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Ministry of Healthcare, Nutrition & Uva
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30 .11.2005

All Provincial Directors of Health Services,
Deputy Provincial Directors of Health Services,
Heads of Institutions,
Regional Epidemiologists,
Port Health Medical Officers,

GUIDELINES FOR THE PREPAREDNESS AND RESPONSE TO AN AVIAN INFLUENZA PANDEMIC THREAT

As of 15th November 2005, 125 laboratory confirmed human cases (including 64 deaths) of avian influenza have been reported globally. Avian influenza viruses are not easily transmitted to humans, but this may change due to either mutation or genetic reassortment (mixing of human and animal influenza genes). Continuous transmission of avian influenza in poultry and human exposure in many countries increases the possibility of a pandemic virus emerging in the near future. However, in Sri Lanka, neither the zoonotic disease among poultry nor the cases of Avian Influenza among humans caused by H5N1 strain has been reported to date. Nevertheless no country can ignore the imminent threat it poses in terms of the next pandemic of influenza in humans.

Why are we concerned now?

Each century had witnessed an average of three pandemics of influenza occurring at intervals ranging from 10 to 50 years. They have started without warning and spread rapidly worldwide causing illness of unprecedented proportions. The great influenza pandemic of 1918-19 caused illness in more than 25% of the total global population, with an estimated 40-50 million deaths within a year. Most deaths occurred in young and healthy persons in the age range of 15 to 35 years. Although the pandemics of 1957 and 1968 were caused by the milder viruses, each killed approximately 2 and 1 million people respectively.

H5N1 virus, the potential candidate for the next pandemic, has not yet acquired the ability for efficient human-to-human transmission. If this happens, all conditions required for a pandemic will be fulfilled. H5N1 virus is gradually expanding its host range (e.g. domestic, wild and migratory birds) and spreading geographically in the affected countries as well as in the other countries. Although no one can predict with certainty when the pandemic will occur, experts warn that it is imminent; there is a great possibility that it would begin from Asia.

Even though, Sri Lanka is an island nation, the country is vulnerable to the potential threat of a pandemic. Poultry farming is widespread in the island and a considerable number of people are actively involved in poultry farming. In addition to the large scale

poultry business, back yard poultry farming is also common in the country. An equally higher number of people who are involved in meat processing are also at risk of contracting the disease. The presence of migratory birds in Sri Lanka increases the risk. Another significant risk factor that needs attention, considering the possibility of emergence of a novel and pandemic virus is the increased travel of people to and from the areas which are currently affected by avian influenza.

The expected pandemic is identified in three stages and is phased out in six phases:

Stages & Phases Identified		***Strategic Activities***
Inter pandemic period (planning and preparedness)		
Phase 1:	Influenza virus sub type in animals only (risk to humans is low)	• Prepare Pandemic Preparedness Plan • Establish surveillance in animals • Establish human influenza surveillance • Establish collaboration between human and animal sectors • Enhance animal surveillance and aggressive response to animal outbreaks • Strengthen human surveillance • Stockpile antiviral. PPE etc. • Strengthen collaboration between different sectors and WHO/OIE/FAO • Develop and implement risk communication strategy • Prepare health and essential service contingency plan
Phase 2:	Influenza virus sub type in animals only (risk to humans is substantial)	
Pandemic Alert (emergency and pre-emptive response)		
Phase 3:	Human infection (transmission in close contacts only)	• Enhance animal surveillance and aggressive animal outbreak containment • Enhance human surveillance and aggressive outbreak management • Early strategic use of antivirals • Social distancing • Implement risk communication strategy • Issue alert for quick implementation of health and essential service contingency plan
Phase 4:	Limited human to human spread; small clusters (<25 cases lasting < 2 weeks)	
Phase 5	: Localized human to human spread; larger clusters 25-50 cases over 2-4 weeks	
Pandemic		
Phase 6:	Widespread in general population	• Implement health and essential services contingency plan • Risk communication • Treat cases and contacts with antivirals, if available • Social distancing: close schools, ban gatherings • Administer vaccine if available

Source: World Health Organization, South-East Asia Regional Office

CURRENT KNOWLEDGE ON AVIAN INFLUENZA

Infectious Agent

Influenza viruses are grouped into three types, designated A, B, and C. Viruses of the C type are common but usually cause no symptoms or only very mild respiratory illness. They are not considered to be of public health concern. Type B viruses cause sporadic outbreaks of more severe respiratory disease, particularly among young children in school settings. Both B and C viruses are essentially human viruses; C viruses are stable, but A and B viruses are prone to mutation.

Of the greatest concern are the influenza A viruses. They have characteristics that make influenza A one of the most worrisome of all the well established infectious diseases. These viruses mutate much more rapidly than type B viruses, and this gives them great flexibility. In addition to humans, they infect pigs, horses, sea mammals, and birds. They have a large number of subtypes, all of which are maintained in aquatic birds, providing a perpetual source of viruses and a huge pool of genetic diversity.

Some unknown time prior to 1997, the H5N1 strain of avian influenza virus began circulating in the poultry populations in parts of Asia, quietly establishing itself. Like other avian viruses of the H5 and H7 subtypes, H5N1 initially caused only mild disease with symptoms that escaped detection. The virus first erupted in its highly pathogenic form in 1997, but did not appear again. Then, towards the end of 2003, H5N1 suddenly became highly and widely visible. An evolving virus H5N1 has found a new ecological niche in poultry in parts of Asia. The virus is now more deadly in poultry and in the mammalian mouse model.

Of all viruses in the vast avian influenza pool, H5N1 is of particular concern for human health for two reasons. First, H5N1, though strictly an avian pathogen, has a documented ability to pass directly from birds to humans. Second, once in humans, H5N1 causes severe disease with very high mortality. These two features combine to make H5N1 of concern for a third and greater reason: its potential to ignite a severe pandemic. Population vulnerability to an H5N1-like virus would be universal.

Influenza A viruses undergo constant stepwise changes in their genetic make-up. This phenomenon, known as ‘antigenic drift’, works well as a short term survival tactic for the virus: the speed with which slight variations develop keeps populations susceptible to infection. Though small, the changes are sufficient to evade the defences of the immune system. Populations protected, whether because of previous infection or vaccination, against one virus strain will not be protected when the next slightly different virus erupts.

As yet another feature, the genetic content of these viruses is neatly segmented into eight genes. This facilitates the most greatly feared event: the swapping of gene segments during coinfection with human and avian influenza viruses, creating a new virus subtype that will be entirely or largely unfamiliar to the human immune system. If this new “hybrid” virus contains the right mix of genes, causing severe disease and allowing easy and sustainable human-to-human transmission, it will ignite a pandemic. This phenomenon, known as ‘antigenic shift’, works well as a long-term survival tactic and has guaranteed a very large population of susceptible hosts.

Reservoir

It is now recognized that wild waterfowl, gulls, and shorebirds are the natural reservoir of all influenza A viruses. Wild waterfowl are the natural reservoir of all influenza A viruses and have historically carried low-pathogenic viruses, in evolutionary equilibrium, without showing symptoms or succumbing to disease. Although more evidence is needed, the findings suggest that the role of migratory waterfowl in the evolution and maintenance of highly pathogenic H5N1 may be changing.

Recent events in South Asian countries indicate that the virus is expanding its mammalian host range. H5N1 caused a large and deadly outbreak in cats and captive tigers – a species not considered as susceptible to disease from any influenza A virus.

New evidence suggests that domestic ducks are now excreting H5N1 in its highly lethal form without showing signs of illness. This "silent" role of domestic ducks may help explain why some recent human cases cannot be linked to contact with diseased poultry.

Mode of transmission

Within a country, the disease is easily spread from place to place. Infected birds shed large amounts of virus in bird droppings (faeces), saliva and nasal secretions contaminating dust and soil. Airborne virus can spread the disease from bird to bird, causing infection when the virus is inhaled. Contaminated equipment, vehicles, feed cages or clothing – especially shoes – can carry the virus from farm to farm. The virus can also be carried on the feet and bodies of animals, such as rodents, which act as mechanical vectors for spreading the disease. Limited evidence suggests that flies can also act as 'mechanical vectors'.

Droppings from infected wild birds can introduce the virus into both commercial and domestic poultry flocks. This risk is greater where domestic poultry roam freely, share a water supply with wild birds or use a water supply that might be contaminated by droppings from infected wild-bird carriers. 'Wet' markets where live birds are sold under crowded and unsanitary conditions can be another source of spread.

From one country to another, avian influenza can spread through trade in birds or through migratory birds. Migratory birds that may not be sick although infected can carry the virus to long distances. Epidemics of avian influenza may occur when domesticated birds come in contact with wild birds carrying the virus.

At present, there is no concrete evidence to confirm sustained human-to-human transmission of avian influenza. The influenza virus type A and its various subtypes can, in the presence of another influenza virus, merge with it through mixing and ressortment. This can result in a new virus with different characteristics than the parent viruses, to which the population has no immunity. These new viruses can lead to human-to-human transmission of a severe disease resulting in a pandemic situation which will be a cause for extreme concern.

All reported human cases so far have been linked to direct exposure to dead or infected birds or contaminated surfaces. A few exceptional cases have been associated with food preparation. No cases have been reported following consumption of properly cooked meat or eggs or among cullers and poultry workers.

Suspicions that human-to-human transmission may have taken place usually arise when cases occur close together in time and place among persons, such as family members or health care workers, known to have had close contact with a case. Such clusters of cases have been detected on several occasions during the 2004 outbreaks. All such instances involved family members. To date, no H5N1 cases have been detected in health care workers despite several instances of close, unprotected contact with severely ill patients.

Clinical Presentation

The incubation period for Avian Influenza appears to have been up to 1-7 days, but usually as short as 2-3 days. In humans symptoms of avian influenza range from typical flu symptoms (e.g. fever, cough, sore throat and muscle aches) to eye infections, pneumonia, acute respiratory distress and other severe life threatening complications.

Methods of control

Detailed recommendations for the prevention and control of Avian Influenza have been issued by WHO (www.who.int).

A. Preventive measures:

1. **Advocacy**: Educate the public and health care personnel, especially on the mode of transmission and the reservoirs.

2. **Immunization:** To date, there is no specific vaccine developed against H5N1 virus. However, the use of common Influenza vaccine will be recommended to the high risk groups such as poultry farmers and their close contacts. This will be for the prevention of influenza due to already circulating Influenza A virus. In the event of a Pandemic of Avian Influenza, WHO guidelines will be adhered to.

3. **Anti viral Treatment:** Anti virals will have great importance as the only influenza-specific medical intervention for reducing morbidity and mortality. Anti virals are used to treat patients and prevent infection in close contacts, including health care workers and family members. The use of anti-virals will depend on the actual need, their availability and effectiveness.

   Currently the Medical Supplies Division (MSD) of the Ministry of Health is in the process of procuring anti-virals.

B. Control of disease among patients, contacts and the immediate environment:

1. **Notification:** Report the case to the local Medical Officer of Health (MOH). It is the responsibility of the MOH to personally investigate reported cases with a view to carrying out preventive and control activities at the field level. Close collaboration with the divisional veterinary authorities and the regional health authorities (Deputy Provincial Director of Health Services, Regional Epidemiologist) is essential. In the event of such a situation, all MOH field staff, particularly the Public Health Inspectors should give priority to preventive and control activities.

2. **Isolation:** At present Infectious Disease Hospital (IDH), Angoda has been identified as the National Referral and Isolation Facility in the country and Lady Ridgeway Hospital for Children (LRH) for paediatric referrals. Number of major hospitals have also been identified as sentinel surveillance and isolation sites. However in the event of an epidemic, because of the increased patient load, it would be desirable to isolate patients suspected to have Avian Influenza by placing them in a separate room/ward (cohorting) during the initial 5-7 days of illness at identified hospitals.
3. **Quarantine:** Not applicable
4. **Investigation of contacts and source of infection:** It is strongly recommended to investigate all Possible, Probable and Confirmed cases in order to identify contacts and source of infection.

Please refer Epidemiologist's letter EPID/34/II/B/99, dated 07th November 2005 on establishment of sentinel hospitals in view of the Avian Influenza Pandemic 2006-8 for details. The list of sentinel hospitals is in annexure.

C. Epidemic Measures:

1. The severe and often disruptive effects of Avian Influenza epidemic on community activities may be reduced in part by effective health planning, strengthening of surveillance and public education.

2. Hospital administrators must anticipate the increased demand for medical care during epidemic periods and possible absenteeism of health care personnel as a result of Avian Influenza.

D. **Control of Avian Influenza in animals.**

The Ministry of Medium and Small Scale Plantation Industries, Rural Human Resource Development and Livestock currently implements preventive and control strategies of avian influenza such as: Strict bio security, Depopulation and disposal, Control of avian traffic, Surveillance and tracing, Increasing public awareness, Avian restocking, Stamping out , Monitoring, Evaluation and reporting.

The most important control measures are rapid culling of all infected or exposed birds, proper disposal of carcasses, and the quarantine and rigorous disinfection of farms. Restrictions on the movement of live poultry, both within and between countries, are another important control measures. Measures while feasible on commercial farms, is virtually impossible in rural areas where chickens and ducks roam freely and mingle with wild birds or share water sources with them. Faecal contamination of water supplies by waterfowl is considered to be a way of efficient transmission of the virus.

All MOOH are advised to contact the Divisional Veterinary Surgeons in case of need for any animal laboratory investigation. It is the responsibility of the MOH to guide the public health staff and the public on animal laboratory surveillance when such a need arises.

For details, please contact Director General, Department of Animal Production and Health (Telephone 081-2388195, Fax : 081-2388619 and refer to Sri Lanka Exotic Disease Emergency Plan (SEDEP) 2004/2005 – Highly Pathogenic Avian Influenza Control Programme Guidelines. [Website: www.epid.gov.lk]

SURVEILLANCE (REPORTING) OF AVIAN INFLUENZA CASES

Every medical practitioner or person who professes to treat the disease, attends on, any person suffering from suspected possible, probable and confirmed cases of Avian Influenza should report the case to the Epidemiologist, Regional Epidemiologist/MOH urgently by telephone (**Epidemiologist emergency Tel. No. 011-4740491**).

Case definitions:

Possible Avian Influenza case -

i. Any individual presenting with fever (Temperature > 38^0C)

***AND* one or more** of the following symptoms:

a) Cough,
b) Sore throat,
c) Shortness of breath

***AND* one or more** of the following:

a) Laboratory evidence for influenza A by a test that does not sub-type the virus
b) Having been in contact, during the 7 days prior to the onset of symptoms, with a confirmed case of Influenza H5N1 while this case was infectious*
c) Having been in contact, during the 7 days prior to the onset of symptoms, with birds, including chickens, which have died of an illness
d) Having worked in a laboratory, during the 7 days prior to the onset of symptoms, where there is processing of samples from persons or animals that are suspected of having highly pathogenic avian influenza infection (HPAI)

OR

ii. Death from an unexplained acute respiratory illness
AND one or more of the following:

(a) Residing in an area where HPAI is suspected or confirmed
(b) Having been in contact during the 7 days prior to the onset of symptoms with a confirmed case of Influenza H5N1 while this case was infectious*

** Individuals infected with Influenza H5N1 virus are considered to be infectious starting from one day before the onset of symptoms up to 7 days after onset of symptoms*

Probable Avian Influenza Case -

Any individual presenting with fever (Temperature > 38^0C)
AND one or more of the following symptoms:

(a) Cough,
(b) Sore throat,
(c) Shortness of breath

AND

limited laboratory evidence for A/H5 (H5 specific antigens detected in a single sample)

Confirmed Avian Influenza Case-

An individual** for whom laboratory testing demonstrates **one or more** of the following:

(a) Immunoflurocence antibody (IFA) test positive using Influenza A/H5 monoclonal antibodies
(b) Positive PCR for Influenza A/H5
(c) Positive viral culture for Influenza A/H5
(d) 4-fold rise in Influenza A/H5 specific antibody titre in paired serum samples

*** Laboratory investigations for Influenza H5N1 may also be undertaken on deceased individuals and in the context of targeted epidemiological studies. Laboratory confirmed cases identified under these circumstances should also be reported*

Important points to note

As Influenza at the hospital level is currently a diagnosis of exclusion a patient should always be managed as clinically appropriate, regardless of their case status.

A case initially classified as possible or probable, for whom an alternative diagnosis can fully explain the illness, should be discarded.

A possible case who, after investigation, fulfil the probable case definition should be reclassified as "probable".

Those possible cases in whom recovery is adequate but whose illness cannot be fully explained by an alternative diagnosis should remain as "possible".

A possible case that dies, on whom no autopsy is conducted, should remain classified as "possible". However, if this case is identified as being part of a chain transmission of Avian Influenza, the case should be reclassified as "probable".

The surveillance period begins with immediate effect from the date of this circular. (1st December 2005)

SCREENING

Screening of suspected cases with flu like illness is important as a priority activity for early detection of the cases of Avian Influenza and thereby to carry out prevention and control activities in the country. As the clinical diagnosis alone would not be sufficient to detect cases or predict an outbreak of Avian Influenza, laboratory confirmation is essential.

Screening may be carried out for three groups:

1. Cases with clinical suspicions: as referred by the physicians
2. High risk groups; People handling poultry, pigs and birds
3. Close contacts

Cases with clinical suspicions: For this purpose it is important to be guided by the standard case definition for Avian Influenza. All hospitals in the country should be aware of the case definition for the Avian Influenza and any clustering of cases matching with the Avian Influenza case definition should be promptly reported to the Epidemiology Unit and early laboratory specimens should be sent to the Virology Department at the MRI. It is the responsibility of the heads of medical institutions to ensure that the specimens are sent to the MRI, as per the guidelines by the MRI.

High risk groups: People handling poultry, pigs and birds are at increased risk of the Avian Influenza. Therefore, random sample testing for these groups are essential. This should be done with the collaboration of the veterinary service authorities.

***Close contacts*:** It is recommended to screen the close contacts of all possible, probable and confirmed cases of Avian Influenza. MOOH should make necessary arrangements for screening of close contacts, with the collaboration of the hospital authorities.

ADMISSION AND ISOLATION OF AVIAN INFLUENZA PATIENTS TO HOSPITAL AND INFECTION CONTROL PRACTICES

(a) Hospital triage of possible Influenza cases

- Appropriate triage of possible Avian Influenza cases is necessary.
- Separate specific reception areas for triaging patients who may have Avian Influenza.
- Staff in this area should apply infection control measures outlined below before further caring for a Probable / Possible case.
- Those who are admitted to health care facilities requiring assessment for Avian Influenza should be given a surgical mask to wear.
- In the event of an admission of a case of Avian Influenza, supplies should be available in adequate quantity.
- Where material resources for barrier nursing are scarce, available supplies should be used sparingly in triage settings (such as by limiting the number of staff working in this area).

(b) Initial screening of the patient should include questions about:

- Fever;
- Respiratory symptoms, such as cough and shortness of breath;
- Contact history with suspected animals (birds, chicken, ducks, pigs) in the previous 14 days
- Contact history – whether the patient is a known contact of a possible / probable / confirmed Avian Influenza case or a person with symptoms suggestive of Avian Influenza.

(c) In the health institution

When a patient is identified at the OPD as a Possible or Probable case of Avian Influenza the OPD staff should follow the guidelines given under section **(a)**.

- The patient suspected of having Avian Influenza should be admitted to an isolation ward.
- However, if the suspected patient is having respiratory distress, instead of admitting to the isolation ward, he should be provided with intensive care with respiratory support, barrier nursing and isolation.
- When a suspected patient is transferred to a referral institution (IDH / LRH or any other identified referral institution), the ambulance staff should be instructed to take adequate precautions in order to protect themselves from possible exposure to the disease.
- The suspected case and ambulance staff should at least wear protective masks.
- At the same time, OPD staff should inform the details of the patient to the respective Hospital Director and the Epidemiologist by telephone.

INFECTION CONTROL

Infection control for influenza H5N1involves a two-level approach:
• **Standard precautions** which apply to **ALL** patients at **ALL** times, including those who have influenza H5N1 infection and
•**Additional precautions** which should include: droplet precautions, contact precautions, and airborne precautions. A combination of these precautions will ensure the appropriate infection control.

Standard precautions

Treating all patients in the health care facility with the same basic level of "standard" precautions involves work practices that are essential to provide a high level of protection to patients, health care workers and visitors.

These include the following:
• hand washing and antisepsis (hand hygiene);
• use of personal protective equipment (PPE) when handling blood, body substances, excretions and secretions;
• appropriate handling of patient care equipment and soiled linen;
• prevention of needle stick/sharp injuries;
• environmental cleaning and spills-management
• appropriate handling of waste.

Additional (transmission-based) precautions

Additional (transmission-based) precautions are taken while still ensuring the maintenance of the standard precautions.

Additional precautions include:

• Droplet, contact and airborne precautions (including the use of high efficiency masks – negative pressure rooms if available)
A combination of these precautions will give the appropriate level of precaution for influenza H5N1. The precautions should be implemented while the patient is infectious:
• Adults > 12 years of age – precautions to be implemented at the time of admission and continued until 7 days have lapsed since resolution of fever,
• Children <12 years of age – precautions to be implemented at the time of admission and continued until 21 days have lapsed since onset of illness**.**
The family should be educated on personal hygiene and infection control measures (e.g. hand-washing and use of a paper or surgical mask by a child who is still coughing).

Infection Control: Isolation and Barrier Nursing of Possible Influenza Cases

The key features of the infection control response to a case of Avian Influenza are isolation and barrier nursing techniques. In this sense, infection control practices required will be similar to those for other infectious respiratory pathogens.

- Management of Avian Influenza patients will be dependent on available resources. Usual ward procedures alone appear to be inadequate for preventing transmission of this disease in health care settings.

- Preparation for the arrival of Avian Influenza patients will be important in limiting the spread. **If possible, a member of the staff who will have the sole job of observing the practice of others and providing feedback on infection control, should be appointed.**

- When Avian Influenza cases are identified, it is essential that steps are taken to minimize the probability of transmission to health workers, family, or the public. This relies on the essential principles of:
  (a) Hand washing
  (b) Isolation and avoidance of unnecessary contact
  (c) Use of personal protective equipment (PPE) by those who are in close contact
  (d) Strict personal hygiene
  (e) Providing a mask to the suspected patients to reduce respiratory spread

  (a) It is desirable that provision are made for stockpiling PPE in sufficient quantities and that it should be sufficiently accessible when an Avian Influenza suspect is identified.
  (b) Where such equipment is not immediately available, the above principles should be adhered to as closely as possible while appropriate PPE is being obtained.

Influenza Isolation Facilities

Within the available facilities an isolation area should be identified beforehand. They should include the following:

- Isolation ward, patient care rooms.
- Changing room. Separate areas in the room for storage of personal clothes, and removal of PPE.
- General access area.

Avian Influenza Isolation Practice

- Treat probable Avian Influenza patients in an isolation room/ward.
- **Do not** manage possible cases in the same room as probable cases.
- Place a patient in a single room. If a single room is not available, where possible place cohorts of confirmed, possible and probable cases of Avian Influenza separately in designated multi-bed rooms or wards.
- Where cohorting is being carried out, the distance between beds should be more than 1m and beds should preferably be separated by a physical barrier (e.g. curtain or partition).
- The room should preferably have monitored negative airflow pressure – often referred to as a "negative pressure room". Keep doors closed at all times.
- Open external windows to areas with no public access.
- Ensure that anyone who enters the room wears appropriate PPE: mask (high efficiency masks should be used where possible, with surgical masks as a second alternative), gown and gloves.
- An **essential** part of isolation involves minimizing contact with other people. Visits by family and non-essential staff should be **avoided** wherever possible.
- Wear clean, non-sterile gloves when entering the room.
- Wear a clean, non-sterile gown when entering the room if substantial contact with the patient, environmental surfaces or items in the patient's room is anticipated.
- Restrict all patient care devices (e.g. torniquets, tubing) to the patient, and staff should dispose or clean and disinfect them by using PPE.

- Limit the movement and transport of the patient from the room for essential purposes only.
- Follow the same principles of isolation, including mask on patient, PPE for all staff, minimal contact, strict hygiene/washing, and disinfection of transport and equipment in the transport of Avian Influenza patients.

Who Should Use PPE?

The patient should be as self-caring as possible, and the staff team assigned to care for the patient should be restricted to a minimum. Staff should be strictly supervised and be experienced in infection control. PPE should be used by:

- All doctors, nurses and health care workers who provide direct patient care to Avian Influenza cases (keep to a minimum number necessary for patients' condition);
- All supporting staff including medical aides, cleaners, laundry staff (keep staff to the minimum necessary);
- All laboratory staff who handle patient specimens from suspect cases (keep to the minimum necessary for laboratory procedures);
- By-standers: Hospital authorities should allow by-standers for paediatric cases. In such cases, by-standers should be provided PPE by the hospital authorities. By- standers should follow the same procedures in using the PPE as the health staff. Therefore, ward staff is advised to educate the by-stander on the strict infection control practices

Heads of hospitals are advised to make requests for PPE to the Director MSD with copy to the Epidemiologist. To ensure rational use of PPE, the National Technical Committee on Avian Influenza will provide the recommendations to the MSD on distribution of PPE to hospitals.

INFECTION CONTROL IN THE COMMUNITY

Contact tracing

- The aim of contact tracing is to identify individuals who have had close contact with a case of Avian Influenza, to advise them of the contact, and to give them advice about personal isolation and observation for symptoms of Avian Influenza, particularly fever.
- When a case of possible or probable Avian Influenza is identified, the Regional Epidemiologist (RE)/Medical Officer of Health (MOH) should undertake contact tracing, in a similar manner to that undertaken for other selected infectious diseases, which are under special surveillance.
- **To date there is NO sufficient evidence on human to human transmission of Avian Influenza**. However, theoretically transmission of Avian Influenza may occur through either droplet spread or direct contact (also through formites).

Close contact is currently defined as:

- having cared for, having lived with, or having had direct contact with respiratory secretions and body fluids of a person with Avian Influenza

Limiting movements or being vigilant for the symptoms of Influenza by contacts should continue until 14 days after the end of their period at-risk following contact with a known case.

For a close contact (with no fever) of a known, probable or possible case of Avian Influenza:

Someone in this category who remains without fever, should be instructed to:

- Monitor temperature daily;
- Monitor self for appearance of possible early symptoms of Avian Influenza, such as shortness of breath;
- Take adequate rest at home;
- Remain at home and not attend work or school at least for a week;
- Avoid direct contact with visitors (arrange for other family members to do this);
- Minimise visitors to the house;
- Minimise contact with other household members, but if close contact cannot be avoided, wear a mask;
- When coughing or sneezing avoid others, cover face or wear a surgical mask;
- Sleep in a separate room away from others;
- Use separate utensils and dishes for meals, and wash these separately from other utensils and dishes.

MANAGEMENT OF INFLUENZA PATIENTS

Anti viral Treatment

Anti viral agents; M2 inhibitors (amantadine and rimantadine) and neuraminidase inhibitors (oseltamivir and zanimivir) have been licensed for treatment and prevention of human influenza.Though they were thought to be effective regardless of the causative strain, it has been recently indicated that these viruses are now resistant to M2 inhibitors.

All subtypes of avian influenza are considered to be sensitive to the newer drugs. At present, one of these drugs, ***Oseltamivi***r, is being used to treat cases. Current evidence suggests that ***Oseltamivir*** is effective in the treatment of H5N1 infections in humans. As the first dose of ***Oseltamivir*** needs to be administered within two days after the onset of symptoms, a critical problem is the tendency of cases to be detected late in the course of their illness. Many patients are not treated early enough for the potentially life-saving role of Oseltamivir to have an appreciable impact on mortality.

Antiviral Drug: Oseltamivir* (Tamiflu®)

Indications	Is effective against all subtypes of influenza viruses A (including H5N1) and indicated for both therapeutic and prophylactic use.
Formulations	Capsule-75 mg, Oral suspension – 12 mg per ml (to be reconstituted in water)
Storage	25^0 C; excursions permitted to 15-30^0 C
Therapeutic use	Treatment of influenza in patients one year of age and above who have been symptomatic for no more than two days
Duration of treatment	Twice daily x 5 days
Dose	Adults and adolescents (13 years of age or more): 75 mg twice daily Children (>1 years) : <15 kg body weight : 30 mg twice daily 15-23 kg body weight : 45 mg twice daily 24-40 kg body weight : 60 mg twice daily, >40 kg body weight : 75 mg twice daily
Prophylactic use	Indicated for chemoprophylaxis in persons 13 years and above. – Close contacts: 75 mg once daily for at least 7 days – Community contacts: 75 mg once daily up to 6 weeks (Protection lasts only during the period of chemoprophylaxis)

Adverse reactions	Most frequent side effects in adults are nausea and vomiting. These are transient and generally occur with the first dose. In children, most frequently reported side effect is vomiting. Other reported events include abdominal pain, epistaxis, ear disorder and conjunctivitis. These events do not require discontinuation of treatment in a majority of cases.
Contraindications	In persons with known hypersensitivity to any of the components of the product.
Pregnancy and lactation	Should be used during pregnancy or lactation only if the potential benefit justifies the potential risk to the foetus or breast-fed baby.

Patients should receive supportive treatment as listed below:

- Maintain oxygenation - ventilate as required.
- At the time of admission, attending physician may prescribe antibiotic therapy that will cover the common causative organisms in acquired pneumonia (including atypical pneumonia). Prophylactic antibiotics may also be considered to prevent secondary bacterial infection.
- Limit therapies / interventions which may cause aerolisation of respiratory secretions, such as nebulised bronchodilators, chest physiotherapy, bronchoscopy, gastroscopy, and any procedure/intervention which may release respiratory secretions. Take appropriate precautions if it is considered that patients require these interventions /therapies.

LABORATORY SURVEILLANCE

Coordination with the local and external reference laboratories

Medical Research Institute (MRI) is the national reference laboratory for the Avian Influenza laboratory surveillance in Sri Lanka. MRI will be supported by other laboratories at both government and private sector. Government laboratories where consultant virologist's / microbiologist's service is available may also be utilized in laboratory surveillance of both Human and Avian Influenza (**MRI - Telephone 011-2697280, 011-2693532-4**).

Laboratory confirmation of cases may not be needed once the existence of the pandemic is confirmed, since clinical symptoms are sufficient to plan for health care demand. University laboratories, where already influenza research is being carried out would be networked by the Technical Committee on preparedness on Avian Influenza appointed by the DGHS. Molecular Medicine unit of the University of Kelaniya is carrying out animal laboratory surveillance and it will continue as an additional focal point for animal laboratory surveillance for the Ministry of Health. Veterinary Research Institute (VRI) at Gannoruwa (Tel: 081-22388195) will be the national focal point for the animal laboratory surveillance. All animal specimens for laborotary surveillance should be sent either to the VRI or University of Kelaniya (Molecular Medicine Unit, Faculty of Medicine Tel: 011-2960483). Epidemiology Unit will coordinate both Animal laboratory surveillance centres to collaborate with the MRI.

At present Sri Lanka has limited capacity for Avian Influenza laboratory surveillance and therefore it has identified external centres to collaborate with; University of Hong Kong, WHO Influenza Centre for Reference & Research on Influenza, National institute for medical Research, Mill Hill, London, WHO Influenza centre at Parkville Melbourne Australia, CDC , Atlanta USA and AFRIM in Thailand.

Criteria for Laboratory Testing

Samples should be collected from the following categories for laboratory testing at the MRI as Sri Lanka is in the pandemic alert phase

- Influenza like illness (ILI) at hospital based sentinel sites
- Unexplained deaths due to acute respiratory tract illness & clusters of ILI in the community.
- Acute respiratory tract illness among at risk population (health care personnel, poultry workers, rural farmers who rear birds at back yard gardens etc)
- Incoming travellers from infected countries with symptoms
- All possible and probable Avian Influenza Cases

Tests available for investigation of Avian Influenza

- Direct fluorescence Test (DFT) to exclude other possible respiratory pathogens
- Rapid antigen/antibody detection for H5N1 antigen or antibody
- RT-PCR
- Virus isolation - Eggs/ Tissue culture
- Serological tests - Haemaglutination (HAI assay) Acute and convalescent samples of sera are required.
- Strain Identification- (At WHO Collaborating centres only)

Confirmation of Diagnosis of H5N1

- Virus isolation
- Detection of viral genome
- Demonstration of rising titre of specific antibody in paired sera

Specimen collection and transport

1. **Naso pharyngeal aspirate (NPA)** – is the best specimen.
   Using a mucous collection device (e.g. disposable mucous extractor) insert an NG tube (size 8) into the posterior nasopharynx, apply suction intermittently as catheter is withdrawn and wash aspirate through the tube using 2 ml of Viral Transport Medium (VTM). VTM is available at the MRI on request Transport the aspirate packed in ice.

2. **Swabs** :
   Nasal: Insert flexible fine – shafted swab into nostril and rotate the swab. Let the swab rest in place for several seconds to absorb secretions. Use separate swab to each nostril and place in VTM. Place both swabs in the same transport bottle.
   Throat: Vigorously swab both tonsil areas and place in VTM. Use tongue depressor to depress tongue so that contamination of swab with saliva is prevented.

   NOTE: 2 nasal swabs and one throat swab should be transported in one bottle of Virus Transport Medium. VTM should be obtained from the Virus Laboratory, MRI.
3. **Broncho Alveolar Lavage (BAL)**
   Place 8-10 ml in sterile container.
4. **Necroscopy specimens**
   - Nasal and throat swabs
   - Lung biopsy / para-mortem biopsy using tru-cut needle
   - Bronchial washings
   - Blood

Note: necroscopy specimens should be collected as soon as possible after death. Fixatives and preservatives should not be added to the specimens.

5. Acute and convalescent sera for influenza serological test.

Key points

- ***All specimens should be collected into VTM, and transported to the laboratory as soon as possible. It is preferable that the laboratory is informed before sending the samples.***
- ***Barrier protection procedures should be used whenever samples are obtained from patients.***
- ***Keep all specimens cool during transport (at 4 °C using ice)***
- ***For any further details, contact the Virologist, MRI.(Telephone 011-2697280)***

DISPOSAL OF A DEAD BODY

Key points in disposing a dead body

- Health care workers must follow standard precautions when caring for the deceased patient.
- If the family of the patient wishes to view the body, they may be allowed to do so.

1. Plug all orifices of the body with cotton wool soaked in 5% Lysol.
2. Wrap the body in a cloth which has been soaked in 5%lysol and wrung out.
3. The body should be fully sealed in a plastic body bag prior to transfer to the mortuary.
4. No leaking of body fluids should occur and the outside of the bag should be clean.
5. Transfer the body to mortuary as soon as possible.
6. In laboratory confirmed and in all unconfirmed cases, place body in a coffin which has been dusted with tropical chlorine of lime and nail down the lid.
7. The coffin should be removed directly for disposal to the closest burial ground under supervision of public health staff and police.

Post mortem procedure

- Initially, until such time an outbreak is confirmed, a post-mortem (pathological) may be required and should be performed with caution if the patient had died during infectious period.
- PPE should be worn by those who are directly involved in post mortem procedure.
- Autopsy specimens should be sent for laboratory confirmation of diagnosis.

Minimizing the risk from an infected cadaver

Prevent the production of aerosols – especially when excising the lung, by:

- Avoiding the use of power saws,
- Conducting procedures under water if there is a chance of aerosoliation,
- Avoiding splashing when removing lung tissues (use eye goggles).

As a general guide, follow standard precautions and:

- Use the minimal amount of equipment in the autopsy,
- Avoid using scalpels and scissors with pointed ends,
- Never pass instruments and equipment by hand – always use a tray,
- Use disposable instruments and equipment,
- Keep the number of staff present to a minimum

CLINICAL WASTE DISPOSAL

Items to be disposed

- Disposable needles, syringes and disposable or non-reusable protective clothing
- Treatment materials and dressings
- Disposable gloves
- Used laboratory supplies and biological samples
- Used disinfectants.

Recommended Disposal Methods

Incineration is recommended for disposal of:

- Needles and syringes
- Used treatment materials and dressings
- Disposable protective clothing
- Laboratory supplies

When an incinerator is not available, burn waste in a pit. Use fuel to accelerate the burning and ensure that all waste is completely destroyed.

Select Staff to Supervise Waste Disposal and Burning

Select a person with authority who will:

- Oversee all the disposal procedures, including preparation of the incinerator and pit.
- Train and supervise the staff who carry out waste disposal.
- Make a schedule for collecting and burning disposable waste.
- Supervise the collection and burning to make sure it is carried out safely.

DISINFECTION OF REUSABLE SUPPLIES AND EQUIPMENT

Cleaning and disinfection

The virus is inactivated by 70% alcohol and by chlorine. Therefore, cleaning of environmental surfaces with a neutral detergent followed by a disinfectant solution is recommended.

Disinfectants	Recommended use	Precautions
Sodium Hypochlorite 1% solution Dilution: 5% solution to be diluted to a ratio of 1:5 in clean water	• Disinfection of materials contaminated with blood and body fluids	• Use in well ventilated • Areas • Wear protective clothing • while handling and using • undiluted solution • Do not mix with strong acids to avoid release of chlorine gas • Use sparingly with metal objects as it can be Corrosive to metals
Bleaching powder 7g/litre with 70% available chlorine	• Toilets / bathrooms • may be used in place of liquid bleach if the latter is unavailable	• Same as above
Alcohol (70%) Isopropyl, ethyl alcohol, methylated Spirit.	• Smooth metal surfaces, • tabletops • other surfaces on Which bleach cannot be used	• Flammable and toxic • use in a well- ventilated area • avoid inhalation • Keep away from heat sources, electrical equipment, flames, and hot surfaces. • Allow it to dry completely, particularly when using diathermy as this can cause Diathermy burns.

o **Prepare Bleach solutions**

In a central place in the health facility, prepare two solutions of ordinary household bleach. Normally, ordinary household bleach has a 5.0% chlorine concentration.[1]

- 1:10 bleach solution[2] is a strong solution used to disinfect excreta and bodies. It is also used to prepare the 1:100 bleach solution.

- 1:100 bleach solution[3] is used to disinfect:
    - o Surfaces
    - o Medical equipment
    - o Patient bedding
    - o Reusable protective clothing before it is laundered (20 minutes).

It is recommended for:

- Rinsing gloves between contact with each patient
- Rinsing gloves, apron, and boots before leaving the patient's room.
- Disinfecting contaminated waste for disposal.

Bleach solutions must be prepared daily. They lose their strength after 24 hours. At anytime if the odour of chlorine is not present, discard the solution.

Note: 1:10 bleach solution is caustic. Avoid direct contact with skin and eyes. Prepare the bleach solutions in a well-ventilated area.

[1] *The recommendations in this section assume ordinary bleach solution has a 5% chlorine concentration.*
[2] *This is a solution with 0.5% chlorine concentration.*
[3] *This is a solution with 0.05% chlorine concentration.*

Disinfect reusable medical instruments

In the isolation room, each time when health care workers wash their hands between treating patients, they should also disinfect thermometers and stethoscopes that they have used to examine the patient.

To disinfect thermometers and stethoscopes with <u>alcohol</u>:

Use rubbing alcohol (70% isopropyl).

To disinfect thermometers and stethoscopes with <u>bleach solution</u>:

Place a covered container of 1:100 bleach solution in the isolation ward for this purpose. Change the bleach solution each day.

Disinfect Bedpan or Waste Bucket

- Cover the contents with 1:10 bleach. Empty the bedpan contents directly into an isolated toilet or latrine.
- Clean the bedpan with soap and water to remove solid waste. Pour water used to clean bed pans into toilet or latrine. Rinse the bedpan in 1:100 bleach solution and return it to patient's room.

Disinfect patient's utensils

If a by-stander assists with patient care, provide 1:100 bleach solution, soap and water so the by-stander can wash the patient's eating utensils. After washing the utensils, rinse them in 1:100 bleach solution, and let them air-dry.

Disinfect infectious waste and disposable supplies for burning

Place a bucket or other container containing 1:100 bleach solution in the patient's room. Use it to collect infectious waste, contaminated items, and disposable supplies to be burnt.

Clean and disinfect protective clothing

1. Move the laundry carefully into a bucket with fresh 1:100 bleach solution.
2. Soak laundry in 1:100 bleach solution for 30 minutes. Ensure that all items are completely soaked.

Clean and disinfect boots

- Place a sprayer or pan with 1:100 bleach solution at the exit of the patient's room for this purpose. Change the pan often.

- Clean and disinfect patient's bedding

For plastic sheeting:

Wash the plastic sheeting with 1:100 bleach solution.

For patient's sheets:

Soak in 1:100 bleach solution for 30 minutes. Ensure all items are completely soaked.

Mattresses:

1. Pour 1:10 bleach solution directly on the mattress. Let the solution soak through completely to the other side.

2. Flood the soiled area with soapy water and rinse with clean water.

Disinfect the vehicle after transporting the patient/body

1. The staff person who disinfects the vehicle must take general precautions.
2. Rinse the interior of the vehicle with 1:10 bleach solution.
3. Let it soak for 10 minutes.
4. Rinse well with clean water and let the vehicle air-dry. Be sure to rinse well because the solution is corrosive to the vehicle.

Notes on Specific Items of personal protective equipment (PPE)

1. Gloves (nonsterile)

2. Masks (2 types are recommended):

- N95 masks are recommended for restricted use in the isolation ward where close contact with the patient and direct contamination with saliva / sputum (cough, sneezing etc) is likely to occur.
- The patient should wear a surgical mask when staff/other people are in the room.
- Disposable masks should be discarded after 4-6 hours of use. They should not be stored in bags and re-used, shared, or hung around neck etc. (patient's mask may be reused by patient).
- It is essential that the mask makes a complete seal on the face (see manufacturer's fitting instructions).
- Masks cannot be worn with beards / unshaven faces.
- If a mask is splashed, wet, it should be changed (adhere to strict hand-washing).

3. Goggles / eye-wear:
Goggles may be worn when required during invasive procedures. They should be cleaned thoroughly in an alcohol-based disinfectant solution prior to re-use. Goggles may be worn with glasses.
4. Long sleeved cuffed gown
5. Plastic apron

NOTES ON USE OF PPE;

- **Never** wear PPE in general ward area.
- **Plan ahead** when entering the isolation area (or laboratory), to ensure that all necessary equipment is available, and all necessary patient care activities are completed in one visit.

A complete change of PPE and thorough hand washing (above) **must** be performed each time, when the staff must temporarily leave the isolation area.

Please refer Hospital Infection Control Manual, published by Sri Lanka College of Microbiologists And WHO Influenza A (H5N1) Interim Infection Control Guidelines for Health Care Facilities (www.who.int)

ROLES AND RESPONSIBILITIES

The prevention and control programme on influenza pandemic will be collectively managed by participating stakeholders. The primary agency for response will change over the course of the stages of pandemic and this will depend on the phase in effect in Sri Lanka. During the pandemic phase, Ministry of Health will be the lead agency, other stakeholders will include: Ministry of Medium and Small Scale Plantation Industries, Rural Human Resource Development and Livestock, Dept. of Wildlife conservation, civil societies, armed forces, private sector, etc. as needed. They will work in close collaboration with one an other.

- Ministry of Health will be responsible for national oversight and monitoring of the pandemic influenza response. It will establish a national "Operation Room" to support the operational activities of all health services and act as a focal point for links and coordination of health services, vaccine distribution, prioritization and distribution of antiviral drugs.
- Provincial health services will maintain a 24 hour operational facility to support district health services and the other health services including the private sector agencies and where necessary to coordinate all responses to public health emergencies.
- All hospitals and ambulance services are responsible for deploying the health care resources for those affected by pandemic influenza. Each service must be able to mobilize local resources flexibly and to the maximum. Further it should be consistent to maintain essential care. Each service must also plan to offer effective support to any neighbouring service that is substantially affected and in return shall be able to rely on such mutual support if needed.
- All primary health services must be able to mobilise and direct health resources to local hospitals at short notice to support them and to sustain the services. They must also plan to harness and effectively utilize primary care resources in case of need of support. Agreed system also must be in place to enable them to work as "lead" primary health care services with others or,(as appropriate), in support of primary health care activities.

- Established National Technical Committee on Avian Influenza (NTCAI) is the technical and advisory body for the Ministry of Health and will oversee the development and implementation of the National Influenza Pandemic Preparedness Plan (NIPPP). It is responsible for developing strategies appropriate to the country's needs and situations drawing expertise from the WHO, international and local multidisciplinary experts. In the event of a pandemic Ministry of Health will be the lead agency for the country with technical inputs from the Committee.
- Laboratories under Ministry of Health are responsible for collection of specimens, examining them, reporting results and sending specimens to WHO collaborating centres based on WHO recommendations. Algorithm etc needed.

Where to find information about influenza H5N1

1. WHO, Communicable Disease Surveillance & Response, Avian influenza
http://www.who.int/csr/disease/avian_influenza/en/

2. Centers for Disease Control and Prevention, Avian influenza
http://www.cdc.gov/flu/avian/index.htm

More details could be obtained from the Epidemiologist, Epidemiological Unit, 231, De Saram Place, Colombo 10 (Tel: 011-2681548, 2695112, E-mail: chepid@sltnet.lk), Consultant Virologist, Medical Research Institute (MRI Tel: 011-2693532, 2693533, 2693534), Veterinary Research Institute (Tel: 081-2388195,2388276, 2388312) and Dept of wild life conservation (Tel: 011-2694241,Email director@d.wlc.lk)

Please bring the contents of this circular to the notice of all officers concerned in your province/district/institution/ Unit/ Ward.

Dr Athula Kahandaliyanage
Director General of Health Services

c.c.- 1. Secretary/Ministry of Healthcare, Nutrition & Uva Wellassa Development
2. DDG (MS)
3. DDG (PHS)
4. DDG (LS)
5. Epidemiologist
6. Director/MRI
7. D/MSD
8. D/HE&P
9. All other Technical DDGs & Directors

Annexure

Sentinel Surveillance and Isolation sites for suspected AI patients in the event the disease is reported in Sri Lanka.

	INSTITUTION	REMARKS
1.	Infectious Disease Hospital / Angoda	National referral & isolation facility
2.	Lady Ridgway Hospital for Children, Colombo	For Paediatric referrals
3.	National Hospital Sri Lanka (NHSL)	Surveillance & referral
4.	Teaching Hospital Kalubowila	
5.	Teaching Hospital Ragama	
6.	Teaching Hospital Peradeniya	
7.	Teaching Hospital Karapitiya, Galle	
8.	Teaching Hospital Ratnapura	
9.	Teaching Hospital Kurunegala	
10.	Teaching Hospital Jaffna	
11.	Teaching Hospital Batticaloa	
12.	Sri Jayewardenepura General Hospital	
13.	General Hospital Badulla	
14.	General Hospital Ampara	
15.	General Hospital Anuradapura	
16.	General Hospital Matara	
17.	Base Hospital Chillaw	
18.	Base Hospital Polonnaruwa	
19.	Base Hospital N-eliya	
20.	Base Hospital Vavuniya	