Standard Operating Procedures
Avian Influenza in Human

Directorate General of Health Services
Ministry of Health and Family Welfare
Government of the People's Republic of Bangladesh

Institute of Epidemiology,
Disease Control and Research

World Health Organization
Country Office for Bangladesh

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Foreword

In Bangladesh, unusual poultry die offs were first noticed in February 2007 in the region of Dhaka and influenza A/H5N1 was subsequently confirmed in March 2007. Since then, a total of 47 out of 64 districts in Bangladesh have reported outbreaks in poultry up to September 2008. One human case was reported as influenza A/H5N1. Following the experience of other countries the possibility of new case is a serious concern and vigilance is required.

These Standard Operating Procedures (SOPs) for Surveillance, Case Detection, Laboratory Testing, Case Management and Reporting of Suspected and Confirmed Avian Influenza (AI) Cases in Humans have been developed to cover all situations in Bangladesh where such human cases might be expected to occur, including occupational at-risk groups, communities and in healthcare facilities. It is an essential tool for effective health service and control for any country.

I hope the SOPs will help to identify AI cases, referral, transport, laboratory testing and case management and will be applied in all Districts, including those not currently experiencing AI outbreaks in poultry because individuals may move from an affected area and present to a healthcare facility in a non-affected District.

I am very happy that the SOPs have been finalized. I would like to acknowledge the sincere efforts of officials from IEDCR, NIDCH, DMCH and DGHS, MOHFW and also I wish to record my sincere thanks to the WHO, Bangladesh for their timely assistance in such an important area of health development. My exclusive thanks to Dr. Duangvadee Sungkhobol, WHO Representative to Bangladesh for her continuous enthusiastic support in this regard. I would also like to thank to Dr Richard Brown, Public Health Specialist, SEARO, WHO, Director, Disease Control, Director, IEDCR, Director, NIDCH and all the resource persons, who are the key persons and contributed a lot in this regard.

I am sure that it will guide health officials at all levels to maintain standard and quality reports and management of AI cases from the grass root level to the central level timely in a very efficient way and will contribute to improve our existing AI surveillance and management system in the country to a very effective manner. I wish a successful implementation of the SOP at every level in the country.

23.09.2008

Professor M A Faiz
Director General of Health Services
Government of Peoples Republic of Bangladesh
Dhaka, March 2008

Preface

Avian influenza is caused by the highly pathogenic H5N1 Influenza A virus. Occurrence of this infection in several countries in poultry and human beings is a cause for grave concern. Though the virus is not easily transmitting from poultry to humans and from human to human, it is believed that a pandemic due to H5N1 virus or its genetically altered form is imminent. The situation is unfolding each day and every event gives a warning and a grim reminder of the devastation caused by influenza pandemics in the past.

First human case of confirmed Influenza A (H5N1) infection in Bangladesh announced by the Ministry of Health and Family Welfare on 22 May 2008. There is a great risk to human as the virus may transfer to the human from birds. The prevailing situation due to Avian Influenza among birds needs preparedness for rapid response and containment.

The Standard Operating Procedures (SOPs) for Surveillance, Case Detection, Laboratory Testing, Case Management and Reporting of Suspected and Confirmed Avian Influenza (AI) Cases in Humans have been developed to cover all situations in Bangladesh where such human cases might be expected to occur, including occupational at-risk groups, communities and in healthcare facilities.

I hope the Standard Operating Procedures (SOPs) will help to identify cases and will be applied at all levels in the country, including those area not currently experiencing AI outbreaks in poultry. Any outbreak of communicable diseases can only be contained if we have reliable information at hand, early case detection and reporting to the Authority, properly handle the detected case and transport to the hospital and take care of the patient at the out patient department and in the isolation ward of the health facilities at all levels in the country. Bangladesh has a good health infrastructures network all over the country. We are still trying to improve and expand these further. Also we have very large health manpower in the health sector. We can easily implement any program if we are really serious about it.

We are grateful to all the resource persons from IEDCR, NIDCH, NIPSOM, DMCH, DGHS, MOHFW and all other participants for their interest and time spent to develop the SOPs. We acknowledge the technical assistance from WHO to develop the SOPs. We also like to thank different team who worked very hard and faced so many troubles in the process of developing this document.

Professor Dr. Moazzem Hossain
Director, Disease Control
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Preface

Since outbreak of avian influenza in 2003, the world has become concerned of another influenza pandemic. With the experience of preceding three influenza pandemics, the global community has been preparing to face the challenge. Along with other countries, Bangladesh is also taking preparatory measures for this dreadful situation. As a part of the measures, Directorate of Health Services of Bangladesh decided to develop some Standard Operating Procedure (SOP) Manuals for performing different activities related to avian influenza. Institute of Epidemiology, Disease Control and Research (IEDCR), was given the responsibility to develop a number of SOPs by the National Technical Committee for Avian Influenza.

All out efforts were taken by IEDCR to develop standard SOPs for avian influenza in human. In total 11 SOPs have been developed that are compiled together in this manual. First a nucleus group formed of the officers of IEDCR worked for days to form skeletons for the SOPs. Then seven core groups formed of Public Health Specialists, Epidemiologists, Laboratory Medicine Specialists, Clinicians, Anaesthetists, Veterinarians, Communication Specialists, Health Managers of Upazila, Districts and Directorate and Consultants of WHO worked for a week to draft the SOPs. The members hailed from Health, Livestock and international organizations. Two review workshops were held involving experts, academicians, policy makers and health managers. The nucleus group then finalized the SOPs incorporating the recommendations of the review workshops. The individual SOPs were then combined together and edited for printing.

The SOPs have addressed almost all related aspects of avian influenza in human including surveillance, outbreak investigation, diagnosis and management, protection of personnel, rapid containment and risk communication. I think that, use of these SOPs will strengthen our efforts for combating the situations evolved out of avian influenza. In spite of the efforts and measures, there might be some mistakes, inadequacies and inappropriateness. With our exercise and experience we shall overcome those limitations in subsequent editions.

I am grateful to the Director General of Health Services for giving us the opportunity and guidance for developing the SOPs. I express my gratitude to Director, Disease Control, DGHS for providing the fund for developing the SOPs. I express my heartfelt thanks to all those honourable members who have contributed to develop, review and edit the SOP. I also acknowledge the SOP 'Standard Operating Procedures for Public Education, Surveillance, Case Detection, Laboratory Testing, Case Management and Reporting of Suspected and Confirmed Avian Influenza Cases in Humans' drafted by DGHS and WHO as the source book. I also acknowledge WHO, Bangladesh for providing technical assistance for the SOPs.

Prof. Mahmudur Rahman PhD
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Acknowledgements

These Standard Operating Procedures (SOPs) for Avian Influenza in Human were developed by the Disease Control Unit, Directorate General of Health Services (DGHS) in collaboration with the Institute of Epidemiology, Disease Control and Research and with technical assistance from WHO. Many experts provided valuable contributions throughout the process of their development.

Special thank is extended to Dr Richard Brown, Public Health Specialist, Communicable Disease Surveillance and Response Sub-Unit at Bangkok, WHO Regional Office for South-East Asia for preparing, in close collaboration with the DGHS, the first draft of the SOPs for Public Education, Surveillance, Case Detection, Laboratory Testing, Case Management and Reporting of Suspected and Confirmed Avian Influenza Cases in Humans. These draft SOPs were extensively reviewed by a group of experts in a consultative meeting held at National Institute of Diseases of the Chest and Hospital (NIDCH). Contribution of these participating experts (listed in annex 1) is gratefully acknowledged.

Following the review meeting at the NIDCH, these SOPs were further developed, reviewed and finalized by a numbers of experts whose name appeared in annex 2. Special thanks are extended to them all.

Sincere appreciation is also extended to WHO Country Office for Bangladesh and all those who have significantly contributed to the development of these SOPs.

Table of Content

SOP 1: Avian Influenza Surveillance

Version 1: October 2008

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SOP 1: Avian Influenza Surveillance

1. Introduction

Surveillance of avian influenza in human is one of the most important steps for early diagnosis, control and prevention of spreading human pandemic avian influenza.

2. Purpose

To conduct surveillance of avian influenza in human

3. Surveillance of Avian Influenza in Human

3.1 Organization of surveillance

The Influenza surveillance will be part of the disease surveillance of the country involving existing health facilities and personnel. It will be supported by international organization and donor agencies. The surveillance will be coordinated by Institute of Epidemiology, Disease Control and Research (IEDCR) the National Influenza Centre (NIC), Bangladesh under Directorate General of Health Services (DGHS).

3.2 Objectives

To identify avian influenza in human as early as possible
To treat the cases appropriately
To prevent spread of the disease
To monitor close contacts for early diagnosis and treatment
To identify new risk groups to prevent further transmission

3.3 Types of Surveillance

3.3.1 "High risk" group surveillance

Among the close contact persons with infected poultry (Cullers & persons involved) Among the live bird handlers in the wet market of urban areas

3.3.2 Hospital based Influenza surveillance

3.3.3 Event based Avian Influenza surveillance

3.3.4 Sentinel Surveillance for Influenza Like Illness

4. Case Definitions Used in Influenza Surveillance

Categories of case definitions for avian influenza surveillance

4.1 Patient Under Investigation
4.2 Possible Case
4.3 Probable Case
4.4 Confirmed Case
4.5 Influenza Like Illness (ILI) Case
4.6 Severe Acute Respiratory Illness (SARI) Case
4.7 Cluster

4.1 Patient under Investigation

Any individual from 'high risk' groups, presenting with

- Fever
- And one or more of these symptoms
- Cough
- Sore throat
- Shortness of breath

High risk Groups are

- Poultry farmers
- Cullers
- Live bird handlers in wet market
- Veterinarians exposed to avian influenza infected poultry,
- Healthcare workers/care givers looking after patients with suspected or confirmed human avian influenza infection or died from unexplained severe respiratory illness

4.2 Possible Case

A "patient under investigation"
With any of the following epidemiological linkage within last 14 days

- Direct contact (1 metre) with sick/dead poultry or birds
- Direct contact with environment contaminated with faeces of infected poultry
- Direct contact (1 metre) with confirmed case of Influenza A/H5N1
- Direct contact (1 metre) with hospitalized patients died with unexplained severe respiratory illness
- Collection, transportation and handling of samples from persons/animals with suspected Influenza A/H5N1
- Consumption of raw or undercooked poultry products (meat/egg) in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last one month

  And
- Positive lab test (Rapid diagnostic test) for Influenza A (not including subtype)

4.3 Probable Case

Any "patient under investigation" or "possible case" who ALSO has

- In-country laboratory evidence for influenza A subtype/H5 (PCR)

4.4 Confirmed Case

Any "patient under investigation" or "possible case" or "probable case" WITH
Laboratory testing demonstrates one or more of following (confirmation by WHO reference laboratory)

- Positive viral culture for H5N1
- Positive PCR for H5N1
- IFA Test positive for H5N1
- At least 4-fold rise in H5N1 in paired serum samples

** A confirmed case of AI has to be reported to WHO as a PHEIC*

4.5 ILI (Influenza Like Illness) Case

Any individual presenting with

- Sudden onset of fever AND
- Cough or sore throat AND
- An absence of diagnosis of other respiratory disease(s)

4.6 SARI (Severe Acute Respiratory Illness) Case

For persons =5 years old:

- History of sudden onset of fever AND
- Cough or sore throat AND
- Shortness of breath / difficulty in breathing

  AND
- Requiring hospital admission / hospitalized patients

For persons < 5 years old: [Adapted from Integrated Management of Childhood Illness (IMCI)]

- Severe Pneumonia or Very Severe Disease
  - A child with cough or difficult breathing and with any of the following signs - any general danger signs, chest indrawing or stridor in a calm child.
  - Requiring hospital admission / Hospitalized patients
- Pneumonia
  - A child with cough or difficult breathing who has fast breathing and no general danger signs, no chest indrawing and no stridor when calm.
  - Requiring hospital admission / Hospitalized patients

4.7 Cluster

4.7.1 Cluster of avian influenza surveillance:

Two or more patients with criteria of 'possible case' and live within a 15 minutes' walk or within 1 kilometre radius who develop symptoms within 7 days of each other.

4.7.2 Cluster of hospital based influenza surveillance:

Two or more patients aged > 5 years admitted with severe acute respiratory illness and live within a 45 minutes' walk or within 3 kilometre radius who develop symptoms within 7 days of each other.

5. Conduction of Surveillance

5.1 "High risk" group surveillance

5.1.1 Among the close contact persons with infected poultry

Close Contact Person: Poultry workers of the H5 infected poultry, cullers, veterinarians and health care personnel who came in contact of the infected poultry.

5.1.1.1 Contact details

- Local health care personnel will prepare the list in collaboration with local live stock authority.
- Contact details should be recorded and kept in given format

5.1.1.2 Follow-up

- Daily follow-up of the contact persons, for development of following symptoms
  - Fever

    And any one of the following
  - Cough
  - Sore throat
  - Shortness of breath
- Follow-up will be done by the local health care authority for 14 days.
- They will keep the record in the given format
- Daily report of contact persons should be sent to IEDCR through Civil Surgeon of that district.

5.1.1.3 Prophylaxis

- All the close contact persons will be administered with Oseltamivir as prophylaxis for seven days (ref SOP 5)
- If any person falls under 'patient under investigation'
  - Should be administered with Oseltamivir as treatment (ref SOP 5.)
  - Samples should be collected from each case and sent to reference laboratory (IEDCR/sentinel district hospital). (ref SOP 4)

- Home confinement of the person until receipt of laboratory test result. (ref SOP 6)
- Follow-up of that person will be done by the local health authority at household level.

5.1.2 Among the live bird handlers in the wet market of urban areas

- Two markets from each zone of all the six city corporations will be included for surveillance, which are nearer to any local health NGO office/clinic.
- Listing of all live bird handlers in those specific markets.
- Follow-up of above mentioned symptoms (ref 5.1.1.2 Follow Up) among the live bird handlers on weekly basis (on every Sunday, if there is holiday then next working day) in given format.
- Weekly report of the follow-up must be sent to IEDCR through fax/e-mail before the end of clinic hour on the same day.
- A weekly summary report (without the line listing) should be sent to their higher authority (Chief health officer) and the Civil Surgeon of that district. Chief health officer will be responsible for ensuring timely sending of report.
- If any person falls under 'patient under investigation', local health authority will take necessary action in consultation with IEDCR.
- Samples will be collected and tested for each case. (ref SOP 4)
- IEDCR will inform the situation to the Director Disease Control with a copy to Divisional Director and Civil Surgeon to take necessary actions.

5.2 Hospital based influenza surveillance

Hospital based influenza surveillance is already ongoing in 12 private and public hospitals across the country with the collaboration of IEDCR, ICDDR,B and CDC, Atlanta.

SOP 1

5.3 Event based avian influenza surveillance

- It is a process of investigating unofficial reports of disease events to verify the truth.
- This surveillance aims to decrease the potential for misinformation and misunderstanding and to inform the public and health officials about disease outbreaks, facilitate a rapid response, and promote public health preparedness.
- IEDCR started the recording of any unusual health events from the daily newspaper, other media or from local health authority. Regarding Avian Influenza, they will also follow the same system.
- If there is any such kind of news, IEDCR will instruct the local health authority to do the rumour verification.
- Samples will be collected from each such patient with appropriate precaution and transported to NIC, IEDCR.
- If necessary, IEDCR team will conduct the investigation.

5.4 Sentinel surveillance for Influenza Like Illness

- Protocol is being finalized to conduct surveillance for ILI in 18 district hospitals. A separate SOP will be produced later on.

6. Recommendation

6.1 Other high risk groups, like poultry hawkers and persons in contact with backyard poultry need to be included in surveillance system.

6.2 Cullers need to be included from the same locality to ensure proper follow up.

SOP 2: Case and Outbreak Investigation of Avian Influenza

Version 1: October 2008

SOP 2

SOP 2: Case and Outbreak Investigation of Avian Influenza

Version 1: October 2008

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SOP 2: Case and Outbreak Investigation of Avian Influenza

1. Introduction

The initial outbreak of highly pathogenic avian influenza A (H5N1) among poultry and people in Hong Kong in 1997 increased awareness of our vulnerability to a global pandemic. Since late 2003 the accelerated geographical spread of influenza A (H5N1) among birds in Asia, Europe, the Middle East and Africa has heightened the concern. Case investigation will lead to confirmation of diagnosis and early containment of outbreak through rapid isolation, case management and enhanced surveillance.

2. Purpose and Scope of the SOP

2.1 This SOP focuses on the key steps that should be undertaken in investigating all cases and outbreaks of avian influenza in human.

2.2 This SOP will be used by medical doctors and assigned health personnel

3. Objectives of Case/Outbreak Investigations

3.1 To detect case and cluster of avian influenza in human

3.2 To determine key epidemiological, clinical, and virological characteristics of cases

3.3 To find out risk factors for transmission

3.4 To suggest measures for containment and control of spread of the diseases

4. The Urgency of Initiating an Investigations

The urgency of initiating an investigation is increased when:

4.1 Two or more persons presenting with unexplained acute lower respiratory illness with fever (greater than or equal to 38°C) or died of an unexplained respiratory illness with onset of illness within a period of two weeks and or reside in the same geographical area and/or are epidemiologically linked;

4.2 Health-care workers who develop unexplained acute lower respiratory illness with fever after providing care to patients or dead case with either known A(H5N1) infection or unexplained acute respiratory illness with fever;

4.3 People working with birds/animals present with unexplained acute lower respiratory illness with fever;

4.4 Routine seasonal influenza surveillance detects influenza-like illness with

- An unusual distribution by age group,
- High frequency of pneumonia, or
- Unexplained acute moderate-to-severe respiratory illness in previously healthy adults or adolescents.

5. Key steps for investigation of human cases of AI/H5N1

A number of critical activities have to be undertaken as part of AI/H5N1 investigation. The order of the activities may vary depending on local circumstances and often multiple activities may have to be undertaken in parallel. For investigation, case definitions will be followed (Reference SOP: 1).

5.1 Formation of Team for Investigation:

The team for the investigation will be formed from members of Rapid Response Teams (RRT) of national, district and upazilla level. The team should preferably consist (along with other members) of

5.1.1 Public health Specialist /Epidemiologist

5.1.2 Clinician

5.1.3 Laboratory Medicine Specialist

5.1.4 Medical Technologist

The expanded team members may be

- Veterinarians
- Medical sociologist
- Logisticians, (Logistics: please refer to checklist in Annex 1)

5.2 Visiting and interviewing the case

5.2.1 Interviewing and data collection:

5.2.1.1 The team has to move rapidly to visit the case and/or family members (if the patient is too ill to be interviewed or has died), within 24–48 hours of notification.

5.1.1.2 The investigation team has to collect basic demographic and epidemiological information and record clinical data.

5.1.1.3 Information should be collected using structured questionnaire (refer to Annex 2)

5.1.1.4 Prepare a line list from the information collected

5.1.1.5 Take measures for managing the cases as per SOP 5

5.2.2 Sample collection and Laboratory diagnosis:

5.1.2.1 Collection, testing and confirmation of clinical samples from the case patient(s) has to be done on urgent basis.

5.1.2.2 Samples should be collected from both cases and contacts

5.1.2.3 Team members must use of PPE while collecting samples

5.1.2.4 Team members can choose to interview persons outdoor and not in a close interior setting and avoid direct face-to-face contact.

5.1.2.5 For detail of sample collection, storage, transport and investigation (refer to SOP 4)

SOP 2

5.3 Active case-finding in the community

The team has to look for cases in the community. The team should consult local health personnel (government, private, NGO), local elites, journalist and others. Active case-finding should focus on:

5.3.1 Persons who may have been co-exposed to the same source as the case patient

5.3.2 Persons with patient, bird and animal exposures

5.3.3 Persons with unexplained acute lower respiratory infection with fever or persons who died of an unexplained respiratory illness with fever

5.4 Active case-finding in the hospital and clinics

Team should visit all traditional and non-traditional health care facilities for cases, who are admitted, were discharged or died. The team should obtain information about the case patient through:

5.4.1 Interview the physician and other care providers about the patient's illness, clinical course, treatment, epidemiological/exposure information;

5.4.2 Review the medical records and collecting copies if possible;

5.4.3 Obtain additional specimens from the patient for testing if needed;

5.4.4 Identify and secure any stored specimens previously collected from the patient

5.4.5 Review registers (e.g. admission, laboratory, consultation) to identify other possible cases both prospectively and retrospectively.

5.4.6 Identify health-care workers, patients, or others who were close contacts

5.4.7 Monitor all health care workers who have provided care for patients with fever and influenza-like illness

5.4.8 Conduct site visits and review procedures in key areas of the facility including
5.4.8.1 Isolation unit/area
5.4.8.2 Outpatient area for triage of persons with acute respiratory illness and laboratory facilities
5.4.9 Provide guidance regarding
5.4.9.1 Medical management of persons with influenza A(H5N1)
5.4.9.2 Infection control procedures
5.4.9.3 Inquire if there are adequate supplies of
5.4.9.3.1 Personal Protective Equipment (PPE)
5.4.9.3.2 Antiviral drugs for treatment of ill patients, chemoprophylaxis for health-care
5.4.9.3.3 Workers and others as guided by the protocol;
5.4.9.3.4 Supportive therapy (e.g. antipyretics, antibiotics);
5.4.9.3.5 Specimen collection equipment, cold chain storage, and transport material.
5.4.10 Initiate enhanced surveillance (Refer to SOP 1)
5.4.10.1 Conduct enhanced surveillance for a minimum of 2 weeks (doubling incubation period)
5.4.10.2 Ensure active surveillance in hospitals particularly targeting in-patient and emergency departments.
5.4.10.3 Include other sources such as traditional healers, private practitioners, private laboratories in the active surveillance
5.4.10.4 Carry active surveillance among the groups that may be at higher occupational risk of exposure (e.g. health-care workers, persons exposed to live or dead birds/animals).

5.5 Contact Tracing and Management

To prepare a line list of all contacts from the information collected (Please refer to Contact tracing form - Annex 3).

5.5.1 Criteria for detection of contact:

5.5.1.1 Persons who had close (<1 meter) unprotected (without PPE) contact with the case from 1 day before start of illness of the case through 14 days after the onset.
5.5.1.2 Persons having close unprotected contact while working (handling or culling) with AI/H5N1 infected poultry
5.5.1.3 Persons providing bedside care to AI/H5N1 or sharing the same sleeping or eating space with the case

5.5.2 Measures for Symptomatic Contact

5.5.2.1 Refer contacts for collection and laboratory testing of specimens on priority basis (Refer SOP 4)
5.5.2.2 Provide appropriate medical care including antiviral therapy (Refer SOP 5)
5.5.2.3 Isolation in home or in nearest hospital setting depending on the severity of illness, acceptability, and the availability of hospital beds while awaiting for test results

5.5.3 Measures for asymptomatic contacts:

5.5.3.1 Monitor the asymptomatic contact for the development of symptoms up to 14 days after the last exposure to the case through daily visits, telephone calls or fax
5.5.3.2 Administer antiviral for chemoprophylaxis

6. Animal health and environmental investigation

The team will also Investigate the unusual occurrence of illness among birds and animals (e.g. large numbers of bird deaths) which should include:

6.1 The patient's home and its surroundings, especially backyard poultry areas
6.2 Poultry farms (commercial or backyard farms) near the case patient's home
6.3 Poultry/live animal markets near the case patient's home
6.4 Places frequented by wild birds (e.g. lakes)

6.5 Feeding and bird handling practices,

6.6 Recent poultry/bird movement (e.g. introduction of new poultry/birds into a flock), and migratory bird patterns

7. Reporting of the Investigation

A written report should be submitted to the concerned authority immediately at the end of investigation. Investigation report should include the following

7.1 Epidemic curve (to determine incubation period and human-to-human transmission)

7.2 Socio-demographic characteristics (geographical distribution, age, sex and occupation)

7.3 Epidemiological data (attack rate, distribution of cases by sex, age and occupation)other epidemiological data

7.4 Clinical information (e.g. spectrum of illness severity, proportion of cases who developed pneumonia, required hospitalization, and died)

7.5 Transmission pattern among contact and family members

8. Assessment of possible human to human transmission

Situations that can indicate human-to-human transmission of A(H5N1) include:

8.1 Sharp increase in the number of AI/ H5N1 cases despite adequate control measures in the animal population;

8.2 Absence of exposures to bird or animals among confirmed/possible AI/ H5N1 cases;

8.3 Clustering of cases with evidence of two or more generations or chains of transmission;

8.4 Increase in cluster frequency, size, duration or spread within a specific area;

8.5 Changes in epidemiological characteristics (e.g. age distribution, severity of disease, etc.).

8.6 Direct, prolonged, and unprotected contact with a symptomatic person in settings such as

8.7 Households and extended families, health-care settings, schools, places of work, and residential institutions such as prisons, military barracks, recreational camps, refugee/displacement locations, or orphanages.

8.8 Several generations of transmission linked to a primary case

8.9 Time interval between contact with a human case and illness onset is 7 days or less

8.10 In line with the International Health Regulations (2005), WHO should be notified if the investigation suggests that human-to-human transmission is occurring

If human-to-human transmission of A (H5N1) infection persists consider of Rapid Containment (for detail please refer to SOP 10)

9. Implementation of prevention and control measures

Standard prevention and control measures to reduce opportunities for further transmission of A(H5N1) should be according to SOP 6.

10. Notification and Report

10.1 Notify upazilla, district and national public health and livestock authorities for launching immediate investigation.

10.2 Inform health-care providers (traditional and non-traditional), hospitals and outpatient facilities, community leaders in the area where the case patient resided and/or travelled

10.3 According to International Health Regulations (2005), the national health authority must notify WHO of any human case of A(H5N1) or other new human influenza virus subtype within 24 hours

10.4 Provide daily situational updates to relevant authorities at local and national levels

Annex 1: Checklist

1.1 Checklist for Forms

Location of Investigation _____ Date _____

1 ID Card
2 SOP for Case/Outbreak Investigation (Avian Influenza SOP 2)
3 Case Investigation form/Reporting Form (SOP 2: Annex 2)
4 Summary Case Count Form
5 Line-listing Form
6 Data Collection form for Environmental / Home Investigation
7 Clinical Sample Collection Form
8 Animal Sample Collection Form
9 Environmental Sample Collection Form
10 Educational and informational material for general public (IEC)
11 Budget Request / Documentation forms for Travel, Lodging, PPE, or other expenses
12 Reference documents on avian influenza in human
13 List of contacts locally and at the national/regional/international level

1.2 Checklist for resources

Sl	Resource	Yes/No
1	Transportation	
2	Personnel	
3	Antiviral medication	
4	PPE	
5	Laboratory/sampling supplies	
6	Educational information (brochures, posters)	
7	Decontamination solution	
8	Guidelines on Conducting an Avian Influenza Investigation in human	
9	Contact list for Team Members, Supervisor, and those who should be informed	
10	Notebook or laptop computer for recording and/or storing data, camera for photos	
11	Communications equipment such as mobile phones and radios	
12	Money	

Annex 2: Case Investigation Form for Avian Influenza AI/H5N1

ID Number _____

1. Reporting details
Name of reporting Country or Territory _____
Date of report to National Health Authorities (dd/mm/yyyy) __ / __ / ____

Contact details of person submitting the report

Name _____
Institution/Organization _____
_____
Address _____
_____
Telephone _____
Fax _____

City/town/village from where case was reported _____
Date of first identification of cases (dd/mm/yyyy) __ / __ / ____

2. Demographic details
Name _____ Sex: 1.Male 2.Female

Date of birth (dd/mm/yyyy) ____/____/____ Age: Years months (if child <5years)

SOP 2

Current contact details

Full address _____
_____
Country _____
Telephone _____
Nationality _____
Ethnicity _____

3. Signs and symptoms

3a Date of onset of illness (dd/mm/yyyy) __ / __ / ____

3b Did you have the following symptoms

Symptoms	Yes=1, No=2, nknown=9
Body temperature higher than 38°C	
Cough	
Sore throat	
Shortness of breath	

4. History of admission to hospital

4a Have you been admitted to the hospital?
1.Yes; 2.No 9.Unknown

4b If Yes, complete table[1] below

Note: If the person became ill while in hospital, include these details of this hospital stay under Hospital 01 in the table. Under these circumstances the date of admission should precede the date of onset of symptoms.

Name of the hospital	Date of admission to hospital (dd/mm/yyyy)	Has the person been isolated Yes=1, No=2, Unknown=9	Date of isolation (dd/mm/yyyy)	Date person discharged from hospital (dd/mm/yyyy)

5. Travel history

5a During the 7 days prior to the onset of symptoms, did you travel to or reside outside Bangladesh?

1. Yes 2.No 9.Unknown

If Yes, complete itinerary in table below.[2]

5b During the 7 days prior to the onset of symptoms, did you travel to or reside in areas outside your district?

Country / Territory of departure	Date of departure (dd/mm/yyyy)	Primary means of transport 1= Plane, 2= Boat, 3=Train, 4=Bus, 5=Other	Country /Territory of arrival	Date of arrival (dd/mm/yyyy)

1. Yes 2.No 9.Unknown

If Yes, complete itinerary in table[3] below

District of departure	Date of departure (dd/mm/yyyy)	Primary mean of transport 1= Plane, 2= Boat, 3= Train, 4= Bus, 5= Other	District of arrival	Date of arrival (dd/mm/yyyy)

[1] Add as many lines as needed to accommodate all hospitals in which the case was admitted

[2] Add as many lines as needed to accommodate all places visited

[3] Add as many lines as needed to accommodate all itinerary

6. Occupational exposure

6a During the 7 days prior to the onset of symptoms, have you been working in any at-risk animal-related occupation, including the following?

Type of occupation	Yes=1, No=2, Unknown=9
Poultry or pig farm worker	
Poultry culler (catching bids, bagging birds, transporting birds, disposing of dead birds	
Worker in live animal market	
Chef working with live or recently killed poultry	
Dealer or trader of pet birds	
Others (please specify)	

6b During the 7 days prior to the onset of symptoms, have you been working as a worker in laboratory where samples are tested for influenza A/H5 viruses?

1.Yes 2.No 9.Unknown ☐

6c During the 7 days prior to the onset of symptoms, have you been working as a health care worker?

1.Yes 2.No 9.Unknown ☐

SOP 2

7. History of exposure to animal populations

During the 7 days prior to the onset of symptoms, have you:

	7a	*7b*	*7c*
	...had contact (within 1 metre) with any live or dead animal of species listed Yes=1, No=2, Unknown=9	...entered settings where animal species were confined or had been confined in the previous six weeks Yes=1, No=2, Unknown=9	If Yes to 7a or 7b, and exposure occurred outside the reporting country/territory, list all countries/territories where these exposures occurred
Poultry			
Wild birds			
Pig			

8. History of exposure to human cases

During the 7 days prior to the onset of symptoms, have you been in contact (within touching or speaking distance) with: (circle the answer)

8a A person you know is a confirmed human case of influenza A/H5 infection

1.Yes 2.No 9.Unknown ☐

If Yes, specify whom _____

8b A person with an unexplained acute respiratory illness that later resulted in death

1.Yes 2.No 9.Unknown ☐

8c Any other person for whom diagnosis of influenza A/H5 is being considered

1.Yes 2.No 9.Unknown ☐

8d If Yes to 8a or 8b or 8c, what is the setting of this contact?

Contact	Yes=1, No=2, Uknown=9
Household member	
Extended Family member	
Hospital patient	
Patient of other residential institution	
Military barracks	
Recreational camps	
Others (specify)	

Annex 3: Contact Follow-up Form:

Case Information:

Name: ....., Age: Sex:

Address:

.....

.....

Onset of Illness: |__ __|__ __|__ __|; Date of notification: |__ __|__ __|__ __|

Contact Follow Up Table

Name	Age	Sex	Contact Type*	Relation with case	Address	Date of last contact with case	Date of first contact with case	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14

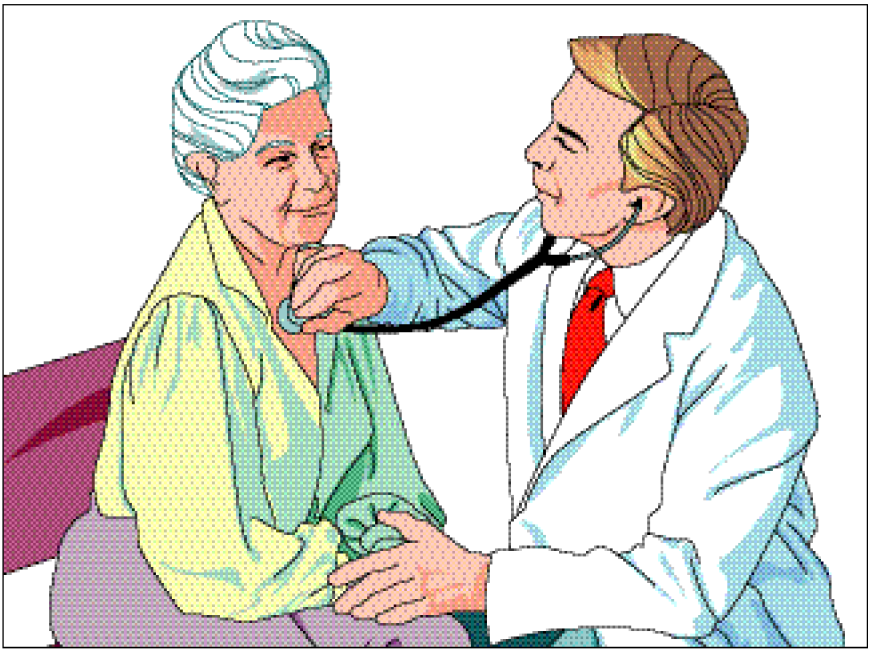
* Contact Type - best description of closest contact since 14 May
D Close Contact (less than one metre)
R Household contact, but more than one metre
P Health Care Worker contact – unprotected
L Other contact - not household, not close

Follow up Findings
S: Seen and healthy
T: Not seen
F: Influenza like illness

SOP 2

SOP 3: Clinical Diagnosis of Avian Influenza in Human

Version 1: October 2008



SOP 3

SOP 3: Clinical Diagnosis of Avian Influenza in Human

Version 1: October 2008

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SOP 3: Clinical Diagnosis of Avian Influenza in Human

1. Introduction

Clinical diagnosis of avian influenza is an important step for management of the patient, prevention of spread and for implementation of a screening and reporting system under disease surveillance. Uniform and homogenous criteria should be followed by clinicians at all level following case definition *(Refer to SOP 1)*.

2. Purpose and application

This SOP will be used by the clinicians working in government, non-government, private and other sectors to examine and diagnose avian influenza in human.

3. Steps of Clinical Diagnosis

3.1 The clinicians must use mask and gloves as Personal Protective Equipments (PPE) for examining patient (Refer to SOP 7).

3.2 The patient should also wear a face mask and to follow cough etiquette

3.3 Take history with special emphasis on the time of onset (Refer to SOP 2; Annex 2)

3.4 Search for epidemiological link- e.g. handling any poultry or poultry product, taking raw or under cooked poultry meat or egg, remaining closer to AI case etc.

3.5 Do physical examination with emphasis on respiratory system

3.6 Do the following laboratory investigations

It is advisable to collect the specimens before start of anti-viral.

- 3.6.1 Complete blood count
- 3.6.2 X-ray chest (PA view)
- 3.6.3 Other tests according to clinical conditions- e.g. LFT, RFT

3.7 For diagnosis of human avian influenza AI/H5N1

- 3.7.1 Collect one of the following swabs as applicable(as per SOP 4)
  - 3.7.1.1 Throat swab from posterior pharyngeal wall or nasal swab
  - 3.7.1.2 Nasopharyngeal aspirate, Tracheal aspirate, Bronchoalveolar lavage
  - 3.7.1.3 Make two aliquots of the specimen
- 3.7.2 Do rapid test with Influenza A kit if possible at the district level
- 3.7.3 Separate serum from the collected blood for detection of antibody and other tests
- 3.7.4 Send one aliquot of the swab and serum to National Influenza Centre at IEDCR with all precautions (Refer to SOP 4)

3.8 Start treatment with Oseltamivir at once within first 48 hours of the illness (refer to SOP 5).

3.9 Assess the severity of illness should be made according to CURB score:

- C- Confusion (no Confusion =0, Confusion =1)
- U- Serum Urea >7mmol/l (< 7mmol/l=0, >7mmol/l =1)
- R- Respiratory Rate >30/min (RR <30=0, RR> 30=1)
- B- Blood pressure (SBP <90mm of Hg and DBP<60mm of Hg=1, SBP>90mm of Hg and DBO>60 mm of Hg=0)
- Interpretation of score
  - Mild =1; Moderate= 2 and Severe = 3 or 4.

4. Management of the patient

The patient will be managed according to *SOP 5.*

5. Notification and Reporting

5.1 The contact details (address, cell phone number) of the patient should be recorded properly for correspondence

5.2 Send the report to local health authorities (upazila -UH&FP0, District- Civil Surgeon and Central-Director, Disease Control, DGHS or Director, IEDCR *as per SOP 11)* mentioning the status as per definition given in *SOP 1*.

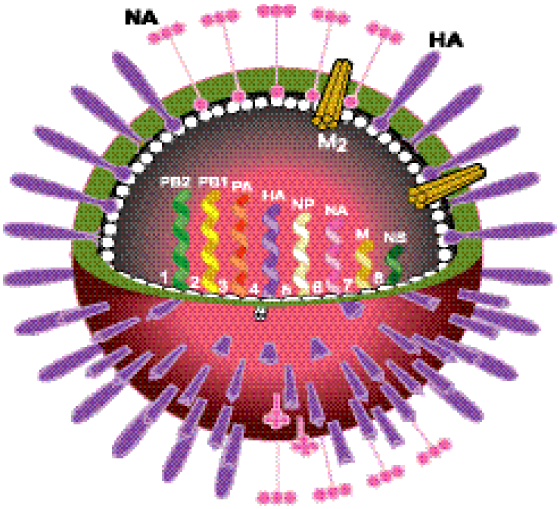
6. Infection control

6.1 Clean and disinfect the hospital areas used by the patient (Refer to SOP 6).

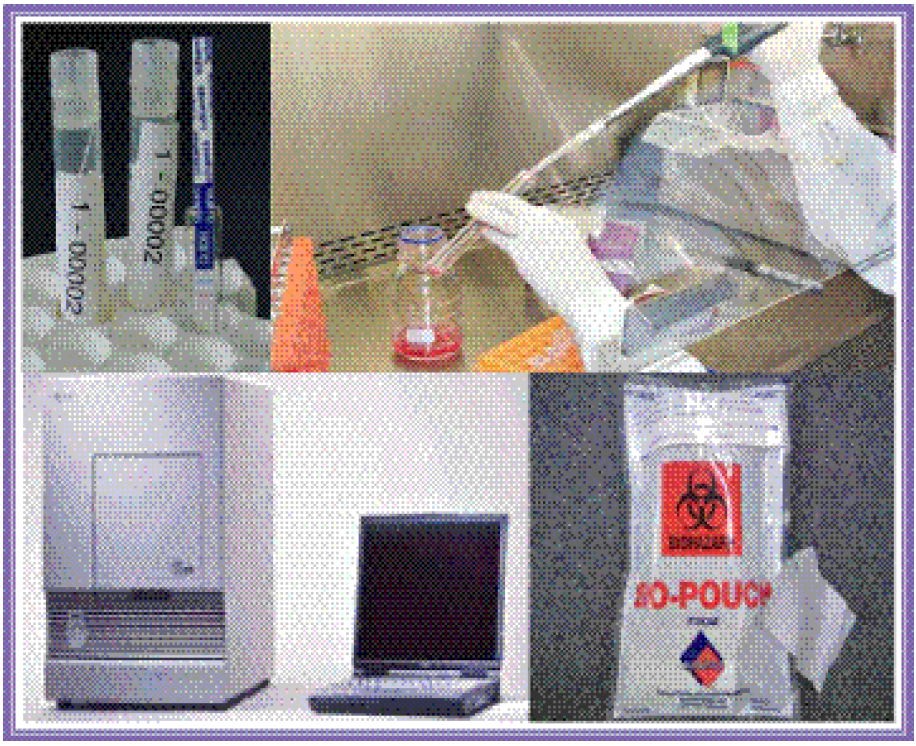
6.2 Give infection control instructions to be followed during transfer of the patient (*Refer to SOP 6*).

SOP 4: Collection, Storage and Transportation of Specimen and Laboratory Diagnosis of Avian Influenza in Human

Version 1: October 2008



SOP 4



SOP 4: Collection, Storage, and Transportation of Specimen and Laboratory Diagnosis of Avian Influenza in Human

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SOP 4: Collection, Storage, and Transportation of Specimen and Laboratory Diagnosis of Avian Influenza in Human

1. Introduction

Laboratory diagnosis plays a key role in identification and management of human avian influenza cases. Specimen collection, storage and transportation in a proper way are essential for correct diagnosis of the disease.

2. Purpose

The SOP will be used by Laboratory Medicine Specialist, trained clinicians and Medical Technologist (lab) for collection, transportation and storage and laboratory diagnosis of specimen for avian influenza (AI/H5N1)

3. Applicability

3.1 During diagnosis of human avian influenza
3.2 During surveillance
3.3 Safe specimen handling and personal protection

4. Source of Specimen

4.1 Case under Investigation
4.2 Suspected Case
4.3 Close Contact

5. Specimen

5.1 Respiratory specimens

5.1.1 Throat swab from posterior pharyngeal wall or nasal swab
5.1.2 Nasopharyngeal aspirate, Tracheal aspirate, Broncho-alveolar lavage

During collection of specimens followings should be kept in mind

I. Blood specimen
   a. For virus isolation, specimen should be collected as early as possible (within first three days is preferred).
   b. Acute phase specimens should be collected within seven days after onset of the illness.
   c. Convalescent phase specimens such as blood should be collected after 14 days of symptom onset.

II. Respiratory specimen
   a. In the case of mechanically ventilated patients, the desired specimens from the respiratory tract are
      i. Nasopharyngeal aspirate,
      ii. Broncho-alveolar lavage and
   b. Endo-tracheal aspirates.
   c. To increase the chance of isolation of virus, and detection of agent collect specimens from different sites of respiratory tract
   d. Collect multiple specimens on multiple days (e.g. collect respiratory specimen on every day for first week if patient is in hospital)

Note: Keep specimen collection kit

- *In a dry, cool place/ some of them in refrigerator*
- *Accessible after office hours and during weekends*

5.2 Blood

5.2.1 Acute phase serum

5.2.2 Convalescent serum

5.3 Kits and forms for specimen collection

5.3.1 Items for collection of respiratory specimen (eg Throat swab, Nasal swab):

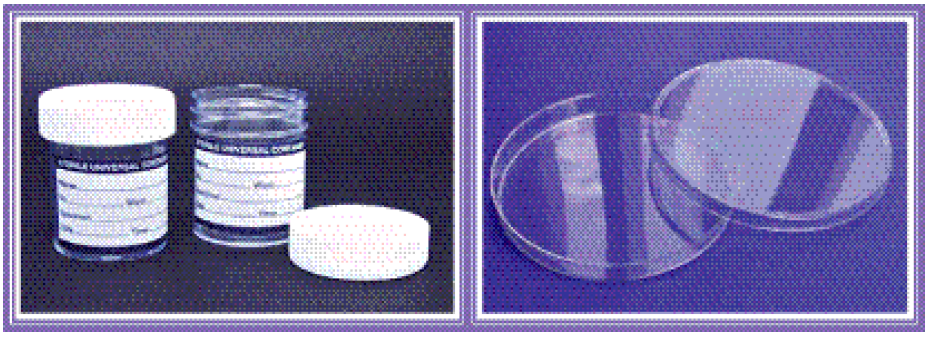
5.3.1.1 Polyester fiber-tipped applicators/ Dacron swab

5.3.1.2 Tongue depressors: disposable

5.3.1.3 Cryo vials

5.3.1.4 Viral Transport Media (VTM) for virus isolation

5.3.1.5 Tryzol or 100% Ethanol for PCR



5.3.2 Items for blood collection:

5.3.2.1 Alcohol/Iodine swab,
5.3.2.2 Tourniquet,
5.3.2.3 Needle –syringe,
5.3.2.4 Bandaids,
5.3.2.5 Vacutainer tube,
5.3.2.6 Centrifuge machine,
5.3.2.7 Eppendroff tube,
5.3.2.8 Transfer pipettes,

5.4 Personal protective equipment: (Refer to SOP 7)

5.4.1 Gloves
5.4.2 Mask (N95)
5.4.3 Gown
5.4.4 Eye protector
5.4.5 Cap
5.4.6 Shoe cover

5.5 Data /sample collection forms and lab. log book

Data collection forms/ lab. log book should contain following information: help in tracing patient's specimen and diagnosis

Patient's information:

- Unique identification (code) number
- Patient demographic information: age, sex, address with contact number, occupation
- Patient's clinical condition: e.g. suspected case of AI with severe dyspnoea
- Diagnostic test results: local e.g. X-ray chest with findings of pneumonia

Specimen information

- Specimen name
- Specimen collection date and time
- Specimen collection location

5.6 Packaging & Transport

5.6.1 Primary container e.g. cryo vial, eppendrof tube (should be air tight)
5.6.2 Secondary container (Air tight Box/Bottle/Tube)
5.6.3 Cool box/ vaccine carrier
5.6.4 Ice packs (put ice packs in deep freezer before transport)
5.6.5 A pen or permanent marker for labelling samples

5.7 Antiseptic, disinfectants and disposal container

5.7.1 Hand sterilizer: 70% Alcohol / Hexisol
5.7.2 Biohazard Bag, sharp container
5.7.3 Disinfectants: 5% Na- hypochlorite soln (e.g. Clotech/ Clorex),/ 0.5% Chlorine solution
5.7.4 Antiviral prophylaxis: annex II

6. Responsible personnel for specimen collection

Specimen should be collected by trained medical personnel under the supervision of Laboratory Medicine Specialist

6.1 Medical Doctor

6.2 Medical Technologist (Lab.)

6.3 Hospital stuff Nurse

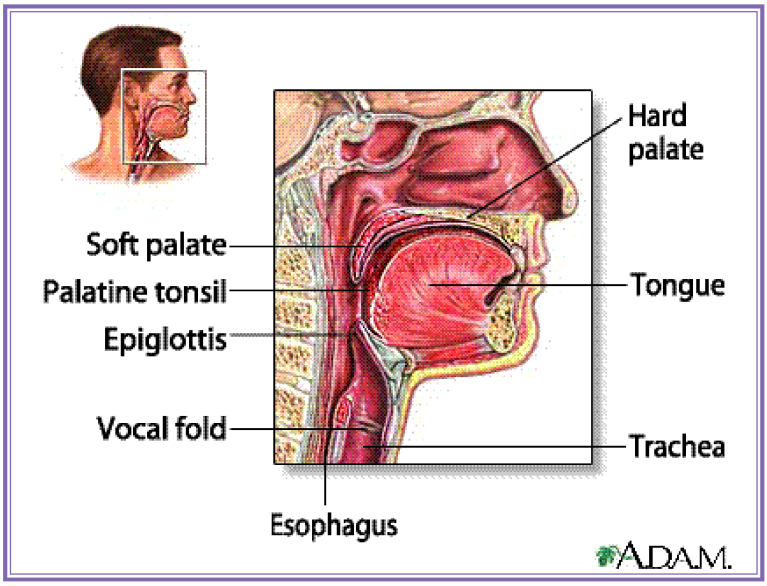
Note:

- Sample collection is usually a hospital staff function
- It may be a rapid responder function
- In field, at least one member of the team should be trained and designated to collect specimens

7. Specimen collection procedures

7.1 Steps to collect throat swab

- Ask the patient to sit on in front of specimen collector with neck flexion
- Depress the tongue with a tongue depressor
- Gently swab the posterior pharynx up and down several times (Avoid tonsillar area).
- Break the stick at the opening of vial; keep broken swab in the transport medium of the vial, and close and airtight the vial.
- For Label, storage and shipment of specimens see section 8 of this SOP.



7.2 Steps to collect nasal swab

- Ask the patient to sit on in front of specimen collector with neck flexion
- insert the dry swab past the nares for 5-6 cm until the tip reaches the area below the inferior turbinate

- allow the swab to remain there for 5-15 seconds to absorb secretion
- rotate the swab gently two to three times and withdraw
- After squeezing the swab against the vial-wall, break the stick at the level of opening/ mouth of vial and keep the swab in the transport medium provided
- Label the container with appropriate information

Precautions for specimen storage and transport:

- *Specimens for virus isolation should be refrigerated immediately after collection and shipped to the laboratory as soon as possible (within 48 hours).*
- *Specimens for PCR test should be kept in either ethanol or lysis buffer (Tryzol) at 4°C.*
- *Specimens for direct detection of viral antigens by immunofluorescence staining of infected cells should be refrigerated and processed within one to two hours after collection*
- *If specimens cannot be processed within 48, they should be kept frozen at or below -70°C.*

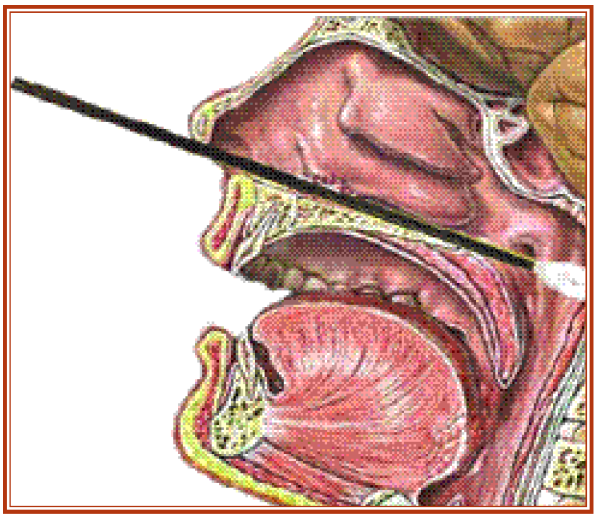
7.3 Nasopharyngeal aspirate: from intubated / ventilated patients

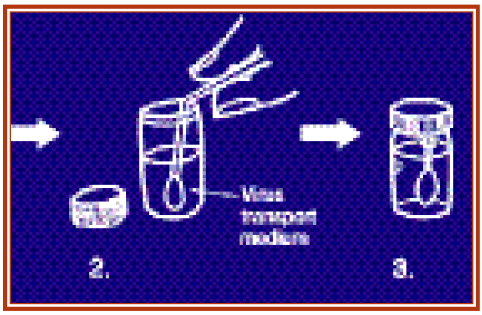
7.3.1 Materials:

- Portable suction pump
- Sterile suction catheter
- Mucus Trap (Luken's tube)
- Viral Transport medium

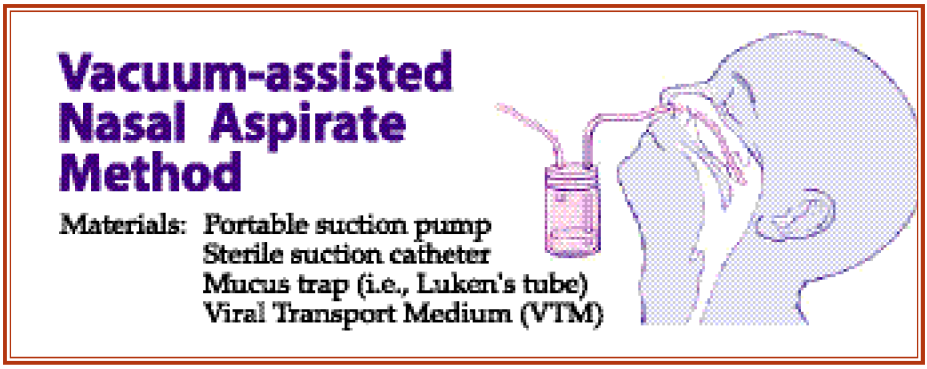
7.3.2 Steps for nasopharyngeal aspiration:

- Collect nasopharyngeal secretions by aspiration through a catheter connected to a mucus trap and fitted to a vacuum source.
- Insert the catheter for 5-6 cm into the nostrils parallel to the palate. Apply the vacuum and withdraw the catheter slowly with a rotating motion.
- Mucus from the other nostril is collected with the same catheter in a similar manner.
- After collection of specimen from both nostrils, the catheter is flushed with 3 ml of transport medium.
- For labelling, storage and shipment of specimens see section 8.





Collection of Nasopharyngeal Aspirate



7.4 Blood samples collection

Usually blood specimens will not be used for diagnosis of AI/H5N1. However, testing paired sera for antibody against AI/H5N1 in some cases (especially for those patients presenting lately [48 hours after onset]) might be helpful for the diagnosis.

- Collect blood both at acute (during acute illness) and convalescent (during recovery phase) periods
- Collect 5 ml blood from adult and 3 ml from children in plain test tube
- Hold the blood for at least half an hour for separation of the serum
- Put all specimens in vaccine carrier/cool box in the field with ice pack

8. Labelling and Packaging of specimen for transportation and storage

8.1 Labelling of Specimens

Label each specimen with:

- Specimen type/name eg. Serum , swab, nasopharyengeal aspirate
- Pt's unique identification number

- Place of collection
- Date and time of collection

Use same information about specimen:

- On the specimen container
- On the field data collection form
- On the log book

8.2 Specimen storage and transport

8.2.1 For Respiratory Specimen

- Keep respiratory specimens in viral transport medium for culture or in Tryzol/ ethanol for PCR
- Transport to the laboratory as soon as possible (within 48 hours)
- If needed keep the sample at + 20C to + 80C for a maximum period of two days
- Store at -700C for longer period;
- Do not store respiratory specimen at -200C;
- Avoid freeze-thaw cycle

8.2.2 For Serum

- If needed keep the sample at + 20C to + 80C for a maximum period of two days
- Send the sample for testing as early as possible in a cool box
- For longer period store at -200C (deep freege)

8.3 Packaging of specimens for transportation

8.3.1 Procedure for in country transportation use cool box with icepacks

- Contact with responsible person of NIC: virology laboratory, IEDCR before transportation.
- Use cool box with icepacks for transporting the specimen
- Send the specimen preferably through messenger

8.3.2 Transport of specimen to WHO Reference Lab

- Contact with WHO reference Laboratory before transportation.
- Use three packaging layers
- First and second layers should be water tight, third layer would be rigid.
- Use absorbent material around primary container
- Keep specimens at +20C to +80C (fill a cooler with ice packs or coolant packs and double bag specimens if ice is used)
- Include an itemized list of specimens with identification numbers and lab instructions

Things to be done on arrival of specimens at NIC

- Check for item list
- Make documentation in laboratory log book as well as in computer
- Open specimen containing box/ container with appropriate safety precaution (in biosafety cabinet if possible)
- Treat specimens as potentially infectious
- Store specimens in a secondary container (BOX)
- Label specimen containing box with code no. and sign of potentially infectious
- Store specimens accordingly in freezer at -70 °C or Liquid Nitrogen or - 20°C

Note: Use a temperature alarm, generator, and back-up

For more detailed guidelines for the storage and transport of specimens for laboratory diagnosis of influenza A/H5 infection see:
http://www.who.int/csr/disease/avian_influenza/guidelines/transport/en/

9. General Procedures of diagnosis of influenza

- According to recommendation of the WHO, the strategy for initial laboratory testing of each specimen should be to diagnose influenza A virus infection rapidly and exclude other common viral respiratory infections
- The optimal specimen for influenza A virus detection is a nasopharyngeal aspirate obtained within 3 days of the onset of symptoms

10. Diagnostic tests for AI/H5N1

- Detection of antigen through rapid test (ICT) or immunofluorescent test
- Nucleic acid detection through PCR
- Virus isolation through culture
- Antibody detection from paired sera
- In Bangladesh, the rapid test will be done in the sentinel district hospitals along with IEDCR
- PCR test will be done at IEDCR and ICDDRB which will need confirmation from WHO reference laboratory

10.1 Rapid tests

- Antigen detection by ICT method
- Commercial kits eg Directogen A/ B, Quick vue.
- Detect Influenza A
- Results in 15 to 30 minutes
- Possible to perform in peripheral labs/ NIC

10.2 Immunofluorescence assay

A widely used, sensitive method for diagnosis of influenza A and B virus infections and five other clinically important respiratory viruses

10.3 Polymerase Chain Reaction (PCR):

- Two types of PCR may be used- Conventional reverse transcriptase polymerase chain reaction (RT-PCR) and Real-time RT-PCR assays.
- Results can be available within a few hours either clinical swabs or infected cell cultures
- PCR detects viral RNA present in either clinical specimens or virus cultures, and can be targeted at genes that are relatively conserved across all influenza A viruses (e.g. matrix gene) or to the haemagglutinin or neuraminidase genes which are subtype specific.
- Including the time taken for viral RNA extraction and for amplicon detection, the turn-around time of conventional RT-PCR assays is 6–8 hours.
- Real time RT-PCR methods can shorten this time interval to around 3–4 hours while providing increased sensitivity and possibility of quantitation of the viral target gene.
- Several WHO Collaborating Centres are developing PCR and RT-PCR reagents for non-typical avian/human influenza
- According to the national plan PCR will be done initially at NIC (Virology laboratory, IEDCR) and then at other centres of the country

10.4 Virus culture

- Both shell-vial and standard cell-culture methods may be used.
- Positive influenza cultures may or may not exhibit cytopathic effects
- Virus identification is done by immunofluorescence, RT-PCR or haemagglutination - inhibition (HI) assay
- Results in 2 to10 days
- Must be done in a special laboratory
- Need BSL3 laboratory facilities

11. Test Procedure: Rapid antigen detection by ICT

– Principle C
- Immunochromatographic test device or strip contains a membrane embedded with antigen (Ag) or antibody (Ab) and colloidal conjugate to detect the counterpart (e.g. Ag or Ab)
- For AI : detect antigen in swab

– When are tests most reliable?
- known influenza activity in the community
- Performed on patients who have signs and symptoms consistent with influenza (e.g., fever, cough, sore throat, muscle aches, headache, and malaise)
- Within first 4 days of illness.

– The predictive values of influenza tests
- Depend on
- level of influenza activity in the community
- exposure of the patient to a contagious person
- susceptibility of the patient
- characteristics of the tests (sensitivity and specificity)
- adequacy of specimen collection
- Inadequate or inappropriate specimens are more likely to yield false negative results.

– Rapid diagnostic tests have been increasingly used because
- can yield results in a clinically relevant time frame, i.e., approximately 30 minutes
- a rapid influenza test or immunofluorescence are the tests of choice to help with decisions to use antiviral medications.

– Materials

All type of respiratory specimens e.g.
- Specimen kit supplied for Human Influenza/ reagents
- Test tube
- Distilled water
- Normal Saline
- Timer
- Hand sterilizer
- Disinfectants
- Pen and record keeping log book

– Test procedure
- Would be according to the instruction supplied in test kit.

– ICT: Interpretation

<u>Positive Result:</u>
- The appearance of both “Control Line” & “Test Line” within the time is considered as positive.

Negative Result:

- The appearance of only "Control Line" is considered as negative.

Invalid Result:

- If the Control line "C" is not visible, the result is considered invalid. The specimen must be retested using a new test device.

12. Test Procedure: Immunofluorescence assay

- Immunofluorescence assay can be used for the detection of virus in either clinical specimens or cell cultures
- The direct fluorescence (DF) staining technique is used to detect viruses either directly in patient specimens or which have been isolated in shell vial or tube cultures. DF method consists of a single staining step using a virus-specific antibody which is conjugated with a fluorochrome
- The indirect fluorescence (IF) method consists of two steps. In the first step, primary antibodies are allowed to react with viral antigens in the cells. These specific complexes are detected in a second step using a species-specific antibody conjugated with a fluorochrome

12.1 Materials required:

12.1.1 WHO Influenza Reagent Kit for the Identification of Influenza A/H5 Virus. The reagents in this kit for the immunofluorescence assay include:

- Influenza type A/H5-specific monoclonal antibody pool
- Influenza A type-specific and influenza B type-specific monoclonal antibody pools
- Influenza A/H1 and an A/H3 subtype specific monoclonal antibodies

12.1.2 Anti-mouse IgG FITC conjugate

12.1.3 Microscope slides

12.1.4 Cover slips, 24 x 60 mm

12.1.5 Mounting fluid

12.1.6 Acetone

12.1.7 Immunofluorescence microscope.

12.2 Procedure

12.2.1 Epithelial cells are washed free of contaminating mucus by centrifugation, fixed, and stained with specific monoclonal antibodies.

12.2.2 Infected respiratory epithelial cells in a clinical specimen are very labile and easily damaged; they should therefore be kept cold on ice during processing and not centrifuged at more than 500g.

12.2.3 Control slides with influenza A/H3- and H1-infected cells (and, when available, H5-infected cells) and uninfected cells should be included to allow appropriate control of monoclonal antibodies and conjugate and to assist with interpretation of specific staining

12.3 Interpretation of results

- Specific staining should be an intense intracellular apple-green (FITC) fluorescence. Nuclear and/or cytoplasmic fluorescence may be observed. It is important to ensure that cell density is adequate. One or more intact cells showing specific intracellular fluorescence can be accepted as a positive result.

- As commercially available monoclonal antibodies for the subtyping of influenza A/H1 have been shown to cross-react with influenza A/H5 subtypes, including current strains, confirmatory testing should be carried out using the monoclonal antibody provided in the WHO kit.

13 Virus Culture

- MDCK cells are the preferred cell line for culturing influenza viruses. Identification of an unknown influenza virus can be carried out by IFA using specific monoclonal antibodies (see above) or, alternatively, by haemagglutination (HA) and antigenic analysis (sub typing) by haemagglutination inhibition (HI) using selected reference antisera.
- Unlike other influenza A strains, influenza A/H5 will also grow in other common cell lines such as Hep-2 and RD cells. Standard bio-safety precautions should be taken when handling specimens and cell cultures suspected of containing highly pathogenic avian influenza A.
- Clinical specimens from humans and from swine or birds should never be processed in the same laboratory.

13.1 Materials required

- Madin-Darby Canine Kidney cells (MDCK), ATCC CCL34
- WHO Influenza Reagent Kit for the Identification of Influenza A/H5 Virus.
- Reagents for identification of A/H5 in cell culture include:
- influenza A/H5 control antigen: inactivated virus
- goat serum to A/Tern/South Africa/61/ H5
- chicken pooled serum to A/Goose/Hong Kong/437-4/99
- WHO Influenza Reagent Kit (Annually distributed)
- A (H1N1) and A (H3N2) reference antigens and reference antisera
- Receptor-destroying enzyme (RDE).
- Red blood cells (chicken, turkey, human type O, or guinea-pig red blood cells) in Alsever's solution.

13.2 Procedure

- Standard laboratory cell-culture procedures should be followed for the propagation of cell cultures, the inoculation of specimens, and the harvesting of infected cells for IFA or culture supernatant for HA and HAI testing.
- Standard laboratory bio-safety guidelines should be followed when manipulating amplified virus.
- Standard HA and HAI procedures should be followed, with the inclusion of all recommended controls.
- Tube culture is the conventional method used by diagnostic virology laboratories for virus isolation.
- The shell vial method employs centrifugation of the patient specimen onto a cell monolayer contained in a vial. In general, the centrifugation step shortens the time to a positive culture result.
- Virus may be detected by direct fluorescent antibody (DFA) or indirect fluorescent antibody (IFA) staining within hours or days of inoculation.

13.3 Interpretation of results

- The highest dilution of virus that causes complete haemagglutination is considered to be the HA titration end-point. The HAI end-point is the last dilution of antiserum that completely inhibits haemagglutination. The titer is expressed as the reciprocal of the last dilution.
- Identification of the field isolate is carried out by comparing the results of the unknown isolate with those of the antigen control. An isolate is identified as a specific influenza A subtype if the subtype-specific HAI titre is four-fold or greater than the titre obtained with the other antiserum.

14 Polymerase chain reaction

- The influenza virus genome is single-stranded RNA, and a DNA copy (cDNA) must be synthesized first using a reverse transcriptase (RT) polymerase. In conventional RT-PCR, the products are detected at the end of the reaction. With real time RT-PCR, products are detected as amplification is ongoing, allowing quantification.
- The procedure for amplifying the RNA genome (RT–PCR) requires a pair of oligonucleotide primers. These primer pairs are designed on the basis of the known HA sequence of influenza A subtypes and of N1 and will specifically amplify RNA of only one subtype. DNAs generated by using subtype-specific primers can be further analyzed by molecular genetic techniques such as sequencing.
- With continuing evolution of H5 viruses, the genetic diversification of the H5N1 virus strains in the past two years has made recommendation of specific primer sets challenging.
- A WHO technical working group has been established to prepare the example protocols for conventional and real time RT-PCR primers to detect circulating strains of avian influenza. The primers listed below are recommended by the WHO H5 Reference Laboratory Network.

For examples of protocols to detect A (H5N1) viruses, please see Annex A of the WHO document:
http://www.who.int/entity/csr/disease/avianinfluenza/guidelines/RecAllabtestsAug07.pdf

14.1 Materials required for conventional RT-PCR protocol:

- QIAamp Viral RNA Mini Kit or equivalent extraction kit
- QIAGEN OneStep RT-PCR kit
- RNase inhibitor (ABI) 20U/μl
- Sterile microcentrifuge tubes, 0.2, 0.5 and 1.5 ml
- Primer sets:

– HA gene primers for H5 amplification (modified from Yuen et al. 1998):
H5-1: GCC ATT CCA CAA CAT ACA CCC
H5-3: CTC CCC TGC TCA TTG CTA TG
Expected product size: 219 bp

– M Gene primers (National Institute of Infectious Diseases (NIID), Tokyo, Japan)
M30F: TTC TAA CCG AGG TCG AAA CG
M264R2: ACA AAG CGT CTA CGC TGC AG
Expected product size: 232 bp

– HA gene primers for H9 amplification:
H9-426: GAA TCC AGA TCT TTC CAG AC
H9-808R: CCA TAC CAT GGG GCA ATT AG
Expected product size: 383 bp

– NA gene primers for N1 amplification (Wright et al. 1995):
N1-1: TTG CTT GGT CGG CAA GTG C
N1-2: CCA GTC CAC CCA TTT GGA TCC
Expected product size: 616bp

– Positive control (Obtained upon request from a WHO H5 Reference Lab)
- Adjustable pipettes, 10, 20, 100 and 200 µl
- Disposable filter tips
- Microcentrifuge, adjustable to 13 000 rpm,
- microcentrifuge tubes tubes (0.2, 1.5ml)
- Vortex mixer
- Thermocycler
- Agarose gel casting tray, electrophoresis chamber and power supply
- UV-light box or hand-held UV light (302 nm)

14.2 Procedure

- Extract viral RNA from clinical specimen with QIAamp viral RNA mini kit or equivalent extraction kit according to manufacturer's instructions.
- One step RT-PCR

– H5 or N1
Prepare master mixture for RT-PCR as below:

• 5x QIAGEN RT-PCR buffer	10 µl
• dNTP mix	2 µl
• 5x Q-solution	10 µl
• Forward primer (5 µM)	6 µl
• Reverse primer (5 µM)	6 µl
• Enzyme mix	2 µl
• RNase inhibitor (20U/µl)	0.5 µl
• Water (Molecular grade)	9 µl
• Total	45 µl
• Add viral RNA	5 µl

– M
Prepare master mixture for RT-PCR as below:

• 5x QIAGEN RT-PCR buffer	10 µl
• dNTP mix	2 µl
• Forward primer (5 µM)	6 µl
• Reverse primer (5 µM)	6 µl
• Enzyme mix	2 µl
• RNase inhibitor (20U/µl)	0.5 µl
• Water (Molecular grade)	19 µl
• Total	45 µ
• Add viral RNA	5 µl

– H9

Prepare master mixture for RT-PCR as below:

• 5x QIAGEN RT-PCR buffer	10 µl
• dNTP mix	2 µl
• Forward primer (5 µM)	6 µl
• Reverse primer (5 µM)	6 µl
• Enzyme mix	2 µl
• RNase inhibitor (20U/µl)	0.5 µl
• Water (Molecular grade)	19 µl
• Total	45 µl
• Add viral RNA	5 µl

– RT-PCR reaction for H5, N1, H9

Set the follow PCR conditions:

• Reverse transcription	30 min 50° C
• Initial PCR activation	15 min 95° C
• 3-step cycling denaturation	30 sec 94° C
• Annealing	30 sec 55° C
• Extension	30 sec 72° C
• Number of cycles	40
• Final extension	2 min 72° C

– RT-PCR reaction for M

• Reverse transcription	30 min 50°C
• Initial PCR activation	15 min 95°C
• 3-step cycling denaturation	30 sec 94°C
• Annealing	30 sec 50°C
• Extension	30 sec 72°C
• Number of cycles	40
• Final extension	2 min 72°C

– Agarose gel electrophoresis of PCR product

Prepare agarose gel, load PCR products and molecular weight marker, and run according to standard protocols. Visualize presence of maker and PCR product bands under UV light.

14.3 Interpretation of results

- The expected size of PCR products for influenza A/H5 is 219 bp, for A/H9 is 383 bp, and for N1 is 616 bp. If the test is run without a positive control, products should be confirmed by sequencing and comparison with sequences in deposited databases.
- The absence of the correct PCR products (i.e. a negative result) does not rule out the presence of influenza virus.
- Results should be interpreted together with the available clinical and epidemiological information.
- Specimens from patients with a high probability of infection with influenza A/H5 or H9 should be tested by other methods (IFA, virus culture or serology) to rule out influenza A (A/H5 or H9) infection.

14.4 Laboratory confirmation

- All laboratory results for influenza A/H5, H7 or H9 during interpandemic and Pandemic Alert periods of the WHO Global Influenza Preparedness Plan

- The result should be confirmed by a WHO H5 Reference Laboratory or by a WHO recommended laboratory.

15. Serological identification of influenza A/H5 infection

- Serological tests available for the measurement of influenza A-specific antibody include:
  - Haemagglutination inhibition test
  - Enzyme immunoassay
  - Microneutralization assay
- The microneutralization assay is the recommended test for the measurement of highly pathogenic avian influenza A specific antibody. Because this test requires the use of live virus, its use for the detection of highly pathogenic avian influenza A specific antibody is restricted to those laboratories with biosafety Level 3 containment facilities.
- Optimally, paired sera, collected first during the acute phase of illness and then 14 days or later after the onset of illness, should be tested simultaneously.
- Retrospectively, infection with H5N1 is confirmed when one the following criteria are met:
- Fourfold or greater rise in antibody titre against A(H5N1) in paired sera (acute and convalescent) with the convalescent serum having a titre of 1:80 or higher.
- Antibody titre of 1:80 or more in a single serum collected at day 14 or later after onset of symptoms and a positive result using different serological assay (e.g. titre of 1:160 or greater in HI using horse red blood cell or an H5 –specific western blot

Key Reference:

1. Recommendations and laboratory procedures for detection of avian influenza A(H5N1) virus in specimens from suspected human cases. WHO, Geneva. Revised August 2007 Available at:
http://www.who.int/entity/csr/disease/avian_influenza/guidelines/RecAllabtestsAug07.pdf

16. Designated laboratories for AI/H5N1

- Peripheral labs/ 18 sentinel labs at district level
- Rapid Antigen Detection Kit(ICT)
- National Influenza Centre (NIC): Virology Laboratory, IEDCR, Mohakhali, Dhaka1212. phone/ fax: 880 2 8821237.
- Rapid Antigen Detection Kit(ICT)
- PCR
- Virus Isolation (after establishment of BSL-3 lab at IEDCR)
- WHO Reference laboratory (CDC< Atlanta, USA)
  - PCR for confirmation
  - Gene sequencing
  - Virus culture

* *ICDDRB : currently performing PCR*

17. Protection of lab Personnel

Avian (H5N1) infection is acquired by inhalation of infectious droplets or droplet nuclei or by direct, and possibly indirect, contact and self-inoculation of infectious virus into the nose, eye or possibly mouth. AI/H5N1 virus can survive for weeks in a moist environment protected from direct sunlight.

17.1 Biosafety during specimen collection and handling for avian Influenza

- Treat all clinical samples as potentially infectious (e.g. Avian influenza)
- Follow standard precautions of hand hygiene and PPE use (Refer to SOP 6 & 7)
- Wash hand with soap-water/ use 70% alcohol/ other hand sterilizer before and after work
- Decontaminate used gloves with 70% ethanol/ soap water before put off, and put off PPEs, keep in biohazard bag/ designated container
- Decontaminate by 5% sodium hypochlorite for 10 mints /by autoclave used PPEs
- Decontaminate work place with 5% sodium hypochlorite/ethanol for 5-10 mints
- Avoid formation of aerosols and droplets
- Avoid recapping needles
- Be careful about spillage of specimen

If spill occurs

- Apply bleach/ 5% sodium hypochlorite/ Ethanol/ detergent on spill
- Wait for 5-10 mints
- Remove decontaminated spill carefully
- Swab the area with soap-water/ bleach /chlorine solution
- Allow to dry the place
- Take antiviral prophylaxis during working in containment zone/(if needed)
- Report immediately if developed fever and take antiviral treatment (See annex 1)

Practices of Biosafety Level 2 procedures

- Hand hygiene
- PPE
- Work in safe environment (in Biosafety Cabinet)
- Practice good and specialized microbiological/ virological technique
- Decontamination of work place and waste
- Decontamination / Autoclave used items
- Waste disposal

Note: When a procedure or process cannot be conducted within a biological safety cabinet, then appropriate combinations of personal protective equipment (e.g., specially respirators, face shields) and physical containment devices (e.g., centrifuge safety cups or sealed rotors) are to be used.

18. Waste Disposal

18.1 Items requiring disposal

- Infectious blood, body fluids, leftover biological samples
- Disposable needles and syringes
- Disposable or non-reusable protective clothing(PPEs)
- Disposable or non-reusable gloves
- Used laboratory supplies
- Used disinfectants

a. Before disposal, waste should be decontaminated

- By chemical disinfectants: e.g. 5% Sodium hypochlorite soln./other chlorine soln./ bleach/ soap water for 30 mints
- Autoclave

b. Dispose off waste after decontamination by

- Burning / Incineration
- Burning and Burial

Annex I: Sample Collection Form

Name of collection site:

ID No. of the Patient	Name of the Patient	Clinical diagnosis	Type of Sample	Number of specimen	Date of collection of sample	Date of sending sample to sentinel/ reference lab (NIC)	Test done at local level	Date of receiving sample in Lab

Possible specimens: Throat swab, nasal swab, nasopharyngeal aspirate, tracheal aspirate, bronchoalveolar lavage, acute serum, convalescent serum, post mortem specimen, etc

Name of the Medical Technologist/ Stuff Nurse

Signature
Date

Name of Medical Doctor

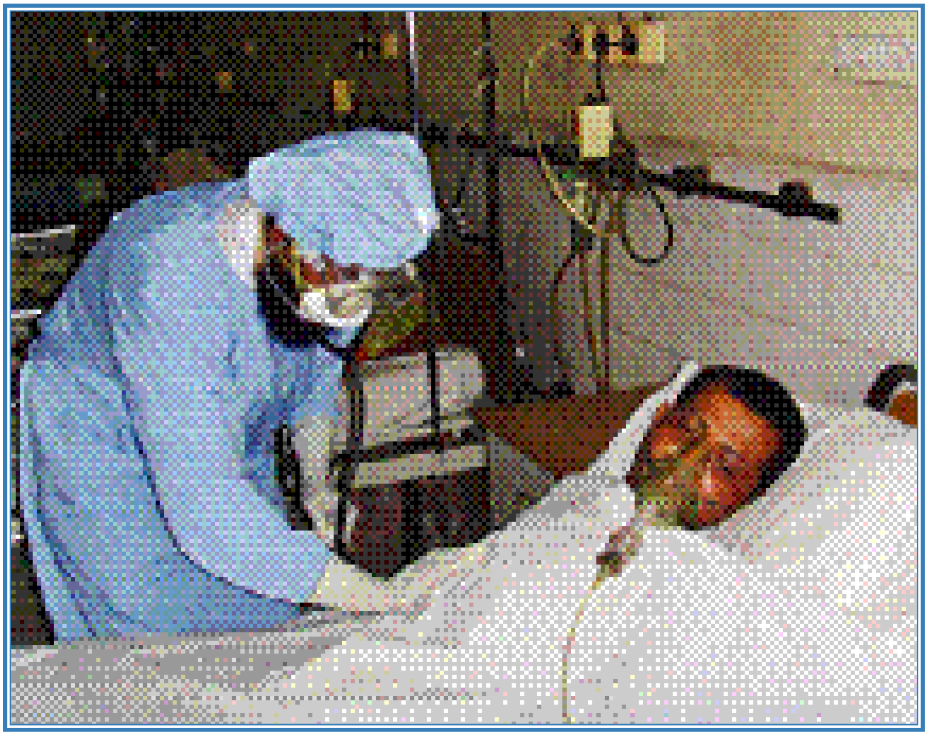
Signature
Date

Annex II: Chart for Methods of transport/storage of specimens for different type of tests

Types of specimens	Method of transport/Storage	Suitable tests
i. Early (3 -7days) after onset		
Nasal swab or wash or aspirate	In viral transport medium at 4^0C or frozen at -70^0 C	1. Virus isolation 2. Rapid antigen detection by IF* or kits 3. PCR*
Nasopharyngeal aspirate	In viral transport medium at 4^0C or frozen at -70^0 C	1. Virus isolation 2. Rapid antigen detection by IF or kits 3. PCR
Throat swab or wash	In viral transport medium at 4^0C or frozen at -70^0 C	1. Virus isolation 2. Rapid antigen detection by IF or kits 3. PCR
Tracheal aspirate or bronchoalveolar lavage	In viral transport medium at 4^0C or frozen at -70^0 C	1. Virus isolation 2. Rapid antigen detection by IF or kits 3. PCR
Acute phase whole blood	At 4^0C for whole blood, or -20^0C for separated serum	Serology by HA* or MN*
ii. Convalescent phase (14 days post-disease onset)		
Convalescent whole blood	At 4^0C for whole blood, or at -20^0C for separated serum	Serology by HA or MN
iii. Post mortem specimens		
Biopsy of lungs or trachea		1. Virus isolation 2. Rapid antigen detection by IF or kits 3. PCR

SOP 5: Management of Avian Influenza Infection in Human

Version 1: October 2008



SOP 5

SOP 5: Management of Avian Influenza Infection in Human

Version 1: October 2008

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SOP 5: Management of Avian Influenza Infection in Human

1. Introduction:

Management of avian influenza in human should be focused on reducing the high case fatality through initiation of antiviral at earlier stage of the disease. There should also be provision of intensive care support for acutely ill patients with respiratory failure, ARDS and multi-organ failure. Infection control measures should get high priority in patient management to prevent spread of the disease.

2. Purpose and Applicability:

The SOP will be used by the physicians for the management of Avian Influenza patients.

3. Principle of Case management

3.1 To start treatment of AI suspect with antiviral as early as possible (within 48 hours of onset of symptoms) and even before confirmation of aetiology

3.2 Avian influenza patients will be managed preferably in government health care facilities with provision of isolation facility

3.3 For managing avian influenza cases, isolation units are being established at district hospitals and an Influenza Ward with intensive care facilities has been established at the National Institute for Diseases of Chest Hospital (NIDCH), Dhaka

3.4 The AI patients have to be managed keeping them in isolation maintaining infection control measures (Refer to SOP 6)

3.5 If any case of avian influenza is detected (Refer to SOP 1 for case definition) refer it to the district hospital having isolation unit

3.6 If it is not possible to transfer the patient to the isolation unit of the district hospital, manage the patient in isolation maintaining infection control measures (SOP 6)

3.7 Cases of AI have to be notified to local health authority

3.8 Critically ill patients with ARDS or features of SARI should be treated in ICU with ventilator facilities.

4. Antiviral Treatment

4.1 Oseltamivir (a neuraminase inhibitor) is the drug of choice for the treatment of human AI infection

4.2 Treat the case with oseltamivir twice a day for five days (Section 3.3)

4.3 If necessary, oseltamivir therapy may be extended for another 5 days

4.4 Higher doses of oseltamivir may be considered on a case-by-case basis, particularly if there is pneumonic disease at presentation or evidence of clinical progression.

4.5 Antiviral (Oseltamivir) and PPE are available with at district level (Civil Surgeons) of the country

4.6 In pandemic situation antiviral will be available in the private and NGO sectors also.

5. Dose of oseltamivir for treatment of human avian influenza patients

5.1 Give oseltamivir twice daily for five days

5.2 Adolescents and Adults (=13 years): 75 mg

5.3 For children (=1 year up to <13 years) calculate oseltamivir according to body weight in kg

5.4 <15 kg body weight: 30 mg

5.5	15-23 kg body weight:	45 mg
5.6	23-40 kg body weight:	60 mg
5.7	>40 kg body weight:	75 mg

5.8 Oseltamivir is not recommended Children under 1 year.

5.9 If creatinine clearance 10-30 ml/min: reduce dose to once daily

6. Use of antibiotic for management of human avian influenza patients

6.1 As AI is a viral disease, so antibiotics have no role against the virus itself

6.2 Give antibiotic to treat secondary bacterial infections and superadded bacterial pneumonia

6.3 Choose antibiotic by taking into consideration the likely pathogens and local susceptibility patterns.

6.4 Do culture and sensitivity of blood and sputum to select antibiotic for Community Acquired Pneumonia (CAP)

7. Use of Systemic corticosteroids

7.1 Do not use systemic steroid for managing avian influenza case unless it is indicated for particular reason

7.2 There is no clear benefit in treating AI associated pneumonia or ARDS with corticosteroids

7.3 There is the potential harm for immunosuppression leading to enhanced AI viral replication, secondary infections or musculoskeletal side effects

8. Use of antipyretic agent

8.1 Use antipyretic agent for remission of high fever

8.2 Use paracetamol as per standard dose on the basis of body weight and age

8.3 Avoid aspirin (salicylic acid) or salicylate-containing products

9. Supportive therapy for critically ill patients

9.1 Consider an AI patient as critically ill if the patient rapidly develops progressive respiratory failure with features of ALI/ARDS and/or multi-organ failure

9.2 Manage the critically ill patients as follows

9.3 Provide oxygen immediately

9.4 Provide ventilator support

9.5 Minimize the risk of barotraumas

9.6 Maintain adequate nutrition through enteric intubation

9.7 Take measures for prevention of nosocomial infections

9.8 Rapidly treat if any nosocomial infection develops

9.9 Take measures for prevention of deep venous thrombosis and gastrointestinal bleeding

9.10 Ensure good nursing care.

9.11 Criteria for transferring cases to Intensive Care Unit (ICU).

Transfer an AI patient to ICU if at least two of the following criteria are fulfilled

9.11.1	Respiratory rate:	=30/min,
9.11.2	Diastolic Blood pressure:	=60mm Hg,
9.11.3	Blood urea:	=7mmol/L.
9.11.4	PaO2 <8kpa with inspired oxygen at	=60%

9.11.5 PaCO2 >6.4kpa (suggesting respiratory fatigue), unless chronic CO2 retainer will have compensated respiratory acidosis

9.11.6 Exhaustion

9.11.7 Respiratory arrest

9.11.8 Evidence of shock or hypoperfusion.

9.12 Oxygen therapy

9.12.1 Supplemental oxygen is essential for the successful management of moderate to severe AI (H5N1) illness (Hypoxaemia, SaO2<92% or PaO2<8kpa regardless of FiO2.)

9.12.2 It is important to recognize and treat hypoxaemia early in order to avoid its consequences and improve clinical outcomes.

9.12.3 As type 1 respiratory failure is found in case of AI patients, so, high flow oxygen therapy is indicated. Where oxygen saturation monitoring is available, SaO2 should be maintained over 90%.

9.13 Ventilatory Support

The indications for invasive positive pressure ventilation (IPPV) in AI patients are the same as those for other causes of pneumonia

9.13.1 IPPV is the preferred mode of ventilatory support for AI patients complicated by ARDS.

9.13.2 Critically ill patients with Human AI infection who require IPPV should be transferred to a facility able to deliver a suitable level of care

9.13.3 A low-volume, low-pressure strategy for ventilation of patients with ARDS due to other causes has been shown to reduce mortality

9.13.4 Lung-protective ventilation includes minimizing tidal volume (goal of maximum 6 ml/kg of predicted body weight) and plateau pressures (maximum 30cm H2O)

9.13.5 Adjust ventilatory frequency to control the severity of respiratory acidosis and do not target a specific partial pressure of arterial carbon dioxide (PaCO2)

9.13.6 Goal for adequate arterial oxygenation may be a saturation of > 90 % or a partial pressure of arterial oxygen (PaO2) > 60 mmHg (7.3kPa),

9.13.7 Achieved using whatever level of fractional inspired oxygen (FiO2) is needed, and an appropriate level of positive end-expiratory pressure (PEEP) to recruit atelectatic alveoli

9.13.8 There is no evidence that high inspired oxygen concentrations in these patients causes oxygen toxicity.

9.13.9 There appears to be a high incidence of pneumothorax in critically ill human AI patients and barotrauma is a particular concern with high volume IPPV.

9.13.10 Lung recruitment and the level of PEEP have not been proven to alter outcomes in ARDS due to other causes.

9.14 As there is no standardized approach to lung recruitment maneuvers in the management of ARDS, no specific recommendations can be made for human AI cases and judgment should be made on a case-by-case basis by the treating clinician.

9.15 Non-invasive positive pressure ventilation (NPPV).

9.15.1 NPPV applied via nasal or facial mask cannot be recommended for routine use for patients with respiratory failure due to AI infection.

9.15.2 There is evidence of high frequency of ARDS and the fact that hemodynamic instability and multi-organ failure are contra-indications to NPPV.

9.15.3 In addition, this strategy is associated with an increased risk of generating potentially infectious aerosols (and risk of infection to healthcare workers).

9.16 Fluid and electrolyte balance

9.16.1 In the early phases of severe sepsis or septic shock, current best practice includes active fluid resuscitation and early organ-system support, targeting measures of adequacy of oxygen delivery.

9.16.2 In patients who develop ALI/ARDS(Acute Lung Injury), a conservative fluid management strategy may increase ventilator-free days and improve oxygenation compared with a fluid liberal strategy.

9.16.3 Albumin and diuretic therapy may improve lung physiology measures in the subset of hypo-proteinaemic patients with lung injury.

10. Special considerations: Treatment during pregnancy

WHO currently recommends that pregnant women should be treated with antiviral therapy

11. Isolation of AI Patients

11.1 Isolation is the separation and restriction of movement or activities of ill persons to prevent disease transmission to persons who are not ill.

11.2 The public should be informed about the most common symptoms of the emerging pandemic virus so that ill persons are isolated quickly.

11.3 Isolation in a hospital or health care facility is preferable.

11.4 However, this may not be feasible if a large number of persons are ill.

11.5 Persons who have milder illness may need to be isolated and cared for at home or in specially designated sites such as schools or community centres.

11.6 Home visits by medical staff or trained community workers will be helpful to advice that ill persons should stay home or seek formal medical care.

11.7 Cases must be isolated in nearest possible places and without any emergency including need for ICU support, they should not be transferred to other places.

11.8 Quarantine

11.8.1 Quarantine is the separation and restriction of movement or activities of persons who are not ill but have been exposed to an infectious agent to prevent further transmission of disease.

11.8.2 It can be applied at the individual, group or community level using individual homes or designated facilities like schools or any camps. Quarantine must include health monitoring and medical care.

12. Management in the Containment Zone and Buffer zone

12.1 Cases of Influenza-like illness should be clinically managed using standard treatment regimens for seasonal influenza, including antivirals

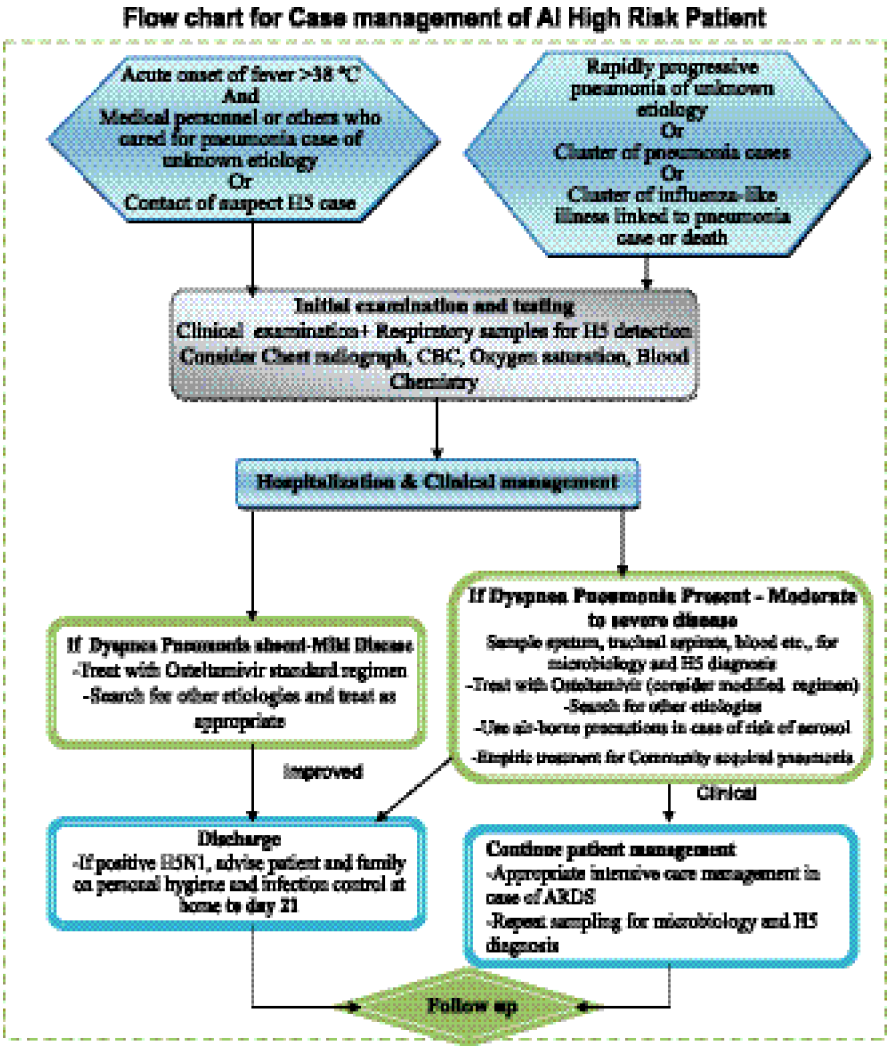
12.2 All persons in the containment zone who are not ill with influenza would be given 20 days of antiviral prophylaxis

12.3 Persons who develop an Influenza like illness in the Buffer -zone should be admitted in the hospital according to severity

12.4 Isolation should be done

12.5 At the same time antivirals must be started (Please follow SOP 11 for further reading).

Prophylaxis: The recommended dose for anti-viral prophylaxis is half the treatment dose, e.g., for an adult or adolescent it is 75mg once per day for 7 days



More complete guidance on treatment of AI patients is available at
www.who.int/csr/disease/avian_influenza/guidelines/clinicalmanage07/en/index.html
Draft reporting forms developed to assist clinicians are available at
www.who.int/csr/disease/avian_influenza/guidelines/clinicalmanage07/en/index.html

SOP 6: Infection Control in Management of Avian Influenza Patient

Version 1: October 2008

SOP 6

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Sop 6: Infection Control in Management of Avian Influenza Patient

1. Introduction

The goal of infection control in management of avian influenza patient is to control the transmission of Avian Influenza (AI) virus from person to person. AI virus is mainly transmitted through respiratory secretions but it can be also present in blood, stool and other body fluids. The virus may be excreted up to 3 weeks after onset of illness.

2. Purpose of the SOP

The purpose of the SOP is to control infection during management of the avian influenza patient by the health care personnel and also other care givers. Effective infection control can prevent transmission of the virus from:

2.1 Patients to health care workers
2.2 Patients to patients
2.3 Patients to family members providing care

3. Mode of transmission of Avian Influenza Virus and precautions

AI/H5N1 virus may be transmitted in three ways:

3.1 Droplet infection (human to human)
3.2 Contact (i.e. birds to human, human to human)
3.3 Air borne (Possible)

For preventing the transmission the precautions include Standard Precaution along with

3.4 Droplet precaution
3.5 Contact precaution
3.6 Airborne precaution

4. Time of Application of Infection Control

4.1 Transportation of the patient
4.2 During assessment of the patient
4.3 During management of the patient
4.4 During taking care following discharge
4.5 During handling the deceased in hospital or during funeral

5. Personnel to Follow Infection Control

5.1 All Avian Influenza (AI) patients
5.2 Health personnel (Doctors, nurses, aya, ward boys and others)
5.3 Care givers of the patients at the house hold setting

6. Pre-hospital precautions

Before sending the patient to the hospital for management, do the following tasks:

6.1 Notify the health care provider about the possible diagnosis
6.2 Receive instructions to whom and where to report in the Health Care Facility (HCF)
6.3 Transfer the patient in an ambulance or personal vehicle with open windows (van, boat etc.).
6.4 Brief all persons accompanying the patient about infection control
6.5 Ensure respiratory hygiene/cough etiquette of the patient

6.6 Put a surgical mask on the patient's face

6.7 All accompanying persons have to wear mask (n95; if not available masks of other grades)

6.8 Keep away all others from the patient as far away as possible (= 1 meter), when in transit and when in the Health Care Facility

6.9 Use hand hygiene after handling the patient or whenever appropriate (e.g. after coughing). *Refer to Annex III*.

7. Infection Control During Entry to the Hospital

7.1 Establish Triage Criteria to promptly identify persons at risk of infection with an acute respiratory disease (ARD). (Annex I)

7.2 Evaluate patients with acute febrile respiratory illness promptly.

7.3 Schedule outpatient clinic patients with acute febrile respiratory disease in different locations from other patients with a totally separate or = 1 metre (3 feet) between each patient in the waiting area.

7.4 Encourage use of tissue papers during coughing, sneezing and provide non-touched covered bin for disposal.

7.5 Upon entry, provide mask for persons with acute febrile respiratory illness.

7.6 Provide hand sanitizers (soap, hand rub etc.) in waiting areas and encourage hand hygiene after contact with respiratory secretions.

7.7 Avoid or minimize the use of items shared by patients such as pens, papers, mobiles and telephones.

7.8 Encourage use of tissue papers during coughing, sneezing and provide non-touched covered bin for disposal.

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7.9 Upon entry, provide mask for persons with acute febrile respiratory illness.

7.10 Provide hand sanitizers (soap, hand rub etc.) in waiting areas and encourage hand hygiene after contact with respiratory secretions.

7.11 Avoid or minimize the use of items shared by patients such as pens, papers, mobiles and telephones.

7.12 Avoid high-risk aerosol-generating procedures in patients with acute febrile respiratory illness in any ambulatory-care setting, unless they are necessary to save life and no alternative exists. (Annex I)

7.13 Encourage use of tissue papers during coughing, sneezing and provide non-touched covered bin for disposal.

7.14 Upon entry, provide mask for persons with acute febrile respiratory illness.

7.15 Provide hand sanitizers (soap, hand rub etc.) in waiting areas and encourage hand hygiene after contact with respiratory secretions.

7.16 Avoid or minimize the use of items shared by patients such as pens, papers, mobiles and telephones.

7.17 Avoid high-risk aerosol-generating procedures in patients with acute febrile respiratory illness in any ambulatory-care setting, unless they are necessary to save life and no alternative exists. (Annex I)

7.18 If such a procedure is performed in this setting, a well ventilated separate room should be used, and participating healthcare workers should use appropriate PPE

7.19 Notify the transporting healthcare workers and the receiving facility staff of the necessary infection control precautions in case of transfer of AI patients

7.20 Clean and disinfect environmental surfaces in the examination room or other areas where the patient was located.

7.21 Clean and disinfect patient-care equipment used for the patient.

Health Education Activities In Hospital

- Take health education measures for the public through posters, leaflets or audiovisual means about the signs or symptoms of suspected human AI.
- Display Posting Signs to alert persons with severe acute febrile respiratory illness to notify staff immediately. (Annex I)
- All directions should be displayed in Bengali in a place easily visible by the patients.

8. Infection control for Healthcare Workers in hospital setting

8.1 Put on PPE carefully before entering patient room or close contact with patient. (Annex-III)
8.2 Remove PPE carefully to avoid self-contamination/inoculation. (Annex-III)
8.3 Perform hand hygiene: (Annex III)
  8.3.1 Before and after any patient contact
  8.3.2 After contact with contaminated items (whether or not gloves are worn)
  8.3.3 Before putting on PPE, before & Immediately after glove removal
  8.3.4 After taking off all PPE items.
8.4 Wash hands with soap and water when they are visibly soiled.
8.5 Use alcohol based hand rub disinfect the hands.

9. Infection Control for Healthcare Facilities

9.1 Apply standard and droplet precautions when caring for patients with acute febrile respiratory illness
9.2 Ensure respiratory hygiene/cough etiquette of patients and others
9.3 Keep the AI cases in isolation room.
9.4 If possible to arrange negative pressure room for AI patients
9.5 If single rooms for AI patients are not available, cohort patients in isolated ward keeping at least 1 meter (3 feet) between beds
9.6 Limit numbers of health-care workers/family members/visitors exposed to AI patient to control hospital acquired infection
9.7 Practice full barrier precautions during specimen collection and standard precautions for specimen transport to the laboratory (Annex I)
9.8 Family members/visitors should be limited and must use full barrier precautions
9.9 Waste contaminated with AI virus have to be disinfected before disposal
9.10 Follow standard precautions for washing dishes/eating utensils and linens. (Annex I)
9.11 Clean and disinfect AI patient room at least once a day; frequently touched surfaces should be cleaned more often
9.12 All patient care equipments should be dedicated to a single AI patient. If not possible, these must be cleaned and disinfected before reuse
9.13 Instruct family members to follow appropriate infection control precautions at home, if patient is potentially infectious during discharge (i.e. discharged within the period of infection control precautions described above).
9.14 Monitor healthcare workers exposed to AI patients for signs and symptoms (mainly fever).

9.15 Antiviral prophylaxis must be supplied to staff at risk of exposure

9.16 Health personnel should not be placed for >5 weeks in AI patient care and must be followed up for the next 1 week

9.17 Training and education of health personnel on infection control should be promoted locally

9.18 If PPE supply is limited, facial protection (eyes, nose, and mouth) and hand hygiene are the most important priorities.

Duration of AI infection control precautions:

Adults >12 years: 7 days after resolution of fever
Children <12 years: 21 days after symptom onset.

10. Infection Control at home for patients with acute respiratory infections including discharged human AI cases

10.1 Limit contact with the ill person as much as possible

10.2 Stay in a different room or stay as far away from the ill person as possible, e.g., sleep in a separate bed

10.3 Shared spaces (restrooms, kitchen, bathroom, etc.) should be well ventilated (e.g., natural ventilation, keeping windows open)

10.4 Cleaning of the environment is important to prevent indirect transmission, particularly in shared spaces

10.5 In case of close contact care patient should cover their mouth/nose with hands or other materials (e.g., tissues, handkerchiefs, mask). Care giver should also wear a mask

10.6 Materials used to cover the mouth/nose should be discarded or cleaned appropriately Avoid direct contact with body fluids. If it happens, perform hand hygiene immediately afterwards. (Annex III)

10.7 Persons at increased risk of severe disease should not take care for the ill person or be in close contact with him.

10.8 Avoid direct contact with body fluids. If it happens, perform hand hygiene immediately afterwards. (Annex III)

10.9 Persons at increased risk of severe disease should not take care for the ill person or be in close contact with him.

All types of possible exposure to the patient or contaminated items should be avoided, e.g., sharing toothbrushes, Razors, cigarettes, eating utensils, drinks, towels, bed linens.

Persons at Increased Risk

- Heart, lung or kidney disease
- Diabetes
- Immunosuppression
- Blood disease (e.g., sickle cell anaemia)
- Pregnant women
- People > 65 years or Children < 2 years.

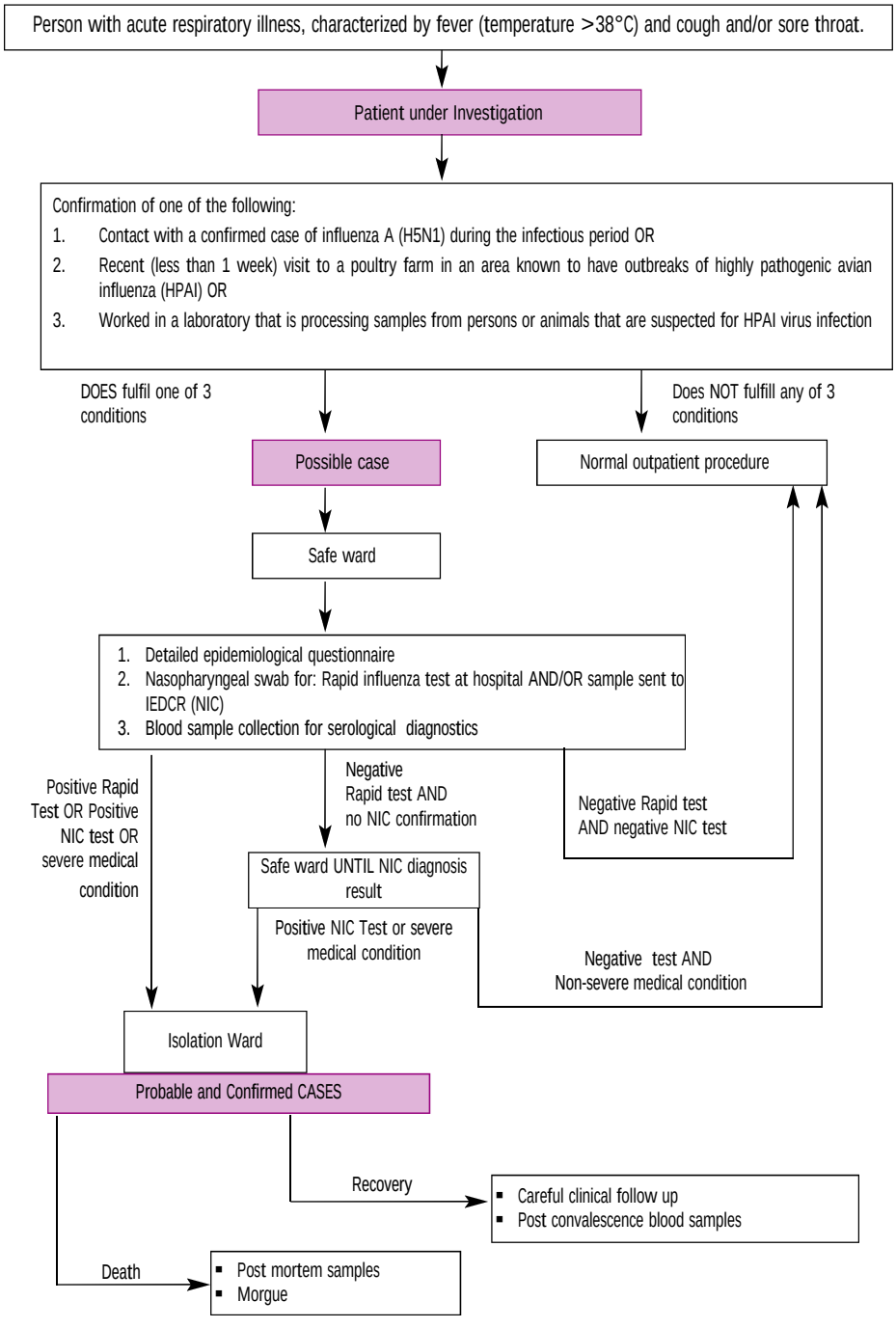
Health Care providers should inform the house hold member of AI patient about the above mentioned procedure in local dialect. Message containing leaflet should be supplied to them.

Annex I: Terminologies Used in This SOP

AEROSOL GENERATING PROCEDURES	Procedures that may generate small particles of respiratory secretions e.g. Endotracheal intubation Bronchoscopy Nebulizer treatment Suctioning
AIRBORNE PRECAUTION	Prevent spread of infection through very small (<5 microns) airborne particles. *Take in addition to standard precaution* N95 mask (or equivalent) Negative pressure isolation room
CONTACT PRECAUTIONS	Prevent infection through direct or indirect contact with patients or patient care environment. *Take in addition to standard precaution:* Limit patient movement Isolate or cohort patients Provide gown & gloves for patient/room contact Avoid touching eyes, nose, and mouth with hands. Avoid contaminating environmental surfaces Wash hand immediately after patient contact Dedicate equipments to single patient (if not possible, clean and disinfect between use. Clean and disinfect patient room daily including bed rails, bedside tables, and lavatory surfaces
DROPLET PRECAUTIONS	Prevent infection by large droplet form during sneezing, talking, coughing. *Take in addition to standard precaution:* Wear surgical mask within 1 meter of patients Wear face shield or goggles within 1 meter of patients Place patients in a single room or cohort 1 meter apart Limit patient movement within facility.
FULL BARRIER PRECAUTION	Total protection of a person from AI *PPE for Full Barrier Precaution:* Clean, non-sterile long-sleeved gowns. A plastic apron over the cloth gown (if splashing of blood, body fluids, excretions, or secretions is anticipated). Clean, sterile, ambidextrous gloves, which cover the cuffs of the gown. Face shield, visor, or goggles. A particulate respirator (for example an N95 mask). Surgical or procedure masks (if particulate respirators are not available).
HAND HYGIENE	The term "hand hygiene" includes both hand washing with either plain or antimicrobial soap and water (when hands are visibly soiled then must) and use of alcohol-based products (gels, rinses, foams) containing an emollient that do not require the use of water. Hand washing facility should be in o Waiting room in out patient departs. o Patient examination room. Entrance of the isolation unit.

ISOLATION UNIT	A single room with an anteroom. Hand-washing facilities in the anteroom. Attached bathroom. Inlet / outlet pass Negative pressure (droplet transmission cases). Air lock.
POSTING SIGN	Detection of persons entering the facility who may have influenza Post visual alerts (in appropriate languages) at the entrance to hospital outpatient facilities (e.g., emergency departments, outpatient clinics) instructing persons with respiratory symptoms (e.g., patients, persons who accompany them) to: Inform reception and healthcare personnel when they first register for care, and Practice *respiratory hygiene/ cough etiquette.*
RESPIRATORY HYGIENE/ COUGH ETIQUETTE	o Cover the mouth/nose when sneezing/coughing. o Use tissues and dispose in no-touch receptacles. o Perform hand hygiene after contact with respiratory secretions. o Wear a mask (procedure or surgical) if tolerated. o Sit or stand as far away as possible (more than 3 feet) from persons who are not ill.
STANDARD PRECAUTIONS	Standard precaution is the minimum level of precaution that are used to Prevent the transmission of common infectious agents when touching Blood & body fluids, Secretions, excretions Contaminated items Non-intact skin Mucous membranes And maintaining hand hygiene. *PPE for Standard Precaution:* Gloves Gown Eye shield
TRIAGE CRITERIA	" Triage" is the French word for 'sorting' Triage is a system used by medical and emergency personnel to ration limited medical resources when the number of patients needing care exceeds the resources available to perform care so as to treat those patients in most need of treatment who are able to benefit first. Triage is a system of carefully using medical resources Where they are needed most Decisions about who is the most ill Decisions about who will respond best to care Four steps of Triage are to: Determine type and severity of illness Assess level of care needed Assess available health care resources Advise on patient referral and transport (See Annex III)
WASTE DISPOSAL	Contain and dispose of solid waste (medical and non-medical) in accordance with facility procedures and/or local or state regulations; Wear gloves when handling waste Wear gloves when handling waste containers Perform hand hygiene

Annex II: Flow chart for triage of patients with suspected Avian Influenza



Cough etiquette and respiratory hygiene

Cover your cough

- When coughing or sneezing, use a tissue to cover your nose and mouth
- Dispose of the tissue afterwards
- Wear a surgical mask, if possible

Wash your hands

- After coughing, sneezing or blowing your nose, wash your hands with soap and water
- Use alcohol-based liquids, gels or wipes if you do not have access to soap and water

Remember hand washing is the single most effective way to reduce the spread of germs that cause respiratory disease.

Anyone with signs and symptoms of a respiratory infection regardless of the course, should be instructed to cover their nose/mouth when coughing or sneezing; use tissue to contain respiratory secretions; dispose of the tissue in the nearest waste receptacle after use; and wash their hands afterwards.

An Australian Government Initiative

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- *Ri (Zvcgv Îv 38.5° †mw›U‡MW ev 101° dv‡ibnvB‡Ui †ekx)*
- *bvK †_‡K cwb Siv*
- *kixi I gvsk‡ckx‡Z e¨_v*
- *gv_v e¨_v*
- *ïK‡bv Kwk*
- *kvm Kó*
- *Mjv e¨_v*
- *wbD‡gwbqv*
- *GQvovI Wvqwiqv, ewg, e‡K I †c‡U e¨_v, †Pv‡Li c`vn, bvK I gwo †_‡K i³ ¶iY Ges Gb‡Kdvj vBwU‡mi j¶Y †`Lv w`‡Z cv‡i|*
- *Avµvš nevi ci Le `“Z (4-5 w`b) GB †ivM Pig cwiYwZi w`‡K GwM‡q †h‡Z cv‡i|*
- *†ivMxi gZ¨i KviY gjZt fvBivm RwbZ wbD‡gwbqv, Zxe kvm Kó (ARDS) Ges kix‡ii wewfb A½ weKj n‡q cov (Multi-Organ failure)|*

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nvmcvZv‡j evW d msµgY cwZ‡iv‡ai Dcvq

- †ivMx‡K Avjv`v (Isolation) ivL‡Z n‡e |
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- †ivMx‡K DbZ gv‡bi gv¯‹ (N-95) e¨envi Kiv‡Z n‡e |
- hviv †ivMxi ms¯úk Avm‡e Zv‡`i g‡a¨ Bbd‡qÄvi DcmM †`Lv hv‡”Q wKbv ‡m e¨cv‡i bRi ivL‡Z n‡e|
- †ivMx‡K Ggb N‡i ivL‡Z n‡e †hLv‡b AšgLx evq cevn (Cross ventilation/ Negative Air Pressure) i‡q‡Q|
- GB iKg †iv‡Mi †¶‡Î `kbv_x‡`i msL¨v hZ`i m¤e Kg ivLv DwPZ|
- `kbv_x‡`i mevB‡K nvmcvZvj KZc¶/ ¯v¯¨Kgx KZK AvZ‡i ¶vKvix DcKiY (Mvfm I gv¯‹) mieivn Ki‡Z n‡e Ges Zv e¨env‡ii Rb¨ wb‡`kbv w`‡Z n‡e|

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- DbZ gv‡bi gv¯‹ (N-95), MvDb, g‡Lvk I MMjm e¨envi Ki‡Z n‡e| †ivMx‡K ¯ú‡ki mgq Aek¨B Mvfm e¨envi Ki‡Z n‡e|
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SOP 6

SOP 7: Personal Protective Equipment (PPE)

Version 1: October 2008

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Version 1: October 2008

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SOP 7: Personal Protective Equipment (PPE)

1. Introduction

Among the infection control measures for avian influenza, personal protective equipments (PPE) play a key role in preventing the spread of the virus. PPE is an important component of the non pharmaceutical intervention (NPI). The use of PPE is mandatory if direct close contact with AI/H5N1 patient is anticipated.

2. Purpose of the SOP

For proper use of the PPE to protect health care personnel, livestock personnel and visitors to and caregivers of AI patients and close contacts (AI cases and AI infected birds).

2.1 Healthcare personnel

2.1.1 Clinicians, health care managers, nursing staff, paramedical professionals (pharmacists, MA, SACMO, FWV), ward boy/aya, cleaners, mortuary workers, ambulance drivers and others

2.1.2 Laboratory personnel: Laboratory medicine specialist, Medical Technologists (Lab), lab attendant, sample collectors.

2.1.3 Field workers of Health and Family Planning departments: AHI, HI, FPI, HA, FWA.

2.2 Live stock personnel

2.2.1 Veterinarians, field assistant,

2.2.2 Laboratory personnel: Live stock scientists technologists, attendants and sample collectors working in AI labs,

2.2.3 Farm and wet market workers, cullers

2.2.4 Poultry farmers and traders

2.3 Close Contacts

2.3.1 Visitors/attendant/close contacts for the patients

2.3.2 Persons in close contact with sick and dead poultry due to avian influenza (personnel working in infected poultry, cullers, cleaners)

3. Indication of PPE Use

3.1 Healthcare provider: During management of patients with any acute febrile respiratory illness (Refer to SOP 1)

3.2 People coming in direct/ close contact with suspected or confirmed AI patients

3.3 Cleaners, mortuary workers, ambulance drivers and others during handling and transport of AI patient and dead body

3.4 Laboratory personnel during collection, transportation and examining samples

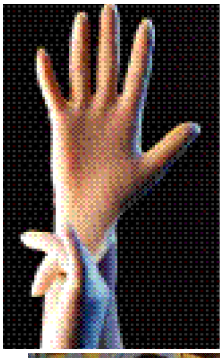
3.5 Personnel handling infected poultry (Livestock official and workers, farm and wet market workers, cleaner, culler, domestic purpose etc)

4. Components of PPE

4.1 Masks and respirators

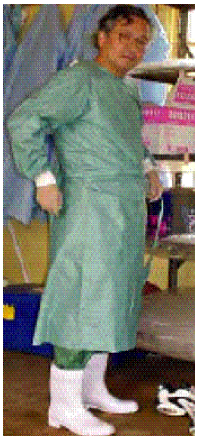
- Particulate respirators: Use a particulate respirator that filters more than 94% of airborne particles; Example
- USA: N95 (95%), N99 (99%), N100 (99.7%)

- Australia/New Zealand: P2 (94%), P3(99.95%)
- China: II (95%), I (99%)
- Japan: 2nd Class (95%), 3rd Class (99.9%)
- European Union: Class 2 FEP2: 95%, Class 3 (99.7%)
- Surgical masks: by the patient, others who will not come in close contact of the patient, in absence of particulate respirator.
- Alternative materials (barrier): Cotton, papers, tissue, cloth



4.2 Gloves

- Clean non-sterile ambidextrous gloves are adequate
- Gloves should cover the calf of the gown
- House keepers' gloves
- Gloves should be worn once and then placed in a waste receptacle

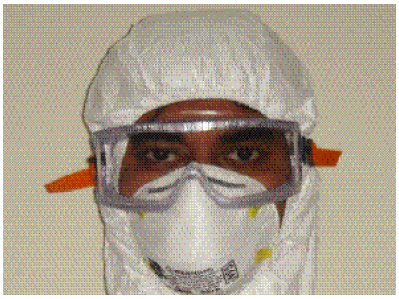


4.3 Gowns

- Synthetic disposable gown
- Washable cloth gown
- May cover the torso fully
- May Have long sleeves
- May fit snuggly at the wrist

4.4 Eye protector

- Facial shields
- Goggles
- Eye protection should be worn when coming in contact within 1 m of the patient with acute febrile respiratory illness



4.5 Hair cover/Cap

4.6 Boot /shoe cover

5. Wearing PPE: in chronological order (Annex 1)

I. Gown
II. Mask
III. Eye protector
IV. Cap
V. Shoe cover
VI. Gloves

6. Removal of PPE: in chronological order (Annex 2)

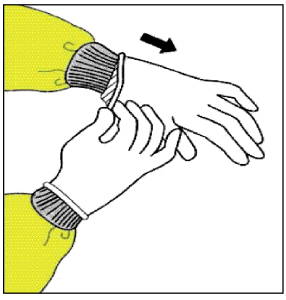
Before removal, prepare biohazard bag (open) to keep all used PPE:

I. Gloves
II. Gown
III. Cap
IV. Eye protector
V. Mask
VI. Shoe cover

Sterilize/ decontaminate gloves before put off

Before wearing and removing PPE wash hands with soap and water or use antiseptic (70% alcohol /spirit / other antiseptic materials).

Instruction: Removal of gloves



- Grasp outside edge near wrist
- Peel away from hand, turning glove inside-out
- Hold in opposite gloved hand

7. Use of different components of PPE

7.1 Full PPE components will have to be used during

7.1.1 Collection of sample from suspected AI patient and during laboratory test

7.1.2 Handling specimen of suspected AI patient in the lab

7.1.3 Duty in isolation unit and ICU for AI patients
7.1.4 Handling, washing and disposing of dead body of AI patient
7.1.5 Culling and disposing

7.2 Minimum components (Gloves and Mask) have to be used

7.2.1 Management of suspect AI or any other patient of potential infection
7.2.2 Transport of suspect AI patient
7.2.3 Interviewing AI suspect during outbreak investigation and in health care facility

8. Disposal of used PPEs

8.1 Put off PPE
8.2 Keep in Biohazard Bag/designated container
8.3 Decontaminate with
- Autoclave or
- Soap water for 30 mint or
- Sodium hypochlorite solution for 5 mints

8.4 Dispose off by incineration/ burning and burial

9. Storage of PPE

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Government has stock of PPE to meet emergency need evolving due to avian influenza outbreak in poultry. The stock of PPE with health is maintained at central and district level. On demand the PPE are supplied from CS office of the districts.

10. Working with Limited Resources

10.1 If recommended PPE is not available, apply appropriate technology for alternative measures.
10.2 If N95 or better grade respirator is unavailable
10.2.1 Use surgical mask having more than one layer
10.2.2 Even tissue, scarf, 'gamcha' or 'Anchol of Shari ' may also be used
10.3 If boot is not available plastic bag may be used to cover shoe
10.4 If gown is not available, laboratory coats or apron may be used

Annexure 1:

Sequence for wearing PPE

1. Wash hands
2. Gown/coverall
3. N95 Particulate respirator
   - Perform seal check
4. Hair cover
5. Goggles or face shield
6. Gloves

Gown/coverall

- Select appropriate type and size
- Opening may be in back or front
- Secure at neck and waist
- If too small, use two gowns
  - Gown#1 ties in front
  - Gown#2 ties in back

Surgical Mask

- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with ties or elastic
- Adjust to fit

N95 Particulate Respirator

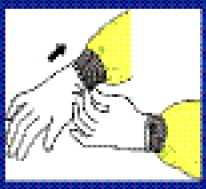
- Pay attention to size (S, M, L)
- Place over nose, mouth and chin
- Fix flexible nose piece over nose bridge
- Secure on head with elastic
- Adjust to fit and check for fit:
  - Inhale - respirator should collapse
  - Exhale-check for leakage around face

Eye and Face Protection

- Position goggles over eyes and secure to the head using the ear pieces or headband
- Position face shield over face and secure on brow with headband
- Adjust to fit comfortably

Gloves

- Don gloves last
- Select correct type and size
- Insert hands into gloves
- Extend gloves over gown cuffs

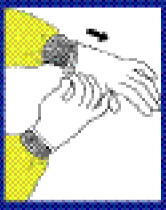


Annexure II:

Sequence for Removing PPE

1. Untie gown and remove shoe covers
2. Gloves
3. Wash hands
4. Gown (and apron, if worn)
5. Goggles
6. Mask
6. Cap (if worn)
6. Boots
6. Wash hands

Removing Gloves (1)



- Grasp outside edge near wrist
- Peel away from hand, turning glove inside-out
- Hold in opposite gloved hand

Removing Gloves (2)

- Slide ungloved finger under the wrist of the remaining glove
- Peel off from inside, creating a bag for both gloves
- Discard

Removing A Gown

- Unfasten ties
- Peel gown away from neck and shoulder

- Turn contaminated outside toward the inside
- Fold or roll into a bundle
- Discard

Removing Goggles or A Face Shield

- Grasp ear or head pieces with ungloved hands
- Lift away from face

- Place in designated receptacle for disinfecting or disposal

Removing a Mask

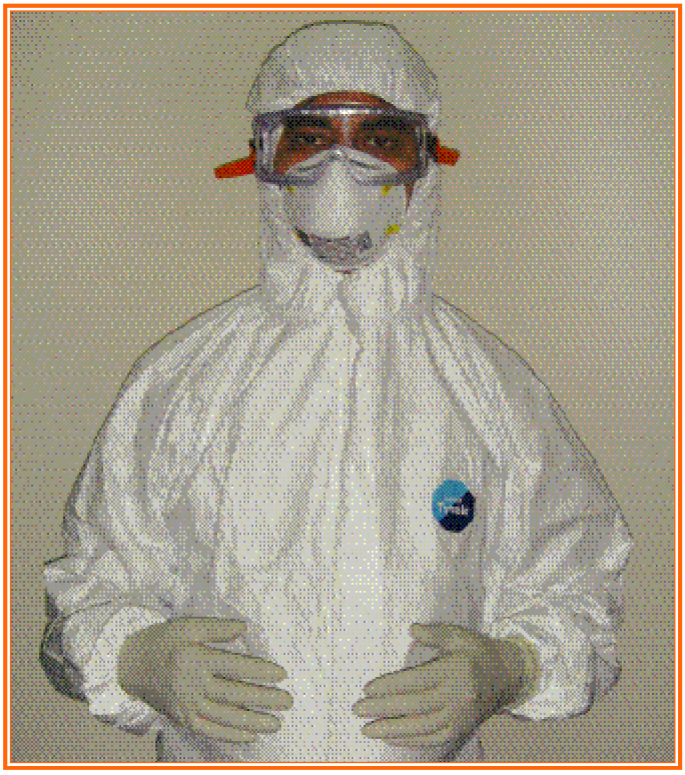
- Lift the bottom elastic over your head first
- Then lift off the top elastic
- Discard

- Don't thouch front of mask

SOP 7

SOP 8: Protection of Health Care Personnel and Visitors

(Version 1:October 2008)



SOP 8

SOP 8: Protection of Health Care Personnel and Visitors

Version 1: October 2008

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SOP 8: Protection of Health Care Personnel and Visitors

1. Introduction

The health care personnel and others who come in close contact with Avian Influenza patients are always at the risk of infection. To minimize the chance of infection, this group of people need to follow infection control measures.

2. Purpose

The SOP will be used as a guide for protection of Health care personnel, and others who come in close contacts with AI cases and infected birds.

2.1 Healthcare personnel

2.1.1 Clinicians, health care managers, nursing staff, paramedical professionals (pharmacists, MA, SACMO, FWV), ward boy/aya, cleaners, mortuary workers, ambulance drivers and others

2.1.2 Laboratory personnel: Laboratory medicine specialist, Medical Technologists (Lab), lab attendant, sample collectors.

2.1.3 Field workers of Health and Family Planning departments: AHI, HI, FPI, HA, FWA.

2.2 Close Contacts

2.2.1 Visitors/attendant/close contacts for the patients

2.2.2 Any person coming in contact with sick and dead poultry due to avian influenza

3. Indication for Personal Protection

3.1 By health care provider during management of patients with any acute febrile respiratory illness (*Refer to SOP 1*)

3.2 By any person when coming in direct/ close contact with suspected or confirmed AI patients

3.3 By laboratory personnel during collection, transportation and testing samples of AI patients

3.4 By any person during working with secretions and excretions from AI patients or contaminated items

4. Protection of Health care personnel, visitors, attendants against AI in Healthcare Facilities

4.1 Basic infection control recommendations: Apply standard and droplet precautions when caring for patients with acute febrile respiratory illness

4.1.1 The "standard" precautions involve 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)
- Appropriate handling of patient care equipment and soiled linen
- Prevention of needle stick/sharp injuries

- Environmental cleaning and spills-management
- Appropriate handling of waste.

4.1.2 Droplet precautions

- Wear surgical mask and face shield when coming within 1 meter (3.28 ft) of patient
- Place patients in single room
- If needed to keep more than one patients in a room place them 1 meter (3.28 ft) apart
- Limit patient movement within the health care facility
- Patient wears mask while outside of isolation room
- Limit numbers of health-care workers/family members/visitors exposed to AI patient.
- Only those essential for patient support should be allowed and they should use full barrier precautions.

4.2 Specimen collection/transport/handling within health-care facilities

(Refer to SOP 6)

- Use full barrier precautions for specimen collection.
- Use standard precautions for specimen transport to the laboratory.
- Health-care facility laboratories should follow best bio safety practices.

4.3 Patient transport within health-care facilities

- AI patients without respiratory distress should wear a N95 mask. If not available the patient should wear surgical mask.
- Health-care workers including driver assisting with transport should wear gowns, gloves and masks.
- The trolley, wheel chair or vehicle should be cleaned with water and detergent.

SOP 8

5. Waste disposal

Treat any waste possibly contaminated with AI virus as clinical waste according to the healthcare facility preferably by incineration. If incineration facility is not available then dispose by burial in such a way that can not be easily surfaced by any person or stray animals. For waste disposal the following guidelines have to be followed.

- All wastes should be disposed of in suitable containers or bags
- All wastes should be treated as clinical (infectious) waste
- Staff responsible for removing waste should wear PPE
- Not to contaminate the outside of the bag
- To use two bags if outside is contaminated (double bagging).
- Liquid waste (urine or faeces) can be safely flushed into the sewer system
- Waste disposal bags should have appropriate biohazard labelling
- Bags be treated and disposed of as per the policy of the hospital
- To follow national regulations pertaining to hospital waste.

6. Protection of caregivers of AI patient at home

If AI patient is managed at home the care givers need to take precautionary measure to prevent spread of the disease to themselves and others. After discharge from hospital if the patient is still potentially infectious instruct family members on appropriate infection control precautions to apply at home.

- All the persons should be briefed by health care personnel regarding infection control
- Preferably keep the patient isolated
- If not possible, sleep at least 1 meter away from the patient
- Keep distance from the patient and preferably by at least 1 meter
- Involve minimum person for care of the patient
- Wash hands frequently and after handling the patient with soap and water
- Alcohol and alcohol based antiseptic may be an good alternative
- To maintain droplet precaution by the family members (See section 4.2 of this SOP)
- Notify to local health authority if any family member of the AI patient .

7. Measures for Exposed Health Care Workers

Health care workers who are involved in caring for a patient with AI/H5N1 should receive training on the mode of transmission, the appropriate infection control precautions and the exposure protocol. Staff not involved in direct patient care should be given general advice about avian influenza. All health care workers who have come in contact with AI patients or an environment contaminated with the virus should take antiviral prophylaxis (*Annexure 1*). The health persons involved in patient care should follow the following instructions:

- Be educated on risks, safe practices, self protection, self monitoring and reporting of illness
- Receive adequate training on putting on, taking off, and hygienic disposal/disinfection of PPE.
- They should also maintain diligence in personal hygiene, including frequent hand washing
- To observe good respiratory hygiene at all times
- To check temperature twice daily and monitor self for respiratory symptoms especially cough
- To keep a personal diary of contacts
- In the event of a fever or ILI, immediately limit interactions and exclude themselves from public areas
- To notify the health authority about the illness and apprehension of infection with AI virus

Annexure 1: Oseltamivir for Prophylaxis of Contacts

When to start prophylaxis:

- From the day of exposure
- Can be given within 7 days of exposure
- No need to give antiviral prophylaxis after one week of exposure (on average incubation period is 2-8 days)

Duration for Prophylaxis

- Seven days for direct/close contact once daily
- Six weeks (42 days) for community contact (for health care workers/ RRT members) once daily

Dosage for Prophylaxis

- Adult and Children > 13 years: 75 mg
- Children >1 to 12 years
  - Body weight, < 15 kg - 30 mg
  - Body weight, 15 - <23 kg - 45 mg
  - Body weight, 23 - <40 kg - 60 mg
  - Body weight, >40 kg - 75 mg

Cautions: *Consider Risk versus benefits for*

- People with kidney disease (adjust dose)
- Pregnant or nursing females

Common Side Effects

- Nausea and vomiting
- Skin rash

Annexure 2: Personal Hygiene

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SOP 9: Protection of Cullers, Farmers and Veterinarians and Veterinary Field Workers (Livestock Personnel)

(Version 1:October 2008)

SOP 9: Protection of Cullers, Farmers and Veterinarians and Veterinary Field Workers (Livestock Personnel)

Version 1: October 2008

Chairman

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SOP 9: Protection of Cullers, Farmers and Veterinarians and Veterinary Field Workers (Livestock Personnel)

1. Introduction

Veterinarians, veterinary field workers (VFW), personnel of vet lab, cullers, poultry farmers and traders, backyard poultry farmers, wet market workers may be at risk of AI infection through activities such as handling, collecting, transporting, culling and disposal of birds and cleaning/disinfection of contaminated areas, examining sick birds and testing specimens for AI. To minimize the chance of infection to themselves or spreading to others, this group of people need to follow infection control measures during performing the above mentioned activities.

2. Purpose of the SOP

The SOP will be used by personnel related to live stock for their protection during handling, collecting, transporting, culling and disposal of birds and cleaning/disinfection of contaminated areas, examining sick birds and testing specimens for AI. The personnel related to live stock includes

2.1 Veterinarians, field assistant,

2.2 Laboratory personnel: Live stock scientists, technologists, attendants and sample collectors,

2.3 Farm and wet market workers, cullers

2.4 Poultry farmers and traders

3. Indication for Personal Protection

3.1 By veterinarians during examining sick birds or doing post mortem of birds or animals

3.2 By veterinary field workers during examining sick bird or animal

3.3 By sample collectors during collection specimen from sick or dead animals

3.4 By laboratory personnel during handling and examining specimens suspected of AI

3.5 By cullers during culling and disposing of AI infected birds

3.6 By farmers and workers during working in poultry farms

3.7 By live wet market traders and workers during handling, slaughtering, defeathering of poultry and during waste disposal

3.8 By housewives, house maid, servants during handling and processing birds

4. Protection measures

All individuals involved in handling, disease investigation for suspected animal AI cases collecting sample, transporting, culling, and disposal of birds, and cleaning/disinfection of contaminated areas should:

4.1 Be educated on risks, safe practices, self protection, self monitoring and reporting of illness

4.2 Receive adequate training on putting on, taking off, and hygienic disposal/disinfection of PPE.

4.3 They should also maintain diligence in personal hygiene, including frequent hand washing

4.4 Receive adequate instruction on disinfection/disposal of potentially contaminated personal clothing and other personal articles

4.5 Be registered with local animal health authorities (who will share this information with local health authorities)

4.6 Wear appropriate Personal Protective Equipment (PPE) according to the nature of activities

4.7 Poultry farmers and traders, veterinarians, VFW, wet market workers at risk of AI infection will be given prophylactic oseltamivir (SOP 8: Annexure 1)

4.8 Cullers should take prophylactics antiviral as long as they will be involved in culling process to a maximum for 42 days

4.9 Either self monitor or be monitored daily for fever (>38°C) and respiratory symptoms for 14 days after the last day of contact with poultry/contaminated environments

4.10 Any person experiencing fever or respiratory symptoms should immediately report to local health authorities for clinical assessment, laboratory testing and treatment

4.11 Any culler, poultry farmers and traders, veterinarians, VFW, wet market traders developing fever following exposure to AI should be regarded as a case under investigation of AI (SOP 1)

4.12 While such a person is being transported to a healthcare facility, appropriate infection control measures should be applied (SOP 6)

4.13 Individuals self reporting to a healthcare facility should be encouraged to observe respiratory etiquette, including wearing a face mask if possible (SOP 6)

4.14 In case of a breach of PPE or in situations where full and appropriate personal protection was impossible, local health authorities may consider more active follow-up for the onset of any illness (active monitoring rather than relying on self-reporting)

5. Use of protection measures according to nature of activities

- Full PPE should be used during the following activities:
  - Investigation of suspected outbreak in birds
  - Culling and disposing birds with AI
  - Specimen processing and testing in the laboratory
- Mask and gloves
  - Workers of live wet market
  - Handling of birds during slaughtering, defeathering, processing for cooking
- Hand washing with soap and water after any activities related to livestock

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SOP 10: Risk Communication for Avian Influenza in human

(Version 1: October 2008)

SOP 10: Risk Communication for Avian Influenza in human

Version 1: October 2008

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SOP 10: Risk Communication for Avian Influenza in human

1. Introduction

Communication is an important part of any successful response to the risk posed by both avian and pandemic influenza. Through sharing knowledge widely, changing poultry farming and hygiene practices, we can reduce the risk of the spread of the H5N1 virus from animal to animal and from animal to human. In a pandemic situation, communication will play vital role in preventing panic and saving lives.

2. Purpose of the SOP

The SOP will be used as a guide for health personnel of different level for communicating the public as well as professionals about avian influenza in human in order to reduce risk of spread of the disease. The SOP will be used by personnel related to avian influenza activities at all levels of health care service.

3. Indication for Risk Communication

3.1 Health authorities at different tiers: Risk communication with community during human AI outbreak and rapid containment (pandemic alert, pandemic and pandemic survival period)

3.2 For health, livestock professionals, government agencies, NGOs and other agencies: Reporting of any outbreak

3.3 For health professionals working for ILI surveillance, rapid response and rapid containment: Communicating with professionals for updating knowledge about surveillance, outbreak and rapid containment

4. Risk Communications during Pandemic Alert Period

4.1 Plan and coordinate emergency communication strategy and activities

4.2 Spokespersons of different levels (ministry, directorate, district, upazila)

- Joint Secretary (PH &WHO) at MoH&FW
- Director (DC) of DGHS at DGHS (Director, IEDCR the technical focal point)
- Civil Surgeon at district level
- UHFPO at upazila level
- However, any other person designated by the appropriate authority may act as spokesperson

4.3 Arrange training of personnel of different levels for training on risk communication

4.4 Develop and disseminate key messages and materials on

- Pandemic influenza and ways that people can protect themselves and their families
- Scientific information, such as travel advisories, infection control measures, availability and appropriate use of antiviral medications and
- Specific public health actions that may be advised.

4.5 Conduct audience research and message testing

4.6 Provide updates about situation when needed

4.7 Coordinate international information exchange and communication strategies with WHO and other international partners, as appropriate.

4.8 Contingency resource plan for risk communication to be used during a pandemic

5. Risk Communications during Pandemic Period

5.1 Review the plan and coordinate emergency communication strategy and activities

5.2 Coordinate communications activities with central and local communications staff

5.3 Explore community resources, such as hotlines and websites to respond to local questions
5.4 Frequent updating of community partners
5.5 Promptly respond to rumors and inaccurate information to minimize concern, social disruption, and stigmatization
5.6 Coordinate international information exchange and follow up communication strategies.
5.7 Tailor communications services and key messages to specific local audiences
5.8 Strengthen pre-alert stage activities and address public anxiety and discomfort

Key points to remember while communicating

Pandemic alert
- To reduce the risk of animal to human transmission
- Improve hygiene to limit spread of seasonal human influenza
- Focus areas: address rumours, reinforce awareness on self-protection and prevention of spread, updating people on situation and outbreak response, and action being taken

Pandemic
- To contain and emerging human pandemic virus
- Survive a pandemic
- Focus are: Strengthen pre-alert stage activities and address public anxiety and discomfort

Communication Input:
Pandemic Alert Period

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Reduce the Risk of Animal to Human Transmission
- Separate your poultry from wild birds and new birds
- Burn or bury dead birds
- Wash hands and clean clothes, footwear, vehicles and cages with soap or disinfectant
- Handle sick and dead birds with appropriate equipment and clothing
- Cover mouth/ nose especially during slaughtering and poultry preparation process
- Keep birds out of living rooms/living areas
- If suffering from influenza after recent contact with sick or dead poultry, report to the nearest health facility immediately

Improve Hygiene to Limit Spread of Human Flu
- Cover coughs and sneezes with handkerchief, clean cloth, tissue, or hands properly
- Avoid spitting in public
- Wash hands frequently with soap/ash and water, especially when you or one of your family members is sick
- Report persistent flu-like illness immediately to the nearest health facility

Focus area:
- Improve hygiene to limit spread of human flu
- Reduce the risk of animal-to-human transmission

Communication Input:
Pandemic Period

Initial Stage with few cases: Contain an Emerging Human (Pandemic) Virus

- Avoid unnecessary social contact
- Avoid crowded places
- Avoid visiting sick relatives and friends
- Avoid coughing and sneezing people
- Avoid shaking hands
- Wear masks
- Stay at home
- Report flu-like illness and deaths from flu immediately to the nearest health facility
- Wash hands frequently with soap/ash and water, especially when you or one of your family members is sick
- Try not to panic

Improve Hygiene to Limit Spread of Human Flu

- Cover coughs and sneezes with handkerchief, clean clothe, tissue, or hands
- Avoid spitting in public
- Wash hands frequently with soap/ash and water, especially when you or one of your family members is sick
- Report persistent flu-like illness immediately to the nearest health facility

Advanced stage with many cases: Survive a Pandemic

- Care for sick at home
- Isolate patients as far as possible
- Restrict to one care giver for sick person
- Both sick person and care giver to wear mask
- Wash hands with soap/ash and water after every contact with a sick person
- Wash clothes of the patient, carer and other family members regularly
- Stay away from crowded places

6. Methods of Risk communication

For risk communication the following methods of communication will be used

6.1 Mass communication

- Press release to mass media
- Interview with mass media
- Interactive discussion with mass media: Director, IEDCR/ subject specialist will be the focal point

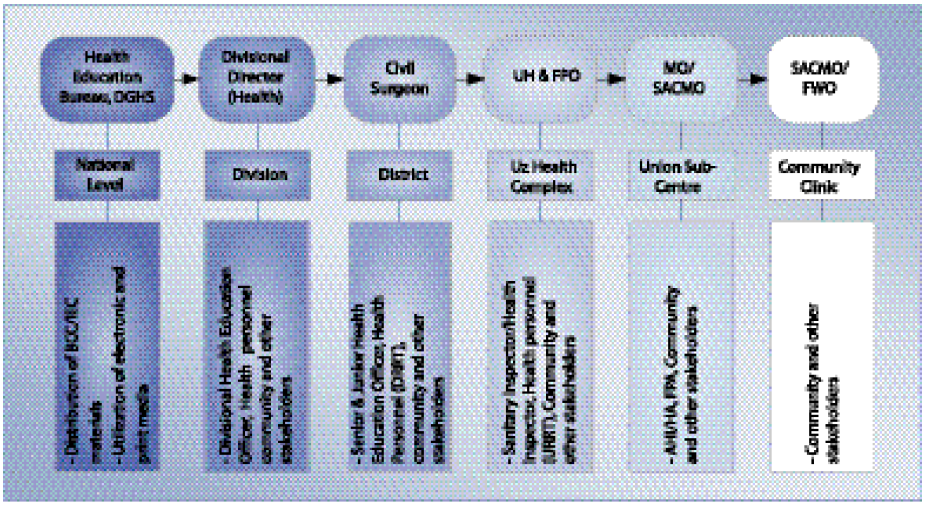
6.2 Communication with Group

- Focus group discussion (FGD)
- Seminar, workshop and advocacy for service provider, local leaders, imams & school teachers

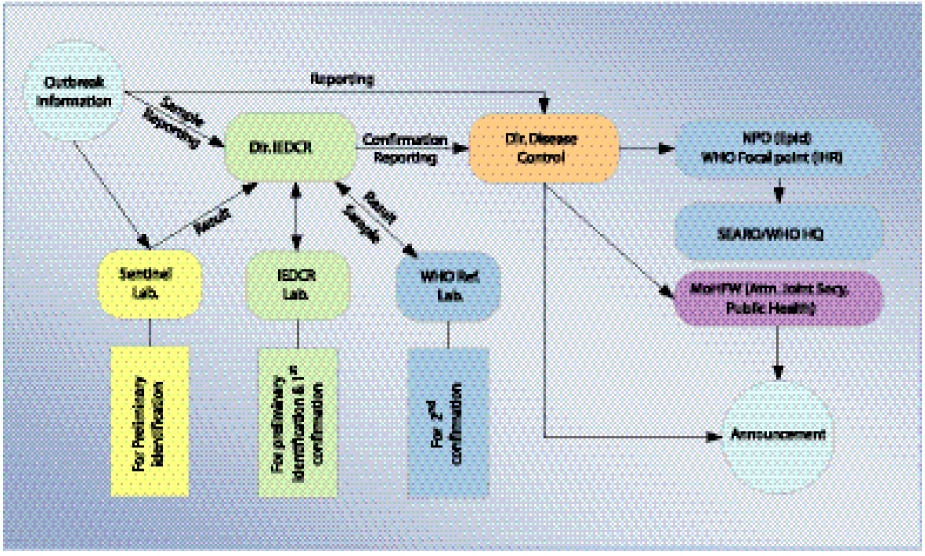
6.3 Communicating with individual

- Inter-personal communication (IPC)

7. Flow chart of risk communication with community and professionals



8. Flow chart of official communication procedure



9. Activities Tables

Personnel/Level	Phases		
	Pandemic-Alert Phase	Pandemic Phase	Pandemic survival Phase
Administrative/Surveillance/Investigation: CS/DCS/MO-CS and other members of Rapid Response Team	Communicating Upward (central level control room) or downward (sub-ordinate staff) through item nos. a – g of tool list. Press information session in advance – senior editors Supplement for newspaper Regular press briefings Radio – announcements, phone in, talk shows TV – PSAs, programmes SMS messages to subscribers Strap line on TV	Communicating Upward (central level control room) or downward (sub-ordinate staff) through item nos. a – g of tool list. Regular press release Radio – announcements, phone in, talk shows TV – PSAs, programmes Pre-recorded message from authorities/ religious leaders on radio and TV Infomercials – 1-5 min short film to be run several times and hour on TV and radio Docu-dramas Short film showing correct procedures to follow. Strap line on TV SMS messages to subscribers Internet	Communicating Upward (central level control room) or downward (sub-ordinate staff) through item # a – g of tool list. Reassure community and let them understand "We'll get through it together!"
Clinical Service Providers: CS/UHFPO/RMO/Consultants/MO and others	No communication to press/public unless you are designated as spokesperson for the area. Advice all patient to follow the infection prevention advise Advice caregiver to take special precaution Provide each patient's family a set of printed communication materials for ready reference	No communication to press/public unless you are designated as spokesperson for the area.	
Information service Providers: Institution Based Health Education Officer (Junior/Senior)	Use following media/channel to aware community about impending epidemic Posters, banners Mobile announcements Loudspeakers Pamphlets Leaflet Billboards Sides of buses Internet Guideline for community leaders	Assist Clinical Service provider to carry out their works No field visit or communication, refer the issue to institutional head	Reassure community and let them understand "We'll get through it together!"

Personnel/Level	Phases		
	Pandemic-Alert Phase	Pandemic Phase	Pandemic survival Phase
Information service Providers: Field Based Field Staff (SI,HI,AHI, HA)	Advice community for not to panic and provide message as approved by technical committee. All messages should focus on promoting hygiene (wash), safe food preparation and cooking, keeping distance (separate) and early reporting. Approved Message should be given through: Organizing Community meeting Conducting Courtyard meeting Disseminating message trough home visit Arranging community events e.g. rally, essay competition Using indigenous media: folk song, Jari gan, Gomvira Address rumours; reinforce awareness on self-protection and prevention of spread, updating public on situation and outbreak response, and action being taken Doing Precaution advocacy ("Watch out!"), alert people to serious hazards when they are unduly apathetic	Assist hospital staff in caring patient and disposal and transportation of dead bodies (if any) No field visit or communication, refer the issue to institutional head Address rumours; reinforce awareness on self-protection and prevention of spread, updating public on situation and outbreak response, and action being taken Reassure people ("Calm down!") about minor hazards when they are unduly upset.	Reassure community and let them understand "We'll get through it together!"

Annexure: Communication Tools and Mechanism

Commonly Used Communication Tools

- *Organizational communication*
  - Official letter
  - Fax
  - Website materials (MoHFW, DGHS, IEDCR, MOFL, WHO, CDC ...)
  - E-mail
  - Telephone: Mobile and SMS
  - Postal service
  - Messenger and courier

  Focus area: Communicating upward or downward

Communicating with people

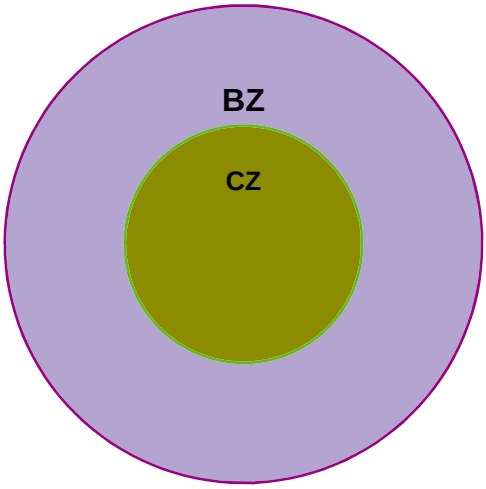
- *Mass media*
  - Advertisement in printing media
  - Advertisement in electronic media
  - Billboard
  - Banner
- *Print media*
  - Leaflet
  - Handbill
  - Poster
  - Brochure
  - Booklet
  - Flip chart
  - Manual
  - Newsletter
  - Scientific literature
- *Audio materials*
  - Audio cassette
  - Radio programme
  - Miking
  - Announcement at mass gatherings, e.g., market, exhibition, cultural events, sports
- *Video materials*
  - Video cassette
  - CD-ROM
  - Advertisement in cinema slide
- *Audio-visual materials*
  - Television programmes
  - Feature film show in communities
  - TV documentary
- *Indigenous*
  - Arranging folk sing, Jaari gan, Gomvira etc.

- *Events*
  - Essay competition for school students
  - Rally
- *Forum formation*
  - Radio listeners forum
  - Readers forum

Focus area: Address rumours, reinforce awareness on self-protection and prevention of spread, updating people on situation and outbreak response, and action being taken

SOP 11: Rapid Containment of Influenza Outbreak with Pandemic Potential

(Version1: October 2008)



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SOP 11: Rapid Containment of Influenza Outbreak with Pandemic Potential

1. Introduction

Rapid containment is a strategic approach to contain the appearance of pandemic influenza. The rapid containment activities include: a joint (national authorities and WHO) risk assessment for indication of pandemic influenza and to begin containment measures and application of both pharmaceutical and non-pharmaceutical interventions.

2. Purpose of the SOP

The SOP will be used as a guide for personnel of health, administration, home, defence, NGO, private sector, international agencies and development partners to deal with activities for containment of pandemic influenza.

3. Risk assessment

3.1 Risk for suspected influenza outbreak of pandemic potential will be assessed by considering the following criteria

3.1.1 Virological: laboratory evidence of AI/H5N1 virus or any novel virus

3.1.2 Epidemiological: evidence of efficient and sustained humans-to-human transmission (clustering of five or more cases closely related in time or space or two or more generations of transmission)

3.2 Once an influenza outbreak of pandemic potential is suspected, national authorities should immediately notify WHO and begin discussions to jointly assess all relevant technical, operational, logistical, political factors and other available information.

3.3 WHO will additionally consult with external experts about the situation and provide input and relevant advice to national authorities.

3.4 National authorities will make the ultimate decision to launch a containment operation and be responsible for leading and managing the national activities related to the containment operation.

In the assessment process preceding the decision, two critical and central questions to address

- Is there compelling virological and epidemiological evidence to suggest that H5N1 influenza virus or any novel virus has gained the ability to transmit easily enough from person to person to initiate and sustain outbreaks, especially community level outbreaks?
- If so, are there any compelling reasons why a containment operation should be deferred?

Conditions under which a rapid containment operation would not be initiated

A decision to initiate a rapid pandemic containment operation might be deferred for several reasons, including the following:

- H5N1 or any other influenza A virus could not be confirmed.
- It was not operationally feasible, including for security reasons, to rapidly implement pharmaceutical and non-pharmaceutical interventions at a level considered minimally acceptable
- National authorities decide against supporting a containment operation for any other reason, e.g., geographically difficult to delineate.
- Evidence suggests that the H5N1 influenza virus or a novel virus has already spread too far to make containment realistically feasible.

4. Defining Containment Areas

To carry out rapid containment operation the area surrounding the index cluster will be demarcated as Containment Zone (CZ) and Buffer Zone (BZ) [*For terminology, see annexure*].

The actual size and shape of the Containment Zone and the Buffer Zone is expected to be influenced by practical considerations such as:

4.1 Known movements and geographical distribution of cases and contacts

4.2 Important local or national administrative boundaries as well as important natural boundaries that may limit the movement of people

4.3 Consideration of infrastructure and essential services (e.g. power, water, sanitation, food supply, communication) that may substantially affect the safety and health of people within the CZ or BZs.

5. Key activities in the Containment Zone (CZ)

5.1 Perimeter control

5.1.1 People should be notified and made aware (Refer to SOP 10). The boundaries of the CZ should be made known to the local population. When feasible, physical reminders (such as signs) of the boundaries should be evident and clear.

5.1.2 It is critical that all non-essential movement of persons in and out of the CZ is discouraged as much as possible. Law enforcers, health workers along with community leaders will monitor movement restriction.

5.1.3 If the CZ encompasses major air, land, and sea transit points, it is possible that screening procedures could be used but the preferable alternative is to close that entry point. Screening will be done by clinical, epidemiological and laboratory parameters where appropriate (details in SOP for surveillance).

5.1.4 Antivirals and other measures (e.g., other healthcare services, nutritional supplements, hand wash facilities) can be incentives for persons to remain in the CZ.

5.2 Antiviral treatment and Prophylaxis

5.2.1 Health authorities at District and Upazilla level will ensure extensive antiviral prophylaxis and treatment (Refer to SOP 6)

5.2.2 In CZ prophylaxis will continue for 20 days

5.2.3 To ensure antiviral stockpiles in the district, and to replenish with fresh antiviral after using the antiviral from the pre-existing stockpile for all the population within the district

5.2.4 To check expiry date of antiviral

5.3 Multiple non-pharmaceutical interventions (*Refer to SOP 6*)

5.3.1 Isolation of ill person

Isolation in a hospital or other healthcare facility is preferable. However, this may not be feasible if a large number of persons are ill. Persons who have milder illness may need to be isolated and cared for at home or in specially designated sites such as schools or community centres. Telephone hotlines or home visits by medical staff or trained community workers may be helpful to advise if ill persons should stay home or seek formal medical care.

5.3.2 Voluntary quarantine of contacts

Quarantine must include health monitoring, medical care and other essential services:

5.3.2.1 Contacts should be informed about what they can do to reduce the chance that they will become infected, the common signs and symptoms of influenza and how to monitor themselves for influenza. Health workers will do this.

5.3.2.2 Contacts should be told how to report an influenza-like illness to health authorities and receive further instructions about medical care. Depending on the severity of illness, contacts who become ill may be isolated at home or at a health-care facility (details in SOP for infection control).

5.3.2.3 Nurse (quarantine in health facility) or Health Assistant (quarantine at home) or any other person designated by health authorities should visit or make telephone contact daily to check and record contacts' health status, including compliance with antiviral prophylaxis.

5.3.3 Social distancing measures

In addition to isolation and quarantine, other "social distancing" measures should be implemented until 14 days after detection of last case of Human Avian Influenza. The goal of these measures is to reduce the number of people that are in close contact which in turn should reduce the risk of becoming infected with influenza.

Examples of social distancing measures include:

- Closing educational institutions in combination with other measures to prevent students from gathering in large groups in places other than educational institutions
- Cancellation of mass gatherings and public events;
- Closing workplaces or having non-essential workers stay at home;
- Staggering work hours or access to market places;
- Restricted use of public transportation.

In addition, community-wide practice of hand and respiratory hygiene would be strongly encouraged (*Refer to SOP 10*). In the context of containment, isolation of persons with an ILI and quarantine of their contacts should be implemented as quickly as possible, i.e. before laboratory test results may be available. It may be mentioned that the initial detection of index cluster will trigger this response.

5.4 Surveillance

5.4.1 Active surveillance is preferred for case detection, monitoring the evolution of the outbreak, evaluating the effectiveness of the containment operation and helping in further decision taking.

5.4.2 Surveillance can be conducted in hospitals (including patients and health care workers), formal health infrastructures (e.g., physicians, outpatient clinics, pharmacies, laboratories and other pre-existing health networks), informal health infrastructures (e.g., NGOs, traditional healers) and in the community as well.

5.4.3 Surveillance will be conducted among every patient in health facilities and every household in the CZ and BZ.

5.4.4 Surveillance will be conducted by a team of health professionals designated by local health manager.

5.5 Laboratory testing and preparedness

5.5.1 Rapid test for influenza will be done in the CZ and BZ. Subtyping of influenza virus will be done in NIC (IEDCR) or if possible at district level

5.5.2 Laboratory testing of all suspect cases is preferable, but may not be possible if there are large numbers of persons with an influenza-like illness. As patient numbers increase, it may be necessary to develop a sampling schema. For example, every "nth" hospitalized patient with suspect influenza could be tested with consideration for geographical, gender and age representativeness. This decision will be taken by UHFPO in consultation with CS.

5.5.3 Once antiviral prophylaxis in the CZ has ended, laboratory confirmation of any possible cases will be required.

5.5.4 Reporting to appropriate authorities as required (according to SOP 10)

Support from WHO

- If required for containment operation, WHO will request and coordinate assistance from international agencies and partners to support the containment operation.
- Such support could include supplies [e.g. personal protective equipment (PPE) and antiviral, laboratory equipment & chemicals], other essential requirements, and personnel

6. Rapid containment communications *(for details see SOP 10)*

The objectives of an effective communications response during rapid containment are:

- To provide the best information available in a timely and easily understood fashion
- To promote compliance with containment measures, identify barriers and facilitating factors to compliance, and adapt approaches to the local context through a policy of transparent communication

- To identify and address inaccuracies, rumours and misperceptions quickly and work to reduce stigmatization of affected groups
- To install and maintain public confidence in the national and international public health system but at the same time convey realistic expectations about its ability to stop the initial emergence of a pandemic virus;
- To prepare for a possible pandemic if containment does not succeed.

7. Key activities in BZ

7.1 People should be notified and made aware by health authorities

7.2 Active and complete surveillance with laboratory testing of all suspect cases (Refer to SOP 1)

7.3 Active surveillance to achieve complete ascertainment of all possible cases in the BZ is essential to assess if the containment measures in the CZ are working

7.4 Laboratory confirmation of all suspect cases in the BZ must be done

7.5 Isolation and treatment of suspect case

- Depending on the clinical severity of illness, such persons should be isolated at home or be admitted to a hospital. Early treatment with antivirals should be initiated before the result of laboratory testing for the emerging virus.

7.6 Antiviral prophylaxis and quarantine of contacts of suspect cases

- Household and other close (face-to-face) contacts of ill persons should be traced, placed in voluntary home quarantine and given antiviral prophylaxis while laboratory testing is pending for the possible case.

7.7 Perimeter controls and non-pharmaceutical intervention (NPI)

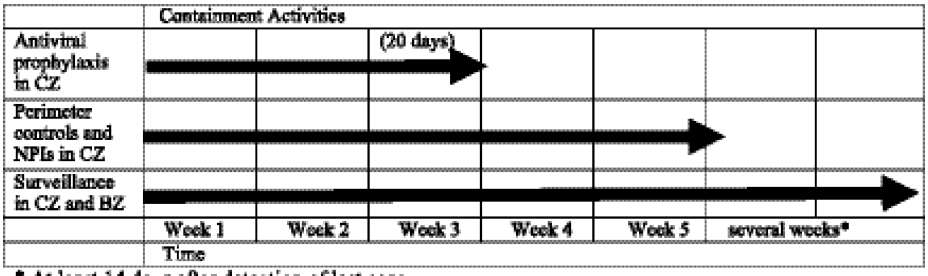
7.7.1 Persons in the BZ would be restricted from entering the CZ as described earlier.

7.7.2 However, there would be no restrictions for healthy person on transit out of the BZ after proper screening.

7.7.3 Other NPIs, apart from the management of suspect cases and their contacts, would not be implemented.

7.8 Reporting to appropriate authorities as required

8. Timeline of Containment activities



* At least 14 days after detection of last case

9. Ethical Considerations

All measures employed during a containment operation will be adhered to ethical principles set within a framework of human rights guaranteed by the constitution and international obligations.

10. Mortuary Issues

During pandemic phase of Avian Influenza safe disposal of dead bodies should be ensured. People involved with disposal of dead bodies from hospital bed to burial must take all protective measures to prevent infection from Avian Influenza. A separate SOP will address this issue.

Table 1. Major activities undertaken during the rapid response investigation of the Index Cluster and in the Containment Zone and Buffer Zone during Rapid Containment.

	Isolation and treatment of cases	Contact tracing	Antiviral prophylaxis	Voluntary quarantine	Hand and respiratory hygiene	Social distancing measures	Perimeter control	Surveillance strategy
Index Cluster	√	√	Contacts of cases	Contacts of cases	√	No	No	Active case-finding All cases laboratory confirmed
Containment Zone	√	Not routinely*	Everyone	Contacts of cases	√	√	√	Active and passive surveillance** Sample of cases laboratory confirmed**
Buffer Zone	√	√	Contacts of cases	Contacts of cases	√	No	No	Active and complete surveillance All cases laboratory confirmed

* All contacts of possible cases identified after antiviral prophylaxis in the CZ is completed should be traced.

** Depending on the number of cases in the CZ, both active and passive surveillance and a sampling schema to laboratory confirm cases may need to be used. After antiviral prophylaxis in the CZ is completed, active and complete surveillance and laboratory confirmation of all cases should be done.

ANNEXURE: Terminology

- *Active surveillance*: Conducting surveillance by regularly contacting (e.g. telephone, personal visit) facilities (e.g. hospital, laboratory) or individuals (e.g. physician, pharmacist) or regularly reviewing data bases (e.g. death records) to identify cases of influenza.
- *Buffer Zone (BZ)*: A geographically-defined area and population surrounding the Containment Zone where active and complete surveillance is done to detect all possible cases of influenza outbreak with pandemic potential.
- *Containment Zone (CZ)*: A geographically-defined area and population that surrounds the Index Cluster of persons with influenza outbreak with pandemic potential and where widespread pharmaceutical and non-pharmaceutical measures would be used to stop further spread of the pandemic virus.
- *Index Cluster:* The first detected cases of influenza outbreak with pandemic potential, when 5 or more cases found which are closely related in time or space or two or more generations of transmission occurs.
- *Isolation*: Separation of ill persons from others to prevent the spread of infection; can occur in a health-care facility, home or other site.
- *Non-pharmaceutical interventions*: Use of measures other than drugs or vaccines (e.g. isolation, quarantine) to help stop the spread of an infectious agent by minimizing the exposure of susceptible persons to the agent.
- *Passive surveillance*: Conducting surveillance by relying on potential reporters of cases (e.g. hospitals, physicians) to initiate contact with public health authorities.
- *Perimeter controls*: Measures to limit all non-essential movement of persons out of and into the CZ to reduce spread of influenza outside the CZ or increase the number of susceptible persons in the CZ.
- *Rapid containment*: Extraordinary public health measures, including widespread use of pharmaceutical and non-pharmaceutical interventions, to stop a potential pandemic of influenza from developing.
- *Rapid response*: Routine public health actions that local and/or national authorities initiate for infectious disease outbreaks including early detection and investigation of ill persons, immediate implementation of prevention and control measures, and timely notification of appropriate authorities.
- *Respiratory hygiene/cough etiquette*: Use of measures (e.g. tissues, masks) to cover the mouth and nose when coughing and sneezing, followed by disposal of contaminated tissues and masks, and hand hygiene.
- *Social distancing measures*: Variety of measures (e.g. closure of educational institutions or businesses) to reduce transmission of infectious diseases by reducing contact between people.

When to initiate containment: Key considerations

- Influenza-like illness
- Detection of H5N1 influenza virus
- Sustained and efficient human-to-human transmission
- Limited spread of the H5N1 virus
- Operational feasibility
- Decision by national government with international assistance as needed

Since such an operation will have considerable implications internationally and for the country of concern, the assessment must be undertaken jointly by WHO and national authorities of the country in which the operation is proposed. A formal declaration of a public health emergency of international concern (PHEIC) does not have to be in place before a pandemic containment operation is implemented (WHO interim protocol 2008).

Factors to consider for a containment operation

Technical factors

Virological: Laboratory evidence of novel virus (H5N1 or any other virus) will be critical.

Epidemiological: Evidence of efficient and sustained human-to-human transmission (e.g. clustering of 5 or more cases closely related in time or space or two or more generations of transmission) is a second critical element. Epi-curve will show the date of onset of cases, which will determine whether it is propagated from human-to-human or infection from a common source.

Operational, logistical, security and political factors

- Size of the cluster
- Time elapsed since the first cases became sick
- Geographical characteristics of the area such as accessibility and natural boundaries,
- Operational readiness of the affected country,
- Ability to ensure basic infrastructure (e.g., physical communication, other communication facilities, health facilities, security)
- Essential services such as food, water and sanitation,
- National authorities' willingness to decide to launch, lead, and manage the containment operation in consultation with WHO
- General security situation (e.g., law and order)
- International support to provide any necessary human, financial, technical, or logistical resources.

Annex-I

National Consultation Meeting on Preparedness for Avian Influenza Infection In Humans

Venue: NIDCH, Mohakhali, Dhaka
Date: March 24-25, 2008

Organized by	:	NIDCH, Directorate General of Health Services
Technical Support	:	World Health Organization, Bangladesh
Chief Guest	:	Dr A M M Shawkat Ali, Hon'ble Advisor, Ministry of Health & Family Welfare, Bangladesh
Special Guest	:	Dr Duangvadee Sungkhobol, WHO Representative to Bangladesh Country Representative to Bangladesh, UNICEF
Chairman	:	Professor M A Faiz, Director General, Directorate General of Health Services (DGHS), Bangladesh

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116	Dr. Md. Abdur Rahman	Asst. Prof. (Microbiology), Dinajpur MCH	Dinajpur

Sl.	Name	Designation	Duty Station
117	Dr. Matiar Rahman	Civil Surgeon, Faridpur	Faridpur
118	Dr. A.N.M Bazlur Rahman	Civil Surgeon, Chuadanga	Chuadanga
119	Dr. Md. Tipu Sultan	Assistant Professor, Chittagong MCH	Chittagong
120	Dr. Md. Ziaur Rahman	Divisional Coordinator, WHO, Chittagong	Chittagong
121	Dr. Md. Abdur Rouf	Civil Surgeon, Sirajganj	Sirajganj
122	Dr. Sujit Kumar Roy	Civil Surgeon, Barguna	Barguna
123	Dr. Nurun Nahar	Civil Surgeon, Bogra	Bogra
124	Dr. Niranjan Dhali	Senior Consultant, Faridpur MCH	Faridpur
125	Dr. Md. Abdul Matin Patwary	Civil Surgeon, Comilla	Comilla
126	Dr. K.M Md. Mizanur Rahman	Civil Surgeon, Dinajpur	Dinajpur
127	Dr. Md. Abdur Rahim	Civil Surgeon, Rangpur	Rangpur
128	Dr. Narendra Nath Dewri	Civil Surgeon, Naogaon	Naogaon
129	Dr. Md. Humayun Kabir	Civil Surgeon, Patuakhali	Patuakhali
130	Dr. Sudhendu Prakash Biswas	Asst. Professor , Sher-e-Bangla MCH	Barisal
131	Dr. Fazle Elahi Khan	Indoor Medical Officer, Comilla MCH	Comilla
132	Dr. Md. Jamal Uddin Bhuiya	Civil Surgeon, Manikganj	Manikganj
133	Dr. Pradip Kumar Nath	Lecturer, Comilla MCH	Comilla
134	Dr. ARM Saifuddin Ekram	Professor & Head, Rajshahi MCH	Rajshahi
135	Dr. Md. Jalal Ahmed	Civil Surgeon, Chittagong	Chittagong
136	Dr. Md. Rezaul Karim Chowdhury	Director (Health), Chittagong	Chittagong
137	Dr. Emdadul Haque choudhury	Divisional Coordinator, WHO, Barisal	Barisal
138	Dr. AKM Rezaul Karim	Civil Surgeon, Gopalganj	Gopalganj
139	Dr.Chitta Ranjan Pramanik	Civil Surgeon, Sariatpur	Sariatpur
140	Dr. Md. Abu Aziz Al- Mansur	Civil Surgeon, Satkhira	Satkhira
141	Dr. Taslin Uddin Ahmed	Civil Surgeon, Nilphamari	Nilphamari
142	Dr. Dipak Lal Banik	Civil Surgeon, Meherpur	Meherpur
143	Dr. Mahfuzul Islam Kaisar	Divisional Coordinator, WHO, Rajshahi	Rajshahi
144	Dr. S.M Shamsul Alam	Civil Surgeon, Mymensingh	Mymensingh
145	Dr. Md. Bazlul Haque	Civil Surgeon, Rajbari	Rajbari
146	Dr. Enayet Karim	Civil Surgeon, Munshiganj	Munshiganj
147	Dr. Abdul Hoque	Civil Surgeon, Kishoreganj	Kishoreganj
148	Dr. Md. Shah Abdul Ahad	Civil Surgeon, Chapai Nawabganj	Nawabganj
149	Dr. Ferdous Alam Shibib	Civil Surgeon, Kurigram	Kurigram
150	Dr. Md. Abdul Wadud Miah	Civil Surgeon, Pabna	Pabna
151	Dr. Md. Atiqul Sarwar	Civil Surgeon, Narayanganj	Narayanganj
152	Dr. Jyotirmay Aich	Civil Surgeon, Panchagarh	Panchagarh
153	Dr. Md. Rezwanul Haque	Civil Surgeon, Narail	Narail
154	Dr. Sudhir Chandra Banik	Civil Surgeon, Netrakona	Netrakona
155	Dr. A.K.M Kamal Uddin	Civil Surgeon, Noahkhali	Noahkhali
156	Dr. S.M Abu Taher	Civil Surgeon, Tangail	Tangail

Sl.	Name	Designation	Duty Station
157	Dr. Mohammad Reazul Hasan	EPI Divisional Coordinator, WHO	Dhaka
158	Dr. Morshed Ahmed	EPI Divisional Coordinator, WHO	Khulna
159	Dr. Emdadul Haque Choudhury	EPI Divisional Coordinator, WHO	Barisal
160	Dr. Mohammad Ziaur Rahman	EPI Divisional Coordinator, WHO	Chittagong
161	Dr. Mahfuzul Islam Kaisar	EPI Divisional Coordinator, WHO	Rajshahi
162	Dr. Afsana Karim	EPI Divisional Coordinator, WHO	Sylhet
163	Dr. ASM Mainul Hassan	National Consultant (Measles), WHO	Dhaka
WHO Secretariat			
1	Dr Khanchit Limpakarnjanarat	Regional Advisor (CSR), WHO SEARO	India
2	Dr Kamruzzaman Biswas	NPO (Epidemiology), WHO	Dhaka
3	Dr Richard Brown	Public Health Specialist, SEARO, WHO	Thailand
4	Dr Sorasak Lochindarat	Temporary Regional Advisor, WHO SEARO	Thailand
5	Ms Hinjoy Soawapak	Temporary Regional Advisor, WHO SEARO	Thailand
7	Dr. Muhammad Zahidur Rahim	National Consultant, WHO	Dhaka
8	Mr. Hasan Mohiuddin Ahmed	National Consultant, WHO	Dhaka
9	Mr. Shafiqul Islam	Data Management Assistant, WHO	Dhaka

Annex-II

List of experts developed, reviewed and finalized these SOPs

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