avian Influenza (LPAI).
HPAI or LPAI has never been reported in Sri Lanka. Avian Influenza therefore is an exotic disease to the country and in terms of the First Schedule of the Animal Diseases Act No. 59 of 1992; it requires the notification of any suspected cases of AI to the Government Veterinary Authority.

Outbreaks of HPAI in East Asia from 2003, followed by new outbreaks in Africa, Europe, Middle East and South Asia have caused devastating effects to the local economies. In addition, recent changes in the biological properties of the virus, particularly the development of the capacity of AI (H5N1) virus to infect humans, has led to a situation of serious public health concern.

2.2 Etiology and Pathogenicity

2.2.1 AI virus

All AI viruses are members of the family Orthomyxoviridae. These viruses are pleomorphic, single-stranded ribonucleic acid (RNA) viruses. They have an envelope studded with symmetrical glycoprotein projections that have haemagglutinating (H) and neuraminidase (N) activity that undergo antigenic variation. These two surface antigens, known as haemagglutinating antigen (HA) and neuraminidase antigen (NA), are the bases for describing the serologic identity of the influenza viruses using the letters "H" and "N" with the appropriate numbers in the virus designation (e.g., H5N2).

There are three antigenically distinct types of influenza virus-Types A, B, and C. In addition, there are now 16 haemagglutinin and 9 neuraminidase subtype antigens described in the Type A influenza viruses. The type specificity is determined by the antigenic nature of the nucleoprotein (NP) and matrix (M) antigens. Only Influenza Type A has been isolated from birds. At present, sixteen H antigens (H1 –H16) and nine N antigens (N1-N9) have been identified. Each subtype has a different combination of H and N, comprising one each from among the 16 H and 9 N antigens (e.g. H1N1, H3N1, H3N2, H5N1 etc). Due to the risk of a H5 and H7 virus of low

virulence becoming virulent by mutation, infections of all H5 and H7 viruses have been identified as Notifiable Avian Influenza (NAI) by the OIE since 2004.

2.2.2 Pathogenicity

The species in the orders *Anseriformes* (ducks, geese, swans) and *Charadriiformes* (shorebirds, waders, gulls) are regarded as the reservoir hosts for influenza viruses. HPAI due to H5 and H7 subtypes can cause severe clinical disease and even subtypes of low pathogenicity, including H5 and H7, can be associated with severe clinical disease in the presence of other infectious agents. The pathogenicity of AI viruses depends on the genetic properties of the virus and the species of the host. *Only viruses with H5 and H7 antigens have been isolated so far from HPAI outbreaks in poultry.*

It has been recorded that Low Pathogenicity Avian Influenza (LPAI) infections of chickens and turkeys with H5 and H7 subtypes that have been allowed to continue without adequate control or eradication procedures have ultimately turned into virulent HPAI infections.

2.3 OIE Definition of Avian Influenza

The OIE has adopted the following criteria for classifying Avian Influenza for notification purposes (OIE Terrestrial Animal Health Code 2005).

2.3.1 Notifiable Avian Influenza (NAI)

An infection of poultry caused by any influenza A virus of the H5 or H7 subtypes or by any AI virus with an Intravenous Pathogenicity Index (IVPI) greater than 1.2 (or as an alternative at least 75% mortality).

NAI viruses can be divided into Highly Pathogenic Notifiable Avian Influenza (HPNAI) and Low Pathogenicity Notifiable Avian Influenza (LPNAI).

2.4 History and World Distribution of the Virus

Fowl plague was first reported and described as a serious disease of poultry in Italy in 1878 by Perroncito. The virus, as the causative agent of fowl plague, was discovered by Centanni and Savunozzi in 1901, but it was not until 1955 that the viruses were characterized and identified as Type A influenza viruses. The viruses related to the original fowl plague isolates that caused high mortality and morbidity among chickens, and other poultry and birds are found in most countries of the world where poultry is produced. Disease outbreaks involving the designated "HPAI virus" have been periodically reported in many parts of the globe including North America, the Middle East, the Far East, Europe, Australia, England, and the former Soviet Union. However, the distribution of AI viruses is clearly influenced by the distribution of both

the domestic and wild avian species, the locality of poultry production, migratory routes, season, and the disease reporting systems used. AI virus occurs, in one or a number of its many serotypes, in all continents where research has been carried out. It appears to be endemic in waterfowl, in which it does not often cause disease. Migratory birds are considered to be one of the means by which the disease travels across and between continents.

Since 1955, all highly pathogenic outbreaks have been attributed to viruses of the subtypes H5 and H7. These subtypes have repeatedly demonstrated the tendency to mutate from low-pathogenicity strains to highly pathogenic forms over a period of time, circulating within a poultry population of mainly Galliformes (chicken-like birds). This has prompted the OIE to redefine its reporting requirements for AI. In 1997, it was reported that a highly pathogenic H5N1 strain of AI virus circulating within poultry populations in Southeast Asia had been transmitted from poultry to humans. This infection resulted in death in a high percentage of the people who became infected with the virus, following very close contact with sick or dead birds. Over the following years, the H5N1 Asian strain continued to cause outbreaks of disease in poultry flocks in Asia. The virus demonstrated high pathogenicity in a number of species, including domestic and wild waterfowl (Anseriformes) and some carnivorous mammals.

The waves of outbreaks that started in Southeast Asia in late 2003 and it has the potential to invade new territories in the future due to changing biological characteristics and mass movement of migratory birds.

2.5 Epidemiology

2.5.1 Susceptible Species

AI virus can infect almost all commercial, domestic and wild avian species. Infections in monkeys, pigs, ferrets, horses, cattle, felines, seals and whales have been reported. The significance of non-avian species in spreading HPAI viruses is not well understood, but appears to be minimal, although the role of cats and pigs requires further investigation.

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Chickens and turkeys: Chickens and turkeys are highly susceptible to infection and clinical disease.

Ducks and geese: Ducks and geese are susceptible to infection with all AI virus strains, but only some very virulent viruses produce clinical disease. AI virus is commonly isolated from these species in endemic areas. Their potential as reservoir hosts has led to waterfowl being considered a major source of virus for poultry.

Guinea fowl, quail, pheasant and partridge: Guinea fowl, quail, pheasant and partridge are susceptible to infection and clinical disease.

***Other wild birds*:** HPAI viruses are readily recovered from free-flying migratory (Antidae family) birds throughout the world. No significant disease problems due to HPAI are known to

occur in these birds. However, research suggests that the huge pool of viruses in wild birds, especially waterfowl, in which the virus replicates in the intestine, provides the opportunity for new combinations of H and N subtype viruses to arise through genetic re-assortment.

Crows: Crows have been reported dead in repeated outbreaks in Japan.

2.5.2 Incubation Period

Incubation periods are extremely variable for HPAI, ranging from a few hours to 2–3 days. The *OIE Terrestrial Animal Health Code* gives a maximum incubation period of 21 days, for regulatory purposes. The less virulent strains have a very variable incubation period, but their transmissibility should ensure that many sick birds would be seen in the early stages of an outbreak. An incubation period extending to 16 days, for both LPAI and HPAI, has been recorded.

2.5.3 Persistence of Virus

Environmental conditions have a marked effect on virus survival outside the bird. HPAI viruses are not very resistant to warm temperatures, but they remain viable for longer periods in cold and humid environments. Survival is prolonged in aerosols, by high relative humidity and low temperature; low temperature and high moisture levels also prolong survival in the feces.

The AI (H5N1) virus can survive in feces for at least 35 days at low temperature (4^0C); at 37^0C, and it could survive for six days in stability tests on fecal samples. It can survive in manure for three months in cool temperatures, and a single gram of contaminated manure can contain enough virus to infect a million birds. While the virus can survive within the poultry house environment for up to five weeks, its survival in the dust in poultry houses has been reported for two weeks after depopulation.

The virus is stable over a pH range of 5.5 – 8 and, is destroyed by the acidic pH.

HPAI virus can be isolated from lake water where waterfowl are present. It may remain infective in lake water for up to four days at 22°C and over 30 days at 0°C.

The presence of lipid in the HPAI virus envelope makes it highly susceptible to disinfectants, including detergents, but only if items have been properly cleaned before they are disinfected.

Wild birds

HPAI virus can infect almost all wild avian species, which form an important reservoir for the virus. AI virus that is highly pathogenic for domestic poultry could emerge from the pool of viruses in wild birds at any time.

Waterfowl

Wild aquatic birds, such as waterfowl and seabirds, are important reservoirs and can shed AI virus for up to one month, compared with two weeks in the case of domestic species. HPAI virus from waterfowl can remain viable in feces and water for up to 32 days.

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Wild Birds other than waterfowl

HPAI virus has been recovered from autolysed carcasses of wild birds (other than waterfowl) after 23 days at 4°C. The virus has been isolated from captured exotic species, but the duration of virus excretion is not known.

Live poultry

Viruses with the potential to be highly pathogenic for chickens and turkeys can be carried and shed in feces and from the respiratory tract for at least two weeks and up to 30 days by birds after recovery from the disease, while the virulent viruses can be carried by other avian species without signs of clinical disease. The importance of spread by live poultry became apparent in the 2004 Eastern Asia epidemic. Cloacal shedding can continue for longer than 30 days after infection in the presence of immunosuppressive diseases or other physical stresses.

Carcasses

HPAI virus survives for several days in carcasses at ambient temperatures, compared with a few weeks at refrigeration temperatures. There is insufficient data on the spread of virus from fresh, frozen and processed meat, but this has not been highlighted as an important method of transmission in outbreaks. Birds processed during the viraemic stage will contaminate other carcasses with blood or fecal material containing virus. Packaging and the drips that develop during storage are also important, as both can be contaminated with virus from infected carcasses.

Meat products

Virus can persist in poultry meat products. Following temperatures are considered to be sufficient to kill HPAI viruses in cooked poultry meat products:

- 70°C for a minimum of 30 minutes;
- 75°C for a minimum of 5 minutes; or
- 80°C for a minimum of 1 minute

Table eggs and egg products

Although severely affected birds will stop laying, eggs laid in the early phase of an outbreak could contain HPAI virus in the albumen and yolk and/or on the shell. The virus can penetrate cracked or intact shells and, more significantly, contaminate the egg trays. The survival time on the eggs and trays is sufficient to allow wide dissemination.

Eggs laid by birds with LPAI infections have significant external AI virus contamination, as the oviduct is a site of virus reproduction.

Egg products could be another source of the virus. Pasteurization procedures are not sufficient to inactivate HPAI virus, which requires at least 4.5 minutes at 64°C, 5 minutes at 60°C or over 15 minutes a 55°C

Fertile eggs

HPAI virus has been isolated from eggs laid by infected breeding hens.

Poultry byproducts

Rendered meals, produced from boned-out skeletons, viscera, blood, feathers, feet, heads, necks, off cuts, are added to poultry feed as poultry offal meal and tallow. They may also be added to pet foods.

Poultry offal meal and pet foods are usually cooked at above 100°C for from several minutes to more than one hour, which is sufficient to kill HPAI virus. However, if the procedure is not carried out properly or cooked product is subsequently contaminated by unprocessed products, HPAI virus could persist in the byproduct for several weeks.

Waste products

Waste can be any of the unwanted byproducts of processing. All products that go into the production of rendered meals may also be discarded as waste. In addition, there will be wastes from hatcheries, laboratories (cultures and specimens, dead birds), farms, processing establishments and egg marketing establishments (unsalable eggs), as well as chicken manure and litter. HPAI virus has the potential to persist in these products and could be spread by vehicles that transport them unless the products are treated before movement.

Fomites

Persistence of the virus in feces and respiratory secretions is of major importance. Their stickiness facilitates spread over a wide geographical area on footwear, clothing, equipment and other fomites. This is the main way infection is transmitted between premises.

2.5.4 Modes of Transmission

Not all strains of AI viruses are highly transmissible for poultry; highly and lesser pathogenic viruses can begin with low transmissibility but, following passage through flocks, transmissibility as well as pathogenicity for the host can increase in the field.

The significance of live poultry markets in generating and spreading HPAI has been observed in several countries. Live market movements have also assisted the dissemination of LPAI viruses in some countries.

In recent times, dissemination of HPAI virus between flocks has been primarily attributed to:

- the movement of infected birds (including vaccinated birds), and
- the actions of humans in moving feedstuff, personnel, equipment and vehicles into and from premises that are contaminated with infected feces or respiratory secretions

Contamination of personnel and fomites is now being considered as the principal way that infection spreads during outbreaks.

Aerosols may cause some secondary spread during AI outbreaks.

Wild birds

Direct or indirect contact with waterfowl is the most likely source of infection in poultry.

Live poultry

Transmissibility in poultry varies enormously between AI virus strains. Contact with feces or respiratory secretions are important, while airborne spread is not considered significant.

Eggs

Vertical transmission via infected eggs has never been proved, although HPAI virus has been detected on the shell surface and in the yolk and albumen of eggs, suggesting that the potential for spread exists. Normal incubation temperatures of 38.7°C in the early stages of embryo development may be lethal to HPAI virus, or infected embryos may be killed by the virus early during incubation. Persistence through the incubation process is most likely through shell contamination.

Fomites

HPAI can spread very rapidly and can be carried over long distances by transport of contaminated materials such as bird cages, pallets, egg trays/boxes, manure and feed, and on contaminated clothing, equipment and vehicles.

Other vectors

There is no evidence to suggest that invertebrates are involved in the inter-epidemic maintenance of transmission. However, there is a possibility of mechanical transmission by either invertebrate or vertebrate vectors through contact with infected feces, although such transmission would be infrequent.

2.5.5 Factors Influencing Transmission

The principal means by which highly and lesser pathogenic AI viruses initiate outbreaks is through contamination by wild birds of food or water supplies of poultry. Subsequent spread of

infection is through the movements of infected live birds or of faecally contaminated feed, equipment, materials and personnel.

Infected backyard poultry and live bird markets can be a source of HPAI virus for commercial poultry, so it is important that the commercial poultry industry operates with strict biosecurity measures to prevent the inadvertent transfer of infection to commercial flocks.

Lower temperatures and higher relative humidity favor HPAI virus survival.

Improving biosecurity is the most important way that poultry producers can prevent the spread of HPAI virus.

2.6 Diagnosis of the Disease

2.6.1 Clinical Signs

The clinical signs of AI infection are variable and influenced greatly by the virulence of the viruses involved, the species affected, age, immune status, existence of concurrent infections and the environment. The pathogenicity in chickens can vary during an outbreak.

HPAI

- In acute cases involving sudden death (per acute), clinical signs may not be seen and mortalities occur as early as 24 hours after the first signs of the disease, and frequently within 48 hours. In other cases, there are more diverse visible signs, and mortalities can be delayed for as long as a week. Overall mortality rates for per acute/acute cases of nearly 100% have been reported.

- Clinical signs in chickens and turkeys include severe respiratory signs with excessively watery eyes and sinusitis, cyanosis of the combs, wattle and shanks, edema of the head, ruffled feathers, diarrhea and nervous signs. The last eggs laid after the onset of illness frequently have no shells.

The disease in turkeys is similar to that seen in chickens, but is often complicated by secondary infections such as fowl cholera, turkey coryza and colibacillosis.

LPAI

- Clinical signs in chickens and turkeys range from inapparent to mild or severe respiratory disease and can be confused with infectious laryngotracheitis and other respiratory tract infections.

- Mortality may vary from 3% to 15 %. High mortalities of up to 90% have been recorded in young turkey poults.

- Egg production in layers can drop by up to 45%, with recovery to normal in 2–4 weeks.

2.6.2 Pathogenesis

Most HPAI viruses isolated from poultry have been from chickens and turkeys. Clinical signs result from the replication of the virus in the respiratory tract and subsequent systemic replication in the visceral organs and brain. The viruses that are non-pathogenic, replicate only on the surfaces of the respiratory tract and intestinal tract.

2.6.3 Pathology

Gross lesions

In many cases, poultry dying from per acute form of the disease lack visible gross lesions; such chickens die on day one or day two after infection. In the acute infections recorded in some countries there have been severe lung congestion, hemorrhage and edema in dead chickens; other organs and tissues appeared normal.

In the acute form of infection, more diverse visible lesions are evident. Chickens have ruffled feathers, congestion and/or cyanosis of the comb and wattles, and swollen heads. The changes in the comb and wattles progress to depressed areas of dark red to blue areas of alchemic necrosis. Internally, the characteristics of acute infections with viruses causing HPAI are hemorrhagic, necrotic, congestive and transudative changes. The oviducts and intestines often have severe hemorrhagic changes. As the disease progresses, the pancreas, liver, spleen, kidney and lungs can display yellowish necrotic foci. Hemorrhages (petechial and ecchymotic) cover the abdominal fat, serosal surfaces and peritoneum. The peritoneal cavity is frequently filled with yolk from ruptured ova, associated with severe inflammation of the air sacs and peritoneum in birds that survive 7–10 days. Hemorrhages may be present in the proventriculus, particularly at the junction with the gizzard.
In infections such as mildly pathogenic AI, lesions may be seen in the sinuses, characterized by catarrhal, serofibrinous, mucopurulent or caseous inflammation. The tracheal mucosa may be edematous with an exudate varying from serous to caseous. The air sacs may be thickened and have a fibrinous to caseous exudate. Catarrhal to fibrinous peritonitis and egg yolk peritonitis may be seen. Catarrhal to fibrinous enteritis may be seen in the caeca and/or intestine, particularly in turkeys. Exudates may be seen in the oviducts of laying birds.

2.7 Diagnostic Techniques

As pathological changes are not definitive for the disease, diagnosis needs to be confirmed by the isolation and characterization of the causative virus.

Serological tests are used to demonstrate the presence of antibodies that may be detected five to seven days post infection. Most commonly used technique is the haemagglutination inhibition (HI) test to detect antibodies to the HA (see SOP xx).

In serologic surveillance programs, the test for the detection of anti-NP (nucleo proteins) antibody is the most commonly used method because it detects antibodies to a cross-reactive antigen shared by all Influenza Type A viruses. However, it is important to be cautious because there is a significant variation in the immune reaction among different avian species. The test can be used as a Rapid test for HPAI detection. Also, Enzyme Linked Immuno absorbent Assay (ELISA) is being used for Sero-surveillance.

For confirmation of the disease either Virus Isolation (Egg Inoculation, Haemagglutination, Haemagglutination Inhibition Test) or Reverse Transcriptase Polymerase Chain Reaction (Rt – PCR and QPCR) is performed.

Table 2-1 Laboratory Tests for HPAI

	Type of Test	**Time**
Screening Test -Antigen Detection	Rapid HPAI detection	1 hour
For Confirmation -	* Egg Inoculation * Haemagglutination * Haemagglutination Inhibition Test Agar GD	4 – 7 days 2 days 2 days (Altogether 10 days)
For Confirmation – Direct RNA Detection	Rt –PCR QPCR (Real time PCR)	1 days 1 day
For Sero Surveillance	Enzyme Linked Immuno absorbent Assay (ELISA)	1 day

2.8 Differential Diagnosis

Depending on the clinical picture and the species affected, the differential diagnosis should include systemic diseases for HPAI and respiratory diseases for LPAI. HPAI could be confused with a number of other diseases that have similar clinical symptoms. Diseases that can cause a large number of sudden deaths of birds include:

- Newcastle disease
- Acute fowl cholera
- Infectious laryngotracheitis
- Escherichia coli cellulitis of the comb and wattles; and
- Acute poisonings
- Management mishaps (i.e: power failures)

HPAI should be suspected whenever sudden bird deaths occur with severe depression, loss of appetite, nervous signs, watery diarrhea, severe respiratory signs and/or a drastic drop in egg production, with production of abnormal eggs. The likelihood of HPAI is increased by the

presence of facial subcutaneous edema, swollen and cyanotic combs and wattles, and petechial hemorrhages on the internal membrane surfaces. Young chickens, or those dying from per acute form of the disease, may not show any lesions.

In the milder forms of AI, it may be confused with other common viral respiratory diseases such as IB, ILT, infections with mycoplasma spp.

3 Poultry Production, Veterinary Services and Risks of Entry of Avian Influenza

3.1 General

Beginning from a backyard system, the poultry sector in Sri Lanka has shown a phenomenal growth and has emerged as a dynamic industry within a short span of time. With a rapidly increasing participation of the private sector, the industry has shown a rapid progress particularly from the year 1990 onwards. The growth was more prominent in the broiler sector, but less remarkable in the layer sector.

The poultry industry today, is to a great extent in the hands of the private sector, few companies dominating the industry output. Due to major structural changes that have taken place in the industry over the past several decades, economies of scale have led to higher productivity and increased competitiveness. Integration has taken place in the sector and at present, the industry is capable of meeting the domestic demand for chicken meat and eggs.

The country's breeder and commercial poultry farms, feed manufacturing plants and processing establishments are mostly concentrated in the Western Province (WP) and North-Western Province (NWP), the area being called the *poultry belt* (Annexure 01). Poultry production is concentrated in these areas due to increased consumption levels, transport and marketing facilities and availability of land (in the NWP) and other resources conducive for poultry production

Intensification in the poultry industry has clearly differentiated into two production systems, the organized commercial (intensive) poultry production and the backyard poultry production systems (Annexure 02). The former comprises three subsystems, viz. industrial integrated, intensive and semi intensive, and their respective bio-security levels may be described as high, moderate and low to minimal. Bio-security in the backyard system is minimal.

3.2 Organized Commercial (intensive) System

Layer

Small-medium scale farms: These are individual farms which are located outside NWP and WP. The average flock size varies and may range from 300 to 1000.

Large-scale farms: These farms are mostly concentrated in the NWP and the WP. Average flock size is above 1000 birds. Input supply (day-old chicks, feed, medicines, vaccines) are provided by Feed Manufacturers and Feed Mixers in the NWP.

Broiler

Small-scale farms: These are individual farms which are not linked to an organized buy-back (out-grower) system. The average flock size varies and may range from 300 to 1000.

Out-grower (large-scale) farms: These are farms which are either linked to integrated companies and operate as out-grower farms or are maintained by integrated companies. The average flock size in out-grower farms is above 1000 and, it could go up to 25,000 birds or more in company owned farms.

3.3 Backyard System

Backyard poultry farms are scattered in the island and average flock size per holding is around 10 to 25.

3.4 Veterinary Services to Poultry Farms

Veterinary services to the poultry sector are provided both by the government as well as by private sector. The Department of Animal Production and Health (DAPH) under the National Government and the Provincial DAPHs under the respective Provincial Councils constitute the government veterinary services. The veterinarians employed for extension and marketing activities by private firms dealing with feed, pharmaceuticals, day old chicks and poultry equipment also are engaged in delivery of veterinary services to poultry farmers. In addition, there are also large poultry farms, which have employed veterinarians to attend to their needs.

3.5 Government Veterinary Service

The DAPH established in 1978 is the main organization responsible for the veterinary service in in Sri Lanka. It is the national level institution responsible for the control of animal diseases, livestock research, animal breeding, training of trainers in animal husbandry, preparation of project proposals for developing the industry and implementing special development programs at national level. DAPH also implements a range of statutes to regulate important aspects of the livestock industry and provide technical backstopping to the Provincial DAPHs.

The most important function of the DAPH is the surveillance/control of scheduled and emerging animal diseases of economic importance by implementing suitable strategies and eradication programs which is carried out by the Division of Animal Health. District level disease diagnosis and surveillance is done by the Veterinary Investigation Centers (VICs). Each VIC is headed by a Veterinary Investigation Officer (VIO) supported by a Research Assistant. These centers are equipped with the required disinfectants, personal protection gears and rapid test kits to diagnose HPAI at field level.

The VIOs are trained to investigate suspected outbreaks of AI, including carrying out post-mortems, collection of specimens and transport of same to the VRI for confirmatory diagnosis. Veterinary Research Institute (VRI) which functions under the DAPH is responsible for planning and implementing research programs and provides technical products and specialized services required for diagnosis and confirmation of animal diseases including HPAI.

The Provincial DAPHs are responsible for carrying out livestock development programs relevant to their provinces in addition to implementing at field level, the national programs on animal health, animal breeding and human resource development, with the support and the technical backstopping provided by the (National) DAPH. The delivery of field level services is carried out by the Provincial DAPHs through a network of Divisional Veterinary Offices each manned by a veterinary surgeon and assisted on the average by about three middle level technicians.

3.6 Risk Factors for HPAI Incursion to Sri Lanka

HPAI has never been reported in Sri Lanka. The disease could enter Sri Lanka in several ways. However, Sri Lanka being an island, the risk of HPAI being introduced to the country could be minimized, if the possible routes of its introduction are identified and strict preventive measures adopted.

Possible sources

The virus could be introduced to Sri Lanka through the following sources.

1. Migratory and wild birds
2. Imports of live poultry or poultry products and by-products from affected countries.
3. Imports of pet birds from other countries.
4. Smuggling of pet birds, poultry and poultry meat from other countries.
5. International passengers and fomites.

3.6.1 Migratory Birds and Wild Birds

A large number of migratory birds annually visit Sri Lanka during the period September to November through the Central Asian Flyway (Eastern, Western and Andaman) into the Northern, Southern and Western regions of the country. These birds begin to leave the country by February. Migratory birds arriving via the Eastern Flyway settle in Northern region such as Mannar and Western fly way route settle in the Kumana Park, Wilpattu etc. It is very difficult to identify and reach these locations of these Flyway risk areas and bird sanctuary areas where these migratory birds settle. Further, wild birds and some aquatic birds from infected countries or flying via infected countries may enter and contaminate the surface water of lakes or lagoons from where backyard indigenous chicken may get infected.

3.6.2 Imports of Live Poultry and Poultry Products

Some HPAI strains of H_5 and H_7 viruses have been reported from several countries and there is a possibility of introduction of such a strain through certified legal imports of poultry and poultry products. HPAI is also known to be transmitted through contaminated surfaces of eggs and therefore hatching eggs could be a potential source of HPAI infection.

It is also known that pigs could harbor the avian influenza (highly pathogenic or mildly pathogenic) virus and transmit it without showing any clinical signs and symptoms. Even though

there is no evidence so far of the current HPAI subtypes being present in pigs, precautions need to be taken.

3.6.3 Importation of Pet Birds

Pet bird owners/breeders, National Zoological Gardens and individuals usually import pet birds from other countries on import permits issued by the DAPH. These birds may harbor HPAI viruses without showing any clinical symptoms and shed them posing a danger of introducing the disease to the country.

3.6.4 Smuggling of live poultry, poultry meat and pet birds

Smuggling of live poultry, poultry products and pet birds into the Northern region of Sri Lanka has been observed. This type of illegal imports from infected countries poses a high risk of introducing infection to the country, depends on the survival of the virus in the illegally imported product. Illegal import of live poultry and pet birds from infected countries could pose a high risk to the country.

3.6.5 International passengers and fomites

The virus could remain viable for long periods in fecal material of birds and this is considered to be the main source of transmission from bird to bird and between birds and human beings. There is a possibility of spreading the virus via fecal contamination on clothing and shoes of people coming from infected countries, if such persons have visited infected farms or have come in contact with infected materials, as heavy fecal contamination is possible unless such person/s are not careful about personal hygiene.

Further, the bio-security measures currently adopted at the ports of entry may not be adequate to screen out the passengers who arrive from HPAI infected countries or had visited HPAI infected poultry farms.

3.7 Conclusion

When all the above factors are taken into consideration, it may be concluded that the overall risk of introduction of HPAI virus into the country is at a moderate level. While migratory birds pose the highest risk, the risk from international passengers arriving from HPAI infected countries also must be taken into account.

4 National Policy and Strategies for HPAI Control and Eradication

4.1 Policy Statement

According to the OIE, HPAI is a notifiable disease, highly lethal to poultry and has the potential to infect humans. Also, the WHO has recommended that all HPAI outbreaks should be promptly stamped out and advocates protections for workers in depopulation and disposal activities of poultry to avoid human infection of AI which may lead to an influenza pandemic.

Sri Lanka's policy on HPAI in domestic poultry is therefore stamping out, including the possible use of pre-emptive slaughter of poultry which will be at risk of contracting the disease. Vaccination of poultry as an adjunct to stamping out and pre-emptive slaughter or as an effort to control the spread of the disease will not be adopted.

A modified stamping out policy may be adopted for LPAI infections in certain sectors of poultry industry once better bio-security infrastructure and a better understanding of LPAI prevalence in domestic poultry are achieved through active surveillance activities.

The treatment of infected birds is prohibited and no vaccination of birds against AI will be used as a method to control the spread of the disease.

4.2 Principles of Control

For an effective stamping-out initiative and control of NAI, the overall purpose is to;

- isolation of infected premises and rapid imposition of effective quarantine measures of infected premises
- quarantine and movement controls on poultry, poultry products and associated items in declared areas to prevent spread of infection
- rapid slaughter of infected birds and sanitary disposal
- pre-emptive slaughter of birds on other premises, depending on information derived from the tracing, surveillance and study of the origin and behavior of the virus
- decontamination of facilities, products and associated items to eliminate the virus on IPs and to prevent spread in declared areas
- tracing and surveillance to determine the source and extent of infection and to establish proof of freedom from the disease
- increased bio-security at poultry establishments
- public awareness campaign to promote cooperation from the industry and the community, and

4.3 Stamping out of Poultry

All poultry in the infected place as well as pre-emptive depopulation of poultry commercial as well as backyard poultry within a one-kilometer radius of the infected place will be carried out once confirmation of HPAI or LPAI virus infection is made. Decisions on the destruction of birds on premises at high risk (because of their location or management) and dangerous contact premises will be based on the information that becomes available from the tracing, surveillance and pathotyping of viruses.

4.4 Disease Control Zones and Movement Control

The important first steps to control the spread of infection will be to define the boundaries of infection and place restrictions in that area to control the spread of infection and prevent it getting out of the defined infected area.

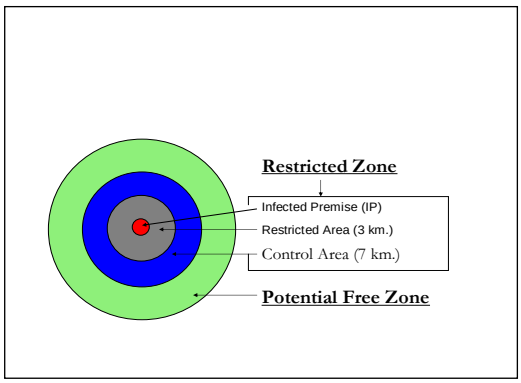
There will be a declaration of two major disease control areas, as shown in Figure 4.1:

- a restricted area (RA) with a radius of 3 km around all IPs. More than one RA may be declared; and

- a control area (CA) encapsulating each RA, with a boundary no closer to the RA boundary than 7 km, to form a buffer between the infected and free areas — this will help contain the disease within the RA, and will have its own level of restrictions.

The Restricted Area (RA will be subjected to strict quarantine, and movement controls on items identified as risk material. Movements of manure and litter off these premises will be prohibited. Equipment (egg boxes/crates, live bird crates etc) and eggs (table and fertile) may need to be destroyed on site. Movements of people and vehicles will be controlled and personal and vehicle decontamination will be required before leaving the premises. The access of wild birds to sheds and water supplies will be restricted. Farmers will be advised to prevent other species of birds entering the premises. Pets will be confined. RAs will be subjected to strict movement controls during investigations into the status of the premises and during the OIE-prescribed incubation period for 21 days. These restrictions may be eased as the situation is better defined. It is important that restrictions on declared premises be eased as soon as circumstances permit.

Figure 4-1 Zoning of Restricted and Control Areas



The initial boundary of the CA may correspond with the district or other geopolitical border, but the boundary will be amended on the basis of epidemiological evidence obtained over time to allow as much commercial activity as possible, in line with accepted disease control measures.

A national standstill for containment of AI infections will not be adopted, since it would have a severe negative effect on the operations of the poultry industry and on the welfare of poultry. Movement controls should not hinder the movements of the general public unless human infection with the outbreak virus is occurring. Quarantine arrangements for humans will need to be imposed in agreement of with health authorities. Industry support for the eradication program through strict bio-security measures on poultry farms will be vital.

4.4 Compartmentalization of Commercial Flocks

For the commercial poultry farms to be considered a separate compartment, as per the OIE definition, from the non-commercial poultry population, the farms must adopt and employ mandatory, auditable and verifiable standards that would ensure effective barriers

Zoning

Zoning could be introduced as soon as possible after the epidemiological investigations have been completed and the extent and severity of the disease have been determined, so as to minimize the destruction of birds. Zoning requirements must be adequate to meet international standards and OIE guidelines. Zones may be established on the basis of geographic areas, enterprises, and infection status. Potential free zones are those areas outside CAs. To achieve free zone status, sero-surveillance to prove freedom within the zone would be required.

If an outbreak of HPAI is rapidly spreading, establishing RAs and CAs containing all IPs as soon as possible will allow rapid investigation of the extent of infection and facilitate the application of zoning. It is important that the smallest possible areas are declared infected areas to cover the likely extent of infection. The relevant factors for establishing zones are as follows:

- Limits should be set on the basis of natural, artificial or legal boundaries
- Documentation should be prepared using the guidelines defined by the OIE Scientific Commission for Animal Diseases, taking account of any specific matters in the relevant chapter of the OIE Terrestrial Code for HPAI
- For industry's operational purposes, each zone should be self-sufficient in poultry operations, including slaughtering.

Zoning will require rigorous surveillance for the disease agent and the imposition of controls on the movement of poultry and poultry products between the infected and free zones. All the restrictions associated with zoning need to be acceptable to the poultry industry.

4.5 Disease Surveillance and Tracing of Origin of AI

Sri Lanka is free of NAI and the purpose of surveillance for AI is to detect any presence of HPAI or LPAI infection in the domestic poultry flocks. Another objective of the surveillance exercise is to monitor disease trends in the event of an outbreak of HPAI or the detection of LPAI in domestic poultry, so as to facilitate the control of the spread of disease.

The Animal Health Division of the DAPH with the help of the government veterinary surgeons network, including the provincial veterinarians, the public health veterinarians and wildlife veterinarians will carry out a passive surveillance for AI and other infectious diseases continuously. This passive surveillance will soon be expanded to cover the private vets both in the corporate sector and individual practice. Any suspected case of AI will be promptly reported and immediately investigated.

In addition to this passive surveillance, there will also be targeted active serological surveillance for AI carried out using rapid test kits and ELISA techniques. Positive serological results will be followed up with virological methods for confirmation. The targeted populations are such as those adjacent to resting sites of migratory birds and wild birds, places where birds and poultry of different origins are mixed, such as live bird markets, and poultry in close proximity to waterfowl or other potential sources of NAIV. Randomized sampling, requiring acceptable sample sizes to detect the presence of NAIV infection at an acceptable level of confidence. The targeted surveillance is timed to coincide with bird migratory seasons in Sri Lanka and carried out regularly during the migratory season.

Active serological or virus detection surveys of birds will be conducted on at-risk and other premises to find the extent of the infection. Backyard poultry also must be included in the surveys, although the main means of controlling the disease and gaining knowledge of its spread will be by defining the extent of infection in the commercial poultry flock.

Active surveillance will also be carried out during an outbreak of HPAI to determine the source and extent of infection and to establish proof of freedom from the disease after the disease control exercises.

Because of the high level of mobility of birds, products and service providers in the industry, the task of tracing will be time consuming. It must begin as soon as possible after HPAI is suspected. Movements of birds, products, people, vehicles and materials, to and from the suspected premises will be traced for at least 20 days before the first signs of disease, and until full quarantine is imposed on the IP. All attempts will be made to trace the original source of the virus, as it could remain a source for more outbreaks.

Similarly, surveillance will be undertaken on those premises considered at risk, and include inspections of birds, follow-up of reports of sick birds, examination of flock records, postmortem and laboratory examination of dead birds, and serological testing of flocks.

Thorough monitoring will be needed to ensure the early detection of AI infection in mammalian species, especially pigs. Any pigs on IPs and in the RA need to be monitored for infection, including collection of samples for virus isolation and serology. Commercial poultry industry is responsible for taking measures to prevent contact between wild birds and poultry.

4.6 Disposal and Decontamination

Disposal of carcasses and manure will be carried out with consideration for the environment. As AI virus is relatively stable in feces and litter, buildings, equipment, vehicles, manure and litter on IPs must all be cleaned and disinfected, or destroyed. The method of disposal will vary from site to site depending on the farm sizes and other local conditions. However, the disposal method used will be one that will minimize the risk of spreading the disease and impact on the environment and suitable for local cultures and practices. There will be specially trained disposal and decontamination person and procedures to address the disposal of carcasses, poultry products and other materials. People should undergo personal decontamination procedures and those engaged in decontamination activities will wear PPE for protection from infection.

Other premises will be decontaminated as considered necessary. All items to be disinfected must be thoroughly cleaned before disinfection.

Decontamination should include standard insect vector and rodent control to prevent mechanical spread of the agent to nearby premises.

4.7 Public Health Implications

Personnel engaged in eradication activities may be vaccinated as advised by the Ministry of Health, treated with antivirals (if appropriate) and be protected from infection by wearing protective clothing. Face masks or other equipment preventing eye splash should be worn at all times when near birds.

4.8 Public Relations and Communication

The overall principle for effective communications in emergency response is to explain policies, plans and practices to all stakeholders clearly, consistently, openly and quickly.

In AI emergency, the news media will require and expect an immediate and constant flow of timely and accurate information. Public reaction on AI outbreak will inevitably be characterized by a sense of urgency, and the situation will be perceived as potentially damaging or perilous. This fear will be heightened by a lack of accurate and timely information — a situation that is commonly encountered at the start of any outbreak. People who have little knowledge about the nature and effect of AI because it has the potential to infect humans, will naturally fear the worst for themselves and their families, animals and livelihoods.

Media demands as such can be expected to be large. Also, media assistance in an emergency will be invaluable.

The principal media spokesmen will be the DG AP&H. He may delegate his authority under certain circumstances. The DG will be assisted by the Director HRD and other relevant Directors of the AP&H.

Media releases by Provincial and local authorities should conform with DAPH recommendations and have a fact sheet on HPAI attached.

4.9 Policy on LPAI

The WHO recommendation for a stamping-out policy currently applies only to HPAI outbreaks in poultry and where there is a risk of human infections, which could arise from HPAI. The OIE has however made both HPAI and LPAI (H5/H7) notifiable diseases (HPNAI and LPNAI) and subject to international trade rules. LPAI (H5/H7) has not been recorded as producing clinical or inapparent infections in humans.

The methods for the control of LPAI (H5/H7) infections in poultry are essentially the same as those for HPAI. The preferred control and eradication option will be stamping out for IPs, if the infection is detected early and immediate surveillance in the area using rapid diagnostic technology indicates no significant spread. Ongoing surveillance for LPAI (H5/H7) infections in at-risk premises will give confidence that infection has been contained and is not establishing widely. These control measures will need to be supported by strict biosecurity by poultry farmers and industry actions to limit the spread of virus in the industry.

4.10 Funding and Compensation

Compensation and rehabilitation policies will be developed in due course in consultation with stakeholders and financial institutions required to implement the Emergency Response, depending on the financial provisions made by the Government of Sri Lanka and international donor organizations.
It is proposed that small scale poultry farmers be paid 100% compensation and provided assistance to restock after the disease is eradicated.

For the commercial industry groups, it is proposed that the government pays a certain proportion of the losses and the industry to bear the balance. However, this has to receive the agreement of the relevant authorities.

5 Emergency Response to HPAI

5.1 Initial Investigation of a Suspected Case of NAI

An initial investigation of poultry premises for NAI will be carried out under the following circumstances.

- Unusual mortality patterns in poultry are reported by a producer, a village level worker such as an LDI or a KRUPANISA or GN etc., or a producer
- Clinical signs suggestive of AI is noted by a veterinarian
- Detection of serological reactors in surveillance activities

The initial investigation will include a clinical examination by the RVS for ruling out AI, submitting the information to the D/AH and apply quarantine and movement control measures at the suspected premises.

5.1.1 Suspicion Made by Farmer or Any Other Individual or by a Private Veterinarian

If the notification is made by the farmer or any other individual, or by a private veterinarian, to DAPH or any office of the DAPH system, the information is communicated immediately to the government veterinary surgeon of the area if he has not been informed about the suspicion by the informant. He will then visit the suspected premises, after taking the necessary precautions, to carry out a preliminary investigation. The RVS will inform his PD and the Director Animal Health of the information he obtained from his visit and his findings. He will alert the D/AH if there is a strong probability that the case he saw was likely to be AI. He will also instruct the owner of the premises to restrict movement off farm immediately to prevent any potentially infected birds or poultry products are taken out of the farm. He will also ensure that enhanced biosecurity measures are put in place in the affected premises.

The D/AH will mobilize the relevant District Emergency Team to carry out detail investigation including collection of specimens/samples for further investigation. The Director Animal Health will keep the DG informed of the alert he has received of AI.

The RVS doing the initial investigation will collect the following information and sent to D/AH for further action:

- Preliminary identification of the productive unit and subunits (topography of the farm), and identification of the unit for which the suspicion has been reported,
- Identification of staff directly involved with that unit,
- Anamnestic data.

The RVS will fax the information on the form provided for ‘Emergency Report on AI’ as well as the ‘Avian Influenza Epidemiological Inquiry Form’ to the D/AH. These forms are given as Annex 08 and 09

With reference to the epidemiological investigation, it is important that:

- **Animal movement**; animal movements should be recorded up to 20 days prior to the onset of the first clinical signs
- **People movements**; all people (staff, relatives, servicing personnel, veterinarians) who had access to the farm must be recorded
- **Vehicle movements**; all vehicles, regardless of their contact with animals, which have had access to the farm must be reported

5.1.2 Detection of AI at a Laboratory

Similarly if a VIC or any other diagnostic laboratory suspects a case of AI while performing their investigation work, or any serological evidence detected in poultry populations during surveillance activities, such information is communicated immediately to the Director Animal Health of the DAPH for further action.

The D/AH will then instruct the PD and the relevant RVS to immediately visit the suspected premises and apply movement control at the site and apply biosecurity measures. The RVS will also collect information on the form provided for 'Emergency Report on AI' as well as the 'Avian Influenza Epidemiological Inquiry Form' and fax them to the D/AH.

5.1.3 Suspicion Raised by Abattoir Staff

If any suspicion was raised by an inspector or a veterinarian at a poultry abattoir about pathological signs similar to AI, the information then should be communicated immediately to the D/AH. He will then inform the respective PD and the RVS regarding action to prevent any products are moved out of the abattoir premises and will direct the DET to visit the abattoir for further investigation. The DG will be kept informed of the situation.

The RVS will seal the premises and prevent any products moving out from the abattoir till a definitive diagnosis is made. In the meantime he will help the DET to collect information to trace the origin of the birds to the growers and to the hatchery and will also collect information about the transport vehicles, workers involved etc.

5.1.4 Clinical Investigation

The RVS in the initial investigation will do a clinical investigation to establish the clinical situation on the farm, including ill and suspect birds. The clinical investigation must be performed on all susceptible species present on the farm, and it must begin from the most peripheral units. Particular attention must be paid to any vaccinations performed. All this information must be reported in the epidemiological investigation form.

All the birds present PER species must be identified, and for each species identified, a report containing the date of onset of clinical signs, description of clinical signs and reported percentage mortality must be prepared.

5.2 Subsequent Investigation

Following the initial investigation, the DET will visit the premises and will undertake a detailed investigation including collection of specimen and samples collection for further investigation. The HPAI diagnosis and reporting network is depicted in Annex 03.

5.2.1 Collection of Pathological Samples

In cases of suspected HPAI the following pathological samples must be collected and sent to the laboratory:

a. At least 5 moribund birds (for post-mortem examination)
b. Pooled tracheal and lung samples from at least 5 moribund birds
c. Pooled intestine samples from at least 5 moribund birds
d. Cloacal and tracheal swabs from healthy birds (also from waterfowl)
e. At least 10 blood samples (acute sera).

Samples from different apparatuses must not be pooled. They must be packaged appropriately (in leak proof containers, wrapped in at least two plastic bags), to avoid dissemination of the infectious agent, and transported safely to the laboratory. Sacrificed animals may be transported in a sealed autoclavable plastic bag, inserted inside a similar, sealed bag. All samples must be carried to the laboratory inside a polystyrene box containing icepacks. The polystyrene box must be appropriately disinfected before leaving the premises.

The samples must be accompanied by sample submission form.

The driver in charge of delivering the samples must drive directly to the laboratory without any intermediate stops.

The procedures for sample collection and dispatch to the diagnostic laboratory for avian influenza is presented in Annex 03

5.3 Laboratory Testing

The specimens/samples sent by the RVS and the DETs will be tested for the presence or evidence of infection with Influenza Type A and for the presence of H5 and H7 subtypes using cELISA or RRT-PCR. The laboratory receiving the samples will also inoculate embryonated eggs for virus isolation and for confirmation of AI.

The results of cELISA and RRT-PCR tests for AI will be available within one day. However, the confirmatory test HAHI test will take about 10 days.

Based on the cELISA and RRT-PCR AI control activities will be engaged to minimize the spread of the infection.

5.4 Disease Control Activities

5.4.1 Legislative declaration, quarantine and movement control

If the diagnostic tests are found to be positive for HPAI, IPs and RA will be declared by DG/DAPH under the provisions of the Animals Disease Act No. 59 of 1992, and quarantine measures are implemented in the RA (Annex 10). A press release will also be issued by DG.

Premises where HPAI is detected will have a signage indicating DISEASE CONTROL AREA –KEEP OUT and fixed at the entrance to the premises in a prominent manner. The poultry and poultry products at the infected place will be ordered destroyed.

5.4.2 Depopulation, disposal and decontamination

If the tests are found to be positive, specially trained depopulation teams will be mobilized by the PDs who will moves into the IPs and into the RA to carry out the depopulation of birds. Poultry from infected premises and pre-emptive depopulation through destruction of all poultry flocks within a 1 km radius of the infected premises will be carried out immediately by the depopulation teams under the supervision of the PDs. Priority for this depopulation effort will be given to premises at the periphery of the RA towards the center and then to similar production type premises.

Birds are killed using carbon dioxide or any other suitable humane method without causing bleeding. The carcasses together with the litter, feed and other material which cannot be properly disinfected will then be incinerated/ buried in the affected farm premises itself. If it is not possible to dispose the carcasses and other material in the farm premises, action will be taken to carry the dead birds and the rest in leak proof bags and in a special container truck which is also leak-proof to a suitable place for disposal.

Once the premises are depopulated the carcasses will be disposed with consideration to the environment and with methods to minimize the risk of spread of disease. Carcasses are disposed in the infected premises itself if conditions permit. In places where disposal is not possible at site, the carcasses are transported in sealed leak-proof bags to a suitable location for disposal.
The premises are then decontaminated by specially trained decontamination teams from the PD who will visit the premises and decontamination carried out according to recommended methods and using recommended detergents.

5.4.3. Communication and Public Awareness

Any report of a possible outbreak of AI in Sri Lanka will attract media interest and will be front-page news across the nation. It can also be expected to dominate television and radio coverage, including leading talk-back programs. Public reaction will inevitably be characterized by a sense of urgency, and the situation will be perceived as potentially damaging or perilous. This fear will be heightened by a lack of accurate and timely information — a situation that is commonly encountered at the start of any outbreak. People who have little knowledge about the nature and effect of AI because it has the potential to infect humans, will naturally fear the worst for themselves and their families, animals and livelihoods.

In the atmosphere of an emergency, the news media can either become part of the solution to the problem or, if mishandled, part of the problem. Cultivating a professional working relationship with the media under stressful emergency conditions is therefore a critical element in an effective emergency response. This relationship needs to be fostered well in advance of any emergency due to an AI outbreak.

5.4.4. Surveillance

When the presence of NAI is first detected in domestic poultry, active targeted serological surveillance is operationalized directed at premises in close proximity to the infected premises and premises that have had significant contact with the infected flock through movement of people, things or birds. Surveillance activities will include dead bird surveillance twice a week for three weeks, and weekly status reports of flocks in the restricted and control areas.

The outbreak surveillance is done to determine if the infection has already spread to these premises. Surveillance will also help to potentially identify what the source of introduction of the virus into the first identified flock may have been.

Also, surveillance will be carried out in flocks considered to be at risk after being exposed to AI virus. Active Sero-surveillance will be carried out in RA continuously for 12 months to determine the disease status.

Premises with Significant Epidemiological Contact outside CA will be identified by the D/AH and such information is passed on to the RVS and the PD. These premises will be kept under strict surveillance. The farmers of such premises will be provided with information on clinical signs of AI and will be told to contact the RVS immediately if any event suggesting an AI outbreak occurs.

5.4.5 Tracing on Positive Infected Places

This is required to determine the possible source of infection and includes both trace-out and trace-in
Procedures during the critical period according to OIE Terrestrial Animal Health Code is 21 days preceding the onset of the clinical signs of AI, and this provides for three cycles or more of the virus in the infected flock.

Tracing will include poultry and poultry products, poultry transport vehicles, feed trucks, trucks bringing in and talking out poultry litter, human and other vehicular traffic and people in the animal service industry including veterinarians.

The epidemiology questionnaire for this purpose should be followed. Based on an epidemiological evaluation of the traced premises, decision for eradication or for monitoring will be made by the D/AH.

6 Organizational Arrangements and Response Mobilization

6.1 Organizational Arrangement

An effective response mechanism for an incursion of AI would involve taking important technical decisions and implementing them promptly such as declaring infected area, depopulation and disposal of stock, and disinfection of persons, vehicles, equipment etc. as well as many (non-technical) support activities such as payment of compensation and enforcement of statutory requirements including movement controls, and keeping the public well informed of the situation etc. All these activities have to be effectively coordinated if the response mechanisms are to succeed. This is an important issue which has become more complex with the devolution of some administrative functions to the Provinces.

In addition to the devolved functions being carried out by the respective Provincial Councils, the centrally controlled administrative functions carried out through are need also be coordinated at District and Provincial level for effective implementation of a control and eradication program for AI. Taking into account of this duality of administrative responsibilities, organizational arrangements have to be considered at National, Provincial, District and local levels. It may be emphasized that most of the structures thus established/strengthened to prepare for and respond to an AI incursion may well be framework for responding to other animal health emergencies as well.

Some officers e.g. Provincial Directors of Animal Production and Health (PDs/APH) may be required to serve in several committees which meet in different locations making it impossible for them to attend all meetings regularly. Such officers may arrange their regular representation by nominating an appropriate senior officer from their respective agencies, who would promptly update them with the relevant information.

6.2 National Level Structures

6.2.1 Inter-Ministerial Emergency Response Committee for Avian and Pandemic Influenza

National level coordination of the response mechanisms shall be the responsibility of an Inter-Ministerial Emergency Response Committee for Avian and Pandemic Influenza (IMERC–API) co-chaired by the Ministers of “Healthcare and Nutrition” and “Livestock Development” respectively. The membership of this Committee will include the Secretaries of these two Ministries as well as Secretaries of the Ministries of Finance, Public Administration, Wild life and Tourism, Disaster Management, Information, Internal Security/Police etc. and Director Generals of the Department of Health Services and DAPH. Others will be co-opted as and when necessary. A Secretary may be represented by a senior officer of the respective Ministry, specially identified for the purpose, who will keep the Secretary and through him the Minister updated about any developments in the Avian and Pandemic Influenza status and any interventions expected of them.

The inaugural meeting of the Committee will be convened by the Minister of Healthcare and Nutrition to emphasize the public health significance of the disease. Thereafter, the Minister of Livestock Development will take the lead role considering its significance to the poultry industry and the fact that humans get it only through contact with affected birds. This Committee will meet as often as it deems fit, but at least once in six ~~three~~ months, consider the reports submitted to it by the Joint Technical Committee on Avian and Pandemic Influenza and the National Animal Health Committee (see below), and monitor the overall progress of the preparatory (and if applicable, control) activities. Agreement will also be reached on broad areas of support the respective Ministries would provide in case of an emergency situation and the members will be made aware of the need to be available at short notice in such an eventuality.

6.2.2 Joint Technical Committee on Avian and Pandemic Influenza

A Joint Technical Committee on Avian and Pandemic Influenza (JTC–API), co-chaired by the Chief Epidemiologist of the MoHN and DG/APH has been in operation since 2005. It has a broad representation of relevant government and international agencies and meets regularly once a month to share information about technical aspects and relevant developments, develop diagnostic and response procedures and monitors the progress on preparatory activities.

Quarterly reports to the IMERC-API and make appropriate recommendations for the strengthening of mechanisms aimed at early diagnosis and rapid and effective response.

6.2.3 National Animal Health Committee

Numerous technical decisions will have to be made promptly when preparing for and responding to animal health emergencies such as an incursion of Avian Influenza (AI) into Sri Lanka e.g. surveillance policy, areas to be proclaimed, types of (poultry) operations to be depopulated, import restrictions, vaccination policy etc.. Constitution of an official National Animal Health Committee (NAHC) as an advisory body to the DG/APH would enable these decisions to be based on a broad analysis of the available information and the ground situation in Sri Lanka. (Vaccination for AI is currently ruled out in Sri Lanka. If a decision is made by NAHC to recommend vaccination, all details including the vaccine to be used, procedures to be adopted and precautions to be taken will have to be decided in advance).

The NAHC would primarily comprise DG/APH, Additional DG/APH, Director/Animal Health (D/AH), Director/Veterinary Research (D/VR), Chief Animal Quarantine Officer (C/AQO), Veterinary Epidemiologist (VE), Registrar of Veterinary Pharmaceuticals, Dean of the Faculty of Veterinary Medicine and Animal Science (D/FVMAS), representative veterinarians from the Local Government and Wild Life Departments, and a representative each from PDs, private sector veterinarians and industry representatives. NAHC will be chaired by the DG/APH and D/AH will be the convener on behalf of the DG.

It will meet once in every three months, and more frequently if necessary, and monitor the overall preparedness for animal health emergencies, make recommendations to DG/APH on matters referred to it by him/her, and also make appropriate recommendations to the IMERC–API and JTC–API on matters of interest.

6.2.4 National Emergency Cell for Avian Influenza

In an emergency situation e.g. incursion of AI into Sri Lanka, the NAHC will incorporate relevant additional members and form a **National Emergency Response Committee (NERC)** to provide the necessary technical guidance, in consultation with the NAHC where necessary, as well as the financial and logistics support to the Provincial and local Committees/Centers described below. The NAHC will also establish a **National Emergency Cell (NEC), headed by the Director/Animal Health.** The Cell will ensure that adequate personnel, transport facilities, equipment and supplies are available for the response campaign through temporary transfers and emergency procurements where necessary. The Cell will be adequately supported with staff including an Administrative Officer and an Accountant, arranged through temporary transfers and/or casual recruitments.

6.3 Provincial and District Level Structures

6.3.1 Provincial Emergency Response Committee

PDs/APH will play a pivotal role in response mechanisms for any animal health emergency in their respective provinces. (S) he will have to harness the cooperation and support of numerous political, official and private sector players, apart from the technical guidance and support from the central agencies to ensure an effective and timely response. This may well be achieved by the formation of an ad-hoc Provincial Emergency Response Committee for AI (PERC-AI) by the Provincial Council once the Provincial Director (AP&H) informs the authorities of an impending threat of AI. The membership of this Ad-hoc Committee will include prominent persons at Provincial level whose cooperation and support will be needed in an emergency situation due to an AI outbreak.

PERC-AI will be chaired by the Chief Secretary of the Province and the PD/APH will serve as the convener on his behalf. Its membership will include the Secretaries of all the Provincial Ministries, Provincial Departmental Heads and 2 – 5 representatives of poultry producers (depending on the concentration of poultry units in the province).

6.3.2 District Agriculture Committee

District Secretary is the government's administrative head of each district. The District Veterinary Surgeon (DVS) and all the Range Veterinary Surgeons (RVSs) in the district are members of the District Agricultural Committee (DAC), chaired and also convened by the District Secretary. This is an ideal forum to seek the cooperation and support of all the important agriculture sector institutions in the District, including the District Secretary, DAC to respond to an animal health emergency e.g. an outbreak of AI.in the district.

AI is included as an agenda item of a DAC meeting, and a brief presentation made by the DVS outlining the public health implications of AI (and other important zoonoses that have not invaded Sri Lanka), the threat of introduction to Sri Lanka, preparedness activities being carried out and the type of support needed from other agencies for implementing community based surveillance and an effective and timely response in case of an incursion. At subsequent meetings preparedness status may be discussed, emphasizing on the need to be vigilant in order to respond to an incursion effectively in a timely manner.

6.3.3 Local Disease Control Centre – Avian Influenza

All AI control activities will be coordinated by one or more Disease Control Centers (LDCCs) located within the area, the number depending on the geographical area identified for disease control activities including depopulation e.g. if it is a small area within a VS range or bordering two or more ranges, one LDCC may be sufficient. However, if it involves more than one VS range, more LDCCs will have to be established.

The LDCC(s) will best be located a short distance away from the Veterinary Office(s) to minimize contact between disease control personnel visiting Infected Premises (IPs) and Dangerous Contact Premises(DCPs) and the Range Veterinary Staff who will be actively engaged in surveillance activities within the range but outside the infected area, unless the entire range is declared as infected. In any event, there will be a close communication link between the RVS(s) and the LDCC(s). If sufficient space cannot be found in a government building to house the LDCC, a private building may have to be obtained on rent.

The establishment and initial management of the first LDCC within a district is the responsibility of the DVS. If more LDCCs have to be established within a district, the management of the first and the responsibility of establishing and managing subsequent ones will be handed over to senior veterinary staff loaned from DAPH headquarters or Provinces that are least likely to be affected. Once a LDCC is established it will remain in operation, scaling down (or up) its work force as necessary, until instructions are issued by the PD to close it. While the LDCC is in operation, its Manager will function as the local media spokesperson, too.

The LDCC is responsible for implementing the entire disease control program within the designated area, and will have adequate office, storage and parking space. It will be provided with appropriate support staff e.g. an Administrative Officer/Office Manager, Inventory Clerk/Store Keeper, a procurement clerk to coordinate all supplies, an accounts clerk to process payments and financial accounts and minor staff, apart from the disease control staff.

Disease control activities would include compensation assessment, depopulation, disposal and decontamination procedures and subsequent monitoring of premises where control activities had been carried out. Each of these activities in a given premises may be handled by a specific team or more than one activity may be undertaken by a single team, depending on the scale of the operation. The number of such teams to be kept in readiness within each VS range depends on the poultry population and its distribution. A practical approach would be to have a sufficient number of leaders trained for each specific team (see below) and to identify the potential sources of support workers in advance.

6.4 Response Mobilization in Case of an AI Incursion

6.4.1 Alert Phase

In case the Preliminary Report submitted by the RVS indicates the likelihood of an AI outbreak, DG/APH, while emphasizing that this is only an alert call as the presence of AI has not been confirmed yet, and that this position has to be maintained (up and) down the line,

- Briefs Secretary/MoLD on preparatory activities and what is expected of him

- Alerts Directors of the DAPH and the relevant PD(s) and requests them to be in readiness to mobilize the response mechanisms, and
- Alerts the members of the NAHC

Secretary/MoLD briefs the Minister and instructs the relevant officer(s) to be in readiness to convene the IMERC-AI

D/AH plays a supportive role to DG/APH on all above activities, and in addition prepares to convene the NAHC and the NERC, and to set up the NEC.

PD/APH of the area in which suspected premises is situated, alerts the Chief Secretary and the Secretary of the relevant Provincial Ministry, prepares to convene the PERC-AI, and drafts the 'Proclamation Notice' in consultation with the RVS(s).

DVS of the relevant district briefs the District Secretary, prepares to set up the LDCC, and visits the suspected premises with the RVS to ensure that adequate preventive measures are in place against disease spread, and to identify the immediate needs of personnel, equipment and materials to undertake disease control activities in case the necessity arises.

RVS of the area assists DVS in above activities, briefs the Divisional Secretary and discusses the feasible boundaries for the disease control areas, recommends disease control area boundaries to PD, alerts the field staff and leaders of community organizations who had been assisting in the community based surveillance activities to be more vigilant, and carries out clinical surveillance around the suspected premises.

VIO of the area conducts rapid tests in contact premises identified during the epidemiological investigation and other premises identified to be at risk.

If confirmation is received that the suspected condition is not AI, all those who were put on alert will be informed of it. However, the alert will be called off only when the NAHC decides that the suspected condition does not need an emergency response.

6.4.2 Operational Phase

DG/APH declares the operational phase immediately on receipt of VRI confirmation of AI or any other condition requiring an emergency response, and informs all those who were alerted in the Alert Phase. The draft 'Proclamation Notice' is obtained from the Provincial Director(s) together with a situation update based on the surveillance activities carried out by the VIO(s) and RVSs and presented at the emergency meeting of the NAHC convened for deciding on the emergency response activities. The NAHC forms the NERC and the NEC and decides on such matters as the areas to be proclaimed, types of farms/units to be depopulated and whether any vaccinations are to be carried out. D/AH will convey these decisions to all relevant officers. The NAHC also makes recommendations to the IMERC-API and JTC-API on assistance and support that may have to be offered by them to the emergency disease control program.

DG/APH either makes the Proclamation following the statutory provisions, based on information provided by the PD.

Secretary/Mold will convene the IMERC-API in consultation with the Minister, table any recommendations received from the JTS-API and NAHC, and facilitate the assistance and support of the relevant agencies to the emergency disease control program.
D/AH will activate the NEC, and liaise with the PD(s) to offer the necessary technical guidance and logistics support to the LDCC(s), and the VIOs and RVSs to implement preventive measures against the further spread of the disease, including vigilant surveillance activities.

PD(s)/APH in affected Provinces will convene the PERC(s)-API in consultation with the relevant Chief Secretary and facilitate the assistance and support of the relevant agencies to implement the emergency disease control program. They will also liaise with the D/AH to provide the necessary technical guidance and logistics support to the LDCC(s), and arrange for the appropriate representation at DAC meetings of the DVS(s) and RVS(s) of the affected areas.

The main responsibility of the DVS(s) in this phase is to establish and operate the first LDCC. S/he will, however, inform the District Secretary about the situation and request him to convene the DAC and obtain the necessary assistance from the relevant agencies to implement the emergency disease control program. He may also be informed about the arrangements being made by PD/APH to represent her/him and the RVS(s) of affected area(s) at the DAC.

RVS(s) of the affected area(s) will make further recommendations to PD on disease control area boundaries, assist DVS(s) in the establishment of the LDCC(s), liaise with the Divisional Secretary(ies) to obtain the necessary assistance to the LDCC(s), obtain the support of the police and Grama Niladhari's to implement movement restrictions, and liaise with the field staff and village organizations to implement community based surveillance activities. As time permits he will also undertake clinical surveillance around the suspected premises.

VIOs will carry out their investigations with increased vigilance and follow instructions issued by D/AH from time to time.

7 Communication and Public Relations

7.1 The need for public awareness

Any report of a possible outbreak of AI in Sri Lanka will attract media interest and will be front-page news across the nation. It can also be expected to dominate television and radio coverage, including leading talk-back programs.

Public reaction in the event of an outbreak of AI and the emergency measures of movement control, mass depopulation and increased biosecurity will inevitably be characterized by a sense of urgency, and the situation will be perceived as potentially damaging or perilous. This fear will be heightened by a lack of accurate and timely information — a situation that is commonly encountered at the start of any disease outbreak which has implications on human health. People who have little knowledge about the nature and effect of AI because it has the potential to infect humans, will naturally fear the worst for themselves and their families, animals and livelihoods.

Consumers may avoid chicken and eggs inflicting heavy losses to the poultry industry. Similarly, the workers who work in poultry farms or poultry slaughter houses may fail to turn up for work for fear of contracting the disease.

In the atmosphere of an emergency, the news media can either become part of the solution to the problem or, if mishandled, part of the problem. Cultivating a professional working relationship with the media under stressful emergency conditions is therefore a critical element in an effective emergency response. This relationship needs to be fostered well in advance of any emergency due to an AI outbreak.

7.2 News media policy

In AI emergency, the news media will require and expect an immediate and constant flow of timely and accurate information. Media demands can be expected to be large. Also, media assistance in an emergency will be invaluable.

The PR approach during a response will be proactive, and flexibility and all media groups will be treated as equal in providing information and access.

It is always best to be proactive about what is happening. Reticence or delay will allow misinformation to gain prominence in the media, and this could hinder containment and eradication efforts.

7.3 Organizational Arrangement for Handling Communications

In order to handle the public relations and media functions, the DAPH will have two levels of media organizations, one at the national level and the other at the regional level.

7.3.1 National Communication Group

The Director General of AP&H, Director HRD, Director Animal Health, Director Planning all from DAPH and a professional media person who will be willing to serve on a voluntary basis will constitute the National Communication Group. This latter person should be from an area close to the DAPH and his transport needs for attending meetings may be provided by the DAPH. The Secretary Ministry of Livestock Development will appoint the National Communication Committee animal diseases.

The National Communication Group will have to be active at normal times also, but it is sufficient to get the delegate of the DG to serve in the group during these times if the DG finds it difficult to attend meetings of the communications group outside emergency periods. However, during an emergency the DG will be the principal spokesperson for the animal production and health sector and it is mandatory that DG chairs the communication group meeting at such times.

7.3.2 Provincial and Local Communication Groups

The Secretary Livestock Development will likewise appoint Regional Communications Groups in an event of an emergency due to an outbreak of AI. Unlike with the National Communication Group, the Regional Committee is not required during normal times. A Regional Communication Group which will comprise of the respective Provincial Director of AP&H, a District VS from the Province trained in communication aspects and 2 LDII trained in communication and PR activities.

The Provincial Director from the Group with the concurrence of the DG AP&H will nominate the relevant range veterinary surgeon of an area to act as the local media spokesperson in an emergency.

7.4 Responsibilities of the National Communications Group

The National Communication Group will carry out among other things the following;

- Develop communication strategies, including key messages to be delivered and talking points,
- Develop a proactive public information programme and a response strategy for reacting to media and other PR needs
- Sharing the above with the communications group from the Health Sector
- Decide what information to be made public and prepare news and media releases
- Identify communication issues that need to be addressed by the Animal Production and Health sector
- Draft media statements and other public and media material

- Clear the media statements, photographs, videos, maps, factsheets and other public and media information material

- Obtain clearance from the Ministry of Livestock Development on media releases, where necessary

- Give directions to the Provincial Communications Group and specify and authorize what is to be made public by the Provincial and Local spokes person

- Liaise with media agencies and,

- Participate in News Conferences where appropriate.

7.5 Communication Activities in an Emergency

In the event of an emergency situation, the National PR Manager will summon the National Communications Group and decide on the appropriate communication activities that should be considered. He will also get the DG AP&H to communicate to the Minister of Livestock Development and other appropriate political authorities and brief them on the situation. He should organize in-house secretariat support and arrange translation services for communicating in Sinhala, Tamil and in English. He will also prepare internal news for agency employees so that no ambiguity is created among any group.

Specifically, he will attend to his responsibilities as mentioned in section. Also it is important that the PR Manager with the help of other professionals carry out an on-going evaluation of the communication and PR activities to determine what worked well and what things really made a difference, judge how well the communication plan worked, assess perceived deficiencies in equipment and personnel, assess the news coverage and its impact, consider other positive and negative aspects of the crisis communication response effort, and to consider the lessons learnt.

7.5.1 Prior Media awareness

It is useful to invite the media personnel to the community empowerment and farmer training programs carried out by the DAPH so that the media is aware of the emergency preparedness and on the strengths and capabilities of the government in facing an event of a AI outbreak.

7.5.2 Interacting with the media

The principal media spokesman

The DG AP&H will be the main human face of the emergency response. A media release or news conference involving the DG can give an air of authority and calm to the PR effort. While media speculation can cause panic or unnecessary anxiety in the community, on-the-record interviews with DG can counter this by providing facts about the nature, extent, cause and effects of the emergency. The DG can also speak authoritatively on the methods and overall procedures involved in the response, and of intended or possible further actions by the authority. Communicating these matters will alleviate the public fears and will also help to build public confidence on the authorities.

Provincial and local PR spokesmen

The provincial directors of the AP& H and the relevant District VSs will be the media spokespersons for the regions/districts and the relevant field VS nominated by the PD AP&H will be the local media spokesperson. These officers may only release information authorized by the national PR Manager DG or the DG's delegate.

It is also important that the PR staff should not comment on any matter that touches on the activities or responsibilities of any organization other than their own.

No local media releases must be issued or local interviews given without the express agreement of the National PR manager. At the local or provincial level no matter how hard pressed, the local PR officer should not put out any releases, give or arrange any interviews or answer any media questions until the National PR manager gives approval for public announcements to begin. If journalists apply pressure, the local PR officer should offer to get back to them as soon as possible.

8 Restocking and Release of Infected Place Declaration

8.1 Policy on Restocking

The agreed policy in Sri Lanka is to allow restocking in the Restricted Area only after 90 days of freedom from the disease based on active surveillance of sentinel birds for any signs of recurrence of the disease. Considering the conditions in Sri Lanka, where large numbers of smallholders are interspersed among the industrial producers, these strict conditions may be justified.

It may be mentioned, however, that there are reports of countries allowing restocking 21 days after satisfactory decontamination and the outbreak has been brought under control. Some countries are monitoring sentinel birds placed in the buildings from the time of depopulation and decontamination to the time of restocking to determine the virus free status. It has been suggested that sampling of dead birds in the repopulated sheds is more efficient than the use of sentinel birds.

Sri Lanka's current policy is not to use vaccination against AI. If a decision is made later on to restock with vaccinated birds, sentinel birds may have to be used among them to ensure that the vaccinated birds do not act as carriers of the virus.

8.2 Surveillance for Freedom from Disease

According to the OIE, if infection from HPAI or LPAI has occurred in a previously free country, the AI free status can be regained three months after a stamping out policy and decontamination of all affected premises, provided that surveillance in accordance with OIE guidelines is carried out during that three month period. Accordingly, a country declaring AI free status should report results of an active surveillance program in which NAI or HPAI susceptible poultry populations are subjected to a well-designed surveillance program based on the OIE guidelines under Articles 10.4.28 to 10.4.34.

The OIE acknowledges that the impact and epidemiology of NAI differ widely in different regions of the world and therefore it is impossible to provide specific recommendations for all situations. However it states that surveillance strategies employed for demonstrating freedom from NAI at an acceptable level of confidence will need to be adapted to the local situation. Variables such as the frequency of contacts of poultry with wild birds, different biosecurity levels and production systems and the commingling of different susceptible species including domestic waterfowl require specific surveillance strategies to address each specific situation. It is therefore necessary that the DAPH provide scientific data that explains the epidemiology of NAI in Sri Lanka and also demonstrates how all the risk factors are managed. There is therefore considerable latitude available to provide a well-reasoned argument to prove that absence of NAI virus (NAIV) infection is assured at an acceptable level of confidence.

A surveillance system considering all the epidemiological factors specific to the particular region of Sri Lanka affected by an AI outbreak will be designed scientifically and

implemented accordingly to demonstrate the confidence that can be given by a randomized representative sample of the population at risk.

8.3 Release of Control of Restrictions Imposed After an Outbreak of AI

The control measures imposed in the restricted area and the control area will be maintained until at least 21 days have elapsed since the decontamination of the confirmed infected places and negative results of surveillance activities in both areas. At the end of 21 days the restricted area and the control area will be merged and measures applied in the control area will be maintained for a further 14 days period before the restrictions imposed are revoked.

8.4 Declaration of Freedom from AI

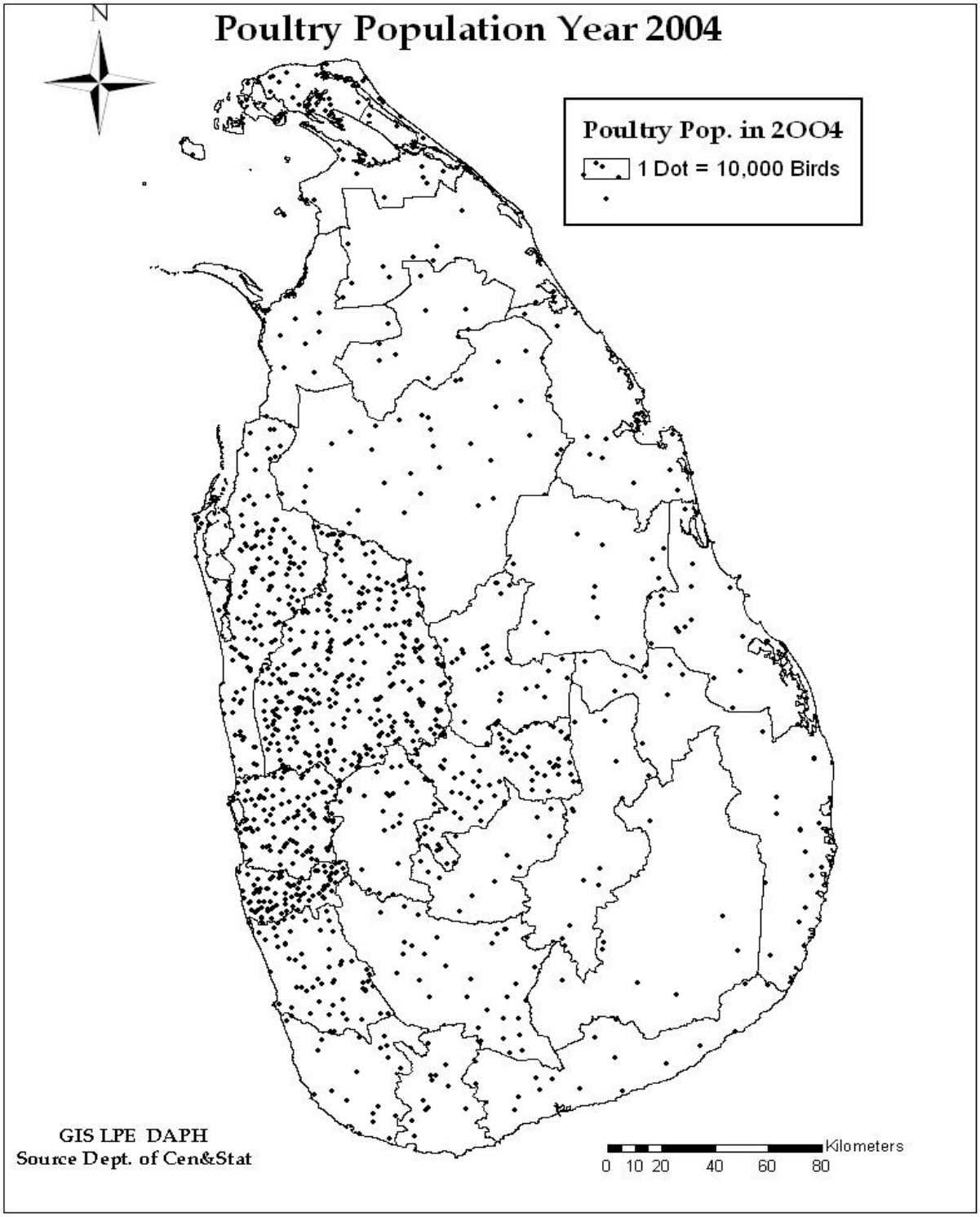
In accordance with the OIE Terrestrial Animal Health guidelines, Sri Lanka will make an application to the OIE after meeting requirements for proof of freedom from AI. The reinstatement of AI free status will require the submission of Sri Lanka policy on AI, the eradication procedures, the veterinary infrastructure and the PVS, veterinary service delivery and animal disease surveillance systems in place, and the organization of the industry. Acceptance of the freedom from disease status may also involve inspection by the international panel of experts to review the eradication program and available data to verify the freedom from disease.

9 Annexures

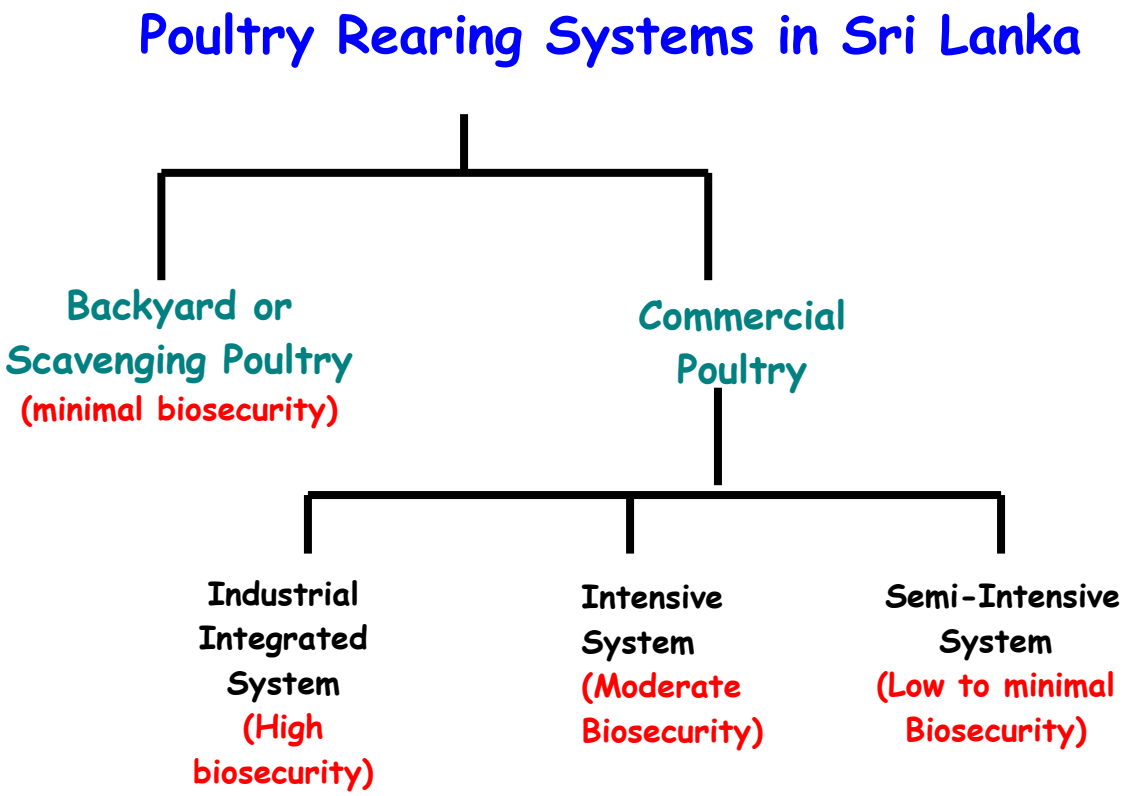
Annex 01 Distribution Pattern of Poultry Population in Sri Lanka
Annex 02 Poultry rearing systems in Sri Lanka
Annex 03 Flow chart – HPAI diagnosis and reporting network
Annex 04 Hot Spots of Migratory Birds
Annex 05 Check List for District Emergency Team
Annex 06 Recommended Disinfectants and Concentrations
Annex 07 Recommended Disinfection/Decontamination/Disposal Procedure
Annex 08 Format for Emergency Report on *HPAI*
Annex 09 Avian Influenza epidemiological inquiry form
Annex 10 Format for Proclamation

Annex 01

Distribution Pattern of Poultry Population in Sri Lanka

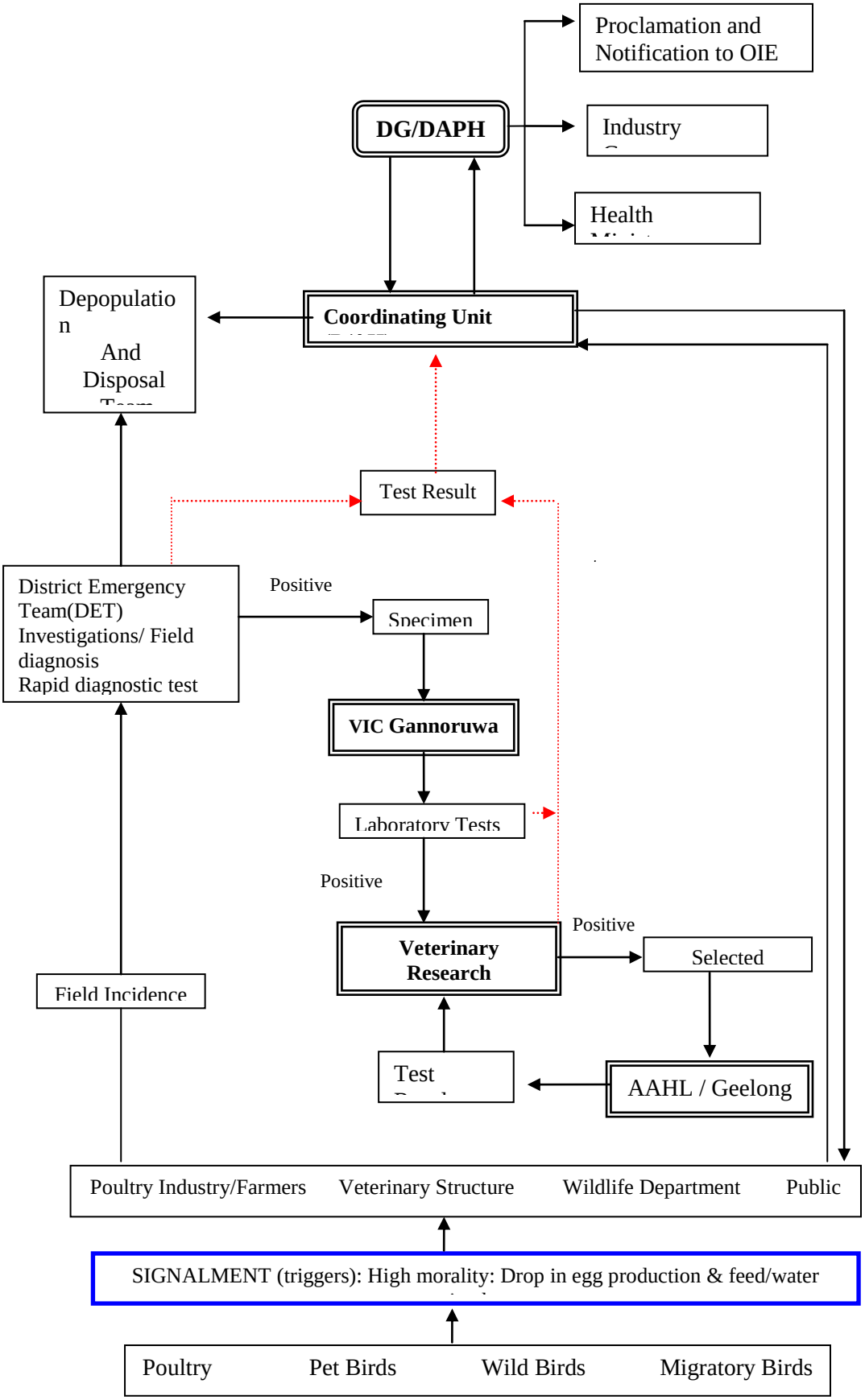


Annex 02


Poultry Rearing Systems in Sri Lanka
Backyard or Scavenging Poultry
(minimal biosecurity)
Commercial Poultry
Industrial Integrated System
(High biosecurity)
Intensive System
(Moderate Biosecurity)
Semi-Intensive System
(Low to minimal Biosecurity)

Annex 03

HPAI diagnosis and reporting network



Annex 04

Hot Spots of Migratory Birds

District	Places
Mannar	Giant Tank, Mudflats, Lagoons
Puttalam	Puttalam Lagoon, Mundal, Palavi to Kalpitiya
Chilaw	Anavilumdawa Lakes, Katupotha Tank, Chilaw Bay
Colombo	Muthurajawela, Negombo Lagoons, Kelaniya Estuary
Hambantota	Salterns, Bundala Santuary, Koholankala
	Lagoons, Mudflats in Yala
	Udawalawe National Park
	Arugam Bay, Kalapuwas in Pottuvil
Mullaitivu	Lagoons and Mudflats
Jaffna	Lagoons and Mudflats

Annex 05

Check List for District Emergency Team

S. No.	Item	Quantity
1.	Plastic box to carry Items	01
2.	Cool box	01
3.	Ice packs	04
4.	Mobile Phone	01
5.	GPS	01
6.	Emergency Report Form	04
7.	Epidemiological Inquiry Form	10
8.	Form accompanying samples	05
9.	Distinctive signs a. AI infected area b. AI infected building c. AI suspected building d. AI suspected area	 02 02 02 02
10.	Writing Pad	01
11.	Labels (large &small)	20 each
12.	Tape	01
13.	Envelop	05
14.	Fencing tape	01
15.	Nails	10
16.	Hammer	01
17.	List of Telephone numbers	01
18.	Torch with spare batteries	01
19.	PPE sets	05
20.	Plastic bags (suspicious material)	05
21.	Carcass bags	10
22.	Plastic Bucket	01
23.	Disinfecting soap	01
24.	Disinfectant (Virkon)	1 L
25.	Disinfectant (Citric acid)	1 L (2% Solution)
26.	Hypodermic syringe (1 ml)	10
27.	Needles	15
28.	Scalpel Blade	01
29.	Tweezers (sterile)	01
30.	Scissors (Sterile)	01
31.	Serum tubes	15
32.	Sterile swabs	20
33.	Container with lid (small)	04
34.	Container with lid (large)	04

Annex 06

Recommended Disinfectants and Concentrations

Key	**Form and final concentration**	**Contact time and notes**
1. Soaps and detergents		Leave in contact 10 minutes
2. Oxidising agents		
2a. Sodium hypochlorite	Liquid, dilute to final 2-3% available chlorine	Not good for organic materials. 10-30 minutes contact.
2b. Calcium hypochlorite	Solid or powder , dilute 2-3% available chlorine (20 g/litre powder, 30g/l solid)	Not good for organic materials. 10-30 minutes contact.
2c. Virkon®	2% (20 g/litre)	10 minutes. Excellent disinfectant
3. Alkalis		
3a. Sodium hydroxide (causticsoda)(NaOH). Do not use with aluminum and like alloys	2% (= 20 g/litre)	10 mins. Do not use in presence of aluminum
3b. Sodium carbonate anhydrous (washing soda) (Na_2CO3. 10 H20)	4% (=40 g/litre) from powder 100 g/l from crystals	10 mins. Recommended for use in presence of organic materials as above. 30 mins
4. Acids		
4a. Hydrochloric	2% (20 ml/litre)	Corrosive, use only when better not available.
4b. Citric	0.2% (2 g/l)	30 mins, safe for clothes and body decontamination
5. Formaldehyde gas	Special generation required	15-24 hrs. Toxic, only if others cannot be used.

Annex 07

Recommended Disinfection/Decontamination/Disposal Procedure

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

Annex 08

Report to be faxed to 0812388317

Format for Emergency Report on *HPAI*

Veterinary Range:

District: **Province:**

Name & Address of the affected Farm:

Type of the Farm: **No. of Birds in the Farm:**

Housing : Free-range/Sheds **Origin of birds :**

Date of onset of clinical signs:

Clinical signs observed:

No. of clinical cases: **No. of deaths:** **No. slaughtered:**

Introduction of birds within 21 days prior to onset of clinical sign: Yes/No : If yes, details:

Exit of birds/eggs within 21 days prior to onset of clinical sign: Yes/No : If yes, details:

Possibility of contact with wild birds: Yes / No If yes, species:……..

Other birds present on site (captive or free): Yes / No If yes, species:……..

Existence of ponds, lakes or water reservoirs: Yes / No

Location of other Farms/Poultry establishments owned by the same owner:

Signature of Veterinary Surgeon

Date:

Annex 09
Page 1 of 5

Report to be faxed to 0812388317

AVIAN INFLUENZA EPIDEMIOLOGICAL INQUIRY FORM

Date:……..

Dr……

Suspicion No:……

Confirmation No:……

Name of establishment:……

Address:…….

District:……

Province:……..

Farm code or identification number:…….

Owner:…….

Address of the owner:……..

Information provided by:……

Farm Veterinarian Dr……. Present: Yes / No

INFORMATION CONCERNING THE FARM

Type of Establishment: Industrial / Rural / Dealer / Retailer

Category/Production Line: Table-egg layers / Meat birds / Pet birds

Type: Grandparents / Parents / Pullets / Broilers / Layers

SPECIES OF BIRDS IN THE FARM AND THEIR NUMBERS

Chickens	Meat No..……..	Breeders No…….	Layers No…….
Turkeys	Meat No..……..	Breeders No…….	
Guinea-fowl	Meat No..……..	Breeders No…….	
Ducks	Meat No..……..	Breeders No…….	
Pigeons	Meat No..……..	Breeders No…….	
Pheasants	Meat No..……..	Breeders No…….	
Geese	Meat No..……..	Breeders No…….	
Quail	Meat No..……..	Breeders No…….	
Other			

HATCHERY OF ORIGIN

Name:……

Address:…….

Debeaking operation. Date:……. Performed by:…….

HOUSING SYSTEM & ENVIRONMENT

Birds kept inside sheds: Yes / No

Type of ventilation system: Natural / Natural with fans / Artificial

Free-ranging system: Yes / No

Bird proof nets: Yes / No

Possibility of contact with wild birds: Yes / No Species:……..

Other birds present on site (captive or free): Yes / No Species:……..

Ponds or lakes in the premises: Yes / No

Other water reservoirs: Yes / No (specify)

Presence of pigs: Yes / No

Other animals: Yes / No

Remarks:

MOVEMENTS OF BIRDS/EGGS

Introduction of birds/eggs from other establishments: Yes / No

(In the time span between the onset of the first clinical signs and twenty days preceding it)

Date	Species/Eggs	No	Origin

Exit of birds/eggs to other establishments: Yes / No

(In the time span between the onset of the first clinical signs and twenty days preceding it)

Date	Species/Eggs	No	Destination

MOVEMENTS OF VEHICLES

(In the time span between the onset of the first clinical signs and twenty days preceding it)

Date of entry	Vehicle No.	Name of Establishment	Purpose of visit	Name of Driver	Other personnel

MOVEMENTS OF PEOPLE

(In the time span between the onset of the first clinical signs and twenty days preceding it)

Date	Name	Address	Purpose

INDIRECT CONTACT WITH OTHER POULTRY ESTABLISHMENT

(Sharing of equipment, vehicles, feed, staff etc in the time span between the onset of the first clinical signs and twenty days preceding it)

Date	Mode of Contact	Name of Establishment	Species in sharing farm

OTHER FARMS OWNED BY THE OWNER

POULTRY FARMS LOCATED NEAR THE OUTBREAK: Yes / No

Name of the establishment	Address

Name of the establishment	Address	Distance (meters)

ANAMNESTIC DATA

(Data concerning mortality rates recorded in the 6 weeks prior to the onset of clinical signs)

Week		Number of Animals dead
From	To	

Week		Number of Animals dead
From	To	

Remarks:……..

Date of onset of AI clinical signs:…….

Clinical signs observed by the farmer:…….

TOTAL NUMBER OF BIRDS Farm put under restriction (dead or alive)	**Number of ill birds** (Farm put under restriction)	**Number of dead birds** (Farm put under restriction)	**Number of birds slaughtered**

N.B. this information must refer to the data collected when the farm has been put under restriction with mortality and morbidity related to the suspicion of AI.

VACCINATION of birds

Vaccination of birds practiced: Yes / No

Date of vaccination	Type of vaccine (Live or inactivated)	Commercial name	Administration route

Vaccinating staff: Family / Employee / External staff / Other
Remarks:……..

ADMINISTRATION OF DRUGS / MEDICAMENTS (in the last 15 days)

Drug/Medicament used & Reason	Administered by: Family/Employee/External staff/Other

CLINICAL INVESTIGATION PER SPECIES

Clinical signs		**Species**			
Depression					
Respiratory signs	Mild				
	severe				
Drop or cessation of egg laying					
Oedema, cyanosis or cutaneous haemorrhages					
Diarrhoea					
Nervous signs					
Other					

GROSS FINDINGS

Description		**Species**			
Rhinitis and sinusitis					
Tracheitis	*catarrhal*				
	haemorrhagic				
Aerosacculitis					
Haemorrhages	*Epicardium*				
	Endocardium				
	Proventriculus				
	Ovarian follicles				
Enteritis	*catarrhal*				
	haemorrhagic				
Pancreasitis					
Other					

Remarks:

Signature **Designation**

Annex 10

Page 1 of 1

Format for Proclamation

Report to be faxed to: 0812388317

ANIMAL DISEASES ACT No. 59 OF 1992

REGULATION No. 5(1)

Where as ……. has broken out among ……... in **……..** Divisional Secretary Division at …….. District of the …….. Province, I …… Animal Production & Health by virtue of the powers vested on me under the Animal Diseases Act No. 59 of 1992, Regulation No. 5(1) do hereby declare the area having the following boundaries as an ***'Infected area'***.

North -

East -

South -

West -

Under regulation No. 5(3) of the same Act, I proclaim that no movement of ……. or ……. from and to this area shall be allowed until this proclamation is revoked.

The attention of all ……. owners in this area is drawn to the Animal Diseases Act, No.59 of 1992 which lay down the actions which persons are by law required to take in an "Infected Area". Details of these regulations can be obtained from the Government Veterinary Surgeon at **…….** or the Divisional Secretary of**…….** Divisional Secretary Division**.**

This declaration shall take effect from the date hereof.

……..
Director General,
Department of Animal Production and Health.

Office of the Director General
Department of Animal Production & Health,
Peradeniya

Note: This report is to be prepared by the relevant Provincial Director/APH in consultation with the field VS of the area to be proclaimed and faxed to DG/DAPH.