

# Action Plan for Prevention, Control & Containment of Avian Influenza (Revised – 2021)



**Ministry of Fisheries, Animal Husbandry and Dairying**  
**Department of Animal Husbandry and Dairying**  
**Government of India 2021**

## Executive Summary

In view of the threat of global outbreaks of Avian Influenza and apprehensions of a human pandemic, Government of India had prepared an action plan in 2005 to deal with eventuality, if any, and circulated it to the States in November, 2005. This proved very useful to contain and control the first outbreak of Avian Influenza in Maharashtra, Gujarat and Madhya Pradesh. Since then, several outbreaks of highly pathogenic avian influenza have been reported from different parts of the country. Based on the subsequent outbreaks in the poultry, the action plan was revised in 2006, 2012 and 2015 for guidance of State Government for prevention, control and containment of Avian Influenza in the Country. The current Action Plan has been updated based on the experience gained and lessons learnt from the outbreaks in wild birds in zoological parks and poultry in various parts of the country and the latest scientific information. The document on Action Plan is comprised of seven chapters:

**Chapter 1:** It advises the States on pre-outbreak preparedness, which includes:

**a) General Preparedness-** Assessment of logistics, training/ capacity-building of the key-persons, who are likely to be involved in the operations needs to be done well in advance before the outbreak is confirmed.

**b) Surveillance** –All the States/UTs would follow the surveillance plan devised by the Government of India. Surveillance (Active and Targeted) therefore, includes both migratory birds and poultry with special emphasis on ducks, live bird markets, international borders and wetlands. Clinical, virological and sero-surveillance are equally important. The samples need to be collected, packed and shipped scientifically.

**c) Obtaining results of Diagnostic Tests-**The NIHSAD, Bhopal would also send a copy of the test report to the Chief Secretary of the state concerned, if the samples are found positive for Avian Influenza.

**d) Co-ordination among various stakeholders-** Control operations require coordination of activities of several agencies at district level under the supervision of District Collector/Commissioner. The various agencies have to play their role.

**e) Availability of Legislative Frame Work-** The Government of India has enacted an Act namely "The Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009" which has come into force in all the States/ UTs. The States have been empowered to take necessary action to appropriately deal with disease situations.

**f) Stocking and Sourcing of Equipment/ Instruments/ Machinery etc. required for conduct of operation-** The States need to maintain reserves of various items like equipments/materials such as PPEs, Disinfectants, Vehicles, Foggers, Spray Machines, JCB, Gunny Bags etc. and determine source of supply in case of an emergency, ensure ability of suppliers to provide equipment/ materials throughout an outbreak as-per-requirements and finalize procedural and financial formalities well in advance.

**Chapter 2:** It contains the actions to be taken if an outbreak of Avian Influenza is suspected, viz: visit of CVO/DAHO to the site immediately on receipt of preliminary information, providing of diagnostic kits for Veterinary Officers/Disease Investigation Officers (DIO), use of PPE, Preliminary and clinical investigation by DIO, collection of samples and dispatch immediately for confirmation, immediate reporting to all concerned, Identification of "Alert- Zone, restrictions to be enforced at the

site, and in the Alert-Zone pending receipt of test results and naming a veterinary officer as “Designated Officer”.

**Chapter 3:** It describes the actions to be taken to handle a confirmed outbreak of Notifiable Avian Influenza (NAI):

**a) Notification of Outbreak-**The State would notify the disease and immediately carry out all control and containment measures after getting the positive report for the samples from NIHSAD, Bhopal.

**(b) Launch of a Containment Operation-** This includes Establishment of a Control Room, Procurement of Logistics (PPEs, Disinfectants, Vehicles, Foggers, Spray Machines, JCB, Gunny Bags etc.), Deployment of RRTs, Health Check-ups, Anti- viral drugs etc.

**(c) Demarcation of Surveillance & Infected Areas and Actions to be Taken –** The area within one km from the site of confirmed AI will be designated as “Infected Zone”. Rest of the area within 10 km is the “Surveillance Zone”. The State government, in consultation with the Government of India may change the radii of the infected zone by one more km each, maximum up to 3 km., if the foci of infection / mortality are scattered over a larger area. In such a case, the culling zone will be extended to one km radius from the new site of infection without notifying the disease again. Further/more occurrence of AI, if any, beyond 3 km. radius of this limit will require to be notified as a fresh/new outbreak.

**(d) Absolute Ban on Movement of Poultry:** Absolute ban on movement of poultry, closure of poultry and egg markets/ shops, restrict access to wild and stray-birds, restriction of movement of persons & vehicles, destruction/culling of birds in the infected zone, disposal of dead birds, destruction of infected materials, cleaning and disinfection of farm premises and farm implements (commercial and backyard Poultry), implementation of the Post Operation Surveillance Plan (POSP), declaration of freedom status and repopulation of birds in the infected zone etc.

**(e) Compensation for Culling –**The farmers are compensated for the loss of birds culled at the fixed rates.

**(f) Re-stocking of birds in culling zone:** will be done after three months of issue of sanitization certificate of an outbreak on completion of POSP.

**Chapter 4:** It is regarding biosecurity measures and advice to the persons handling AI infected poultry. This includes: exchange of information with industry/farmers, media briefing by the official spokesperson, advice to public on handling, processing and consuming poultry product, biosecurity measures and advice about contact with poultry in an area with AI.

**Chapter 5:** This chapter is on Information, Education and Communication campaign on Avian influenza and the advisories on biosecurity and hygiene.

**Chapter 6:** This chapter is regarding guidelines for zoological parks

**Chapter 7:** This chapter is regarding guidelines for establishment of avian influenza free compartment in the country.

[The Action Plan is duly supported by advisories, annexures, proforma, links to international websites and the check lists.](#)

## INTRODUCTION

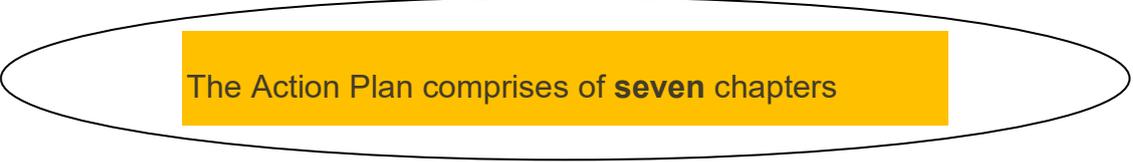
Avian influenza (AI), as per World Organization for Animal Health (OIE), is defined as an infection of poultry caused by any influenza A virus of the H5 or H7 subtypes or by any influenza A virus with an intravenous pathogenicity index (IVPI) greater than 1.2 (or as an alternative at least 75% mortality) as described below. These viruses are divided into high pathogenicity avian influenza viruses and low pathogenicity avian influenza viruses:

**High pathogenicity avian influenza (HPAI) viruses** have an IVPI in six-week-old chicken greater than 1.2 or, as an alternative, cause at least 75% mortality in four-to eight-week-old chickens infected intravenously. H5 and H7 viruses which do not have an IVPI of greater than 1.2 or cause less than 75% mortality in an intravenous lethality test should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the hemagglutinin in molecule (HA0); if the amino acid motif is similar to that observed for other high pathogenicity avian influenza isolates, the isolate being tested should be considered as high pathogenicity avian influenza virus;

**Low pathogenicity avian influenza viruses** are all influenza A viruses of H5 and H7 sub-types that are not high pathogenicity avian influenza viruses.

**Avian Influenza (AI) viruses have been circulating worldwide for centuries with at least three major pandemics recorded in the last century. India notified the first outbreak of H5N1 HPAI virus on 18<sup>th</sup> February, 2006. Since then, several outbreaks of HPAI have been reported from different parts of the country.**

In view of a threat of global outbreak of AI and apprehensions of a human pandemic, the Department of Animal Husbandry, Dairying & Fisheries (DAHD), Government of India had prepared an action plan in 2005 which was revised in 2006, 2012 and 2015 for guidance of State Government for prevention, control and containment of Avian Influenza in the Country. The current Action Plan has been updated based on the experience gained and lessons learnt from the outbreaks in wild birds in zoological parks and poultry in various parts of the country.



The Action Plan comprises of **seven** chapters

- **Chapter 1** advises the states/ UTs on preparedness against AI outbreaks
- **Chapter 2** indicates the actions to be taken if an outbreak of AI is suspected
- **Chapter 3** describes the actions during an outbreak of the disease
- **Chapter 4** is regarding post operation surveillance plan (POSP) and freedom from the disease
- **Chapter 5** deals with education campaign on general awareness and bio-security measure on NAI outbreaks
- **Chapter 6** is on guidelines for zoological parks
- **Chapter 7** is regarding compartmentalization (Avian Influenza free)

## **CHAPTER 1 GENERAL PREPAREDNESS AGAINST AVIAN INFLUENZA**

### **1.1 Assessment of preparedness**

Assessment of preparedness should be made routinely, irrespective of any outbreak. The check-list for preparedness, control and containment of AI in general (at Annexure 1) and immediate steps to handle AI, if outbreak is confirmed (Annexure 2) can be referred. States can add to the check-list and continually upgrade it as per their local requirements.

Training of the key-persons, who are likely to be involved in the operations, should be taken as part of preparedness, as under -

- a) All the veterinarians and para- veterinarians should be made aware of and be trained in control and containment activities
- b) Civil-administration involving Chief Secretary, District Collector (DC), Revenue Officers, District Magistrate, Chairman and members of Panchayati Raj Institutions/ Municipality/ Local bodies, Officers of Home Department, Health and other line departments should be familiarized with action plan by organizing awareness/sanitization workshops.

### **1.2 Surveillance plan for avian influenza**

Disease surveillance is an integral and key component of all government veterinary services. It is of utmost importance for animal disease emergency preparedness particularly for the diseases like Avian Influenza. This is important for early warning of diseases, planning and monitoring of disease control programme, provision of sound animal health advice to farmers, certification of export of livestock / livestock products, international reporting and evidence of freedom from diseases.

The avian influenza surveillance programme should include an early warning system throughout the production, marketing and processing chain for reporting suspicious cases.

## Objectives

1. Early detection of clinical disease and infection
2. Assess temporal and spatial patterns of the disease to improve effectiveness of control efforts
3. Demonstrate country freedom from the disease

## Surveillance strategies

Surveillance is aimed at identification of disease and infection and should cover all the susceptible poultry species within the country, zone or compartment. Regular surveillance including active and passive surveillance for Avian Influenza should be ongoing. Surveillance should be composed of random and targeted approaches using clinical, virological, and serological methods.

Targeted surveillance e.g. based on the increased likelihood of infection in particular localities or species, may be an appropriate strategy for valuable clues on the disease.

Special emphasis should be given on surveillance in Live Bird Markets (LBMs), wetlands, border areas, areas with high bird density and areas inhabited by wild and migratory birds to rule out any possibility of new or low pathogenic virus strains.

## Surveillance must include both poultry and migratory birds

Poultry includes chicken and all other domesticated birds, viz. ducks, geese, turkeys, guinea fowls, quails, etc. India has a poultry population of nearly 851.81 million, including backyard poultry. A large population of migratory birds start arriving in India during September and leave by the end of March every year. Surveillance, therefore, of migratory birds and poultry would include the following components:

**Clinical surveillance:** aims at the detection of clinical signs of avian influenza at the flock level

**Virological surveillance:** (of cloacal and oropharyngeal swabs in poultry and wild birds where possible). It should be conducted to monitor at risk populations; to confirm clinically suspect cases; to follow up positive serological results; in establishments epidemiologically linked to an outbreak

**Serological surveillance:** aims at the detection of antibodies against avian influenza virus.

States should follow the surveillance plan of Government of India by taking a village as an epidemiological unit. As regards to migratory/ wild birds, the State Animal Husbandry Department shall carryout the surveillance along with State Department of Forest. Surveillance plan shall consider the following factors -

- Population and density of poultry in each block, both in backyard and commercial establishments, flyways of migratory-birds and wetlands
- Live-bird markets including wet-markets
- Existence of wildlife sanctuaries/ national-parks/ water-bodies/wet lands visited by migratory/ wild birds
  - Areas adjacent to international land-borders, especially those affected with AI
- Interstate borders with the AI affected States

Surveillance procedure for AI free establishments for recognition of AI free compartments should be as per guidelines issued by Government of India ([www.dahd.nic.in](http://www.dahd.nic.in)).

## **Avian population at risk**

There is a need to define and identify the population at risk of infection with AI in the first instance. This is done in accordance to the bird population in the area

## **Population at high risk for Avian Influenza**

- (i) Commercial birds with high density- chicken and ducks
- (ii) Backyard Birds – chickens, ducks, pigeons and other species- Bio-security is usually poor and there is no specific population estimate or density distribution estimate for backyard birds
- (iii) Wild/migratory birds
- (iv) Live bird markets including wet markets particularly at the border areas

## **Risk factors for Avian Influenza**

- Disease situation in neighboring area across the border
- States/districts previously affected by AI and adjoining states/districts
- Sharing borders with Bangladesh, Pakistan, Nepal, Bhutan, China and Myanmar
- Domestic duck population
- Backyard bird population
- Number and activity of live bird markets
- Poultry value chain / wholesale live bird markets
- National sanctuaries, wetlands / lakes used by migratory/ wild birds and their proximity to domestic poultry population/establishments
- Captive birds
- Flyways of migratory birds

More efforts are required in the high-risk areas/ hot spots.

## **A detailed surveillance plan on Avian Influenza is given in Annexure 3**

The Surveillance Plan is an ongoing activity and may be updated from time to time based on new requirements, experience gained, scientific knowledge and epidemiology of the disease.

### **1.2.1 Packaging of survey samples**

The faecal and/or oro-pharyngeal swabs, collected from the poultry by officials of the State Department of Animal Husbandry; and from the wild birds by the officials of the State Forests Department should be packed properly as per the standard procedure and sent to National Institute of High Security Animal Diseases (NIHSAD), Bhopal and the RDDs, as per Annexure 4 and Annexure 13.

### **1.2.2 Arrangements for immediate reporting of unusual sickness and mortality in birds**

- a) The poultry owners/ integrators/ hatcheries, their consultants, field veterinary institutions and anyone who notices it, must report unusual sickness/ mortality in domestic or wild birds immediately and in any case within 24 hours of its occurrence to the nearest veterinary institution and/or any other government agency
- b) The entire machinery of the Animal Husbandry/Veterinary Department in every district should remain in a state of full alertness and preparedness in case of report of unusual sickness and mortality in birds
- c) The Veterinary staff concerned must make regular visits to high-density poultry units (backyard and commercial). Section 4(2) of the Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009 also states that the Village Officer, as designated by State Government under this Act, shall visit the area falling within his/her jurisdiction for reporting any outbreak of the disease. All veterinary officers in the district (government, semi-government or private) should report to the CVO/ DAHO/DIO on phone/ or fax or e-mail, of any unusual sickness or mortality in poultry and wild birds.
- d) Similarly, the forest guard/ forester in Forest Department should remain vigilant and report any unusual sickness/ mortality in wild and migratory birds, in sanctuaries and water-bodies etc. to the senior forest officials and or to the nearest veterinarian /CVO/ DAHO/DIO of the State Animal Husbandry Department.
- e) Create public-awareness about reporting any unusual sickness and mortality in poultry and wildbirds and encourage them to provide informal and supplementary information about any unusual sickness and mortality in avian species in their vicinity. This can be done through regular Information, Education and Communication (IEC) campaigns

for poultry farmers, holding Gram Sabha in rural areas and through print and electronic media. However, due care should be taken so as to not create any panic in the public

The state governments should ensure capacity-building measures to get mortality reports at the earliest. Establishment of separate Avian Influenza Cells and Toll-Free telephones are some of the suggested ways.

### **1.3 Co-ordination between State Animal Husbandry Department and Forests**

The Chief Secretaries of the States should ensure that the Department of Animal Husbandry and of Forestry must undertake coordinated survey programmes. As a first step, the Forest Department should prepare details of the areas visited by wild/ migratory birds. Simultaneously, the Department of Animal Husbandry should prepare details of areas of poultry concentration. High density poultry areas visited by the migratory birds, live-bird/wet-markets and international borders porous for poultry and birds are the core and critical areas for targeted surveillance. Prepare lists/maps of such critical areas and circulate to all concerned including the Government of India. This would help the designated diagnostic laboratories to setup priorities for testing the material. Advice on the role of different departments as summarized at Annexure V.

### **1.4 Guidelines for Collection, Packing and Transportation of Samples**

The States should adhere to the following guidelines in this connection -

a) The States/ UTs must distinguish at their level between unusual sickness/ mortality and normal incidences of sickness and mortality in poultry. Only in case of unusual sickness/ mortality raising suspicion of AI, forward the samples immediately either to respective Regional Disease Diagnostic Laboratory or directly to National Institute of High Security Animal Diseases (NIHSAD), Bhopal through special messenger under intimation to the Joint Secretary (Livestock Health), in the Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

b) Timely collection of samples in the prescribed manner and packaging and quick dispatch to RDDDLs/NISHAD is of utmost importance for quick and accurate results.

c) Sampling will be governed by the Surveillance Plan as given in Annexure 3 of the Action Plan which may be reviewed/ updated from time to time and accordingly notified to the States/UTs.

d) All the samples from a village should be packed together so that if required, the samples can be pooled and tested. Samples from other villages / areas should be kept separate.

e) In case of mortality, the dead birds are the sample of choice.

f) It is imperative that the cold-chain is maintained while dispatching/ transporting the samples.

g) The samples should be accompanied with a prescribed proforma (Annexure 6) for referring to designated laboratories for diagnosis of AI. The details of the area from where the samples were collected, place etc. should accompany the samples. The laboratories shall not accept samples without fully filled proforma.

**Contact details of RDDs, NIHSAD and DAHD are given at Annexure 7**

## **1.5 Obtaining results of diagnostic tests**

NIHSAD shall communicate the results of testing of samples to the Secretary (AHD), Animal Husbandry Commissioner (AHC), Joint Secretary (Livestock Health) of Department of Animal Husbandry and Dairying, Govt. of India, the Chief Secretary and Director, Animal Husbandry of the State concerned.

A series of immediate actions shall be taken by the State Government in case of confirmed positive report as detailed in the Action Plan of the Department and also in the 'Contingency Plan' of Ministry of Health & Family Welfare on Bird Flu issued in 2005 for rapid control & containment. These actions shall be taken by Animal Husbandry & Public Health Departments of the State Government, which includes setting up of a control room in the State, constitution of Rapid Response Teams (RRTs), setting up of infected zone of 1 KM of radius from epicenter, surveillance zone of 1-10 KM radius of epicenter with details of population of birds involved in 1 KM radius for culling operations and 1-10 KM for surveillance zone, medicines/ disinfectants, Personal Protective Equipment (PPE) kits, health check-up and supply of oseltamivir/any other antiviral drugs recommended by

Ministry of Health and Family Welfare, Govt. of India. Further action involved are restriction of movement of birds from infected & surveillance zone, mass culling of birds in the infected zone and disposal of dead/culled birds. Information, Education & Communication (IEC) campaign shall be carried out on the disease and payment of compensation to farmers on the birds culled ([www.dahd.nic.in](http://www.dahd.nic.in)).

After culling operations, clean-up and disinfection of the culling area will have to be done as per Action Plan and sanitization certificate will be issued by the State Govt. for issue of Post Operational Surveillance Plan (POSP).

The requisite information on population of birds, geographical location of the place with map of the epicenter/s should be sent to the Department of Animal Husbandry and Dairying, Govt. of India for further notifying the disease outbreak to OIE and Ministries concerned.

## **1.6 Role of District Collector/Deputy Commissioner/ District Magistrate**

District Collector/ Deputy Commissioner/ District Magistrate has to play a central and coordinating role to deal with the outbreak of AI. He /she should ensure proper enforcement of restrictions including movement control, ban on sale of poultry related products, closure of shops, payment of compensation (payment and verification), clean- up and maintenance supply lines for equipment etc. Associated Revenue Officers should be thoroughly familiarized with the Action Plan to enable them to assume responsibility in case of outbreak. He/she should also define and monitor role of officers from line departments required to be deployed during control and containment operation.

## **1.7 Legislative Frame Work**

The Government of India has enacted an Act namely “The Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009”. The Act has come into force in all the states/ UTs. The list of notifiable diseases by the states is given in the Schedule under the Act. The states have been empowered to take necessary action to appropriately deal with disease situations.

## **1.8 Stocking and sourcing of equipment/ instruments/ machinery, etc. required for conduct of operations**

Equipment/materials such as Personal Protective Equipment (PPE) kits (Annexure 8), slacked lime and quicklime, sodium hypochlorite, formalin, sodium pentobarbital, gunny bags, plastic sheets, plastic bags, spray pumps suitable for crops, spray-pumps suitable for spraying at height such as on trees etc., fogging machines, jetting-cum-suction machines, gumboots, JCB machines, flame guns, LPG cylinders, firewood, kerosene and coal etc., are required for the conduct of operations. The States / UTs should develop reserves of these items and determine source of supply in case of an emergency; ensure ability of suppliers to provide equipment/ materials throughout an outbreak as per requirements and finalize procedural and financial formalities well in advance. Vehicles and machinery may have to be hired in situation of outbreak. An illustrative list of instruments/ equipment/ other materials required in AI operations is at Annexure 9.

## CHAPTER 2 STEPS TO BE TAKEN IN CASE OF SUSPECTED AVIAN INFLUENZA OUTBREAK

### 2.1 Visit to the site of outbreak (Epicenter)

On the report of unusual sickness or mortality of poultry or other birds etc., the CVO/ DAHO/DIO/ Disease Investigation Officer (DIO) shall visit that place immediately and ascertain the circumstances, facts and oversee activities as demanded by the situation. While visiting the farm/ village/ affected premises, all precautions including use of PPE etc. should be exercised and proper instructions on biosecurity measures to the owners of the birds including cleanliness/ hygiene, segregation of healthy birds from the sick ones, restriction of movement of birds and human beings within the premises and from outside.

**CAUTION: DO NOT OPEN ANY BIRD SUSPECTED FOR AI FOR POSTMORTEM IN THE FIELD**

#### 2.1.1 Kit for Veterinary Officers / DIO and its use

- Each investigation officer should be equipped with a 'kit' (indicated in Annexure 8), so that he/she is in a position to conduct preliminary and clinical investigations as demanded by situation and, if necessary, collect and dispatch samples for laboratory analysis. All investigation officers who are required to visit the suspected/ outbreak areas should wear the PPE kits (details given at Annexure 8). Two or three fogging/ spraying machines and 10 or more sets of essential kits, should be carried to each suspected place. The office of every CVO/ DAHO/DIO should have at least 5 (five) fogging/ spraying machines and 50 (fifty) sets of protective clothing as per details at Annexure 10.
- It must be ensured that the used PPE are disposed-off by burning prior to departure from the suspected site of infection.
- The DIO must wear protective gear in a room designated as changing-room for the convenience of reference before entering the suspected premises. He/she must leave the following items from the kit in the changing room -

- Leak-proof and water-resistant container
- Thermos container (ice-box) for carrying samples
- Two pairs of latex gloves
- Five autoclavable plastic bags
- Five black disposal bags
- Disinfecting solution

The remaining components of a kit must be carried inside the premises to be examined.

### **2.1.2 Preliminary and clinical investigations to be carried out by Disease Investigation Officer (DIO) / Veterinarian**

Collect the following information depending on system of poultry rearing -

- (i) Preliminary identification and topography (name of owner, village & district) of the production unit and sub-units of the farm
- (ii) Whether commercial farm or village/backyard poultry under suspicion
- (iii) Number of birds and other animals present in the farm/village
- (iv) Date-wise morbidity and mortality-rate in each species of birds kept in the farm / village
- (v) Identification of staff as well as vehicles directly involved with that unit
- (vi) History about the recent movement of people, equipment, vehicles and animals/ birds in the farm /village
- (vii) Availability of disinfectants and equipment for disinfecting the premises (if it is a farm).
- (viii) Weekly market from where the birds are purchased, if any
- (ix) Anamnestic data - data concerning mortality rate recorded in 6 weeks prior to onset of clinical signs, data relating to vaccinations carried out and any untoward reaction, sickness or mortality after vaccination or medication
- (x) Presence of ornamental birds for fancy keeping, fighter cocks for gambling, etc. in the village / on the farm etc.
- (xi) Information about any cross-border movement of poultry and products in the vicinity of the farm / in the village

## **2.2 Clinical investigation**

The DIO should establish clinical situation on the farm including sick and suspected birds. The clinical investigation must be performed on all susceptible species (chicken, ducks, turkeys, guineafowl, goose, quail, etc.) present in the farm/ village and it must begin from the most peripheral units.

## **2.3 Epidemiological inquiry report**

An epidemiological inquiry report must be faxed or e-mailed immediately to the Secretary/ Director of Animal Husbandry of the state/ UT as well as to the Government of India (DAHD) as per Annexure 11.

### **2.3.1 Actions following Clinical Investigations**

If AI is not suspected, adequate local publicity should be given for the same so as to re-assure the poultry farmers as well as the general public.

If the preliminary investigation further raises suspicion of AI, then the CVO/ DAHO/DIO has to ensure that the following steps are taken immediately.

### **2.3.2 Collection of samples and dispatch for laboratory tests**

#### **Type of Samples to be sent to the laboratory for testing / post mortem**

- Up to 5 birds (either recently died or the birds showing acute signs of disease after euthanizing them) from each affected premises/village
- Cloacal and oro-pharyngeal swabs collected from at least 10 healthy birds. Swabs must be collected ensuring that the oro-pharyngeal swabs are completely wet and at least one gram of faecal material is actually present on the cloacal/fecal swab and immersed in viral transport medium (VTM) (preferable) or 1 X Phosphate buffered saline
- Serum samples from at least 10 birds showing acute signs of disease
- In case, any duck population is present in the vicinity of mortality, at least 5 serum samples should be sent

### **2.3.3 Collection and Dispatch of Samples**

Samples must be packaged, wrapped in at least two leak-proof plastic bags to avoid seepage of the infectious-agent and transported inside a polystyrene box (ice-box) / thermocol boxes containing icepacks Annexure 13) which must be appropriately disinfected

before leaving the premises. The samples must be accompanied with an appropriate form (Annexure 11).

A special messenger should leave for NIHSAD, Bhopal or to the respective Regional Disease Diagnostic Laboratory within 24 hours from the initial report and reach the laboratory as soon as possible, by air, if necessary. The CVO/ DAHO/DIO should inform the State Secretary/ Director of Animal Husbandry/ the respective laboratory in advance of the dispatch and to the DAHD, Government of India - Animal Husbandry Commissioner (AHC) on Tel: 011-23384146 (O) or Joint Secretary (LH), GOI (Tel: 011-23382354 (O). NIHSAD, Bhopal /respective RDDDL should be requested to receive the samples to carry out the tests as soon as the samples reach there (Telephone nos. of NIHSAD, Bhopal and RDDDL are at Annexure7).

Following the collection of samples, the DIO and his assistants should change their protective gear in the designated changing room and burn them off within the premises prior to departure, collect all equipment that can be sterilized in an autoclavable bag, sealed and inserted into a second bag which is disinfected externally. All single use materials, paper-sheets, disposable gear and shoe-covers should be buried after following disinfection protocol or burnt.

## **2.4 Mortality in wild birds**

In case of unusual mortality of wild birds like crows, parrots, egrets, pigeons, migratory-birds etc., dead birds and swabs as mentioned in the poultry should be sent. Further, samples from domestic poultry in the affected area on the above lines should also be sent.

### **2.4.1 Immediate reporting to the Director, Animal Husbandry and the District Collector**

The CVO/ DAHO/DIO shall immediately report by telephone, fax or e-mail the matter to the state Secretary/ Director of Animal Husbandry, District Collector, District Medical Officer and the Revenue Department (Sub Divisional Officer, Tehsildars etc.). The District Administration and state Department of Animal Husbandry will then proceed to act with regard to enforcement of restrictions indicated below.

## 2.4.2 Identification of “Alert Zone”

All villages and habitations within 10 KM radius from the affected place are identified as “Alert Zone”. The Panchayat/ Municipal Authorities, Civil, Veterinary and Health Officials in those areas should be alerted about the possibility of AI outbreak and requested to enforce the restrictions mentioned below.

## 2.4.3 Restrictions to be enforced at the site, and in the “Alert-Zone” pending receipt of test results

### Restrictions and Activities within an “Alert Zone”

Pending receipt of the test results, the entire suspected farm or site should be cordoned off and the following restrictions should be immediately brought into effect in the alert zone, by the district administration with the assistance of the Animal Husbandry Department etc.

- No vehicles should be allowed to ply in and out of the affected farm/ site. Personal vehicles should be left outside the farm premises
- No movement of poultry, eggs, dead carcasses, manure, used litter, farm machinery, equipment or any such material should be allowed to and from the alert zone
- The personnel working inside the farm should wear protective clothing all the time inside the farm, including face-masks and gloves, gumboots (or shoes with disposable covers) etc. While leaving the farm, leave the protective clothing etc. at the farm and clean themselves thoroughly with suitable disinfectants
- Movement of people to and from the suspected farm should be restricted to the barest minimum. No other animals and birds should be allowed in the farm
- Inter-sectional movements of farm personnel should be banned. They should not visit any other poultry farm, bird-sanctuary or zoo etc.
- Disinfection procedures (e.g. by using 2% NaOH/ KMnO<sub>4</sub>) should be strictly applied at the entrance of the premises.
- All records of birds present at the farm are to be properly maintained
- Before the test results are received, the possibility of closing the markets and shops in the area may be explored by the District Collector/sub-divisional officer/revenue

authorities in consultation with the State Animal Husbandry Department, particularly if more farms become suspects during this period

- Practices of scavenging of poultry in the open backyard should be prevented and marketing of birds/chicks/eggs through hawkers, venders etc. should be banned
- Police force should be deployed for assistance to enforce above measures, if necessary.

## **Continued Surveillance and collection of Information Pending Receipt of Results**

The DAHO/DIO should arrange to record mortality or sickness of birds at the suspected site and in the alert-zone. Also he/she should collect information about the total poultry population (with details of age, breed) with individual poultry farmers, both backyard and commercial within a radius of 0-1KM (for the purpose of culling) and between 1-10 KM (for the purpose of carrying out movement restrictions and surveillance) from the suspected site. For this purpose, a scale-map has to be drawn indicating all the villages in 0-1 and 1-10 KM radius.

## **Action by Forest Department in bird/wildlife sanctuaries/ zoological parks, etc.**

In case the suspected site happens to be a bird/wildlife sanctuaries/ zoological parks etc., the actions indicated in Chapter VI are to be undertaken by the Forest Department with assistance of the Animal Husbandry Department, wherever required. The Department of A.H and of the Forests should assign at least one officer each as the Designated officer to co-ordinate necessary procedures.

## **2.5 Action to be taken in case laboratory diagnosis is Negative for AI**

Lift the restrictions mentioned above. However, if the above average mortality or disease situation continues, the restriction shall continue till the mortality subsides. The laboratory must test for the associated/suspected diseases like Newcastle disease, Marek's disease, Infectious bursal disease etc. as differential diagnosis.

## **CHAPTER 3 ACTION PLAN TO DEAL WITH CONFIRMED OUTBREAK OF AVIAN INFLUENZA (AI)**

### **3.1 Notification and information of outbreak of Avian Influenza (AI)**

NIHSAD Bhopal shall inform the confirmation of notifiable Avian Influenza (HPAI) to DAHD, Government of India with a copy to Chief Secretary and Director, Animal Husbandry Department of the state concerned and respective RDDDL. State will notify the disease and take immediate actions for control and containment of Avian Influenza as detailed in Para 1.4.

Government of India shall depute central observers from the Department of Animal Husbandry and Dairying, Government of India if the situation so warrants or if specifically requested for by a state government. The Central Observer will provide technical assistance and guidance to the state government in the conduct of operations.

The Chief Secretary/ Secretary Animal Husbandry of the State will notify to the highest authorities of the State Government as well as all the private and public agencies concerned of the outbreak along with the necessary guidelines/instructions.

The officials of the Animal Husbandry Department, GOI will immediately inform the AI outbreak to their counterparts in the Human Health Department at the district, state and national level.

Department of Animal Husbandry and Dairying, Government of India shall notify the disease outbreak to OIE as per procedure.

### **3.2 Implementation of contingency procedures under co-ordination of District Collector/ Deputy Commissioner/ District Magistrate**

Once Avian Influenza (AI) is notified in a particular area, all contingency procedures for its control and containment should be implemented at once. The responsibility shall rest with the District Collector / Deputy Commissioner/ District Magistrate, with technical assistance from the Departments of Animal Husbandry, Human Health and Forest etc., as deemed appropriate. While the CVO/ DAHO will act as the supervisory officer for all technical operations in general, only the Forest Officer concerned will take charge for containing outbreaks in a zoo/ wildlife sanctuary or other forest area etc.

Following step-wise activities are suggested -

## **Quick start of a coordination process**

District Magistrate / District Collector / Deputy Commissioner should hold an emergency meeting with the Senior Superintendent of Police, Chief Medical Officer, Chief Veterinary Officer and officers of other line departments e.g. P.W.D, Heads of Panchayats /Local Bodies and other Government and NGOs and establish the following -

- (a) Set out the strategy of the whole work of control and containment operation for Avian Influenza (AI) in the shortest possible time
- (b) Define the roles and responsibilities of all the departments as per Annexure 5
- (c) Draw a scale-map of the infected and surveillance zones showing all villages to be covered. This will help in calculating the poultry population, number of commercial farms, human population, number of houses etc. in the area

## **Establishment of a Control Room**

Set-up a 24-hour Control Room within the infected area, equipped with telephones, STD-facility, fax-machines, computers with internet access, secretarial-assistance, etc. The personnel deployed in the Control Room should be able to receive and disseminate clearly all comprehensive information. The Control Room may be contacted by several news agencies/media.

## **Establishment of Rapid Response Teams (RRT)**

Sufficient number of Rapid Response Teams (RRTs) fully equipped with PPE and sanitization materials for disinfection need to be established.

The RRTs shall be responsible for operations like culling, disposal of birds, supervising and undertaking clean-up and disinfection of infected premises, etc. All veterinary, para-veterinary and other related personnel of the State Animal Husbandry Departments are trained in the procedure to be adopted for control and containment of Avian Influenza by the states. Daily wagers, untrained/ unskilled labourers/ or personnel, if engaged on contractual basis, should be trained for their personal safety and quarantine measures, in addition to the control and containment operations.

### The states are advised to check following issues as part of preparedness -

- The RRTs for clean-up and disinfection shall function under the overall supervision of veterinarians/ para-veterinarians and comprise of supporting staff / labour, etc. Generally, there are 4 to 5 members in each RRT
  - The total number of RRTs required to be set up is based on area, type and concentration of poultry
  - Allot the work and the area to each RRT in a precise manner and keep a record of it. This should be started well in advance
  - Arrange boarding and lodging for RRTs. Arrangements for food and refreshments must be a part of this exercise.
- 
- If the need arises, Director A.H./Commissioner should mobilize manpower from other districts. Faster mobilization of RRTs to outbreak areas is an important element of planning. Necessary medical checkup of the RRTs should be planned accordingly.

#### **(ii) Personal Protective Equipment (PPE)**

Prior to the commencement of operations, briefing must be given to all involved on the importance of kit, its use and disposal etc. PPE must be used by RRTs and all persons having direct and active exposure to infected poultry. Workers/ labour force, if engaged for clean-up and disinfection etc. must also be provided with PPE kits. Operations should not be started without the use of PPE.

The composition of the kit is given at **Annexure 8**. Kits used by the direct handlers i.e. cullers and others having direct exposure to infected poultry must have a face mask with a filter (N-95).

### The sequence for wearing the PPE is as under:

- i) Wear shoe-cover
- ii) Wash hands
- iii) Wear 'dangri'
- iv) Put on the face-mask/ mask with filter (N95 standard)
- v) Fix protective glasses over eyes (goggles)
- vi) Fix hood over head
- vii) Put on gloves

**The sequence of removing PPE should be followed as below:**

- i) Remove shoe-covers
- ii) Remove gloves
- iii) Wash hands
- iv) Remove 'dangri' with attached hood
- v) Remove disposable protective glasses(goggles)
- vi) Remove face masks (for other than direct handlers)/ N95 standard (for direct handlers)
- vii) Dispose of all the above articles by burning
- viii) Wash hands with disinfectants

**(i) Safety of Personnel Engaged in Control Operations**

Persons engaged in control operations have high chances of exposure to infection. It is therefore, of utmost importance to ensure the safety measures as explained in succeeding paras -

- **Health checkup of personnel before start of operations**

The members of the RRTs must be physically and mentally healthy.

**(iv) Safety of Personnel Engaged in Control Operations**

Persons engaged in control operations have high chances of exposure to infection. It is therefore, of utmost importance to ensure the safety measures as explained in succeeding paras:

- **Health checkup of personnel before start of operations**

The members of the RRTs must be physically and mentally healthy.

- **Use of Antiviral Drug (Oseltamivir or any other drug recommended by Ministry of Health and Family Welfare, Government of India):**

Prophylactic medication under medical supervision with the antiviral drug, (Oseltamivir) of the personnel coming in direct contact with poultry is essential. The Dept. of Public Health, supplies Oseltamivir free of cost to all those engaged in operations including labour.

- All persons exposed to infected chickens or to farms under suspicion should be under close monitoring by local health authorities. Serological surveillance of exposed farm workers and veterinarians is encouraged. Further details can be obtained from the "Contingency Plan for Management of Human Cases of AI" hosted on the website of the Ministry of Health & Family Welfare, Government of India([www.mohfw.nic.in](http://www.mohfw.nic.in)).

- **Personal Hygiene and cleanliness**

Proper hand hygiene through regular and proper washing is necessary for the cullers and transporters after each operation. Quarantine of all the personnel engaged in operations of culling/ cleaning operations must be enforced under medical supervision. Arrangements for boarding/ lodging of such personnel during this period and payment of wage for the labor should be ensured. Self-surveillance is strongly advised with quick reference to a health institution, governmental or private, in case of any flu-like symptoms or respiratory complaints etc.

### **III.3 Demarcation of Surveillance and Infected Areas and Actions to be taken**

The district administration will notify the names of all the villages and habitations within a radius of 0-1 KM i.e. 1 KM radius from the site of confirmed AI case and within 1-10 KMs radius. The area within one KM from the site of confirmed AI will be designated as "**Infected Zone**". Rest of the area within **1- 10 KM** is the "Surveillance Zone". The infected zone should be clearly and prominently displayed in the local language, preferably through sign-boards. The Surveillance zone should act as a buffer-zone between the infected area and the disease-free area. The State Government, in consultation with the Government of India may change the radii of the infected zone by

one more KM each, maximum up to 3 KM., if the foci of infection / mortality are scattered over a larger area. In such a case, the culling zone will be extended to one KM radius from the new site of infection without notifying the disease again. Furthermore occurrence of AI, if any, beyond 3 KM. radius of this limit will require to be notified as a fresh/new outbreak by the Department/ State Government as per due procedure.

In case of outbreak confirmation in a live bird market, all the birds in the entire live bird market shall be culled and the market shall be closed for a period of 21 days from the date of issue of sanitization certificate. The surveillance will be carried out within the radius of 10 KMs as per the Action Plan.

#### **III.4 Immediate tasks of the Designated Veterinary Officer**

The designated veterinarian must wear PPE and take antiviral drug (Oseltamivir) under medical supervision and immediately undertake the following steps:

##### **(i) Assessment of the situation:**

- Quickly assess the state and condition of the farm/ premises/ site to determine the nature and scope of operations to be conducted.
- Identify locations where vehicles leaving the farm/ premises/ site can be properly washed and disinfected.
- Activate the disinfection procedures at the point of entrance to/ exit from the infected premises; identify sites where staff may wash and disinfect; and ensure that on leaving the premises, all staff, wash and disinfect exposed body parts and shoes and agree to wash their clothing as soon as they return home and the disposable gear is disposed-off by burning. Ensure that they do not go from one farm to the other.
- Ensure that vehicles are washed and disinfected properly and should leave the infected premises only if absolutely necessary.
- Take necessary steps to ensure that contamination of water-reservoirs is avoided.

##### **(ii) Estimating Requirements of Store and Manpower:**

Handling of an AI outbreak may need the following items / manpower:

- \* 100-150 kg of slack lime is required to cover 2m x 2m x 2m burial pit.
- \* On an average, one gunny bag can carry 35-40 culled birds.
- \* One member of culling team can cull 100-250 birds a day in an organized poultry farm, 18-100 in backyard poultry depending on the rate of arrival of birds etc.
- \* Requirement of PPEs dependent on number of shifts, number of members of RRTs, and number of days required to complete the culling and sanitization operation.

### **III.5 Ban on Movement of Poultry**

Movement of live birds from and to the infected area should be completely banned by the State Government. Restocking of poultry in that area will commence not before three months after the Sanitization Certificate is issued as per Para III.11 subsequent to the approval of the DAHD, Government of India. Police, Local bodies, media and representatives of the farm organizations should be involved with this work. Various types of physical restrictions like Nakabandi, drop-gates on all outgoing roads of the infected area may be imposed by engaging police personnel.

### **III.6 Closure of Poultry and Egg Markets/ Shops**

The States or District administration should immediately announce the closure of all shops and markets dealing with poultry products and eggs within the radius of 10KMs from the infected site. Take the assistance of revenue, municipal and panchayat authorities. These shall remain closed till completion of culling and sanitization operations. Thereafter, trade of eggs and processed poultry / products shall be allowed within the surveillance zone without any outward and inward movement of poultry and poultry products.

### **III.7 Restrict Access to Wild and Stray-Birds**

All possible steps should be taken to ensure that wild and stray-birds do not have access to the poultry, poultry sheds and water supplies in the infected area.

### III.8 Restriction of Movement of Persons & Vehicles

To and fro movement of the number of vehicles and staff in the infected premises should be reduced to the minimum necessary to handle the outbreak, as both human beings and vehicles can be instrumental in further spread of infection. The movement of people and equipment from the infected premises should be allowed only when necessary. Staff in the infected premises may leave the farm after a complete change of clothing and disinfection and proper disposal of protective equipment.

The vehicles of the veterinarians and others visiting the infected premises must be left at least 500 meters away from it. If necessary, e.g. JCBs for control and containment operations may be allowed. However, these will be fully washed & disinfected before leaving the farm/ infected premises.

### III.9 Depopulation of Birds in the Infected Zone

Stamp out all the live poultry birds/ other captive birds within the infected zone. Culling should start from the periphery of the infected zone. **It should take place in the presence of designated Veterinary Officer and concerned local authorities such as officials of the Revenue Department, Municipality, Panchayat etc.**

#### III.9.1 Method of Culling/ Depopulation on a Farm

The birds should be culled by a quick twisting of the neck (cervical dislocation), taking care that the process is humane. Sodium Phenobarbital mixed with water (80mg of Sodium Phenobarbital in 55 ML of water) for anesthesia should be used before manual or mechanical cervical dislocation for birds above 3 kilograms as per OIE Terrestrial Animal Health Code 2019 (Chapter 7.6.17). Depopulation and disposal of infected birds must be done quickly with the doors of the shed/ house closed to prevent entry of wild birds and other animals.

#### III.9.2 Culling Strategy for Backyard Poultry

Typically, backyard poultry is let out in the morning for scavenging. Public announcement should be made a day before culling, suggesting not to release the birds in the morning. Cooperation of local bodies is necessary for operations in the backyard. A common location should be identified for the culling and disposal of the culled birds in consultation with the local bodies.

**Depopulation in the backyard poultry is comprised of three steps done over the consecutive days:**

Culling operation: Immediately after notification of outbreak, most of the backyard birds are culled. However, a few mayescape

Mopping operation: Culling of birds which could not be presented during the culling operation.

Combing operation: Willfully hidden birds during culling and mopping operations but found during the combing operation are culled without any compensation

### III.10 Disposal of Infected Material

**Do not allow transportation of infected birds, dead birds, eggs and other related materials out of the infected site under any circumstances.** These must be disposed of as explained below:

#### III.10.1 Disposal of Dead Birds

Most appropriate is to burn or incinerate the dead / sacrificed birds. Approximately 5 quintals of wood would be required to burn 100 kg of dead birds. However, the most common practice in the recent outbreaks has been to bury in deep pits, cover with calcium hydroxide followed by at least 40 cm layer of soil. More layers of lime and soil can be applied to level the pit. A pit of 2x2x2 meters will accommodate around 1800 birds (fowls) and about 450 turkeys. Pits must be deep enough to prevent access to rodents or dogs etc. The burial ground is suitably marked and is not opened for at least one year. Top it up with earth and lime if it sinks over time. A certificate of disposal of birds must be obtained from the designated officer. The burial site should be away from the habitat and water logged areas/ ponds/ rivers etc.

## SITES FOR DISPOSAL OF BIRDS AND ITS MANAGEMENT

- i) For proper management, pits should be dug on a common land within the infected zone, in limited numbers
- ii) All the pits should be well covered with multiple layers of lime and soil
- iii) Adequate amount of lime should be spread over the pits
- iv) The pit sites should be fenced with thorny (kanta) shrubs / bushes
- v) Permanent warning signboard should be fixed in all the pit sites
- vi) The pits should be monitored at regular intervals to check any sinking, water accumulation etc. and if necessary, steps be taken as mentioned in Sl. No. i) to iii) above
- vii) The pits should be located on the farm premises, and in case of backyard, a village common land/ forest land preferably be at a higher level, to avoid accumulation of water during rainy season. Pits should be located away from river/ lake side and residential areas. No crop should be grown further for at least one year on the pit site. During digging of the pits, it should be ensured that no water is oozing out of the pit

### All the pits should be dug one day in advance of the culling

#### III.10.2 Destruction of Contaminated Materials

Materials likely to be contaminated e.g. meat, eggs, feather, used litter, manure, feed, feed ingredients, gunny bags, curtains, paddy husks and saw dust used for bedding, egg trays, drugs and vaccines must either be buried in a deep pit along with animal carcasses or should be burnt.

#### III.11 Clean-up and Disinfection

Clean-up and disinfection is the last stage of a control and containment operation. The infected premises are disinfected after the birds and the infected materials have been destroyed. Different protocols may be considered for clean-up and disinfection of commercial and backyard poultry as explained in succeeding paras.

### III.11.1 Cleaning and disinfection of Commercial Farms

- Jetting and suction machines should be deployed for cleaning the lower level of the two-tiered poultry sheds. Ensure complete disposal of faecal material and slurry etc. collected on the lower story. The feces slurry and water (collected on the lower story) discharged into pits dug on the same premises. The pits need to be covered properly using netting or layers of earth and lime, replenished periodically
- The infected farm premises/ area should invariably be disinfected by spraying disinfectants like 2% Sodium Hypochlorite or 4% Formalin prior to reduce the virus load.
- Wash and disinfect the walls, floors and ceilings of the sheds in the premises to remove organic material with either or a combination of the following:
  - 3% calcium-hydroxide solution
  - Sprinkling of bleaching powder and lime on the floors of the sheds
  - White-washing of concrete areas with lime
  - Fumigation of closed chambers and sheds with Potassium-permanganate (KMnO<sub>4</sub>) and formalin
  - Treating all the equipment with 2% sodium-hypochlorite solution for 48hrs
  - Cages and other large metal structures may be decontaminated by heat treatment (flame gun)
  - Feathers spread around the farm or attached to metal net, if any, should be burnt with the flame gun
  - All units and items which are physically or functionally connected to the establishment (e.g. hatchery, egg store rooms, packaging rooms, egg trolleys and egg product plants etc.) must also be properly disinfected. Vehicles used for transporting live birds, eggs and feed must also be disinfected.
  - Water-reservoirs must also be emptied, washed and disinfected
  - Feed tanks (silos) need to be emptied, washed with a hot water-pressure pump and subsequently fumigated
  - After washing and disinfecting, all units must be fumigated twice with at least two weeks between the fumigations

- Wash hands and feet of farm workers and the visiting officials with soap and disinfectant with approved detergent or rectified spirit

Use 2% solution of NaOH should be used at the entrance on foot mats to clean the shoes gumboots and other items

- Use Quaternary-ammonium salts for the treatment of walls, floors, ceilings and equipment etc. Cresolic-acid 2.2% solution or Synthetic phenols 2% solution for the treatment of floors
- Commercial disinfectants such as Virkon-S<sup>®</sup>, D-125<sup>®</sup>, Instakol Plus<sup>®</sup>, Trilucid concentrate<sup>®</sup> etc. may be used as per manufacturer's directions.

### III.11.2 Clean-up and disinfection - Backyard poultry

- (i) Burn entire litter, baskets, feed, gunny bags, curtains, paddy husks, saw dust, egg trays and temporary cages and garbage in and around all the poultry in the infected zone
- (ii) Spray all the houses in the villages within infected area, irrespective of the presence or absence of poultry, with 2% sodium hypochlorite solution
- (iii) Spray poultry rearing houses in infected area with 2% sodium hypochlorite solution.
- (iv) Spray all the damp areas, drains etc. with 4% formalin except in the inhabited dwellings due to its irritant effects. In such areas, sodium hypochlorite or commercial disinfectants such as Virkon-S<sup>®</sup>, D-125<sup>®</sup>, Instakol Plus<sup>®</sup> Trilucid concentrate<sup>®</sup> etc. may be substituted. Thereafter, lime may be sprinkled
- (v) Lime may be applied on the roads, streets etc. in all the villages under operation
- (vi) White wash the poultry rearing houses/ cages in the infected area
- (vii) Apply lime and bleaching powder in and around the poultry houses/ cages in the infected area
- (viii) Spray 2% Sodium-hypochlorite solution in poultry houses/ cages kept within the households / verandas and with 4 % formalin if birds were kept far away from the residency

### III.11.3 Poultry owners to be responsible for Clean-up and Disinfection

States should ensure clean-up and disinfection of the infected area. However, it is the responsibility of poultry owners under direct supervision of veterinarians/ para-veterinarians etc. as per prescribed procedure. The poultry owners are responsible to maintain minimum standards of hygiene and must undertake post disease clean-up and disinfection.

#### **III.11.4 Submission of Daily Reports on Control and Containment**

Daily reports of control and containment are required to be compiled and sent to Government of India. This includes number of RRTs engaged, birds culled, eggs/feed destroyed, pits dug, amount of compensation paid, surveillance and sanitization undertaken etc. The report should be sent on a prescribed proforma (Annexure 14).

##### **Submission of Avian Influenza Epidemiological Information Form**

Avian Influenza Epidemiological Information Form has to be submitted by the State Animal Husbandry department to Department of Animal Husbandry and Dairying (DAHD), Government of India for each outbreak in the prescribed proforma (Annexure XII).

##### **Sealing of the Disinfected Premises and Issue of Sanitization Certificate**

After the culling and disinfection have been completed, the premises are to be sealed and a sanitization certificate issued by the State Animal Health authorities stating that culling has been carried out and the area has been cleaned and disinfected as per Action Plan and operations have been concluded. Thereafter, Post-operation surveillance will be carried out for three months. The areas where the birds were culled will be repeatedly disinfected by fumigation (Indoors) or sprays (open place) at every 15 days during the 3 months of surveillance.

## **CHAPTER 4 : POST OPERATION SURVEILLANCE AND FREEDOM FROM DISEASE**

Checklist of the materials, appliances, resources and facilities that may be required in successful conduction of POSP is at Annexure **15**.

### **Re-induction of Birds:**

Farmers may re-start poultry production and marketing 90 days after the release of sanitization certificate. New eggs, chicks and/or birds must only be procured from the areas known to be free from AI.

Ensure that no birds are inducted into the culled and disinfected areas for the specified period of three months.

Any poultry found in the infected zone after issue of sanitary certificate without permission for restocking from competent authority will be culled at the cost of the farmer. No compensation will be paid for culling at this level.

### **(A) POSP Surveillance Zone:**

The "Surveillance Zone" is the area beyond the infected/ operational area (between 1 - 10 KM from the epicenter). Surveillance in this zone will involve collecting samples (serum and cloacal/oro-pharyngeal swabs) from poultry both commercial and backyard. Four rounds of samples collected as per the guidelines should be sent to the NIHSAD, Bhopal on fortnightly basis. Information on the dispatch of samples is required to be sent on a proforma (Annexure **16**).

This information should be disseminated to all villages/farms explaining the logic for it, as it is necessary to move towards a disease-free status. People trying to bring in birds into the area stealthily should be prevented under all circumstances.

### **(B) Sample Type Size and Time Frame for POSP:**

**Poultry Units:** Collect samples from 3 (three) poultry birds in a poultry unit with 50-1000 birds and from 6 (six) birds in the case of bigger units.

**Backyard poultry:** Collect samples from 6(six) birds in all villages that fall within the surveillance zone.

Samples need to be collected from 1-10 KM surveillance zone covering about 25% of the villages distributed over all the four quarters in each of the circle (as per the POSP map Fig.1)per fortnight thereby covering all villages in the fourfortnightly sampling.

Illustration: For example, if there are a total of 48 villages within the 1-10 KM surveillance zone and within each of the circle, there are 16 villages, then ensure that four villages are selected from each of the circle (C2 to C4) and one village from each quarter (Q1 to Q4) of each circle.

#### **DESPATCH OF SWAB SAMPLES:**

- Send the cloacal/oro-pharyngeal swab samples dipped in about 5.0 ml sterile screw capped plastic vials containing 3.0 ml of PBS with 1 % Bovine Serum Albumin (pH 7.2-7.4)/VTM containing suitable antibiotic and antifungal agents in appropriate concentration Cloacal swabs must contain minimum 1.0 g faecal material.
- Composition of PBS (0.01 M; pH – 7.2 to 7.4)
  1. Sodium-chloride – 8.0g
  2. Potassium-chloride -0.2g
  3. Disodium hydrogen-phosphate, anhydrous -1.15 g
  4. Potassium dihydrogen-phosphate, anhydrous -0.2g

5. Distilled-water -1.0 liter
6. Antibiotics: The following antibiotics combinations can be used:
  - a) Benzyl-penicillin -2X 10 IU /l ,Streptomycin – 200 mg/l & Nystatin –  $0.5 \times 10^6$  IU/lor
  - b) Polymixin-B – 2x 10 U/l & Nystatin –  $0.5 \times 10^6$  IU/lor
  - c) Gentamicin-sulphate – 250 mg/l & Nystatin –  $0.5 \times 10^6$  IU/l

### **DISPATCH OF SERUM SAMPLES**

- Send at least 0.5 ml serum samples in 1.0 or 2.0 ml sterile screw capped plastic vials.
- Mark each vial properly by laboratory serial number of the dispatching districts with a water proof marker pen before putting it into ice packing.
- There must be sufficient ice packing in the carton containing the samples to avoid decomposition during transportation.
- Container having samples should be clearly marked and labeled for ease of diagnostic laboratory.
- POSP samples should be forwarded with an enclosure (Annexure XVI) that contains the details of the samples. Further, the sample dispatching authority should maintain a sufficiently descriptive record for each dispatched samples so as to locate the Poultry Owner, Village, Mouza, Gram Panchayat, Ward, Municipality, Block, District, type of bird, system of rearing, flock strength of the pen and farm, So as to trace back the source of sample for further necessary action.

Checklist of the materials, appliances, resources and facilities that may be required in successful conduction of POSP is at Annexure XV.

### **(C) Further action if samples test positive in the Surveillance Ring:**

Control and containment operations will be carried out in accordance with the extant Action Plan.

#### **(D) Further action in the event of samples testing negative:**

If samples collected test negative, re-population of poultry will be allowed in the affected area after completion of three months from the issue of sanitization certificate.

#### **E) Surveillance in the Repopulated Poultry Unit /Village:**

Random clinical investigations on the repopulated flock should be carried out after a fortnight of restocking as detailed below.

- (i) 2 birds (either recently died or the birds showing acute signs of disease after sacrificing them)and / or
- (ii) Cloacal and oro-pharyngeal swabs collected from at least 10 healthy birds per pen/shed.
- (iii) Serum samples from at least 10 birds. Such sampling shall be done once every fortnight over a period of two months. Samples will be sent to the NIHSAD, Bhopal for testing. If samples test positive, control and containment operations will be again undertaken as per Action Plan.

**Checklist of the materials, appliances, resources and facilities that may be required in successful conduction of POSP is at Annexure 15.**

#### **IV.2 Freedom from Disease**

In case no other outbreak takes place in the area or no samples collected from the post operations surveillance test positive for the next 3 months after issue of Sanitization Certificate “Disease Free” Status can be declared under intimation to the OIE.

#### **IV.3 Compensation to be paid for forced culling**

It is GOI’s policy that the farmer must be compensated for the loss of birds during culling. District Collectors should be assigned to expedite payment and to prevent the misuse of the scheme. It will be necessary to collect data on the poultry population in each area before the receipt of test results. The Government of India

will share 50 % of the total cost of compensation paid.

The rate of compensation may be reviewed and decided from time to time by GOI in consultation with State Governments. The share of expenditure of Government of India can be charged to the CSS "Assistance to States for Control of Animal Disease (ASCAD)" operational in each State. It is suggested that State Governments should consider compensation as part of operational preparedness.

Compensation should be paid on the spot, immediately after the culling is over or at the time of collecting birds from the owners. The revenue department of the State Government may be involved for payment of compensation.

## **Chapter 5** Education campaign on general awareness and bio-security measure on NAI outbreaks

### **V.1 Share concerns with Industry and Farmers**

Following a notification of the disease, the Government (Secretary and Director, Animal Husbandry) should take the poultry industry and small poultry farm owners into confidence and inform them periodically about the measures that are being taken to control AI. Popular poultry and livestock journals and mass media should be encouraged to disseminate information about the government's initiative on AI. The support of the industry should be sought for implementing the government's decisions.

### **V.2 Media briefing by a designated official spokesperson**

In order to avoid rumors about the impact of disease on public health and distress selling of poultry, clear and precise briefing of the media should be made regularly only and only by a designated official spokesperson of the state Government.

### **V.3 Advice to the public on handling, processing and consuming poultry product**

- Awareness in the general public should be made taking care that no panic is created. Electronic media and mass communication such as programs in Kisan channel of Doordharshan, mobile app, cable network etc. can be used for such awareness programs.
- It must be emphasized that poultry meat cooked at more than 70°C temperatures for 30 minutes inactivates the virus and it is absolutely safe to consume properly cooked poultry meat and eggs.
- Encourage hygienic way of slaughtering, dressing and packing of chicken meat. Media should be invited to awareness campaigns to report the things in the right perspective.

- The poultry farmers associations, cooperatives, NECC, APEDA, etc. should be actively involved in this process. Expenditure on awareness campaigns can be met from the centrally sponsored scheme of “ASCAD”.

#### V.4 Bio-security Measures

To control AI, strict biosecurity measures should be imposed and poultry owners be advised to adopt following measures in all farms, even though they are not currently infected:

##### **Biosecurity Measures in Commercial Farms:**

**a) Keep-distance-** Only those who take care of the poultry at the farm should be allowed to go close to the birds. Visitors should be strictly restricted from entering the sheds. Inter-mingling of other birds/ animals with poultry should be avoided.

Disinfect and wash shoes, clothes and hands before and after contact with poultry. If equipment, tools or poultry supplies are borrowed from other farms, always clean and disinfect them before bringing them and before sending them back.

**b) Keep-cleanliness:** The bird cages should be cleaned and food and water for birds changed daily.

##### **c) Do not Introduce New Birds to the Flock:**

The new birds should be kept away from the flock for at least 30 days.

##### **d)Recognize the signs of AI:**

- A close check must be kept on birds’ mortality. Swelling around the eyes, neck, head, nasal discharge, discoloration of the wattles, combs, legs, drop in egg production, sudden weakness, drooping wings and lack of movement among birds are the warning signs.

##### **e) Report sick birds:**

- Every unusual sickness or death of birds should be immediately reported to the nearest veterinary center.

**f) Follow uniform age group policy:**

- In poultry farm, uniform age-group policy should be adopted. This is best done by adopting 'all-in-all-out' production system.

**g) Restrict Inter-sectional movements:**

- Where necessary to move to other farms, the personnel must clean their shoes and clothes.

**Biosecurity Measures in backyard poultry:**

- a) Keep the birds indoor. Do not allow wild and birds from neighbor's birds to mingle with your birds.
- b) Keep the yard and surroundings clean and regularly bury/ burn the wastes
- c) Do not catch and keep any wild or migratory bird
- d) Report sickness/mortality in birds immediately to the veterinarians
- e) Bury the dead birds properly. Do not throw them in drains or in open areas.

**Biosecurity Measures in markets:**

- i. The persons handling and dressing the poultry birds should use gloves and mask.
- ii. There should be regular/ daily sanitization of live markets/wet markets.
- iii. Care to be taken for any unusual sick/dead birds.
- iv. Hygienic dressing of birds, care to be taken for disposal of viscera/ feathers in live/ wet markets. There must be proper drainage and disinfection facility in the market.
- v. Regular cleaning of cages of birds should be undertaken. Footbath/spraying/ dusting and hand washing facility should be made available.
- vi. Inspection by Government agency should be undertaken on daily basis.

Other guidelines on bio-security measures are available at departmental website ([www.dahd.nic.in](http://www.dahd.nic.in)) under the heading 'Bio Security Measures' and have also been

circulated to the State Governments/ UTs through letter dated 22nd February, 2006.

## **V.5 Advice for Persons likely to be in direct Contact with infected poultry**

### **V.5.1 People in areas with confirmed AI should do asunder:**

- Avoid contact with chickens, ducks or other poultry as much as possible. Children should not have contact with poultry or any other affected birds.
- Avoid handling (live or dead) chickens, ducks or any other poultry while visiting friends or family, even if the birds appear healthy.
- Avoid visiting poultry farms, duck farms or any farm where birds have been sick or suspected to have bird flu.
- All persons exposed to an infected environment, must wash hands and face properly and change clothes and monitor temperature for 4 days. If he/ she develop a high temperature, immediately consult doctor.
- Persons expected to work with infected birds / farms should take antinflu medication (e.g. Oseltamivir or any other drug recommended by Ministry of Health and Family Welfare, Government of India) under medical supervision.

### **V.5.1: Advice for Persons likely to work with infected poultry**

The persons likely to work with infected poultry should follow the guidelines as given in Chapter 3.

## Chapter VI: Guidelines for zoological parks

### 6.1 General Precautions:

1. There should be no import of any animal or bird without observing quarantine for a minimum of 21 days. A well-equipped quarantine animal house/ birding place to be created, if not already existing. Only after the imported animal is found free of any infection, should it then be allowed to mix with resident animals or birds.
2. No visitor should be allowed to take food from outside for the animals/ birds, nor be allowed to throw feed or any object inside the cage/housing/shed.
3. Staff movement, visitors, laborers and delivery boys as well as researchers including volunteers and students should always follow a protocol before entering the premises for normal work purposes because they may have contact with other pets / farm animals / birds in their homes. Humans can transmit diseases either mechanically, through fomites or as a result of anthrozo zoonosis.
4. Caretakers/ attendants/ sweepers/ Persons should enter the animal cages/ animal houses/ inside the fencings only with change of clothes and gum boots/ shoes separately for each cage; such provisions may be made at the entry to the animal housings. They should also be provided with caps that cover their hair completely. Entry points should be provided with disinfectants in a tray and every attendant/
5. Veterinarian /caretaker should take necessary precautions while entering.
6. Every person entering/exiting zoo animal pen should be encouraged to wash their hands often. Therefore outside the door and inside the house there is a need to provide wash basins with disinfectant solution.
7. Place informational signage at the entrance to all bird areas identifying them as a site for biosecurity precautions.
8. Instruct employees not to come to work and to call their supervisors if they have a bird at home that is sick or has died.
9. Include employee education efforts such as the following measures:
  - a. Hold general employee biosecurity briefings at multiple times during the course of the outbreak.

- b. Bring in regulatory officials to provide outreach presentations.
  - c. Create and distribute summary publications to all employees.
  - d. Create and distribute documents listing biosecurity measures to employees.
  - e. Distribute information letters to all employees describing the disease outbreak and precautions that they could take as individuals.
  - f. Discourage employees from visiting other bird or bird product facilities (e.g. pet stores, feed stores, etc.).
10. All the animals / birds should be observed at least twice in a day, any animal / bird showing signs of sickness should be immediately investigated and attended by a qualified veterinarian. On suspicion of a possible involvement of a contagious disease, the ailing animal /bird should be segregated in isolation room/premises where visitors' and other animals'/ birds' entry is banned.
11. All the animals /birds should be provided with diet that is healthy and certified safe. It is not considered a good practice to utilize the leftover feed from one cage/house to be added in another one.
12. The practice of offering feed to migratory birds has been noticed in some zoo establishments. Technically it is to be discouraged, however, if it has to be continued in the public interest for attracting more migratory birds for public viewing, the feed should be offered at a distance away from the area of captive birds and water bodies.
13. They should be regularly vaccinated as specified by zoo authorities in consultation with DAHD as per their schedule. For the ectoparasites and endoparasites scrupulous control programs should be strictly followed at stipulated intervals.
14. The management should check the following points regarding source of water to supply cool, clean and safe potable water that should be available *ad-lib* in clean utensils.
- a. The overhead or ground level tanks – Must be covered
    - b. Supply line to individual rooms/shades/pens-should ensure no leakage and away from drainage
    - c. Water troughs/buckets/pots- should not be allowed to share by peri-domestic birds like sparrows, crows, pigeons etc. Ideally the feed/water troughs should be

kept at a place that has a net covering so that other birds would not have access for feed /water

15. Safe source of food supply – In addition to a balanced ration with adequate fiber contents and nutrition for the zoo animals/birds, the management should also ensure the feed storage place free of rodents, insects or dog/cats so that safe and uncontaminated feed is reached to cages/houses
16. Scientific method of waste management – Sanitation and hygiene is to be followed; disposal should not attract the birds, predators or scavenger animals, flies and other insects or other animals.
17. Disease status and proximity to animals in the surrounding area – Captive birds/animals in zoo should not have sharing boundary with other animal /bird enclosures /presence of wildlife and pest species. Similarly the management must have alertness towards any infectious disease in the area/locality being reported frequently or zoonotic disease potential of any newer infection.
18. Vehicles, machinery, tools and other equipment moving into the zoo are likely to carry infectious agents.
  - a. Materials used as bedding (straw, litter, sand and gravel), equipment for carrying animals/birds like hay, crates, boxes or crates, egg trays, empty medicine boxes and containers and other veterinary instruments need to be brought in a separate room, first cleaned, disinfected by spraying or fumigation and then allowed to enter in animal premises.
  - b. The vehicles/ trucks entering in should pass through slowly via a long trench that is filled with disinfection solution in such a way that at least 50 per cent tyres are dipped at a time and when the vehicle rolls through the trench, the wheels should complete at least two rounds (4 half circles) so that the tyres are adequately dipped in the solution.
  - c. Animal waste products of transferred animals in the vehicle it had carried should be disposed off properly.
  - d. The driver of the vehicle should also be treated as visitor and should have all restrictions in place for his movements.
19. In case in any cage/open space an animal/bird is found dead, immediately it has to be taken out in a leak-proof container/trolley and the area where the animal /bird was

lying should be got covered with disinfected. It is always a good practice to vacate that premises completely for sterilization/disinfection.

## 6.2 Specific Biosecurity for Avian Influenza:

1. **Testing of captive birds:** Every zoological park and water bodies should conduct active disease surveillance for Avian Influenza at the start and end of migratory bird season through testing of cloacal and oro-pharyngeal swab and sera samples from captive birds. In case of mortality, the bird carcass should be tested for avian influenza.
2. **Segregation of birds:** Birds need to be segregated species wise and the sick birds need to quarantine under strict monitoring and symptomatic treatment.
3. **Disinfection of premises:** Disinfection of the premises may be carried out in consultation with environmentalist using chemicals or other methods keeping in view of the fragile ecology of the zoos.

## 6.3 During suspected /confirmed AIV (H5 or H7 subtype) outbreaks:

1. If mortality is reported in significant number in any species of birds, quick actions irrespective of protocols need to be taken to avoid losses.
  - a. The sick/dead birds from that site are to be quickly removed, qualified veterinarian be called for investigation and conducting postmortem examination in an isolated closed room.
  - b. The movement of the persons at that site be reduced to minimum and disinfection of the place be properly carried out.
  - c. The testing lab should be alerted on phone and a representative sample/freshly died birds (whole carcass properly packaged as per standard protocol) should be sent by maintaining cold chain with special messenger with complete history. Organ samples from an individual bird may be pooled. However, DO NOT pool the organ samples from different birds. Similarly, DAHD and the state Govt. AHD as well as State Dept. of Health services should be informed about this suspicious disease.
2. As soon as the disease is confirmed as H5 or H7 Avian Influenza, the control actions to be initiated are same as for domestic poultry. However wild /endangered/ precious

captive birds confirmed as non-infected may be exempted from culling. Visitors' entry needs to be stopped forthwith.

3. The dead birds should be collected with proper labeling in a strong leak-proof carry bags and kept ready for sanitary disposal.
4. The movement of the persons/vets/laborers should be restricted and in no case they should move from infected pens to healthy pens. The management of the healthy sheds should be done by separate team.
5. Include employee education efforts such as the following measures:
  - a. Hold general employee biosecurity briefings at multiple times during the course of the outbreak.
  - b. Bring in regulatory officials to provide outreach presentations.
  - c. Create and distribute summary publications to all employees.
  - d. Create and distribute documents listing biosecurity measures to employees.
  - e. Distribute information letters to all employees describing the disease outbreak and precautions that they could take as individuals.
  - f. Discourage employees from visiting other bird or bird product facilities (e.g. pet stores, feed stores, etc).
6. All precautions of disinfection and hygienic maintenance of the premises should be observed.
7. The feed and water from the infected sheds should not be allowed to be mixed in common stocks/drainage, should be sterilized if at all needed to be re-used.
8. Even in the absence of mortality in wild/ migratory birds, their movements in the free range/water bodies/ swimming places be stopped and all the birds should be confined in the close premises.
9. Since the infection is air-borne, air sanitizers, fogging with disinfectants on the roads/sheds, free spaces should be undertaken.
10. In any case, no vaccinations are to be allowed in the premises, even if the date is due.
11. Cloacal and oro-pharyngeal swabs from all the birds, irrespective of their disease status should be collected, labeled and sent *on-ice* to the reference laboratory to

know the involvement of the birds, because many wild bird species do not show the clinical signs or mortality but may be excreting the virus. While collecting samples, movement of the persons should be from healthy pen to infected pen.

#### **6.4 Response and Surveillance after Outbreak (RSAO)**

1. Emergency risk assessment and formulation of biosecurity plan need to be carried out by a committee comprising of Zoo authority, Environmentalist, Public health professional, Biosecurity expert and Disease experts.
2. In case of uninfected wild/ migratory birds, since they may be high value birds/extinct species and not trade subjects, culling is not recommended. Even for captive birds, as they may be precious or extinct species, culling is to be avoided. Only the birds that are seriously ill need to be euthanized.
3. Maximum possible number of birds is to be sampled, while sampling on a water body, birds arriving at different locations be taken into consideration, it should be ensured that different species are proportionately represented.
4. Fresh fecal droppings and wherever possible, cloacal swab/oro-pharyngeal swabs are to be collected with wild/ migratory bird with species identification, (If spot identification is not possible, then a photo of the bird be captured and the same is to be tagged with sample number) are to be collected, labeled properly and sent to the lab as per the sample collection and transport guidelines.
5. In addition to sampling of birds, environment samples like water, soil etc. are to be collected and sent for testing.
6. The POSP surveillance will be the same as mandated for domestic poultry. Sampling has to be repeated every 15 days for at least 4 times and if consecutive two samplings from the last positive result are found negative then the opening of the zoo for public may be considered by the competent authority.

## CHAPTER 7: Guidelines for Compartmentalization (Avian Influenza free)

When outbreaks of Highly Pathogenic Avian Influenza (HPAI) occur in OIE member countries with until then disease-free status, member countries can use 'compartmentalization'.

Compartmentalization is a procedure which may be implemented by a country to define and manage animal subpopulations of distinct health status within its territory, in accordance with the recommendations in the OIE Terrestrial Animal Health Code (the Code), for the purpose of disease control and/or international trade.

**Compartment:** means an animal subpopulation contained in one or more establishments under a common biosecurity management system with a distinct health status with respect to a specific disease or specific diseases for which required surveillance, control and biosecurity measures have been applied for the purpose of international trade.

Compartmentalization entails the definition of an animal sub-population of a specified health status within the national territory. This status is maintained through management and husbandry practices related to biosecurity, in compliance with the standards in the Terrestrial Code (Chapters 4.3 and 4.4) and the recommendations in the relevant disease chapters.

The National Veterinary Authority is responsible for granting, suspending and revoking the status of a compartment. The use of compartmentalization is not only as a trade facilitating measure but also as a tool to improve animal health and to reduce the risk of disease outbreaks within and outside the compartment.

### 7.1 Application of compartmentalization

*Establishing and maintaining a disease free status throughout the country should be the final goal for member countries. However, establishing and maintaining a disease free status for an entire country may be difficult, especially in the case of diseases that can easily cross international boundaries. For many diseases, member countries have traditionally applied the concepts of zoning and compartmentalization to establish and maintain an animal subpopulation with a different animal health status within national boundaries.*

The fundamental requirement for compartmentalization is the implementation and documentation of management and biosecurity measures to create a functional separation of subpopulations.

### 7.2 Salient points for defining compartment:

- Disease status of the adjacent area;
- Biosecurity status of the compartment
- Biosecurity Plan
- Surveillance (Internal and External Surveillance)
- Traceability
- Documentation
- Diagnostic Capability
- Emergency Response notification
- Supervision control of the compartment.

### **7.3 Application:**

- The industry applies to the local government as per the check list prescribed by GOI giving the full details of the establishment along with the complete chain from source to marketing
- The local Government has an Expert Team to inspect the establishment
- After satisfactory evaluation, the local government sends the recommendation to the DAHD for inspection.
- The DAHD has its inspection team headed by the Experts from ICAR and Veterinary University/College.
- After inspection the DAHD issues letter of recognition to the State Animal Husbandry Department for issuing of letter of recognition to the company. The compartment recognition is valid for three years.
- After recognition, the State Animal Husbandry through the local veterinarians inspect the compartment regularly and samples are collected for AI surveillance and testing.

### **7.4 Recognition of compartment depends on:**

- Epidemiology of the disease
- Environmental factors
- Surveillance
- Biosecurity measures
- Quality of vet services / other competent authority
- Cooperation between govt and private sector for compartments
- Migratory birds-domestic birds interface

### **7.5 Responsibilities of the Veterinary Administration:**

- Veterinary Administration must document the measures taken to:
- Identify the animal sub-population
- Recognize its distinct health status
- Maintain its distinct health status
- Records and Surveillance of the disease
- Evaluation of Surveillance and reporting by state officials.
- Evaluation and validation of Biosecurity Measures
- Hatchery monitoring
- Health status in adjoining area
- Providing veterinary services

- Laboratory services
- Regular inspection of the compartment
- Any outbreak in commercial birds especially of viral etiology in past 3-6 months and steps taken to contain further spread
- Any ongoing problem in migratory birds in nearby areas or high mortality recorded in wild/migratory birds

#### **7.6 Industry responsibility:**

- Application of Biosecurity Measures
- Quality Assurance Scheme if any
- Surveillance in farm for AIV and other commonly encountered diseases of viral etiology
- Health of the birds
- Hatchery Monitoring
- Documentations of corrective actions
- Sanitary procedures including waste management and dead bird disposal system in the compartment

**Checklist for Preparedness for Control and Containment of  
Avian Influenza**

Sl. No	Point of action	Details of action to be taken by State Government absence of AI outbreak
1	Familiarization with Action Plan	The Action Plan has been translated in local/ vernacular languages, circulated to all concerned and they have been familiarized with the contents. The Action Plan has also been put on the Departmental website ( <a href="http://dahd.nic.in">http://dahd.nic.in</a> ).
2	Familiarization with guidelines	Government of India guidelines and Action must be perused and studied ( <a href="http://dahd.nic.in">http://dahd.nic.in</a> ).
3	Familiarize District Magistrate/ Collectors/ Commissioner and other Departments in control and containment of AI	<p>(i) The District Magistrate/ Collectors/ Commissioner have been briefed to assume the Charge of co-ordination of activities related to containment and control in case of outbreak, e.g., quarantine, movement control, closure of markets, ban on sale of related products, culling operations, payment of compensation, administering and developing a vaccination plan, clean-up etc.</p> <p>(ii) All personnel of the Animal Husbandry Department are familiarized.</p> <p>(iii) Concerned departments have been alerted informed about their roles.</p>
4	RapidResponse Teams(RRTs)	<p>Rapid Response Teams for culling have been formed, and also trained.</p> <ul style="list-style-type: none"> <li>• State/UT may determine the number of RRT's required as per size/concentration/type of poultry etc.</li> </ul>

	Time required to mobilize RRT's.	<ul style="list-style-type: none"><li>• Mobilization has to be immediate after notification of AI</li><li>• Detailed deployment plan of RRT's i.e. how RRT's will <u>move</u>, begin and conduct operations has to be developed. The first phase will concentrate on culling of poultry etc. and disposal.</li></ul>
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5	Personal Protective Equipment (PPE's)	<ul style="list-style-type: none"> <li>• Sufficient stock of is readily and immediately available both for direct handlers and others.</li> <li>• Staff dealing with NAI must be equipped with PPE without fail.</li> <li>• Two types of kits of PPE, viz for direct handlers and for others are detailed in the Annexure VIII.</li> <li>• The N95 mask is necessary for direct handlers i.e.cullers.</li> <li>• Tie-up for regular supplies during operations</li> </ul> <p>Samples of these kits were also sent to the States in November 2005 to facilitate purchase of PPE. Further, the WHO interim guidelines for protection of persons involved in mass slaughter of birds have been conveyed to State Governments by vide letter dated 25th November, 2005 and are available as a direct link from the Departmental website.</p> <p>Large quantities of PPE's were used up in operations in Maharashtra and Gujarat and also in others States for control &amp; containment operations. Therefore, sufficient stock and continuous supplies are necessary.</p> <ul style="list-style-type: none"> <li>• Kit has to be changed every time a worker moves from one infected premises to another</li> <li>• Briefing must be given on importance of kit, its use, its disposal, and the need to change the kit on exiting an infected premises.</li> <li>• Kit has to be disposed-off by burning.</li> </ul>
6	Antiviral drug (Oseltamivir or any drug recommended by Ministry of	Ensure availability of antiviral drug (Oseltamivir or any drug recommended by Ministry of Health and Family Welfare, Government of India) for each worker to be involved in operations. Liaison with Health authority is necessary.

	Health and Family Welfare, Government of India)	
7	Availability of other stocks	<p>Sufficient stock of following is should be available:</p> <ol style="list-style-type: none"> <li>1. Kit for testing by CVO/DIO as per Action Plan read with the letter dated 30th November, 2005 of GOI. The letter is on the DAHD website.</li> <li>2 Equipment and drugs for depopulation of poultry as per the Action Plan.</li> <li>3. Disinfectants, which are active against AI as per the Action Plan.</li> <li>4. Foggers/spray machines for disinfecting the premises/area.</li> </ol>
8	Compensation	<ul style="list-style-type: none"> <li>• Funds should be available at local level to pay compensation on the spot, at culling of birds.</li> <li>• System of verifying claims must be decided in advance.</li> </ul>
9	Information required in case of suspicion of outbreak	<p>The State Animal Husbandry Department should have the following information in a stage about the suspected outbreak:</p> <ol style="list-style-type: none"> <li>(i) Preliminary identification of the farms/villages involved;</li> <li>(ii) Number of birds and other animals in the suspected area;</li> <li>(iii) Identification of staff as well as vehicles likely to be directly involved with that unit;</li> <li>(iv) Availability on site of disinfectants and equipment's for disinfecting the premises;</li> <li>(v) Anamnestic data (data relating to immune response).</li> <li>(vi) Information on any vaccination performed</li> </ol>

		<p>(vii) Record of animal or poultry movements up to 20 days prior to the onset of the first clinical signs;</p> <p>(viii) Record of movement of all people (staff, relatives, servicing personnel, veterinarians etc.) who had access to the farm;</p> <p>(ix) Report of all vehicles, regardless of their contact with animals, which have had access to the unit (in case offarm).</p> <p>(x) In addition, sales of poultry, if any, over recent period may be determined and further information about sale viz. person to whom sold, place to which transported, use to which put, further sales, if any, etc. needs to be verified for containment and control.</p> <p>Record of mortality or sickness of birds at the suspected site and in the alert zone is required. Collect information about the total poultry population and population with individual poultry farmers keeping more than 100 birds in the alert zone (separately within a radius of 1 KMs and between 1-10 KMs from suspected site).</p>
10	<p>Identification of infected zone (1 KMs around infected farm premises) and surveillance zone (1 to 10 KMs around infected farm premises)</p>	<p>Identify the following immediately before confirmation is available:</p> <ul style="list-style-type: none"> <li>• Number of villages in infected zone and surveillance zone.</li> <li>• Human population in infected zone and surveillance zone.</li> <li>• Number of households in infected zone and surveillance zone.</li> <li>• Poultry population in infected zone and surveillance zone.</li> <li>• Type of poultry in infected zone and surveillance zone viz. backyard and commercial with breakup of each in each zone.</li> </ul>

11	General actions/points in case of suspicion of outbreak	<ul style="list-style-type: none"> <li>• Identify logistics viz .latitude and longitude of closest place where helicopter can land if supplies are to be rushed</li> <li>• Daily report must reach Department of Animal Husbandry and Dairying (DAHD), Government of India</li> <li>• 24 hour control room should be functional in the State. Telephone Number be given to Government of India.</li> <li>• Person who will lead operations on from the Animal Husbandry side should be clearly identified.</li> <li>• Communication between teams and with control authority should be ensured. Allowing reimbursement of mobile bills up to a certain amount for the personnel engaged in operations can be considered.</li> </ul>
12	Restrictions to be enforced at the site and the alert zone pending receipt of test reports.	<p>Pending receipt of the test results, the entire suspected area should be cordoned off and following restrictions should be immediately brought into effect in the alert zone :</p> <ul style="list-style-type: none"> <li>• No vehicles should be allowed to ply in and out of the affected premises.</li> <li>• No movement of poultry, eggs, dead carcass, manure, litter, farm machinery, equipment or any such material should be allowed both within the alert zone and from and to outside the zone.</li> <li>• The farm personnel should wear protective clothing all the time inside the farm, including face-masks and gloves, gumboots (or shoes with disposable covers) etc. While leaving the farm premises, farm personnel should leave the protective clothing etc. at the farm and clean themselves thoroughly with suitable disinfectants.</li> </ul>

		<ul style="list-style-type: none"> <li>• Movement of people to and from the suspected premises should be restricted to the barest minimum. No other animals should be allowed in the premises.</li> <li>• Inter-sectional movements of personnel should be banned. They should not visit any other poultry farm, bird sanctuary, zoo etc.</li> <li>• Disinfection procedures should be strictly applied at the entrance of the premises.</li> <li>• Before the test results are received, the possibility of closing the markets and shops in the area may be explored in consultation with the district revenue authorities. Necessary legislative framework should be checked in this regard.</li> </ul> <p>The restrictions mentioned above should, of course, be abolished if the laboratory diagnosis proves to be negative for AI.</p>
13	De-population of affected flock	If the laboratory diagnosis is positive, the entire poultry and related material will have to be destroyed as per action plan. Ensure that all preparations are made in advance of the results, i.e .PPEs,RRTs ,bags,disinfectants etc.
14	Disposal of contaminated material and disinfection of premises	<ul style="list-style-type: none"> <li>• Identify method of disposal of carcasses and infected material. It can be by burning or burial and remain ready, accordingly. If burning method is to be adopted, inform the fire department in advance as an emergency preparedness.</li> <li>• Plastic sheets, bags/sacks, calcium hydroxide etc. is required in sufficient quantities for disposal.</li> <li>• Ensure availability of sufficient disinfectants, and related equipment.</li> </ul>

15	Media briefing by official spokesperson	In order to avoid spreading panic both in terms of public health and distress selling by poultry farmers, clear and precise briefing of the media should be made regularly by a designated official Spokesperson of the state Government.
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**Steps to be taken immediately in case an outbreak is confirmed**

These should be read in addition to the steps listed for preparedness in Annexure

1.

Sl. No.	Activity	Detailed Scheduling
□	General	<ul style="list-style-type: none"> <li>• District Collector should implement quarantine, closure of shops etc., compensation (payment and verification), maintaining supply lines for equipment etc.</li> <li>• Daily report must reach Department of Animal Husbandry and Dairying (DAHD), Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.</li> <li>• 24 hour control room should be functional in the State. Number be given to Government of India.</li> <li>• Person who will lead operations on the Animal Husbandry side should be clearly identified</li> <li>• Communication between teams and with control authority should be ensured. Allowing re-imburement of mobile bills up to a certain amount for the personnel engaged in operations can be considered.</li> </ul>

□	Declare “Infected Zones” and “Surveillance Zone”	<ul style="list-style-type: none"> <li>• Closely demarcate 1.0 KM radius zone as “Infected Zone”.</li> <li>• 1-10 KM radius zone as “Surveillance Zone”.</li> </ul>
3.	Rapid Response Teams(RRT’s)	<ul style="list-style-type: none"> <li>• Immediately mobilize already identified RRTs and assign them areas of work with specific targets.</li> </ul>
4.	Personal Protective Equipment(PPE’s)	<p>Large quantities of PPE’s are required for control &amp; containment operations. Therefore sufficient stock and continuous supplies are necessary. Two kits have been recommended by Government of India viz. for direct handlers and other than direct handlers. The N95/ N99 mask is necessary for direct handlers i.e. cullers. The PPE is very important in conduct of operations</p>

		<p>as it provides safety to the cullers/Workers/labor force will also have to be engaged at some stages of the operation especially for clean-up and culling. They will also be provided with kits. No instance of infection in persons involved in control operations has come to light in the affected countries. It has to be ensured that persons are engaged in control and containment only after being provided these kits. Points to observe are as under:</p> <ul style="list-style-type: none"> <li>• Ensure that every person involved with the outbreak must wear a PPE.</li> <li>• Availability of sufficient stock.</li> <li>• Tie-up for regular supplies during operations.</li> <li>• Kit has to be changed every time a worker moves from one infected premises to another.</li> <li>• Briefing must be given on importance of kit, its use, its disposal, and the need to change the kit on exiting an infected farm premises.</li> <li>• Kit has to be disposed of by burning on exiting a farm premises.</li> </ul>
5.	Antiviral drug (Oseltamivir or any drug recommended by Ministry of Health and Family Welfare, Government of India)	Each worker/person involved in operations must be administered Oseltamivir or any antiviral drug recommended by Ministry of Health and Family Welfare, Government of India by the Health authorities. Liaison with Health Secretary is necessary.

6.	Regulation of access to infected premises/restrictions on movement etc.	<ul style="list-style-type: none"> <li>• An absolute ban on movement of poultry and its products from and to the infected area is to be imposed.</li> <li>• All poultry and egg markets/shops in a radius of one KM from the infected site immediately be closed.</li> <li>• Movement of people to and from the farm premises to be restricted to requirements related to handling the disease with proper cover and disinfection procedures.</li> <li>• Farm personnel in the infected area should not to be allowed to visit any other poultry farm.</li> </ul>
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7.	Manner of Culling	<ul style="list-style-type: none"> <li>• Birds can be culled as per Action plan (Section 3.9)</li> </ul>
8.	Disposal	<ul style="list-style-type: none"> <li>• Dispose carcasses and other related material as per Action Plan (Section 3.10)</li> </ul>
9.	Compensation	<ul style="list-style-type: none"> <li>• Pay compensation on GOI approved rates, on the spot of culling, and keep records.</li> </ul>
10.	Clean-up and Disinfection	<ul style="list-style-type: none"> <li>• As per Action Plan (Section 3.11)</li> </ul>

## **Surveillance Plan for Avian Influenza**

Disease surveillance is an integral and key component of all government veterinary services. It is of utmost importance for animal disease emergency preparedness particularly for the diseases like Avian Influenza. This is important for early warning of diseases, planning and monitoring of disease control programmes, provision of sound animal health advice to farmers, certification of export livestock / livestock products, international reporting and evidence of freedom from diseases.

### **How will it benefit?**

- i. Surveillance will help in early detection of the disease and hence in taking the preventive actions
- ii. Knowing the epidemiology (transmission routes, virus evolution etc. ) of the disease
- iii. Risk analysis for having trade of livestock/ livestock products

### **Objectives**

1. Early detection of clinical disease and infection
2. Assess temporal and spatial patterns of the disease to improve effectiveness of control efforts
3. Demonstrate country freedom from the disease

### **Surveillance strategy**

The surveillance strategy may be divided into following parts:

Part I: Regular Surveillance (in the absence of Outbreak)

Part II: Surveillance during the Outbreak

Part III: Surveillance for 60 days after the completion of control and containment operation (Post-Operation Surveillance Plan)

## **Part I. - Regular Surveillance (in the absence of Outbreak) Avian population at risk**

There is a need to define and identify the population at risk of infection with AI in the first instance. This is done in accordance to the bird population in the area

### **Population at high risk for Avian Influenza**

- (i) Commercial birds with high density- chickens and ducks
- (ii) Backyard Birds – chickens, ducks, pigeons and other species-The biosecurity is usually poor and there is no specific population estimate or density distribution estimate for backyard birds.
- (iii) Wild/migratory birds
- (iv) Live bird markets particularly at the border areas

The risk factors for Avian Influenza are as under:

1. Disease situation in neighboring area across the border
2. States/districts previously affected by AI and adjoining states/districts
3. Shared borders with neighboring country like Bangladesh, Pakistan, Nepal, Bhutan, China and Myanmar
4. Domestic duck populations
5. Backyard bird populations
6. Number and activity of live bird markets
7. Poultry Value chain / Wholesale live bird markets
8. National sanctuaries, wetlands / lakes used by migratory/ wild birds and their proximity to domestic poultry population/establishments.
9. Captive birds

**More efforts are required in the high-risk areas/ hot spots.**

## **I.2.1 Methods of Surveillance**

### **Method of surveillance and type of samples**

#### **1. Passive Surveillance**

All stakeholders/ poultry producers/ entrepreneur, associations, private veterinary practitioners, community organizations, wildlife officials, NGO participatory groups, veterinary institutions and village animal health workers are required to report to the nearest veterinary authority for any unusual sickness or mortality in poultry and other species of birds.

i). Swab samples from sick bird and collect dead birds from specific bird populations at-risk

- Swab sample shall be taken from oro-pharynx, cloaca or fresh wet faeces.
- Tracheal samples are best for species with the virus accumulating in the respiratory tract (chickens).
- Cloacal swabs are best for species with the virus accumulating in the intestinal tract (ducks).
- Fresh, wet faeces swabs are useful for birds that are not handled (wild birds) or where it is uncommon to see sick or dead birds (live market and wild)

- Fresh droppings from live bird market and wild water bird zone

ii) Dead birds: A fresh whole carcass is extremely valuable with any species of bird. After proper wrapping, whole carcasses should be submitted for testing as per the instructions for packaging for maintenance of cold chain and mode of transport.

## 2. Active Surveillance

Active surveillance for avian influenza is a specific targeted investigation for evidence of AIV in at-risk populations based on detecting exposure to (antibody detection by serology) or the presence of (virus or antigen detection through swabs) the AIV. The veterinary authorities shall visit commercial poultry farms, backyard poultry and live bird markets (LBMs) for clinical examinations and collection of samples etc.

### Sampling plan:

- Surveillance should be carried out with multistage stratified / cluster random sampling. The following sampling frame has been constructed with the assumption of conserved prevalence rate of 2%; cluster level prevalence of 10% of 2% of animal prevalence; 90% test sensitivity; 50% Herd level sensitivity for detection of disease and 95% confidence interval.

### Sampling plan for surveillance of avian Influenza in India

Sl.No	State	District	Poultry Population	Total number of block to be sampled	Number of villages to be sampled	Number of birds to be sampled	Average No of birds per Village
1	Andaman And Nicobar Islands	Nicobars	82702	2	2	77	39
2	Andaman And Nicobar Islands	North And Middle Andaman	493083	1	1	39	39
3	Andaman And Nicobar Islands	South Andamans	665397	1	1	39	39
4	Andhra Pradesh	Anantapur	2424447	7	8	310	39
5	Andhra Pradesh	Chittoor	13691057	10	10	348	35
6	Andhra Pradesh	East Godavari	24232735	11	13	499	38
7	Andhra Pradesh	Guntur	8442945	5	5	193	39
8	Andhra Pradesh	Krishna	15657359	8	8	311	39
9	Andhra Pradesh	Kurnool	1257740	7	7	269	38
10	Andhra Pradesh	Prakasam	1288462	7	8	306	38

11	Andhra Pradesh	Spsr Nellore	2037674	9	9	346	38
12	Andhra Pradesh	Srikakulam	1987413	11	14	532	38
13	Andhra Pradesh	Visakhapatnam	5623790	20	23	844	37
14	Andhra Pradesh	Vizianagaram	5364006	10	13	496	38
15	Andhra Pradesh	West Godavari	17884222	8	8	310	39
16	Andhra Pradesh	Y.S.R.	1722536	7	7	270	39
17	Arunachal Pradesh	Anjaw	14655	3	3	91	30
18	Arunachal Pradesh	Changlang	127426	3	3	113	38
19	Arunachal Pradesh	Dibang Valley	22707	1	1	36	36
20	Arunachal Pradesh	East Kameng	147300	5	5	180	36
21	Arunachal Pradesh	East Siang	100632	1	1	38	38
22	Arunachal Pradesh	Kra Daadi	83276	2	3	111	37
23	Arunachal Pradesh	Kurung Kumey	89550	3	3	109	36
24	Arunachal Pradesh	Lohit	158630	3	3	112	37
25	Arunachal Pradesh	Longding	11065	1	1	37	37
26	Arunachal Pradesh	Lower Dibang Valley	91062	1	1	36	36
27	Arunachal Pradesh	Lower Subansiri	144371	5	5	179	36
28	Arunachal Pradesh	NAMSAI	7617	1	1	38	38
29	Arunachal Pradesh	Papum Pare	142404	4	4	148	37
30	Arunachal Pradesh	SIANG	52420	1	1	38	38
31	Arunachal Pradesh	Tawang	5162	1	1	21	21
32	Arunachal Pradesh	Tirap	33373	1	1	38	38
33	Arunachal Pradesh	Upper Siang	100860	1	1	38	38
34	Arunachal Pradesh	Upper Subansiri	77884	4	4	142	36
35	Arunachal Pradesh	West Kameng	30797	2	3	97	32
36	Arunachal Pradesh	West Siang	48421	3	3	107	36
37	Assam	BAKSA	1162702	2	5	194	39
38	Assam	Barpeta	3083824	6	7	272	39
39	Assam	Biswanath	1003735	3	7	269	38
40	Assam	BONGAIGAON	1190905	3	5	194	39
41	Assam	Cachar	1250523	5	8	305	38
42	Assam	Chirang	696055	3	4	153	38
43	Assam	DARRANG	1395156	4	4	155	39
44	Assam	DHEMAJI	1965522	5	15	569	38
45	Assam	DHUBRI	1407349	4	5	194	39
46	Assam	Dibrugarh	1977570	4	10	376	38
47	Assam	Dima Hasao	347905	3	5	188	38
48	Assam	Goalpara	1811777	3	5	194	39
49	Assam	Golaghat	2526444	3	8	310	39
50	Assam	Hailakandi	771239	2	3	116	39
51	Assam	Hojai	1133243	2	3	116	39
52	Assam	Jorhat	2015937	3	5	195	39
53	Assam	Kamrup	1816738	4	8	308	39
54	Assam	Kamrup (M)	222102	2	3	115	38
55	Assam	Karbi Anglong	1312966	3	18	647	36

56	Assam	Karimganj	1273342	5	10	376	38
57	Assam	Kokrajhar	1140785	4	8	307	38
58	Assam	Lakhimpur	1842170	5	8	311	39
59	Assam	Majuli	165631	1	3	115	38
60	Assam	Morigaon	1355252	4	5	194	39
61	Assam	Nagaon	2905187	6	7	270	39
62	Assam	Nalbari	1089745	3	4	155	39
63	Assam	Sibsagar	1262931	3	5	195	39
64	Assam	Sonitpur	1971916	3	8	309	39
65	Assam	Soraideu	620452	1	3	116	39
66	Assam	South Salmara	963577	1	3	117	39
67	Assam	Tinsukia	1795706	4	9	346	38
68	Assam	Udalguri	1536749	2	5	194	39
69	Assam	West Karbi Anglong	653705	1	5	192	38
70	Bihar	Araria	744839	4	5	185	37
71	Bihar	Arwal	84807	1	1	36	36
72	Bihar	Aurangabad	654420	6	9	318	35
73	Bihar	Banka	219999	3	5	174	35
74	Bihar	Begusarai	184677	3	3	93	31
75	Bihar	Bhagalpur	253025	4	4	142	36
76	Bihar	Bhojpur	335609	3	4	130	33
77	Bihar	Buxar	122345	2	3	86	29
78	Bihar	Darbhanga	345648	4	4	144	36
79	Bihar	Gaya	753061	10	15	517	34
80	Bihar	Gopalganj	816094	3	5	158	32
81	Bihar	Jamui	166578	3	3	96	32
82	Bihar	Jehanabad	234411	2	3	102	34
83	Bihar	Kaimur (Bhabua)	243251	4	4	127	32
84	Bihar	Katihar	783408	5	7	262	37
85	Bihar	Khagaria	78436	1	1	35	35
86	Bihar	Kishanganj	1151345	4	5	194	39
87	Bihar	Lakhisarai	90573	2	3	100	33
88	Bihar	Madhepura	136851	2	3	111	37
89	Bihar	Madhubani	251295	3	3	104	35
90	Bihar	Munger	69685	3	3	94	31
91	Bihar	Muzaffarpur	835754	5	5	178	36
92	Bihar	Nalanda	657128	4	4	147	37
93	Bihar	Nawada	314942	5	5	181	36
94	Bihar	Pashchim Champanan	390428	6	8	273	34
95	Bihar	Patna	331666	3	5	165	33
96	Bihar	Purbi Champanan	853775	4	5	183	37
97	Bihar	Purnia	1229002	3	7	264	38
98	Bihar	Rohtas	392930	5	5	162	32
99	Bihar	Saharsa	88842	2	3	98	33

100	Bihar	Samastipur	596264	4	4	145	36
101	Bihar	Saran	348448	5	5	159	32
102	Bihar	Sheikhpura	82255	2	3	98	33
103	Bihar	Sheohar	181153	1	1	39	39
104	Bihar	Sitamarhi	388252	4	4	150	38
105	Bihar	Siwan	590046	4	4	130	33
106	Bihar	Supaul	258807	3	3	110	37
107	Bihar	Vaishali	637360	5	5	165	33
108	Chandigarh	Chandigarh	12306	1	1	34	34
109	Chhattisgarh	Balod	1113763	2	5	170	34
110	Chhattisgarh	Baloda Bazar	659066	4	5	163	33
111	Chhattisgarh	Balrampur	392988	5	5	190	38
112	Chhattisgarh	Bastar	1070214	4	5	193	39
113	Chhattisgarh	Bemetara	35552	2	4	122	31
114	Chhattisgarh	Bijapur	573842	3	5	192	38
115	Chhattisgarh	Bilaspur	713941	5	7	254	36
116	Chhattisgarh	Dantewada	392041	2	3	116	39
117	Chhattisgarh	Dhamtari	324680	2	4	142	36
118	Chhattisgarh	Durg	1574524	3	3	104	35
119	Chhattisgarh	Gariyaband	303423	3	5	181	36
120	Chhattisgarh	Janjgir-Champa	352841	5	5	161	32
121	Chhattisgarh	Jashpur	514212	3	5	189	38
122	Chhattisgarh	Kabirdham (Kawardha)	143995	4	5	162	32
123	Chhattisgarh	Kanker	879243	5	9	343	38
124	Chhattisgarh	Kondagaon	749316	3	5	192	38
125	Chhattisgarh	Korba	276686	2	5	184	37
126	Chhattisgarh	Korea	424541	3	5	186	37
127	Chhattisgarh	Mahasamund	1112721	5	8	280	35
128	Chhattisgarh	Mungeli	45501	2	4	118	30
129	Chhattisgarh	Narayanpur	235706	2	3	114	38
130	Chhattisgarh	Raigarh	331901	5	8	272	34
131	Chhattisgarh	Raipur	2405183	2	3	92	31
132	Chhattisgarh	Rajnandgaon	2093647	7	10	340	34
133	Chhattisgarh	Sukma	678139	2	4	155	39
134	Chhattisgarh	Surajpur	299698	4	4	150	38
135	Chhattisgarh	Surguja	401915	3	5	190	38
136	Dadra And Nagar Haveli	Dadra And Nagar Haveli	87613	1	1	39	39
137	Daman And Diu	Daman	12935	1	1	37	37
138	Daman And Diu	Diu	2356	1	1	38	38
139	Goa	North Goa	93210	3	3	109	36
140	Goa	South Goa	243259	2	3	111	37
141	Gujarat	AHMADABAD	412166	1	1	30	30
142	Gujarat	AMRELI	574	1	1	24	24

143	Gujarat	ANAND	6996660	3	3	117	39
144	Gujarat	ARVALLI	276141	3	3	104	35
145	Gujarat	BANAS KANTHA	998170	3	3	106	35
146	Gujarat	BHARUCH	343768	4	4	143	36
147	Gujarat	BHAVNAGAR	1490071	1	1	35	35
148	Gujarat	BOTAD	65	1	1	13	13
149	Gujarat	CHHOTAUDEPUR	335488	2	4	148	37
150	Gujarat	DANG	234182	2	3	113	38
151	Gujarat	DEVBHUMI DWARKA	10573	1	1	31	31
152	Gujarat	DOHAD	542196	4	5	191	38
153	Gujarat	GANDHINAGAR	181783	1	1	32	32
154	Gujarat	GIR SOMNATH	26090	1	1	36	36
155	Gujarat	JAMNAGAR	135035	1	1	39	39
156	Gujarat	JUNAGADH	169926	1	1	36	36
157	Gujarat	KACHCHH	169311	1	1	29	29
158	Gujarat	KHEDA	1446974	3	3	100	33
159	Gujarat	MAHESANA	148213	1	1	24	24
160	Gujarat	Mahisagar	145285	3	4	142	36
161	Gujarat	MORBI	1625877	1	1	39	39
162	Gujarat	NARMADA	142291	2	4	144	36
163	Gujarat	NAVSARI	1819969	3	4	152	38
164	Gujarat	PANCH MAHALS	182069	2	4	148	37
165	Gujarat	PATAN	78844	1	1	28	28
166	Gujarat	RAJKOT	17513	1	1	31	31
167	Gujarat	SABAR KANTHA	328185	1	3	112	37
168	Gujarat	SURAT	130824	3	3	105	35
169	Gujarat	SURENDRANAGAR	247	1	1	19	19
170	Gujarat	TAPI	596430	4	4	153	38
171	Gujarat	VADODARA	367025	4	4	136	34
172	Gujarat	VALSAD	1706051	3	4	154	39
173	Haryana	AMBALA	2872727	1	1	35	35
174	Haryana	BHIWANI	696056	1	1	31	31
175	Haryana	CHARKI DADRI	1151986	1	1	39	39
176	Haryana	FARIDABAD	69663	1	1	12	12
177	Haryana	FATEHABAD	356958	1	1	29	29
178	Haryana	GURUGRAM	148532	1	1	39	39
179	Haryana	HISAR	2816778	3	3	117	39
180	Haryana	JHAJJAR	403358	1	1	29	29
181	Haryana	JIND	5539928	2	3	95	32
182	Haryana	KAITHAL	2405256	1	3	113	38
183	Haryana	KARNAL	9469646	2	3	113	38
184	Haryana	KURUKSHETRA	3508701	2	3	115	38
185	Haryana	MAHENDRAGARH	981002	1	1	38	38
186	Haryana	MEWAT	23749	1	1	28	28
187	Haryana	PALWAL	18535	1	1	25	25

188	Haryana	PANCHKULA	5874419	1	1	39	39
189	Haryana	PANIPAT	5138898	1	1	39	39
190	Haryana	REWARI	441498	1	1	39	39
191	Haryana	ROHTAK	309054	1	1	27	27
192	Haryana	SIRSA	339706	2	3	89	30
193	Haryana	SONIPAT	954534	1	1	30	30
194	Haryana	YAMUNANAGAR	1283511	1	1	39	39
195	Himachal Pradesh	Bilaspur	44585	3	3	79	26
196	Himachal Pradesh	Chamba	41142	3	4	117	29
197	Himachal Pradesh	Hamirpur	27266	3	3	65	22
198	Himachal Pradesh	Kangra	466714	11	13	301	23
199	Himachal Pradesh	Kinnaur	19516	2	3	100	33
200	Himachal Pradesh	Kullu	11131	1	1	33	33
201	Himachal Pradesh	Lahul And Spiti	1763	1	1	20	20
202	Himachal Pradesh	Mandi	31146	3	5	141	28
203	Himachal Pradesh	Shimla	26763	3	3	80	27
204	Himachal Pradesh	Sirmaur	32109	2	3	73	24
205	Himachal Pradesh	Solan	226241	2	3	69	23
206	Himachal Pradesh	Una	407628	2	3	82	27
207	Jammu And Kashmir	Anantnag	256729	2	3	108	36
208	Jammu And Kashmir	Badgam	743680	4	4	147	37
209	Jammu And Kashmir	Bandipora	236830	1	1	38	38
210	Jammu And Kashmir	Baramulla	727541	4	5	184	37
211	Jammu And Kashmir	Doda	160715	3	3	101	34
212	Jammu And Kashmir	Ganderbal	690493	2	3	110	37
213	Jammu And Kashmir	Jammu	254950	2	3	95	32
214	Jammu And Kashmir	Kargil	50719	1	1	38	38
215	Jammu And Kashmir	Kathua	761683	1	3	112	37
216	Jammu And Kashmir	Kishtwar	34374	1	1	37	37
217	Jammu And Kashmir	Kulgam	122120	2	3	111	37
218	Jammu And Kashmir	Kupwara	369723	3	4	154	39
219	Jammu And Kashmir	Leh Ladakh	9365	1	1	32	32
220	Jammu And Kashmir	Poonch	267309	1	3	114	38

221	Jammu And Kashmir	Pulwama	1125007	2	3	105	35
222	Jammu And Kashmir	Rajauri	259871	2	3	112	37
223	Jammu And Kashmir	Ramban	86400	1	1	38	38
224	Jammu And Kashmir	Reasi	125346	2	3	106	35
225	Jammu And Kashmir	Samba	297248	1	1	39	39
226	Jammu And Kashmir	Shopian	85228	2	3	89	30
227	Jammu And Kashmir	Srinagar	338005	1	1	39	39
228	Jammu And Kashmir	Udhampur	65199	2	3	97	32
229	Jharkhand	Bokaro	1605248	4	5	192	38
230	Jharkhand	Chatra	658794	6	9	333	37
231	Jharkhand	Deoghar	476924	5	9	327	36
232	Jharkhand	Dhanbad	908600	5	9	336	37
233	Jharkhand	Dumka	823632	7	15	545	36
234	Jharkhand	East Singhbhum	1719563	5	13	494	38
235	Jharkhand	Garhwa	379010	5	5	183	37
236	Jharkhand	Giridih	972304	7	15	528	35
237	Jharkhand	Godda	480542	6	9	327	36
238	Jharkhand	Gumla	1358175	6	8	307	38
239	Jharkhand	Hazaribagh	2531137	8	9	337	37
240	Jharkhand	Jamtara	486423	4	8	297	37
241	Jharkhand	Khunti	923729	3	5	193	39
242	Jharkhand	Koderma	136855	1	3	105	35
243	Jharkhand	Latehar	512911	5	5	188	38
244	Jharkhand	Lohardaga	397648	3	3	115	38
245	Jharkhand	Pakur	765367	6	9	338	38
246	Jharkhand	Palamu	584693	6	9	324	36
247	Jharkhand	Ramgarh	378244	3	3	113	38
248	Jharkhand	Ranchi	2295671	8	10	385	39
249	Jharkhand	Sahebganj	571484	7	9	331	37
250	Jharkhand	Saraikela Kharsawan	1876084	5	9	346	38
251	Jharkhand	Simdega	972648	3	4	155	39
252	Jharkhand	West Singhbhum	2467535	12	14	540	39
253	Karnataka	Bagalkot	1232006	3	5	186	37
254	Karnataka	Bangalore Rural	6920484	4	9	338	38
255	Karnataka	Belgaum	2401806	4	9	333	37
256	Karnataka	Bellary	1623782	4	5	185	37
257	Karnataka	Bengaluru Urban	1140676	3	5	181	36
258	Karnataka	Bidar	719742	3	5	179	36
259	Karnataka	Bijapur	257604	4	5	187	37

260	Karnataka	Chamarajanagar	714869	2	5	184	37
261	Karnataka	Chikballapur	2369133	5	13	470	36
262	Karnataka	Chikmagalur	2329590	3	7	261	37
263	Karnataka	Chitradurga	1720490	3	5	185	37
264	Karnataka	Dakshin Kannad	2520478	1	3	116	39
265	Karnataka	Davangere	2537666	4	5	187	37
266	Karnataka	Dharwad	1232694	2	3	106	35
267	Karnataka	Gadag	356419	2	3	113	38
268	Karnataka	Gulbarga	352803	5	7	263	38
269	Karnataka	Hassan	2305793	8	17	597	35
270	Karnataka	Haveri	353648	3	5	183	37
271	Karnataka	Kodagu	180391	2	3	114	38
272	Karnataka	Kolar	8595908	4	13	483	37
273	Karnataka	Koppal	3949597	4	5	185	37
274	Karnataka	Mandya	2158272	6	13	479	37
275	Karnataka	Mysore	3053419	5	9	330	37
276	Karnataka	Raichur	371320	3	5	183	37
277	Karnataka	Ramanagara	2341718	3	5	185	37
278	Karnataka	Shimoga	2009697	7	13	476	37
279	Karnataka	Tumkur	1590097	8	17	618	36
280	Karnataka	Udupi	1109892	1	3	117	39
281	Karnataka	Uttar Kannad	508655	6	9	326	36
282	Karnataka	Yadgir	288964	3	4	153	38
283	Kerala	Alappuzha	1681242	5	9	344	38
284	Kerala	Ernakulam	3823577	5	10	384	38
285	Kerala	Idukki	713593	4	7	267	38
286	Kerala	Kannur	1160529	3	9	343	38
287	Kerala	Kasaragod	588298	3	5	190	38
288	Kerala	Kollam	1395509	4	9	346	38
289	Kerala	Kottayam	2135123	5	9	346	38
290	Kerala	Kozhikode	1561678	3	9	346	38
291	Kerala	Malappuram	5652228	7	15	581	39
292	Kerala	Palakkad	1943315	5	13	497	38
293	Kerala	Pathanamthitta	724712	4	7	267	38
294	Kerala	Thiruvananthapuram	2218638	5	10	385	39
295	Kerala	Thrissur	3180459	6	13	498	38
296	Kerala	Wayanad	784245	3	4	154	39
297	Lakshadweep	Lakshadweep District	226025	1	1	39	39
298	Madhya Pradesh	AGAR MALWA	64759	2	3	94	31
299	Madhya Pradesh	ALIRAJPUR	1341029	4	5	194	39
300	Madhya Pradesh	ANUPPUR	348794	1	4	142	36
301	Madhya Pradesh	ASHOKNAGAR	11574	3	3	84	28
302	Madhya Pradesh	BALAGHAT	646969	6	9	332	37
303	Madhya Pradesh	BARWANI	814422	5	5	192	38

304	Madhya Pradesh	BETUL	503411	5	8	288	36
305	Madhya Pradesh	BHIND	13579	2	3	57	19
306	Madhya Pradesh	BHOPAL	1147007	2	3	101	34
307	Madhya Pradesh	BURHANPUR	94686	2	3	113	38
308	Madhya Pradesh	CHHATARPUR	162769	3	4	127	32
309	Madhya Pradesh	CHHINDWARA	599988	8	13	462	36
310	Madhya Pradesh	DAMOH	23099	3	3	82	27
311	Madhya Pradesh	DATIA	7143	1	1	29	29
312	Madhya Pradesh	DEWAS	111755	5	5	164	33
313	Madhya Pradesh	DHAR	661361	4	10	370	37
314	Madhya Pradesh	DINDORI	217730	2	5	181	36
315	Madhya Pradesh	EAST NIMAR	113382	3	4	138	35
316	Madhya Pradesh	GUNA	40273	2	3	84	28
317	Madhya Pradesh	GWALIOR	21241	1	1	27	27
318	Madhya Pradesh	HARDA	33512	2	3	90	30
319	Madhya Pradesh	HOSHANGABAD	391235	3	3	94	31
320	Madhya Pradesh	INDORE	652523	2	3	94	31
321	Madhya Pradesh	JABALPUR	2578193	4	4	120	30
322	Madhya Pradesh	JHABUA	604032	3	5	189	38
323	Madhya Pradesh	KATNI	84379	2	3	84	28
324	Madhya Pradesh	KHARGONE	448599	6	8	293	37
325	Madhya Pradesh	MANDLA	350982	5	9	324	36
326	Madhya Pradesh	Mandsaur	150471	3	3	93	31
327	Madhya Pradesh	MORENA	148789	1	1	34	34
328	Madhya Pradesh	NARSINGHPUR	38073	1	3	74	25
329	Madhya Pradesh	NEEMUCH	42655	2	3	99	33
330	Madhya Pradesh	PANNA	39131	2	3	93	31
331	Madhya Pradesh	RAISEN	118318	4	4	123	31
332	Madhya Pradesh	RAJGARH	65368	3	3	72	24
333	Madhya Pradesh	RATLAM	285766	3	5	172	34
334	Madhya Pradesh	REWA	190577	4	4	111	28
335	Madhya Pradesh	SAGAR	268764	3	4	131	33
336	Madhya Pradesh	SATNA	33607	4	4	110	28
337	Madhya Pradesh	SEHORE	422972	2	3	94	31
338	Madhya Pradesh	SEONI	270387	5	9	311	35
339	Madhya Pradesh	SHAHDOL	128783	3	5	176	35
340	Madhya Pradesh	SHAJAPUR	115309	2	3	94	31
341	Madhya Pradesh	SHEOPUR	79291	2	3	103	34
342	Madhya Pradesh	SHIVPURI	76066	3	3	87	29
343	Madhya Pradesh	SIDHI	329380	3	5	179	36
344	Madhya Pradesh	SINGRAULI	153729	3	3	100	33
345	Madhya Pradesh	TIKAMGARH	195278	4	4	145	36
346	Madhya Pradesh	UJJAIN	165243	4	5	155	31
347	Madhya Pradesh	UMARIA	38347	3	3	88	29
348	Madhya Pradesh	VIDISHA	66249	2	3	83	28

349	Maharashtra	Ahmednagar	8873277	9	13	488	38
350	Maharashtra	Akola	172329	3	4	130	33
351	Maharashtra	Amravati	1354790	6	8	276	35
352	Maharashtra	Aurangabad	588410	4	5	177	35
353	Maharashtra	Beed	1518757	6	9	340	38
354	Maharashtra	Bhandara	308771	4	5	187	37
355	Maharashtra	Buldhana	382316	5	7	250	36
356	Maharashtra	Chandrapur	613191	7	10	350	35
357	Maharashtra	Dhule	2034701	3	5	189	38
358	Maharashtra	Gadchiroli	1000162	8	13	478	37
359	Maharashtra	Gondia	638646	6	7	258	37
360	Maharashtra	Hingoli	164901	3	4	145	36
361	Maharashtra	Jalgaon	973088	7	9	319	35
362	Maharashtra	Jalna	285232	4	5	183	37
363	Maharashtra	Kolhapur	3355513	7	9	343	38
364	Maharashtra	Latur	487497	3	5	179	36
365	Maharashtra	Nagpur	1188064	8	9	320	36
366	Maharashtra	Nanded	520416	5	9	325	36
367	Maharashtra	Nandurbar	871011	3	8	301	38
368	Maharashtra	Nashik	7986337	7	13	463	36
369	Maharashtra	Osmanabad	641100	2	4	149	37
370	Maharashtra	Palghar	1949941	4	7	270	39
371	Maharashtra	Parbhani	148906	4	5	175	35
372	Maharashtra	Pune	16328944	8	14	538	38
373	Maharashtra	Raigad	4023573	9	14	527	38
374	Maharashtra	Ratnagiri	854899	7	13	479	37
375	Maharashtra	Sangli	3451043	4	5	192	38
376	Maharashtra	Satara	3972978	8	14	533	38
377	Maharashtra	Sindhudurg	913433	4	5	192	38
378	Maharashtra	Solapur	3085687	6	9	347	39
379	Maharashtra	Thane	2949932	4	7	268	38
380	Maharashtra	Wardha	266387	4	5	170	34
381	Maharashtra	Washim	117289	3	4	134	34
382	Maharashtra	Yavatmal	758019	9	13	451	35
383	Manipur	Bishnupur	997753	1	1	39	39
384	Manipur	Chandel	179316	2	4	148	37
385	Manipur	Churachandpur	159717	3	5	180	36
386	Manipur	Imphal East	641026	2	3	116	39
387	Manipur	Imphal West	659017	2	3	116	39
388	Manipur	Senapati	477638	4	7	257	37
389	Manipur	Tamenglong	228476	2	3	115	38
390	Manipur	Thoubal	652374	1	3	117	39
391	Manipur	Ukhrul	641464	3	3	116	39
392	Meghalaya	East Garo Hills	369472	3	5	191	38
393	Meghalaya	East Jaintia Hills	131351	1	3	114	38

394	Meghalaya	East Khasi Hills	652622	6	8	302	38
395	Meghalaya	North Garo Hills	603467	2	4	154	39
396	Meghalaya	Ri Bhoi	521596	2	5	189	38
397	Meghalaya	South Garo Hills	529934	2	5	190	38
398	Meghalaya	South West Garo Hills	327417	2	4	152	38
399	Meghalaya	South West Khasi Hills	181962	2	3	112	37
400	Meghalaya	West Garo Hills	1010627	4	9	343	38
401	Meghalaya	West Jaintia Hills	258775	3	3	114	38
402	Meghalaya	West Khasi Hills	592029	3	7	265	38
403	Mizoram	AIZAWL	379453	1	1	39	39
404	Mizoram	CHAMPHAI	192109	1	1	39	39
405	Mizoram	KOLASIB	78263	1	1	39	39
406	Mizoram	LAWNGTLAI	186038	3	3	115	38
407	Mizoram	LUNGLEI	185997	3	3	115	38
408	Mizoram	MAMIT	106694	1	1	39	39
409	Mizoram	SERCHHIP	91962	1	1	39	39
410	Mizoram	SIAHA	90298	1	1	38	38
411	Nagaland	Dimapur	392220	2	3	116	39
412	Nagaland	Kiphire	101856	1	1	38	38
413	Nagaland	Kohima	231200	1	1	39	39
414	Nagaland	Longleng	65254	1	1	38	38
415	Nagaland	Mokokchung	195568	1	1	38	38
416	Nagaland	Mon	229886	3	3	116	39
417	Nagaland	Peren	230657	1	1	39	39
418	Nagaland	Phek	349283	1	1	39	39
419	Nagaland	Tuensang	214492	3	3	115	38
420	Nagaland	Wokha	137611	2	3	114	38
421	Nagaland	Zunheboto	252473	3	3	116	39
422	Odisha	Anugul	217538	5	7	234	33
423	Odisha	Balangir	2114531	8	13	481	37
424	Odisha	Baleshwar	1606672	11	19	695	37
425	Odisha	Bargarh	486179	8	9	331	37
426	Odisha	Bhadrak	327343	8	8	289	36
427	Odisha	Boudh	106730	4	7	230	33
428	Odisha	Cuttack	1394075	7	7	241	34
429	Odisha	Deogarh	164375	3	5	178	36
430	Odisha	Dhenkanal	782533	4	5	170	34
431	Odisha	Gajapati	354525	6	13	459	35
432	Odisha	Ganjam	2921615	12	15	476	32
433	Odisha	Jagatsinghapur	492074	4	4	141	35
434	Odisha	Jajapur	319604	7	9	306	34
435	Odisha	Jharsuguda	127593	3	3	110	37
436	Odisha	Kalahandi	785947	11	15	542	36

437	Odisha	Kandhamal	465432	12	18	616	34
438	Odisha	Kendrapara	442491	4	7	250	36
439	Odisha	Kendujhar	2000497	11	15	564	38
440	Odisha	Khordha	1539947	3	5	169	34
441	Odisha	Koraput	985806	10	15	536	36
442	Odisha	Malkangiri	580637	4	8	301	38
443	Odisha	Mayurbhanj	3726144	19	29	1103	38
444	Odisha	Nabarangpur	660843	7	7	267	38
445	Odisha	Nayagarh	625522	5	5	164	33
446	Odisha	Nuapada	299392	3	5	186	37
447	Odisha	Puri	585567	4	4	129	32
448	Odisha	Rayagada	452338	7	17	595	35
449	Odisha	Sambalpur	500497	6	9	328	36
450	Odisha	Sonepur	351574	3	5	175	35
451	Odisha	Sundargarh	1416759	11	14	519	37
452	Puducherry	Karaikal	53140	1	1	39	39
453	Puducherry	Pondicherry	95273	1	1	38	38
454	Punjab	Amritsar	270907	2	3	75	25
455	Punjab	Barnala	2353044	1	1	39	39
456	Punjab	Bathinda	260616	3	3	88	29
457	Punjab	Faridkot	50162	1	1	29	29
458	Punjab	Fatehgarh Sahib	344835	1	1	23	23
459	Punjab	Fazilka	62459	1	1	32	32
460	Punjab	Firozepur	421066	1	1	32	32
461	Punjab	Gurdaspur	876616	1	3	81	27
462	Punjab	Hoshiarpur	1010547	3	3	75	25
463	Punjab	Jalandhar	135232	2	3	87	29
464	Punjab	Kapurthala	154784	1	1	31	31
465	Punjab	Ludhiana	2707781	2	3	77	26
466	Punjab	Mansa	239210	2	3	85	28
467	Punjab	Moga	133304	1	1	33	33
468	Punjab	Muktsar	154548	1	3	93	31
469	Punjab	Nawanshahr (Sbs Nagar)	127569	1	1	22	22
470	Punjab	Pathankot	946418	1	1	39	39
471	Punjab	Patiala	1907900	2	3	68	23
472	Punjab	Rupnagar	185720	1	1	28	28
473	Punjab	S.A.S Nagar	1835127	1	1	29	29
474	Punjab	Sangrur	2531510	2	3	116	39
475	Punjab	Tarn Taran	175072	1	1	28	28
476	Rajasthan	Ajmer	7380116	5	5	178	36
477	Rajasthan	Alwar	428008	4	5	154	31
478	Rajasthan	Banswara	394366	5	9	330	37
479	Rajasthan	Baran	35850	3	4	121	30
480	Rajasthan	Barmer	10253	2	3	78	26

481	Rajasthan	Bharatpur	192663	3	4	103	26
482	Rajasthan	Bhilwara	383178	5	5	129	26
483	Rajasthan	Bikaner	5133	1	1	26	26
484	Rajasthan	Bundi	12572	2	3	76	25
485	Rajasthan	Chittorgarh	61209	4	5	142	28
486	Rajasthan	Churu	184117	1	1	23	23
487	Rajasthan	Dausa	18406	1	1	23	23
488	Rajasthan	Dholpur	639	1	1	23	23
489	Rajasthan	Dungarpur	135922	3	5	180	36
490	Rajasthan	Ganganagar	66777	6	7	144	21
491	Rajasthan	Hanumangarh	173006	1	3	74	25
492	Rajasthan	Jaipur	898573	3	3	79	26
493	Rajasthan	Jaisalmer	3133	1	1	30	30
494	Rajasthan	Jalore	6929	3	3	68	23
495	Rajasthan	Jhalawar	15761	2	3	72	24
496	Rajasthan	Jhunjhunu	2115230	3	3	111	37
497	Rajasthan	Jodhpur	29345	3	3	71	24
498	Rajasthan	Karauli	9886	1	1	15	15
499	Rajasthan	Kota	12771	3	3	73	24
500	Rajasthan	Nagaur	80421	3	3	67	22
501	Rajasthan	Pali	78290	3	3	82	27
502	Rajasthan	Pratapgarh	97925	5	5	173	35
503	Rajasthan	Rajsamand	24699	2	3	75	25
504	Rajasthan	Sawai Madhopur	5435	1	1	25	25
505	Rajasthan	Sikar	366799	2	3	63	21
506	Rajasthan	Sirohi	49500	3	3	91	30
507	Rajasthan	Tonk	44335	3	3	79	26
508	Rajasthan	Udaipur	333540	4	9	304	34
509	Sikkim	East District	155086	1	1	38	38
510	Sikkim	North District	38269	1	1	38	38
511	Sikkim	South District	242355	3	3	116	39
512	Sikkim	West District	136586	1	1	39	39
513	Tamil Nadu	Ariyalur	276334	2	3	115	38
514	Tamil Nadu	Coimbatore	7517816	3	3	116	39
515	Tamil Nadu	Cuddalore	988461	5	7	266	38
516	Tamil Nadu	Dharmapuri	4233851	3	4	155	39
517	Tamil Nadu	Dindigul	3843526	3	3	116	39
518	Tamil Nadu	Erode	4414538	3	3	117	39
519	Tamil Nadu	Kanchipuram	348679	6	7	259	37
520	Tamil Nadu	Kanniyakumari	540427	2	3	117	39
521	Tamil Nadu	Karur	967820	2	3	117	39
522	Tamil Nadu	Krishnagiri	5927072	3	5	193	39
523	Tamil Nadu	Madurai	607352	3	5	192	38
524	Tamil Nadu	Nagapattinam	499387	3	4	152	38
525	Tamil Nadu	Namakkal	45874041	3	4	156	39

526	Tamil Nadu	Perambalur	423200	2	3	114	38
527	Tamil Nadu	Pudukkottai	2029956	4	5	194	39
528	Tamil Nadu	Ramanathapuram	564524	2	4	154	39
529	Tamil Nadu	Salem	4756640	4	5	194	39
530	Tamil Nadu	Sivaganga	1085155	2	5	195	39
531	Tamil Nadu	Thanjavur	734965	4	7	268	38
532	Tamil Nadu	The Nilgiris	17243	1	1	37	37
533	Tamil Nadu	Theni	483468	1	1	39	39
534	Tamil Nadu	Thiruvallur	687524	4	5	191	38
535	Tamil Nadu	Thiruvarur	334351	5	5	191	38
536	Tamil Nadu	Tiruchirappalli	1614450	4	4	154	39
537	Tamil Nadu	Tirunelveli	1622543	3	4	154	39
538	Tamil Nadu	Tiruppur	16166325	3	3	117	39
539	Tamil Nadu	Tiruvannamalai	444587	5	7	256	37
540	Tamil Nadu	Tuticorin	621077	3	4	153	38
541	Tamil Nadu	Vellore	1776732	5	5	190	38
542	Tamil Nadu	Villupuram	1571623	5	10	351	35
543	Tamil Nadu	Virudhunagar	896792	4	4	154	39
544	Telangana	Adilabad	526023	4	4	153	38
545	Telangana	BHADRADRI KOTHAGUDEM	1460261	3	3	117	39
546	Telangana	Jagitial	835921	3	3	116	39
547	Telangana	JANGOAN	869635	3	3	116	39
548	Telangana	JAYASHANKAR BHUPALAPALLY	907043	4	4	155	39
549	Telangana	JOGULAMBA GADWAL	1427600	2	3	113	38
550	Telangana	KAMAREDDY	1374120	4	4	152	38
551	Telangana	Karimnagar	2136232	3	3	116	39
552	Telangana	Khammam	2032339	3	3	117	39
553	Telangana	KUMURAM BHEEM ASIFABAD	440758	3	3	114	38
554	Telangana	MAHABUBABAD	1080295	3	3	117	39
555	Telangana	Mahbubnagar	2724330	5	5	194	39
556	Telangana	MANCHERIAL	849358	3	3	115	38
557	Telangana	Medak	2456691	3	3	116	39
558	Telangana	MEDCHAL MALKAJGIRI	3942924	1	1	39	39
559	Telangana	NAGARKURNOOL	2451040	3	3	116	39
560	Telangana	Nalgonda	4355250	5	5	194	39
561	Telangana	Nirmal	480886	3	3	113	38
562	Telangana	Nizamabad	1666115	4	4	154	39
563	Telangana	PEDDAPALLI	961509	3	3	116	39
564	Telangana	RAJANNA SIRCILLA	740238	2	3	116	39
565	Telangana	Rangareddi	21982388	3	4	154	39
566	Telangana	SANGAREDDY	1205316	4	5	186	37

567	Telangana	SIDDIPET	8927618	3	3	116	39
568	Telangana	SURYAPET	1867509	3	3	117	39
569	Telangana	VIKARABAD	522617	4	4	150	38
570	Telangana	WANAPARTHY	751266	3	3	116	39
571	Telangana	Warangal Rural	1940649	2	3	117	39
572	Telangana	WARANGAL URBAN	559852	1	1	39	39
573	Telangana	YADADRI BHUVANAGIRI	4371643	2	3	116	39
574	Tripura	Dhalai	471455	3	3	116	39
575	Tripura	Gomati	625054	2	3	117	39
576	Tripura	Khowai	378210	1	1	39	39
577	Tripura	North Tripura	299665	3	3	117	39
578	Tripura	Sepahijala	775883	3	3	117	39
579	Tripura	South Tripura	627842	3	3	117	39
580	Tripura	Unakoti	263032	1	1	39	39
581	Tripura	West Tripura	446363	3	3	117	39
582	Uttar Pradesh	Agra	82439	1	1	24	24
583	Uttar Pradesh	Aligarh	199986	3	3	61	20
584	Uttar Pradesh	Allahabad	253831	3	5	157	31
585	Uttar Pradesh	Ambedkar Nagar	255076	3	3	85	28
586	Uttar Pradesh	Amethi	673650	2	3	97	32
587	Uttar Pradesh	Amroha	24294	3	3	73	24
588	Uttar Pradesh	Auraiya	30999	1	1	29	29
589	Uttar Pradesh	Azamgarh	904389	5	9	290	32
590	Uttar Pradesh	Baghpat	19842	1	1	32	32
591	Uttar Pradesh	Bahraich	172276	3	4	128	32
592	Uttar Pradesh	Ballia	152892	2	4	132	33
593	Uttar Pradesh	Balrampur	99505	2	3	83	28
594	Uttar Pradesh	Banda	18207	2	3	78	26
595	Uttar Pradesh	Barabanki	874543	3	3	81	27
596	Uttar Pradesh	Bareilly	162064	3	3	70	23
597	Uttar Pradesh	Basti	59135	1	3	87	29
598	Uttar Pradesh	Bijnor	330039	2	4	101	25
599	Uttar Pradesh	Budaun	230676	2	3	68	23
600	Uttar Pradesh	Bulandshahr	32607	3	3	78	26
601	Uttar Pradesh	Chandauli	269054	2	3	105	35
602	Uttar Pradesh	Chitrakoot	66313	2	3	75	25
603	Uttar Pradesh	Deoria	208526	3	4	123	31
604	Uttar Pradesh	Etah	35230	1	1	26	26
605	Uttar Pradesh	Etawah	54766	1	1	28	28
606	Uttar Pradesh	Faizabad	515662	2	3	76	25
607	Uttar Pradesh	Farrukhabad	8180	1	1	10	10
608	Uttar Pradesh	Fatehpur	448585	3	3	77	26
609	Uttar Pradesh	Firozabad	35306	1	1	21	21

610	Uttar Pradesh	Gautam Buddha Nagar	90902	1	1	17	17
611	Uttar Pradesh	Ghaziabad	158358	1	1	34	34
612	Uttar Pradesh	Ghazipur	70069	3	4	113	28
613	Uttar Pradesh	Gonda	176234	3	3	87	29
614	Uttar Pradesh	Gorakhpur	360697	3	3	70	23
615	Uttar Pradesh	Hamirpur	26425	2	3	83	28
616	Uttar Pradesh	Hapur	10319	3	3	68	23
617	Uttar Pradesh	Hardoi	63884	1	3	81	27
618	Uttar Pradesh	Hathras	76685	1	1	20	20
619	Uttar Pradesh	Jalaun	10002	1	1	26	26
620	Uttar Pradesh	Jaunpur	102333	3	5	133	27
621	Uttar Pradesh	Jhansi	20444	3	3	77	26
622	Uttar Pradesh	Kannauj	3403	1	1	21	21
623	Uttar Pradesh	Kanpur Dehat	24390	1	1	24	24
624	Uttar Pradesh	Kanpur Nagar	558710	1	1	28	28
625	Uttar Pradesh	Kasganj	3477	1	1	15	15
626	Uttar Pradesh	Kaushambi	34397	2	3	94	31
627	Uttar Pradesh	Kheri	531739	3	5	165	33
628	Uttar Pradesh	Kushi Nagar	383894	3	3	100	33
629	Uttar Pradesh	Lalitpur	22914	1	3	78	26
630	Uttar Pradesh	Lucknow	75460	3	3	90	30
631	Uttar Pradesh	Maharajganj	78591	1	4	111	28
632	Uttar Pradesh	Mahoba	11595	2	3	82	27
633	Uttar Pradesh	Mainpuri	27137	1	1	36	36
634	Uttar Pradesh	Mathura	12505	2	3	50	17
635	Uttar Pradesh	Mau	122656	2	3	97	32
636	Uttar Pradesh	Meerut	384405	2	3	71	24
637	Uttar Pradesh	Mirzapur	258574	3	3	84	28
638	Uttar Pradesh	Moradabad	99104	1	3	78	26
639	Uttar Pradesh	Muzaffarnagar	21442	2	3	57	19
640	Uttar Pradesh	Pilibhit	22125	3	3	59	20
641	Uttar Pradesh	Pratapgarh	121005	2	3	94	31
642	Uttar Pradesh	Rae Bareli	49824	3	3	71	24
643	Uttar Pradesh	Rampur	80653	3	3	71	24
644	Uttar Pradesh	Saharanpur	509461	3	3	64	21
645	Uttar Pradesh	Sambhal	24000	1	1	23	23
646	Uttar Pradesh	Sant Kabeer Nagar	88403	3	3	78	26
647	Uttar Pradesh	Sant Ravidas Nagar	30488	2	3	84	28
648	Uttar Pradesh	Shahjahanpur	89799	2	3	69	23
649	Uttar Pradesh	Shamli	293671	1	1	25	25
650	Uttar Pradesh	Shravasti	10257	1	1	32	32
651	Uttar Pradesh	Siddharth Nagar	25848	3	3	82	27
652	Uttar Pradesh	Sitapur	282750	3	3	73	24
653	Uttar Pradesh	Sonbhadra	150200	3	4	132	33

654	Uttar Pradesh	Sultanpur	70995	3	3	85	28
655	Uttar Pradesh	Unnao	35656	3	3	72	24
656	Uttar Pradesh	Varanasi	116789	2	3	98	33
657	Uttarakhand	Almora	71527	4	9	249	28
658	Uttarakhand	Bageshwar	17738	3	3	72	24
659	Uttarakhand	chamoli	32694	3	3	84	28
660	Uttarakhand	Champawat	118344	3	3	85	28
661	Uttarakhand	Dehradun	517965	3	3	94	31
662	Uttarakhand	Haridwar	272583	3	3	93	31
663	Uttarakhand	Nainital	630893	3	4	129	32
664	Uttarakhand	Pauri Garhwal	41357	5	8	168	21
665	Uttarakhand	Pithoragarh	89951	3	5	135	27
666	Uttarakhand	Rudraprayag	22328	1	3	79	26
667	Uttarakhand	Tehri Garhwal	57604	4	5	147	29
668	Uttarakhand	Udham Singh Nagar	2763453	3	4	151	38
669	Uttarakhand	Uttarkashi	27140	2	3	88	29
670	West Bengal	24 Paraganas North	6350349	13	13	503	39
671	West Bengal	24 Paraganas South	9194373	11	17	658	39
672	West Bengal	Alipurduar	1307855	3	3	117	39
673	West Bengal	Bankura	5355914	15	28	1040	37
674	West Bengal	Bardhaman	7376879	13	17	655	39
675	West Bengal	Birbhum	4570309	14	18	689	38
676	West Bengal	Coochbehar	1911846	7	9	343	38
677	West Bengal	Darjeeling	796490	4	5	193	39
678	West Bengal	Dinajpur Dakshin	1844318	6	13	493	38
679	West Bengal	Dinajpur Uttar	2573752	6	13	500	38
680	West Bengal	Hooghly	3538794	9	15	573	38
681	West Bengal	Howrah	1333590	6	7	269	38
682	West Bengal	Jalpaiguri	1284820	3	4	156	39
683	West Bengal	Jhargram	3265416	8	19	722	38
684	West Bengal	KALIMPONG	316468	1	1	39	39
685	West Bengal	Maldah	2975414	7	13	499	38
686	West Bengal	Medinipur East	4150302	13	23	875	38
687	West Bengal	Medinipur West	5133056	16	39	1455	37
688	West Bengal	Murshidabad	4695719	10	15	546	36
689	West Bengal	Nadia	3301850	7	9	349	39
690	West Bengal	PASCHIM BARDHAMAN	545340	4	4	153	38
691	West Bengal	Purulia	4065861	12	19	731	38
<b>TOTAL</b>				<b>2356</b>	<b>3371</b>	<b>119455</b>	<b>35</b>

- The State Animal Husbandry Departments should ensure the collection and transportation of the samples in accordance with the sampling plan. From each district, the birds to be sampled should be from organized and backyard farms/units and live bird markets from the specified number of blocks and villages as per the surveillance plan. Environmental samples viz. cage swabs/knife swabs, droppings in the cages and waste water from live bird markets, drinking water (various points of water source/drinkers etc.), droppings in the cages and waste water from organized and backyard farms/units, water from waterbodies nearby the farm (water along with the sediments collected at the banks from various points pooled into one sample of 200 ml) should also be collected.
- The total number of birds to be sampled from each district given in the sampling plan is for chicken only. Additionally, same number of birds from other species like ducks, pigeon, guinea fowl, quail, turkey etc. need to be sampled in accordance to their proportion in the districts where their combined population is more than 10% of the poultry population. In districts where the combined population of other species is less than 10% of the poultry population, the proportionate number of birds to be sampled from other species may be 25% of the number of poultry birds to be sampled from the districts. The cloacal and oropharyngeal swabs need to be collected from all the required number of birds and serum samples need to be collected from 50% of the birds only. The samples must be labeled bird wise accordingly.
- The State at its discretion decide on the districts to be covered on a monthly basis in such a way that each district will be covered only once in a year. For example, if 12 districts are to be covered from a State in a year, the samples will be sent from one district in each month. In State with less than 12 districts, the monthly schedule will be same as that of number of districts. The monitoring of the sample collection status will be carried out by RDDDLs in collaboration with State Animal Husbandry Departments.
- The district level officer may decide at his/her own discretion the blocks and villages (as per the number required) from where the samples need to be collected. The quality of samples collected should be monitored and the samples need to be sent within 7 days of their collection in cold chain.
- The State shall send 70% of samples from each district covered in a month to the respective RDDDLs and 30% to NIHSAD with the epidemiological enquiry form at village level.

- The test results carried out at RDDDLs shall be shared with ICAR-NIHSAD in addition to DAHD.
- The RDDDLs shall send all the positive samples including sera samples (Influenza A/subtyped by any test) to NIHSAD for confirmation and characterization and NIHSAD shall send the result of these samples to the respective RDDDL in addition to DAHD and respective State Government.

### **Wild birds and Domestic poultry in Buffer Zones**

Dead bird surveillance should be carried out in all identified wild life sanctuaries/ water bodies & buffer zone around such areas especially in case of abnormal mortality of wild birds/ in poultry farms nearby. Fresh fecal samples of wild birds may be collected from their nesting places and waterbodies. Wildlife officials, conservation organizations, participatory groups and the public residing in the vicinity of water bodies are required to report dead birds to DAHO for sampling. After proper wrapping, whole carcasses should be submitted for testing at NIHSAD/RDDLs. Migratory waterfowl may be sampled by collecting fresh wet feces from areas used overnight by the birds in conjunction with wildlife officials.

Adequate number of fecal samples are to be taken once monthly at each designated wildlife sanctuaries / water bodies during the wild bird migration season from September to March of each year.

Adequate number of serum samples from domestic poultry should be collected from buffer zones (national park, lake and watershed areas) and buffer zone of each water bodies during the wild bird migration season (September to March). Border vigilance by the states bordering the neighboring countries shall be stepped up.

All the samples for testing should be sent with the epidemiological enquiry form at village level.

### **Surveillance data collection, analysis, monitoring and reporting**

Data shall be compiled, analyzed, monitored, and a report has to be submitted by the State Veterinary Epidemiology Centre in electronic form every month to DAHD, NIHSAD, RDDDL and respective State Directorates (AH).

## Part II- Surveillance during Avian Influenza Outbreak

A specific surveillance strategy shall be applied in the Infected and High Alert Zones.

### Surveillance during outbreak:

Surveillance Team may include DAHO/ Veterinarian, Veterinary Technician and Helper. The number of surveillance teams shall depend upon number and size of the outbreak, and risk. Such teams shall be appointed by Director, AH of the State and shall work in association with control room. Such teams shall formulate surveillance program and road map in their respective areas as per the surveillance plan.

#### 1. Activities to be carried out in the Infection Zone:(up to 1 kilometer radius)

- i. AI surveillance shall be carried out during culling activities
- ii. After culling, cleaning, and disinfection, environmental sampling shall be carried out
- iii. When re-stocking is allowed, clinical observation and sampling shall be carried out
- iv. Infected premises shall be visited by the veterinarian weekly for three months to inspect the sealed gate, burial site, and to confirm no restocking of poultry.

#### 2. Activities to be carried out in the Surveillance (High Alert) Zone: (up to 10 kilometers outside infected zone)

- i. Visit all commercial poultry and backyard premises- clinical surveillance followed by sampling of sick/ dead birds on daily basis.
- ii. Visit live bird markets, poultry distributors, slaughter facilities, and other key stakeholders on daily basis.
- iii. Conduct community dialogue and sample collection as indicated based on clinical surveillance on daily basis.

## PartIII:- Surveillance for 60 days after the completion of control and containment operation (Post Operation Surveillance Plan)

### Formation of the Surveillance Team

The number of surveillance teams shall depend upon number and size of the outbreak, and risk. Such teams shall be appointed by Director, AH. Such teams shall formulate surveillance program and road map in their respective areas as per the post-operative surveillance plan.

The surveillance teams shall be responsible for regular surveillance of backyard birds including live bird market and commercial poultry area/farms in their territory. Surveillance team shall report at least twice a week to Director, AHD. They are also responsible to monitor the illegal import and transport of any kind of poultry and poultry products. They shall monitor the local market and poultry outlets. Surveillance activities shall be carried out in the infected zone, surveillance zone and dangerous contact and in whole district and risk areas of adjoining districts.

### **Sampling and Testing Methodology:**

- Samples need to be collected from 1-10 KM surveillance zone covering about 25% of the villages distributed over all the four quarters in each of the circle (**Fig. 1**) per fortnight thereby covering all the villages in the four-fortnightly sampling. Illustration 1: For example, if there are a total of 48 villages within the 1-10 KM surveillance zone and within each of the circle, there are 16 villages, then ensure that four villages are selected from each of the circle (C2 to C4) and one village from each quarter (Q1 to Q4) of each circle. Illustration 2: For example, if there are a total of 46 villages within the 1-10 KM surveillance zone and within each of the circle, there are 16, 16, 14 villages, then ensure that four villages are selected from each of the circle (C2 to C4) and one village from each quarter (Q1 to Q4) of each circle for the first and second fortnights, four villages are selected from each of the circle (C2 and C3) and three villages from C4 circle for the third and fourth fortnights.

### **Sample Type and Size:**

The proportion of fowl and duck samples shall be at the ratio of 2:1 for giving special emphasis on ducks. Samples shall be collected both from poultry units and backyard poultry as detailed below:

#### **i. Poultry units:**

- a) Poultry farm having at least 50 birds will be treated as poultry unit.
- b) Samples shall be collected from 6 birds for a poultry unit having population of 50-1000 and from 18 birds for bigger units.
- c) The sample shall include serum, oro-pharyngeal/tracheal swab and cloacal swab in a ratio of 2:1:1. The sample size per poultry unit having a population of 50-1000 birds will be 12 and that of bigger unit will be 36. For example, in poultry unit having a population of 50-1000 birds, the ratio of the samples will be 6:3:3 from 6 birds.

#### **ii. Backyard poultry:**

- a. Collect samples from all villages (six birds in each village) that fall within the surveillance zone.
- b. The sample shall include serum, oro-pharyngeal/tracheal swab and cloacal swab in a ratio of 2:1:1. The sample size per village will be 12.

#### **iii. Periodicity of sampling:**

Samples shall be collected in 4 phases on fortnightly basis and no sample shall be collected more than once from the same farm/village. Sampling will be done only once from a particular poultry unit / village.

#### **iv. Surveillance in the Re-populated Poultry Unit/Village:**

- Random clinical, investigations on the repopulated flock should be carried out after a fortnight of restocking as detailed below
- 2 birds (either recently died or the birds showing acute signs of disease after euthanizing them) and / or
- Cloacal and oro-pharyngeal/tracheal swabs collected from at least 10 healthy birds per pen/shed.
- Serum samples from at least 10 birds.

**Collection of Faecal samples from wild and migratory, wild resident, domestic birds:**

The following guidelines should be followed for collection of fecal samples from a single bird or from a flock of birds:

- Birds are observed from a distance, using binoculars. All the avian species to be sampled should be first correctly identified with the help of forest department. Ensure that birds in the flock are of one species or different species. Your approach towards birds normally causes a group of roosting birds to move or fly away and in the process some individual birds will defecate. Observe the bird species and collect fecal specimen. If bird species cannot be identified, take the photograph of bird, which will help to identify the bird with ornithological expertise later.
- Collect only fresh fecal specimens, ideally those that are still moist, using a sterile swab and place it in a labelled vial containing viral transport medium (VTM). Transport specimen in VTM to laboratory within 48 hours at +4°C (with cool packs).

## ROLE OF DIFFERENT DEPARTMENTS

Preparedness and control of AI is a multi-departmental activity involving people from all sectors of the society. The Deputy Commissioner / District Magistrate / District Collector holds the highest administrative position in a district and as such the major role of coordinating between different relevant Departments. To monitor preparedness and the measures to counter AI form a district level committee on HPAI under the chairmanship of the Deputy Commissioner/ District Magistrate. It should include district level officers of the departments of Health, Animal Husbandry, Home, Environment, Forest and other allied departments.

Deputy Commissioner/ District Magistrate/ District Collector: -

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- To chair and oversee the activities of district level committee on HPAI during day-to-day surveillance for AI.
- To play the central and coordinating role as Chief Executive Officer in different aspects of control and containment operation of AI in the district.
- Augmentation of information sharing between all concerned departments
- Collection of information regarding details of nearest paramilitary units, nearest rail head, nearest airports, helipads with coordinates etc. as a part of preparedness plan.
- Imposition and execution of legislative power.
- Implementation of ban on movements of vehicles from epicenter of infection, if any outbreak is suspected.
- Reporting of activities to concerned higher authorities.
- Restriction of movement of persons and vehicles.
- Imposition of movement control of poultry birds, feed, farm supplies, farm personnel etc.
- Cordoning off the culling and surveillance zone for easy identification

and awareness of the villagers.

- Arrangement of manpower, financial, logistical support including vehicles, equipments and quarantine.
- Management for systems of compensation (payment and verification).
- Ban on sale of any poultry products, feed, chicks & any other poultry related items and scavenging of backyard poultry.
- Closure of poultry markets &/or shops.
- Monitoring of cleaning and disinfection procedures(Check posts and /or area under control and containment operation).
- Ban on reintroduction of live bird in the culling zone till freedom from disease is achieved etc.

- Monitoring the restocking of poultry in areas that has achieved freedom from AI status.
- Media briefing.

**Implementing Surveillance, Control and Containment Operation:** Specific duties are mentioned point-wise in the following.

**(A) Animal Husbandry and Veterinary Services Department(AH&VS):**

- Formulation of an effective and appropriate routine surveillance plan of AI.
- Recording of population and density of poultry birds in each Block (Backyard/Commercial)with the help of panchayat functionary.
- Fly way of migratory birds–In coordination with forest department.
- Existence of wild-life sanctuaries / National Parks etc. / Water bodies visited by migratory / wild birds in coordination with forest department.
- Block wise location and number of live bird market (wet market) and their days of operation with particular attention to the markets situated at international borders.
- Areas sharing the international border with the neighbouring countries.
- Interstate borders with the AI affected states.
- Sample collection from backyard and organized poultry farms.
- Sample collection from wild and migratory birds in Coordination with Forest Department.
- Immediate reporting of unusual mortality of poultry birds that raises suspicion of AI to Director of A.H. & V.S.
- Investigation of mortality, morbidity and collection of samples for dispatching to laboratory.
- Procurement of all logistics for Preparedness, Control and Containment, Post Operation Surveillance, etc.
- To supervise and participate in all activities related to culling, cleaning and disinfection, sealing of farm / premises, Post operation surveillance, restocking of poultry etc.
- Keeping records of birds culled, eggs destroyed and feed burnt during

control and containment operation.

- Advice about biosecurity measures for both organized and backyard poultry.
- To actively participate and deliver in mass awareness programmes organized by Government Departments / Semi Government Organizations and NGOs.

## **(B) Forest Department:-**

- Formulation of an effective and appropriate routine surveillance plan of AI particularly in the wild/migratory bird so for the forest areas.
- To demarcate and identify the area visited by wild/Migratory birds.
- To draw up list of areas of notified water bodies, bird sanctuaries in the state and indicate the mon state map for surveillance work of AI.
- Report for unusual mortality of wild and migratory birds to senior forest officials and civil administration with intimation to AH &VS.
- Determination of fly way of migratory birds.
- Recording of route map to notified water bodies, bird sanctuaries in the state regularly visited by wild and migratory birds.
- Recording of nearest veterinary and health institutions with notified water bodies, bird sanctuaries in the state.
- Collection of surveillance samples from wild and migratory birds with the help of ARD personnel.

## **(C) Health Department:-**

- Formation of medical RRTs for regular health checkup of RRTs for culling, vaccination, cleaning & disinfection, surveillance etc.
- Medical checkup of personal involved in culling operation including testing of paired serum sample.
- Arrangement for boarding and lodging of medical RRT to provide medical facilities to the personnel engaged for control and containment operations for 24hours.
- Procurement of required logistics for the medical RRTs.
- Arrangement for steady and timely supply of antiviral drugs.
- Quarantine measures towards members of RRTs.
- To involve in cleaning and disinfection works in control and containment operations.
- To actively participate and deliver for mass awareness programme

organized by Government Departments / Semi Government Organizations and NGOs.

- Plan for management of human case of AI as posted on the web site of Ministry of Health and Family Welfare, Government of India ([www.mohfw.nic.in](http://www.mohfw.nic.in)).

**(D) Panchayat and Rural Development Department:-**

- To organize meeting involving all related Government Departments, panchayat functionaries and NGOs to plan activity for preparedness to counter AI at block level.

- Implementation of all the prescribed measures as imposed by the Deputy Commissioner / District Magistrate / District Collector for preparedness and control and containment of AI.
- Arrangement for boarding and lodging of RRT personnel.
- Arrangement of logistics and other pre-requisites.
- Payment of compensation and recordkeeping.
- Payment of wages for the labourers engaged in the control and containment operations.
- Arrangement of manpower involving NGOs, Disaster Management Group, Self Help Group (SHG) and other people having experience of handling poultry for formation of RRTs.
- Ban on reintroduction of live bird in the culling zone till freedom from disease is achieved.
- To arrange for nursing of burial pits as and when necessary.
- Organization of Mass Awareness programme on AI.
- Cordoning off the culling and surveillance zone for easy identification and awareness of the villagers.
- To erect temporary and permanent sign boards for mass awareness indicating culling and surveillance zones and identify the pit sites.
- Assistance for post operation surveillance programme.

**(E) Land and Land Reforms Department:-**

- Drawing of scale map for culling and surveillance zone.
- Identification of khas and other lands in the culling zone for burial of culled birds and other related disposal materials.

**(F) Public Works Department:-**

- To assure availability of different machineries viz. JCB machine, Jetting cum Suction machine, Fogger machine, Spraying Machine etc. for control and containment process of AI.
- To assist in making the scale map of confirmed outbreak area.
- To assist in cordoning off the culling and surveillance zone for easy

identification and awareness of the villagers.

**(G) Home Department:-**

- To enforce the restrictions imposed by the Deputy Commissioner / District Magistrate / District Collector.
- To assist the culling teams as and when necessary during culling, payment of compensation, combing, mopping and Post operation surveillance.
- To maintain law and order for peaceful conduction of the control and containment activity.

- To prevent introduction of birds and related products from bird flu affected neighboring states and places.

#### **(H) Border Security Force:-**

- To prevent illegal movement of birds and other related products from neighboring countries/States.







**Addresses of the Diagnostic Laboratories**

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**Composition of PPE Kits for use in AI outbreak**

**A. Components of Kit for direct handlers**

1.	'Dangri'	Disposable, free size, full sleeves, made up of non woven fabric (spun bonded, poly propylene material not less than 90 GSM), cuff with elastics, zipper in front, hood attached covering sides of face and neck.
2.	Hand gloves	Disposable, ISI mark, size - 10 no.
3.	Shoe cover	Disposable, made up of polyester woven fabric with protective rubber coating preferably Tetoron, with thick padded foot base and can be used under field condition.
4.	Face Mask	N95 Face Mask.
5.	Disposable protective glasses	Disposable, with clear glasses, zero power, eye fitting and elastic band holder

**B. Components of Kit for other than direct handlers**

1.	'Dangri' with hood attached
2.	Hand gloves
3.	Shoe covers
4.	Face Mask
5.	Disposable protective glasses

**Instruments/equipment/other materials required in AI operations**

- PPE,
- JCB – By hiring
- Vehicles–Transportation of RRTs–by hiring,
- Jet cum suction machine–by hiring
- Fire gun,
- Foggers,
- LPGas,
- Vaccine gun,
- Disposable needles/syringes
- Sterilizer,
- Coldc abinet,
- Vaccine carriers,
- Computer,
- Mobile Incinerator.
- Lime brisker/whitewash,
- Formalin, Sodium Hypochlorite, other disinfectants
- Lime powder
- Dettol/Dettol soap,
- Napkins,
- Caustic soda,
- Drinking water for RRTs,
- Hygienic food,
- Transport facilities,
- Battery/torch
- Antiviral drug(oseltamivir),
- Spirit.
- Gunny bags,

- Thread for packing gunny bags
- Paint,
- Brush,
- Plates and sticks,
- Raincoat and gumboot if necessary,
- Stationary,
- Telephone STD/Mobile phones/internet,
- Fax/Xerox machine,
- Camera

The above list is illustrative.

**KIT for the Veterinary Officer / Disease Investigation Officer**

- 1) Paper and pens
- 2) Epidemiological inquiry form
- 3) Equipment necessary for the clinical visit and sampling procedures:
  - (a) PPE Kits as per composition/ specification approved by Government of India and detailed at Annexure VI.
  - (b) Paper tissues
  - (c) 5 leak proof containers
  - (d) 5 leak proof and water-resistant plastic bags
  - (e) Torch
  - (f) Active disinfectant solution
  - (g) 2 pens and a notepad
  - (h) 100 syringes 2.5 ml with needle
  - (i) 100 thin, small plastic bags
  - (j) 2 pairs of surgical scissors
  - (k) 2 pairs of forceps
  - (l) Tape
  - (m) 2 felt tip pens
  - (n) 1 thermic container (icebox)
  - (o) 5 frozen ice packs
  - (p) Sterile swabs
  - (q) 50 test tubes
  - (r) 10 black waste-bags
  - (s) 50 rubber bands
  - (t) Cardboard container
- 4) At least 10 of these kits should be carried to all suspected or infected places in case of suspicion of outbreak.

**Epidemiological Enquiry Form**

**(Proforma for referring clinical material to laboratory from birds suspected ofAI)**

1. Name and address of the farm/farmer/owner withphone number/email. \_\_\_\_\_  
 \_\_\_\_\_

2. Species from which the samples collected (encircle the appropriate):
- (a) Domestic poultry (Chicken, duck, turkey, quail, emu, pigeon, guinea fowl, geese,.....)
  - (b) Other pet birds (Please specify):
  - (c) Wild birds (Please specify):

3. Species of birds and livestock in the farm/backyard (Please write the number ofbirds/animals)

Chicken	Duck	Turkey	Goose	Guinea fowl	Quail	Pig	Other (Pl. Specify)

4. If domestic chicken(Please tick the correctone/fillin as needed):
- A. Type of birds: Layer/Broiler
  - B. System of rearing: Backyard/Commercial
    - 1) If commercial:
      - (a) Method of rearing: Caged/Deep litter
      - (b) Method of poultry housing: All in all-out system (one agegroup)  
 /Birds of various ages kept together (different age groups)

- (c) Breed/Line \_\_\_\_\_
- (d) Age of the birds: \_\_\_\_\_ weeks (single age in all-in-all-out system and different age group in mixed housing)
- (e) Date/s of day-old chicks purchased:
- (f) Name of the commercial Hatchery:
- (g) Total no. of birds in the farm:
- (h) Date on which clinical signs started appearing:
- (i) Type /description of clinical signs:
- (j) Morbidity (birds showing clinical signs/total no. of birds)
- (k) Mortality pattern(number of bird death on day 1.....day 2.....day 3..... day 4.....day



Source of vaccine									
Vaccinating Staff									
Route of vaccination									

(r) Tentative diagnosis made:

(s) Details of medication done (if any):

5. If backyard poultry (Please tick):

(a) Husbandry Practice: Free ranch/fenced

(b) Number of Birds:

(c) Breed Name(if any) and type of bird:(dual type/egg type

(d) History of vaccination/s done:

**AVIAN INFLUENZA EPIDEMIOLOGICAL INFORMATION FORM**

(To be submitted by the State Animal Husbandry department to Department of Animal Husbandry and Dairying (DAHD), Government of India for each outbreak)

Date:

Name and Address of farm with Phone No.: /email:

District : State:

Farm code or identification number:

Address of the owner with Phone No.:

Information provided by:

Farm Veterinarian's Name:

Whether the Veterinarian Present during this investigation: YES/NO

**1. INFORMATION CONCERNING THE FARM**

TYPE OF FARM: Industrial/Rural/Dealer/Retailer

CATEGORY/PRODUCTION LINE :Table-egg layers/Meatbirds

Type: Grandparents (No.)..... Parents (No.).....

Pullets (No.).....

HATCHERY OF ORIGIN:

Commercial Hatchery Address(if any):

District: State:

Phone: Fax:

HOUSING SYSTEM: Deep litter: YES/NO

Cage system: YES/NO

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

Presence of Birdproof nets: YES/NO

Possibility of contact with wild birds: YES/NO

Species of contacting wild bird:

Species of other birds present on site (captive or free):

Presence of ponds or lakes and other water reservoirs (specify if any):

Presence of pigs/other animals (specify):

Remarks if any:

## 2. INFORMATION CONCERNING MOVEMENTS OF BIRDS

(a) Introduction of birds from other establishments/hatcheries/farms/exhibitions/markets/fairs (Till twenty days prior to the onset of the first clinical signs): YES/NO

If Yes:

Date: No.: Species :

Introduced from (please tick): Farm/Hatchery/Exhibition/Market/Fair

Name and address of Farm/Hatchery/Exhibition/Market/Fair:

District: State:

(b) Exit of birds /eggs/other materials to other farms /establishments /hatcheries /abattoirs /other fair/markets/exhibitions (Till 20 days prior to the onset of the first clinical signs and the date the farm was put under restriction): YES/NO

If Yes:

Type of material: Date: No:

Destination (Please tick):

Other farm/Hatchery/Abattoir/other fairs/markets/exhibitions

Address:

District : State:

## 3. INFORMATION CONCERNING MOVEMENT OF PEOPLE (Till 20 days prior to the onset of the first clinical signs and the date the farm was put under restriction): YES/NO

If Yes:

Date:

Person moved: Veterinarian/Technician/Vaccinating crew/Debeaker  
/farmer/Dealer/Farm employee/other (specify) Destination  
of movement:

District: State:

Previously visited farm: Name:

District :

4. INFORMATION CONCERNING MOVEMENT OF VEHICLES (Till 20 days prior to the onset of the first clinical signs and the date the farm was put under restriction):

Purpose of movement: (A) Transport of animals, (B) Transport of feed, (C) Transport of eggs, (D) Collection of dead animals, (E) Fuel/Gas, (Other) Specify Date of entry

Vehicle:

Name of owner of vehicle: Phone number/Fax:

5a) INDIRECT CONTACTS WITH OTHER POULTRY ESTABLISHMENTS (Sharing of equipment, vehicles, feed, staff, etc. in the time span between 20 days before the onset of the first clinical signs and the date the farm was put under restriction): YES/NO

If yes: Date of contact:

Name and address of farm or establishment:

Shared vehicle/shared feed/shared equipment/shared staff/collection/recycle of litter/other (specify):

5b) INFORMATION ABOUT POULTRY FARMS LOCATED NEAR THE OUTBREAK (within 1 KM and 10 KM):

Name of farm or establishment (if any):

Name of the Owner: Address:

Distance in meters:

Species farmed: Number: Empty/Full

ANAMNESTIC DATA

WEEKLY MORTALITY (NB: data concerning mortality rates recorded in the 6 weeks prior to the onset of clinical signs)

WEEK: FROM: TO:

NUMBER ANIMALS DEAD:

Remarks:

Date of onset of AI clinical signs:

Clinical signs observed by the farmer:

TOTAL NUMBER OF BIRDS (NB: this information must refer to the data collected when the farm has been put under restriction after confirmation of NAI):

Farm put under restriction (dead or alive): Number of ill

birds (Farm put under restriction):

Number of dead birds (Farm put under restriction):

Number of birds depopulated:

#### 6. CLINICAL INVESTIGATION:

Species: Depression:

Respiratory signs: mild/severe Drop

or cessation of egg laying:

Oedema, cyanosis or cutaneous haemorrhage:

Diarrhoea:

Nervous signs:

Other

#### 7. GROSS FINDINGS:

Rhinitis and sinusitis

Tracheitis: catarrhal/haemorrhagic – Airsacculitis

Haemorrhages epicardium – endocardium – proventriculus – ovarian follicles

Enteritis catarrhal/haemorrhagic – Pancreatitis

Other: Remarks

Signature Date:

### Transport of material for testing Avian Influenza in Three Layer Packing

#### ■ Preparation for packing

- All packing materials required should be gathered before the start. Frozen gel packs should be arranged in advance, kept ready and placed in to shipping container, if required. Timing of the shipping should be planned in such a way that the package is not held up over a weekend or holiday
- Before shipping the samples, inform the concerned RDDs or NIHSAD by mail or fax.
- Properly label the samples with nature of content and identification number, if any (to be matched with the sample dispatch letter and epidemiological enquiry form)
- **Samples should ALWAYS be sent with duly filled epidemiological enquiry form.**

#### ■ Basic triple packaging system



The samples should be sent using the triple packaging system principle. The system consists of three layers as described below.

1. **Primary receptacle:** It is a labelled primary watertight, leak-proof receptacle containing the specimen. Dead birds must be individually wrapped in disposable bags/polythene bags and taped tightly. The swab/serum samples should be sent in a leak-proof primary container (Polycarb/Polypropylene) enclosed in a disposable bag/thick polythene bag. Samples can be packed either village-wise or block-wise with individual identification number on the samples.
2. **Secondary receptacle:** A second durable, watertight, leak-proof container to enclose and protect the primary receptacle(s). Several absorbent-wrapped primary receptacles

may be placed in one secondary receptacle. Sufficient additional absorbent material must be used to cushion multiple primary receptacles. Thermos flasks /Thermocol box of adequate strength for its capacity, mass & intended use & with at least one surface with min. 100 × 100 mm so that it does not break during the transport. Letters, specimen data forms, and other types of information that identify or describe the specimen and also identify the shipper and receiver should be wrapped in a polythene bag and then taped to the **outside** of the secondary receptacle. **Never keep the loose forms inside the secondary receptacle as it may endanger the laboratory personnel.**

3. **Outer shipping package:** The secondary receptacle is placed in an outer shipping package with suitable cushioning material which protects it and its contents from outside influences such as physical damage and water while in transit. Identification of the shipper and receiver should be taped to the outside of the outer shipping package also which could be a cardboard box. However, **do not paste** specimen data forms, and other types of information that identify or describe the specimen in the outer receptacle.

Annexure 14

**Format for daily report of control and containment operation**

A) **ACTIVITIES CONDUCTED FOR CULLING OPERATION AS ON** \_\_\_\_\_

Sl. No.	Activities	DISTRICTS/ EPICENTRES		Total
1)	Deployment of RRT			
	a) For Culling			
	b) For Mopping			
	c) For Surveillance			
	d) For Disinfection & Sanitation			

	e) For Supervision			
	<b>TOTAL RRT</b>			
<b>2</b>	<b>Target of culling of birds</b> )			
<b>3</b>	<b>Culling of birds</b> )			
	a) Upto___			
	b) On_____			
<b>Progressive Total of Birds Culled including Mopping</b>				
<b>4</b>	<b>No. of eggs destroyed</b> )			
	a) Upto___			
	b) On_____			
<b>Progressive Total of eggs destroyed</b>				
<b>5</b>	<b>Quantity of Feed destroyed (Kg)</b> )			
	a) Upto___			
	b) On_____			
<b>Progressive Quantity of Feed destroyed (kg)</b>				
<b>6</b>	<b>Payment of Compensation</b> )			
	a) Upto__(Rs.)			
	b) On_____(Rs.)			
<b>Progressive total of compensation (Rs.)</b>				

B) NO OF MORTALITY REPORTED ON\_

**C) DETAILS OF EPICENTERS ASON\_**

<b>Name of Village/Block</b>	<b>Invol ved Dist ricts</b>	<b>Date of Notifi cation on</b>	<b>Perio d of Culli ng</b>	<b>Period of Moppi ng &amp; Disinf ection</b>	<b>Date of Sanitiz ation</b>	<b>No. and Date of Sanitization Certificate</b>

**SIGNATURE OF THE  
DESIGNATED OFFICER**

## Annexure 15

### CHECKLIST OF THE MATERIALS, APPLIANCES, RESOURCES AND FACILITIES THAT MAY BE REQUIRED IN SUCCESSFUL CONDUCTION OF POSP

- Serum clot activator 2 ml/vacutainer should be used for collection of blood.
- Adhesive sticker – for marking of blood samples.
- Permanent marker pen (Black or Blue inked) – for marking of samples in laboratory and in field.
- Poly syringe, 2.0 ml/5.0 ml, sterile, individually packet – for collection of blood samples.
- Absorbent cotton – for making swabs of spirit during collection of samples.
- Rectified spirit – for making swabs during collection of samples.
- Test tube basket – for carrying sample collecting materials in field and in laboratory.
- Test tube stand – for cataloguing of serum samples before dispensing.
- Cryovial, screw cap, 1.0/ 1.8/ 2.0 ml – for collection of serum samples under strict sterility.
- Rack for cryovial, 1.0/ 1.8/ 2.0/ 4.5/ 5.0 ml – for cataloguing of collected samples.
- Poly packet of different sizes – for packing of collected samples before dispatch.
- Elastic rubber bands – for closing the opening of the poly packets.
- Cryo vial, screw cap, 4.5 / 5.0 ml, filled with 3 ml PBS containing suitable antibiotic – for collection of swab samples maintaining highest possible sterility.
- Swab, sterile, individually packed – for collection of swab samples maintaining highest possible sterility.
- Vaccine carrying box/ Thermocol box – for dispatch of samples maintaining cold chain, if thermocol box is used, coloured cello tape of 1” diameter will be required for sealing the boxes.
- Ice-bottle/ ice gel packs – for packing of the vaccine carrying box or thermocol box for dispatching the collected samples.
- Refrigerators – for overnight keeping of collected clotted blood samples in vertical direction in test tube baskets for proper elution of serum and for

preservation of regularly collected samples under appropriate cataloguing before dispatch. Never put blood samples that have been collected for separation of serum in refrigerators before clotting because this will ultimately result in either elution of some haemolyzed serum or no serum. It is always preferable to preserve the all types of samples of Avian Influenza at a temperature of below 0<sup>0</sup>C. Further, sufficient numbers of ice-bottles or ice gel packs will be required by the laboratories for sending the samples. For this a deep freezer (-20<sup>0</sup>C or less) may be used. However, in absence of a deep freezer, the freezing chamber of any ordinary refrigerators had to be used.

- Computer – for accurate proper maintenance of records of the samples collected and sent under particular laboratory serial number. This maybe done in a table for each epicenter prepared in Microsoft Excel programme.
- Printer–for printing of reports and documents as and when necessary.
- Computer paper (in accordance with supplied printer) – for printing of documents.
- Note book – for proper maintaining records of the samples collected and send under particular laboratory serial number in conjunction with the records maintained in computer.
- Copy of format for forwarding of samples.
- Advanced Planning – for advanced intimation to the respective authorities for assisting the persons so deployed for collection of samples in a predetermined a village/ mouza/ organized farm.
- Public Awareness – for easy access of the team for collection of samples to the areas of Surveillance Ring under definite planning.
- Vehicle – for easy movement of different teams to different areas in a same day under proper planning.
- Human Resources-
  - For sample collection:
    - Trained Veterinary Professional –01
    - Group D/C Employee –01
  - For Laboratory:
    - Trained Veterinary Professional – 02 (at least01 Veterinary Professional should have knowledge to operate Microsoft Word and Excel Programme).
    - Laboratory Attendants -06





**SIGNATURE OF THE DESIGNATED OFFICER**

## **Important points at the start of control and containment operation**

1. Meeting as stated in the chapter 3.2 is must to decide all the aspects and strategy of the operation.
2. Scale map is to be drawn for infected and surveillance zone at the beginning of the operation.
3. Cordon off the 1 and 10 KM radius boundary as per notification.
4. Before starting the operation, meeting to be arranged in all Gram Panchayats in the village level (without village level meeting and convincing the people for culling the output will be very less, time consuming) involving the villagers to get higher response during operation as well as culling in the camp (not door to door at initial stages; door to door will be during mopping). While main culling will be in the camp, some mobile teams can be sent door to door. However, strategy of door to door culling can be adopted depending upon the situation.
5. Announcement through public address system in the previous evening in the areas where the operation will take place in the next morning.
6. In backyard the culling operation to be started in the morning by 7.00 AM.
7. During culling motivators to be taken from the respective local areas for smooth operation.
8. The compensation to be paid in the camp.
9. A separate list of commercial farms may be prepared Gram Panchayat wise and all the owners may be asked individually help the cleaning of their sheds after the culling operation for final cleaning and disinfection under the supervision of the RRTs.
10. Farm birds to be buried with in the farm premises.
11. Strength of drop gates and physical surveillance to be in order in the infected and surveillance zone to prevent any infiltration of poultry and poultry products in to the infected zone as well as any outward movement from the infected and surveillance zone.
12. All the commercial farms where the birds have been culled by the RRTs during operation to be sorted out and to be cleaned disinfected and sealed. Any other farms where there were no birds at the time of culling operation also to be identified and cleaned and disinfected.

13. After the cleaning and disinfection of all commercial farms the same has to be disinfected in every 15 days and again to be sealed.
14. The RRT members to be briefed thoroughly for clear understanding of cleaning and disinfection before starting the procedure.

## ***Frequently Asked Questions***

- **What is avian influenza?**

AI, or “bird flu”, is a contagious disease of animals caused by viruses that normally infect only birds and, less commonly, pigs. AI viruses are highly species-specific, but have, on rare occasions, crossed the species barrier to infect humans.

In domestic poultry, infection with AI viruses causes two forms of disease, distinguished by low and high pathogenicity. The so-called “low pathogenic” form commonly causes only mild symptoms (ruffled feathers, a drop in egg production) and may easily go undetected. The highly pathogenic form is far more severe. It spreads very rapidly through poultry flocks affecting multiple internal organs and may lead to death of the birds that can approach 100%, often within 48 hours.

- **Which viruses cause highly pathogenic disease?**

Influenza A viruses have 18 H subtypes and 11 N subtypes. Only viruses of the H5 and H7 subtypes are known to cause the highly pathogenic form of the disease. However, not all viruses of the H5 and H7 subtypes are highly pathogenic and cause severe disease in poultry.

On present understanding, some H5 and H7 viruses introduced into poultry flocks in their low pathogenic form can mutate into highly pathogenic form when allowed to circulate in poultry populations. This is why the presence of an H5 or H7 virus in poultry is always cause for concern, even when the initial signs of infection are mild.

- **Do migratory birds spread highly pathogenic avian influenza viruses?**

The role of migratory birds in the spread of highly pathogenic AI is not fully understood. Wild waterfowl are considered the natural reservoir of all influenza A viruses. They have probably carried influenza viruses, with no apparent harm, for centuries. They are known to carry viruses of the H5 and H7 subtypes, but usually in the low pathogenic form. Considerable circumstantial evidence suggests that migratory birds can introduce low pathogenic H5 and H7 viruses to poultry flocks, which may then mutate to highly pathogenic form. As such events are very rare, migratory birds do not pose significant threat to poultry.

- **How do people become infected?**

Direct contact with infected poultry, or surfaces and objects contaminated by their faeces, is presently considered the main route of human infection. To date, most human cases have occurred in rural or semi-urban areas where many households keep small poultry flocks, which often roam freely, sometimes entering homes or sharing outdoor areas where children play. As infected birds shed large quantities of virus in their faeces, opportunities for exposure to infected droppings or to environments contaminated by the virus are abundant under such conditions. Moreover, because many households depend on poultry for income and food, they may sell or slaughter and consume birds when signs of illness appear in a flock, and this practice has proved difficult to change. Exposure is considered most likely during slaughter, defeathering and preparation of poultry meat for cooking.

- **Is it safe to eat poultry and poultry products?**

In areas free of the disease, poultry and poultry products can be prepared and consumed as usual (following good hygienic practices and proper cooking), with no fear of acquiring infection with the avian influenza virus.

In areas experiencing outbreaks, poultry and poultry products can also be safely consumed provided these items are properly cooked and properly handled during food preparation. The avian influenza virus is sensitive to heat. Normal temperatures used for cooking (70°C in all parts of the food) will kill the virus. Consumers need to be sure that all parts of the poultry are fully cooked (no “pink” parts) and that eggs, too, are properly cooked (no “runny” yolks).

Consumers should also be aware of the risk of cross-contamination. During food preparation, raw poultry and poultry products should never be allowed to mix with items eaten raw. When handling raw poultry or raw poultry products, persons involved in food preparation should wash their hands thoroughly and clean and disinfect surfaces in contact with the poultry products. Soap and hot water are sufficient for this purpose.

In areas experiencing outbreaks in poultry, raw eggs should not be used in foods that will not be further heat-treated as, for example by cooking or baking.

AI is not transmitted through cooked food. To date, no evidence indicates that anyone has become infected following the consumption of properly cooked poultry or poultry products, even when these foods were contaminated with the avian influenza virus.

- **Does the virus spread easily from birds to humans?**

Though human cases of H5 and H7 avian influenza virus have been reported in many countries, the avian influenza viruses did not spread easily from birds to humans as evidenced by the huge number of birds affected and the numerous associated opportunities for human exposure, especially in areas where backyard flocks are common. It is not presently understood why some people, and not others, become infected following similar exposures.

Source: WHO website

[http://www.who.int/csr/disease/Avian\\_influenza/avian\\_faqs/en/](http://www.who.int/csr/disease/Avian_influenza/avian_faqs/en/)

- **Has any human case of avian influenza virus reported in India?**

No human case of avian influenza virus has been reported in India.

- **Why our domestic birds only are being culled? What about the crows and other birds? Can they not carry the virus?**

Yes, other birds can also carry the virus but since the domesticated poultry and ducks are present in close proximity with the keepers/ household members, the chances of transmission of the virus is high. Even though the crow deaths due to avian influenza virus have been reported, their role in spread of the virus is yet to be established.

- **There are no bird mortalities in my village. Then why is culling required?**

Even if there are no bird mortalities in the village but if the village comes in the culling zone, chances are high that the infection may arrive. It is better to depopulate the village of all poultry otherwise infection can pose human risk.

- **Our ducks appear healthy and not a single case of mortality or for that matter they are not even sick. Why should we give them up?**

Domestic ducks move around in virus-contaminated water bodies and can excrete large quantities of highly pathogenic virus without showing signs of illness, and are now acting as a “silent” reservoir of the virus, perpetuating transmission to other birds. This adds yet another layer of complexity to control efforts and removes the warning signal for humans to avoid risky behaviors.

- **Can the virus be carried through air and do flies and mosquitoes carry**

**them?**

Virus cannot be carried through air unless it is carried by some fomite like feather/ faeces particle etc. The spread of the virus through flies and mosquitoes has not been reported so far.

- **When can I restock the birds after the outbreak? Who will give me the birds after the three months?**

The birds can be restocked after completion of POSP and no sample found positive in it. Normally, it takes three months for completion of POSP. After declaration of freedom by Government of India, one can purchase day old chicks (DOC) from government / private hatcheries as per choice.

- **Many people die of other reasons here. Then why is bird flu so dangerous?**

Previous outbreaks (pandemics) of influenza virus of avian origin in human beings have resulted in deaths of thousands and thousands of people worldwide. Three such pandemics have been recorded in the previous century. The recent bird flu viruses can spread from poultry to human beings directly and hence their widespread persistence in poultry populations poses major pandemic risks for human health.

- **Why big farms are spared and their products are sold (elsewhere) whereas our birds are culled?**

Policy for control and containment procedures are followed as per a defined Action Plan irrespective of whether it is a big farm or small / backyard farm and procedures of various operations may vary to ensure complete depopulation, sanitation and disinfection as per the type/ system of farm/ farming.

- **Is it safe to take the drug (Tamiflu or any drug recommended by Ministry of Health and Family Welfare, Government of India)?**

Tamiflu or any drug recommended by Ministry of Health and Family Welfare, Government of India is safe if taken under medical supervision. All the RRT members are briefed & cautioned about their side effects and they should report the same immediately to Medical Officers.

- **Why cannot I go out for work during the quarantine period?**

Quarantine is done to ensure that the virus, if at all carried by you, is not spread to other places and your family and friends are protected. Also immediate medical help can be extended in case you became sick.

- **Is not there any other humane way to kill the birds?**

There are some other ways but in the present condition, the methods adopted viz., neck dislocation for younger birds and euthanization by anaesthesia in adult/heavy birds are best for humane as well as speedy depopulation.

### List of animal species known to be affected by Avian Influenza (H5N1)

No	Name	Common Name
<b>I</b>	<b>Order: Anseriformes</b>	
1.	<i>Aix sponsa</i>	Wood duck
2.	<i>Amazonetta brasiliensis</i>	Brazilian teal
3.	<i>Anas acuta</i>	Northern pintail
4.	<i>Anas bahamensis</i>	Bahama pintail
5.	<i>Anas castanea</i>	Chestnut-breasted teal
6.	<i>Anas crecca</i>	Blue-winged teal
7.	<i>Anas Penelope</i>	Eurasian wigeon
8.	<i>Anas platalea</i>	Argentine shoveller
9.	<i>Anas platyrhynchos</i>	Domestic duck/Mallard
10.	<i>Anas sibilatrix</i>	Chiloe wigeon
11.	<i>Anas Strepera</i>	Gadwall
12.	<i>Anas versicolor</i>	Puna teal
13.	<i>Anser albifrons</i>	Greater white-fronted goose
14.	<i>Anser anser</i>	Greylag goose
15.	<i>Anser anser domesticus</i>	Domestic goose
16.	<i>Anser indicus</i>	Bar-headed goose
17.	<i>Aythya marila</i>	Greater scaup
18.	<i>Aythya Americana</i>	Redhead
19.	<i>Aythya ferina</i>	Common pochard
20.	<i>Aythya fuligula</i>	Tufted duck
21.	<i>Branta bernicla</i>	Brent goose
22.	<i>Branta Canadensis</i>	Canada goose
23.	<i>Branta hutchinsii</i>	Cackling goose
24.	<i>Branta leucopsis</i>	Barnacle goose

25.	<i>Branta ruficollis</i>	Red-breasted goose
26.	<i>Cairina moschata</i>	Muscovy duck
27.	<i>Callonetta leucophrys</i>	Ringed teal
28.	<i>Chenonetta jubata</i>	Manned wood-duck
29.	<i>Coscoroba coscoroba</i>	Coscoroba swan
30.	<i>Cygnus atratus</i>	Black swan
31.	<i>Cygnus buccinators</i>	Trumpeter swan
32.	<i>Cygnus Cygnus</i>	Whooper Swan
33.	<i>Cygnus melanocoryphus</i>	Black-necked swan
34.	<i>Cygnus olor</i>	Mute swan
35.	<i>Dendrocygna viduata</i>	White-faced whistling-duck
36.	<i>Mergus albellus</i>	Smew
37.	<i>Mergus merganser</i>	Goosander/Common merganser
38.	<i>Nesochen sandvicensis</i>	Hawaiian goose
39.	<i>Netta peposaca</i>	Rosybill pochard duck
40.	<i>Netta rufina</i>	Red-crested pochard
41.	<i>Tadorna ferruginea</i>	Ruddy shelduck
<b>II</b>	<b>Order: Charadriiformes</b>	
1.	<i>Larus argentatus</i>	Herring gull
2.	<i>Larus atricilla</i>	Laughing gull
3.	<i>Larus brunnicephalus</i>	Brown-headed gull
4.	<i>Larus ichthyaetus</i>	Great black-headed gull
5.	<i>Larus ridibundus</i>	Black-headed gull
6.	<i>Larus schistisagus</i>	Slaty-backed gull
7.	<i>Tringa ochropus</i>	Green sandpiper
<b>III</b>	<b>Order: Ciconiiformes</b>	
1.	<i>Anastomus oscitans</i>	Asian open-billed stork
2.	<i>Ardea cinereal</i>	Grey heron

3.	<i>Ardea herodias</i> (?)	Great blue heron
4.	<i>Ardeola bacchus</i>	Chinese pond heron
5.	<i>Ciconia ciconia</i>	White stork
6.	<i>Egretta garzetta</i>	Little egret
7.	<i>Nycticorax nycticorax</i>	Black-crowned night heron
<b>IV</b>	<b>Order: Columbiformes</b>	
1	<i>Columba livia</i>	Feral pigeon
2	<i>Macropygia ruficeps</i> ?	Little cuckoo dove
3	<i>Streptopelia tranquebarica</i>	Red-collared dove
<b>V</b>	<b>Order: Falconiformes</b>	
1	<i>Accipiter gentilis</i>	Northern goshawk
2	<i>Accipiter trivirgatus</i>	Crested goshawk
3	<i>Buteo buteo</i>	Buzzard
4	<i>Buteo lagopus</i>	Rough-legged buzzard
5	<i>Falco cherrug</i>	Saker falcon
6	<i>Falco peregrinus</i>	Peregrine falcon
7	<i>Falco tinnunculus</i>	Common kestrel
8	<i>Gyps</i> sp?	"wild vulture"
9	<i>Ichthyophaga ichthyaetus</i>	Grey-headed fish-eagle
10	<i>Milvus</i> sp.	Kite
11	<i>Spilornis cheela</i> ?	Serpent eagle
12	<i>Spizaetus nipalensis</i>	Crested hawk-eagle
13	<i>Spizaetus nipalensis orientalis</i>	Mountain/Hodgson's hawk eagle
<b>VI</b>	<b>Order: Galliformes</b>	
1	<i>Alectoris chukar</i>	Chukar partridge
2	<i>Colinus virginianus</i>	Bobwhite quail
3	<i>Corurnix coturnix japonicas</i>	Japanese quail
4	<i>Gallus domesticus</i>	Domestic chicken
5	<i>Lophura leucomelanos</i>	Kalij pheasant

6	Meleagris gallopavo	Turkey
7	Numida meleagris	Pearl guineafowl
8	Pavo cristatus	Peacock
9	Pavo cristatus albus	White Indian peafowl
10	Phasianus colchicus	Ring-necked pheasant
<b>VII</b>	<b>Order: Gruiformes</b>	
1	Amauronis akool?	Brown (red-legged) crane
2	Fulica atra	Coot
3	Gallinula chloropus	Common moorhen
4	Porphyrio porphyrio	Sultan (Purple swamphen)
<b>VIII</b>	<b>Class: Mammalia</b>	
1	Bos Taurus	Cow
2	Canis lupus familiaris	Dog
3	Chrotogale owstoni	Owston's Palm Civet
4	Felis domestica	Domestic cat/feral cat
5	Macaca fascicularis	Cynomolgus macques
6	Martes foina	Stone marten
7	Martes foina	Stone (beech) marten
8	Mus musculus	House mouse
9	Mustela putoris furo	Ferret
10	Oryctolagus cuniculus	New Zealand white rabbit
11	Panthera pardus	Leopard
12	Panthera tigris	Tiger
13	Rattus norvegicus	Rat
14	Sus domesticus	Pig
<b>IX</b>	<b>Order: Passeriformes</b>	
1	Acridotheres cristatellus	Crested mynah
2	Carpodacus mexicanus	House finch
3	Copsychus saularis	Oriental magpie robin
4	Corvus cornix	Hooded crow

5	<i>Corvus frugilegsu</i>	Rook
6	<i>Corvus macrorhynchos</i>	Jungle or Large billed crow
7	<i>Corvus monedula</i>	Jackdaw
8	<i>Corvus splendens</i>	House crow
9	<i>Dicrurus macrocercus</i>	Black drongo
10	<i>Gracula religiosa</i>	Hill mynah
11	<i>Lanius schach</i>	Long-tailed shrike
12	<i>Leiothrix argenteauris</i>	Silver-eared mesia
13	<i>Leiothrix lutea</i>	Red-billed leiothrix
14	<i>Lonchura atricapilla</i>	Chestnut munia
15	<i>Lonchura punctulata</i>	Scaly-breasted munia
16	<i>Lonchura sp.</i>	Munia
17	<i>Lonchura striata</i>	White-rumped munia
18	<i>Oriolus chinensis chinensis</i>	Black-naped oriole
19	<i>Passer domesticus</i>	House sparrow
20	<i>Passer montanus</i>	Eurasian tree-sparrow
21	<i>Pica pica sericea</i>	Korean magpie
22	<i>Sturnus sericeus</i>	Red-billed starling
23	<i>Sturnus sturninus</i>	Daurian starling
24	<i>Sturnus vulgaris</i>	European starling
25	<i>Taeniopygia guttata</i>	Zebra finch
26	<i>Turdus merula</i>	Blackbird
27	<i>Urocissa erythrorhyncha</i>	Blue magpie
28	<i>Zosterops japonicas</i>	Japanese white-eye
<b>X</b>	<b>Order: Pelecaniformes</b>	
1	<i>Pelicanus sp.</i>	Pelican
2	<i>Phalacrocorax carbo</i>	Great cormorant
3	<i>Phalacrocorax niger</i>	Little cormorant
<b>XI</b>	<b>Order: Phoenicopetriformes</b>	

1	Phoenicopterus ruber	Greater flamingo
<b>XII</b>	<b>Order: Strigiformes</b>	
1	Bubo nipalensis	Spot-bellied eagle-owl
2	Ketupa ketupu	Buffy fish-owl
3	Ketupa zeylonensis	Brown fish-owl
4	Strix uralensis	Spotted wood-owl
<b>XIII</b>	<b>Order: Struthioniformes</b>	
1	Dromaius novaehollandiae	Emu
2	Struthio camelus	Ostrich
<b>XIV</b>	<b>Order: Psittaciformes</b>	
1	Melopsittacus undulates	Budgerigar
<b>XV</b>	<b>Order: Podicipediformes</b>	
1	Podiceps cristatus	Great crested grebe
2	Podiceps nigricollis	Black-necked Grebe
3	Tachybaptus ruficollis	Little grebe
<b>XVI</b>	<b>Order: Diptera</b>	
1	Aldrichina graham	Blow fly
2	Calliphora nigribarbis	Blow fly
3	Culex tritaeniorhynchus	Mosquito

Fig. 1 POSP map

