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2nd National Avian and Pandemic Influenza Preparedness and Response Plan, Bangladesh

2009-2011

Government of the People's Republic of Bangladesh

2nd National Avian and Pandemic Influenza Preparedness and Response Plan, Bangladesh, 2009-2011, Directorate General of Health services, Bangladesh

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List of Acronyms

AGPT	Agar Gel Precipitation Test
AHI	Assistant Health Inspector
AI	Avian Influenza
AMES	Acute Meningo Encephalitis Surveillance
AHRD	Animal Health Research Division
BARC	Bangladesh Agricultural Research Council
BAU	Bangladesh Agricultural University
BTV	Bangladesh Television
BBS	Bangladesh Bureau of Statistics
BDR	Bangladesh Rifles
BCCP	Bangladesh Centre for Communication Programme
BFRI	Bangladesh Forest Research Institute
BLRI	Bangladesh Livestock Research Institute
BMA	Bangladesh Medical Association
BPIA	Bangladesh Poultry Industries Association
BPC	Bangladesh Penal Code
BRAC	Bangladesh Rural Advancement Committee
BVA	Bangladesh Veterinary Association
BSL-3	Bio Safety Level -3
BSMMU	Bangabandhu Sheikh Mujib Medical University
CAHW	Community Animal Health Worker
CDC, Atlanta	Centre for Disease Control and Prevention
CDC	Communicable Disease Control
CDIL	Central Disease Investigation Laboratory
CFR	Case Fatality Rate
CMSD	Central Medical Store Department
CSO	Chief Scientific Officer
CSR	Communicable Disease Surveillance and Response
CHO	Chief Health Officer
CVASU	Chittagong Veterinary & Animal Science University
CVO	Chief Veterinary Officer
DANIDA	Danish International Development Assistance
DC	Differential Count
DDRRT	District Animal Disease Rapid Response Team
DGHS	Directorate General of Health Services
DRRT	District Rapid Response Team
DLS	Department of Livestock Services
DMC	Dhaka Medical College
DOC	Day Old Chick
DMCC	District Multisectoral Coordination Committee
DG	Director General
DIMO	District Immunization Medical Officer
DVH	District Veterinary Hospital
DLO	District Livestock Officer
EDS	Egg Drop Syndrome
EHA	Emergency Humanitarian Action
ELISA	Enzyme Linked Immuno Sorbent Assay

EPI	Expanded Program on Immunization
ESD	Essential Service Delivery
FAO	Food and Agriculture Organization
FD	Forest Department
FDIL	Field Disease Investigation Laboratory
FBCCI	Federation of Bangladesh Chamber of Commerce and Industries
FPI	Family Planning Inspector
FWV	Family Welfare Visitor
GDP	Gross Domestic Product
GIS	Geographic Information System
GPS	Global Positioning System
HA	Health Assistant
HA	Hemagglutination
HCC	Health Care Workers
HI	Health Inspector
HNPSP	Health Nutrition and Population Sector Program
HPAI	Highly Pathogenic Avian Influenza
HQ	Head Quarter
HPI	Human Pandemic Influenza
IATA	International Air Transport Association
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
ICT	Immuno-chromatography Test
IDS	Integrated Disease Surveillance
IHR	International Health Regulation
IEC	Information Education & Communication
IEDCR	Institute of Epidemiology Disease Control and Research
IFAT	Indirect Fluorescent Antibody Test
ILI	Influenza Like Illness
IMR	Infant Mortality Rate
IPH	Institute of Public Health
JICA	Japan International Co-operation Agency
JTC	Joint Technical Committee
LGED	Local Government Engineering Department
LGRD	Local Government and Rural Development
LPAI	Low Pathogenic Avian Influenza
LRI	Livestock Research Institute
MIS	Management Information System
MMR	Maternal Mortality Rate
MO	Medical Officer
MDG	Millennium Development Goal
MoFL	Ministry of Fisheries and Livestock
MoEF	Ministry of Environment and Forest
MoH&FW	Ministry of Health and Family Welfare
MP	Malarial Parasite
NAC	National Advisory Committee
NIC	National Influenza Centre
NMTF	National Multi-sectoral Task Force
NTC	National Technical Committee
NAI	Notifiable Avian Influenza
NRRT	National Rapid Response Team
NRL-AI	National Reference Laboratory for Avian Influenza

ND	Newcastle Disease
NDSC	National Disease Surveillance Centre
NGO	Non Government Organization
NPO	National Professional Officer
NIAH	National Institute of Animal Health
NIDCH	National Institute of Disease & Chest Hospital
NIPSOM	National Institute of Preventive & Social Medicine
OIE	Office International des Epizooties (World Organization for Animal Health)
OPV	Oral Polio Vaccine
OTI	Officers Training Institute
PCDS	Priority Communicable Disease Surveillance
PCR	Polymerase Chain Reaction
PPE	Personal Protective Equipment
PHEIC	Public Health Emergency of International Concern
PDDL	Poultry Disease Diagnostic Laboratory
PRSP	Poverty Reduction Strategic Paper
PSO	Principal Scientific Officer
RMO	Resident Medical Officer
RDT	Rapid Diagnostic Test
RRT	Rapid Response Team
RT-PCR	Reverse transcriptase Polymerase Chain Reaction
SEARO	South East Asian Regional Office (WHO)
SOP	Standard Operational Procedure
SMO	Surveillance Medical Officer
SMS-Gate	Short Message Service Gate
SSCAIB	Strengthening of Support Services for Combating Avian Influenza in Bangladesh
SARI	Severe Acute Respiratory Infection
SS	Sentinel Surveillance
TAD	Transboundary Animal Disease
TAPP	Technical Assistant Project Proposal
TOR	Terms of Reference
TT	Tetanus Toxoid
U5MR	Under Five Mortality Rate
UMCC	Upazila Multisectoral Coordination Committee
URRT	Upazila Rapid Response Team
UNICEF	United Nations International Children's Emergency Fund
ULO	Upazila Livestock Officer
UHC	Upazila Health Complex
UHFPO	Upazila Health and Family Planning Officer
UH&FWC	Union Health & Family Welfare Centre
USC	Union Sub Centre
USAID	United States Agency for International Development
VDP	Village Defense Party
VDRL	Venereal Disease Research Laboratory
WHO	World Health Organization

PREFACE

The National Avian Influenza and Human Pandemic Influenza Preparedness and Response Plan 2006-2008 (1st Plan) was prepared by a National Multi-sectoral Planning Team from the Ministry of Environment and Forest, Ministry of Fisheries and Livestock and Ministry of Health and Family Welfare with joint technical support from the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). The 1st National Plan was approved by the Honorable Prime Minister of the People's Republic of Bangladesh on 17 April 2006.

The country experienced 288 outbreaks of avian influenza in poultry and an outbreak in human, which were managed following the guidelines in the 1st plan.

As the 1st Plan ends in December 2008, Government of the People's Republic of Bangladesh formed a Planning Team to draft the 2nd National Plan for 2009-2011. The team consists of experts from Ministry of Health and Family Welfare, Ministry of Fisheries & Livestock and Ministry of Environment & Forest, and international organizations i.e., WHO, FAO, UNICEF, ICDDR,B.

Experiences from country and global situation of avian influenza and achievement and challenges faced during implementation of the 1st Plan were reflected in the 2nd Plan. The Plan provides a strategic framework for coordinating activities within and between different sectors and stakeholders for preparedness and response to avian and pandemic influenza in Bangladesh. As the epidemiology of avian and pandemic influenza evolves, the Plan will be periodically reviewed and revised whenever deemed necessary. Guidelines, strategies and standard operation procedures for managing avian and pandemic influenza will follow the principles of the Plan.

Among the pandemic periods of influenza (pre-pandemic, pandemic alert and the pandemic period) we are now passing through the pandemic alert period**.** At this stage, the lead role has shifted from Ministry of Fisheries and Livestock (MoFL) to the Ministry of Health and Family Welfare (MoH&FW). In the pandemic period, the office of the Prime Minister will take the lead role.

The goal of the Plan is to prevent & control avian influenza and prepare for the influenza pandemic. It is expected that people of Bangladesh will be able to face the threat of pandemic with a well-prepared Plan.

CONTENTS

EXECUTIVE SUMMARY

The Avian Influenza (AI) outbreaks among poultry and wildlife occurred in 61 countries since 2003. Though with coherent efforts from countries and international communities, the number of outbreaks in poultry across the globe has reduced but the disease remains as a potential threat. In Bangladesh first outbreak in poultry was declared on 22 March 2007. As of 12 November 2008 a total of 288 H5N1 outbreaks have been reported in 47 districts and 142 upazilas/thanas (sub-districts) resulting in death and destruction of over 1.6 million birds. With the reporting of one human case of avian influenza in Bangladesh on 22 May 2008, the country has entered into the pandemic alert period.

Though HPAI (Highly Pathogenic Avian Influenza) is primarily a disease of birds but human cases is occurring consistently since 2003. The transmission is mainly from birds to human with limited human to human transmission. Infections in human often have serious consequences with a high case fatality rate averaging 63%. According to WHO, as of 10 September 2008, there have been a total of 387 avian influenza human cases with 245 fatalities around the world (for update www.who.int). Widespread outbreaks of H5N1 in poultry and continued human infections have increased the chance of evolving a mutated strain or another novel virus having pandemic potential.

The goal of the 2nd National Plan is to prevent and control avian and pandemic influenza and to prepare for reducing morbidity & mortality in both poultry & human with the aim to minimize socio-economic & environmental impact. The strategy of this plan is to develop a multi-sectoral approach with community participation and collaboration with International organizations.

In the pandemic alert period, the objectives are to:

- Improve programme management with a focus on policy, planning, co-ordination and regulations;
- Strengthen disease surveillance;
- Ensure prevention and control
- Case management.

If Bangladesh and rest of the world enter into pandemic period, the specific objectives are to:

- Co-ordinate and mobilize multisectoral resources to contain the pandemic;
- Ensure essential services; and to strengthen bilateral, regional and international collaboration.

In the pandemic period the office of the Prime Minister will take the lead role.

Five strategies have been worked out to achieve the objectives under the plan. These strategies are operational in both pandemic alert and pandemic period.

- Planning and co-ordination,
- Surveillance,

- Prevention & control,
- Risk communication, and
- Operational research.

For implementation of the plan the following committees will function.

- National Advisory Committee (NAC) will be headed by Minister of MoH&FW. They will endorse National Plan before sending for approval by Cabinet, monitor/review the activities under the plan
- National Multi-sectoral Task Force (NMTF) will be headed by Secretary of MoH&FW. They will also endorse National Plan before sending for approval by Cabinet, support implementation of the National Plan
- Communication Committee (CC) will be headed by Joint Secretary, (Public Health and WHO) of MoH&FW. Will endorse communication materials to NMFT for final approval.
- Joint Technical Committee (JTC) will be headed by Director General of Health Services. The committee will sit when required to decide matters arising from issues concerning decision of both National Technical Committee
- National Technical Committees (NTC) for both Health and Livestock will be headed by DG of Health Services and DG of Livestock respectively. They will implement respective section of the National Plan (human health and animal health respectively)
- District Multi-sectoral Co-ordination Committee (DMCC) will be headed by Member of Parliament in-charge of District. The committee will coordinate district Avian Influenza activities.
- Upazila Multi-sectoral Co-ordination Committee (UMCC) will be headed by Upazila Chairman. The committee will coordinate upazila Avian Influenza activities.

Besides the committees a National Co-ordination Cell (NCC) will be situated at NIC, IEDCR. The Cell will provide informational support for coordination.

Surveillance activities will focus on early detection of avian influenza, including novel virus both in birds and humans. Rapid response, early warning and situation monitoring will be important activities under surveillance. The committees through which surveillance and outbreak investigation for both sector will be done through:

- National Rapid Response Team (NRRT)
- District Rapid Response Team (DRRT)
- Upazila Rapid Response Team (URRT)

The prevention and control strategy aims to reduce the risk of transmission of avian influenza from animal to animal, animal to human, and human to human. To achieve the target, improvement of poultry husbandry system, poultry trade regulation and Isolation, quarantine, pharmaceutical and non-pharmaceutical monitoring, live bird market and game bird market improvement, slaughter place improvement, biosecurity, waste management and stamping out of infected poultry are incorporated in this strategy. Interventions will be implemented for reducing transmission and control of the disease. Strengthening capacity for diagnosis and management of patients is an important activity

of this strategy. Training of clinical staff on safe clinical care of human cases of avian influenza will be conducted for this.

Risk communication will be undertaken at three levels:

- Official communication during outbreak, response and control activities;
- Scientific communication among scientists and officials through training, workshop and meeting;
- Mass communication using IEC materials, mass media, IPC, announcement, advertisements etc.

Operational research is needed for successful implementation of the plan and assess the evolving situation and thereby revise the strategies and activities under the plan.

In the pandemic alert period, the important activities will be:

- Increasing awareness of people on AI and their role in prevention and control of the disease and during outbreak;
- Strengthened surveillance in human, poultry and wildlife;
- Outbreak response;
- Strengthening laboratory capacity for diagnosis of human and animal cases;
- Establishment of rapid communication system;
- Management of patients;
- Compensation, rehabilitation and credit for affected commercial farmers and backyard poultry owners;
- Drafting, updating and enforcement of relevant laws;
- Developing messages and ensuring co-ordination among technical and communication staff;
- Development and implementation of policy for vaccination and antiviral.

During pandemic period, the office of Prime Minister will implement all relevant elements of the National Plan. The PM office will put into effect the emergency contingency plan; monitor all the activities of NMTF. When Bangladesh will not be affected, but pandemic outbreak occur in other countries, cross-border surveillance will be established and for such purpose harmonisation of protocols for surveillance and rumour verification will be conducted. If Bangladesh is affected, surveillance will be enhanced and strengthened, case investigation will be conducted to identify index cases/contacts, risk factors and track geographical spread. Need assessment for emergency measures, monitoring for possible changes in epidemiology, clinical presentation and virological characteristics or modification and sharing information with international partners will be accomplished. Sale of live birds will be restricted and only hygienically produced meat will be allowed for supply and sale. Social distancing will be enforced through ban on public gatherings, market, school, cinema hall etc. Massive campaign and communication will be conducted to ensure peoples' involvement and participation to enforce pandemic contingency plan.

Only the outline of the activities has been presented in this plan. Burden of infection, death and service during pandemic period are not included here. It will be provided in a supplementary plan using recently developed various programmes.

Budget Summary: 2009-2011(BDT)

Pandemic alert period:

- Human health: 2,058,454,000
- Animal health : 3,237,400,000
- Wildlife: 627,130,000
- TOTAL: 5,922,984,000

Pandemic Period

- Human health : 760,040,000

Total budget for Pandemic Alert and Pandemic Period: 6,683,024,000

Chapter I

BACKGROUND

BACKGROUND

1 Implementation status of the "National Avian Influenza and Human Pandemic Influenza Preparedness and Response Plan Bangladesh 2006-2008

1.1 Development and functioning of the plan and committees

1.1.1 Approval of the "National Avian Influenza and Human Pandemic Influenza Preparedness and Response Plan Bangladesh 2006-2008" by the Government of the People's Republic of Bangladesh in April 2006;

1.1.2 Development of "Bangladesh National Communication Strategy and Action Plan for Human Influenza and Human Pandemic Influenza 2007-08" : February 2007;

1.1.3 Formation and functioning of National Advisory Committee (NAC), National Multi-Sectoral Task Force (NMTF), Technical Committee (Health) and Technical Committee (Livestock);

1.1.4 In the Pre-pandemic Phase and when the infection was confined in poultry, The Honorable Minister/Adviser, Ministry of Fisheries and Livestock chaired NAC and the Secretary, Ministry of Fisheries and Livestock chaired NMTF;

1.1.5 The leadership of both NAC and NMTF shifted from MoFL to MOH&FW as the country entered Pandemic Alert phase with detection of first human case;

1.1.6 The Technical Committees of health and livestock are chaired by the respective Director Generals;

1.1.7 Formation and functioning of District Multi-sectoral Coordination Committee (DMCC) and Upazila Multi-sectoral Coordination Committee (UMCC);

1.1.8 Inventory of country capacity for avian and pandemic influenza preparedness.

1.2 Implementation status: Animal Health

1.2.1 Planning and Coordination

1.2.1.1 Formation and functioning of committees

1.2.1.1.1 Central Quick Response Team;

1.2.1.1.2 District Influenza Animal Health Management Committee;

1.2.1.1.3 District Animal Disease Rapid Response Team (DDRRT) ;

1.2.1.1.4 Upazila Avian Influenza Animal Health Management Committee;

1.2.1.1.5 Establishment of a National Diagnostic Network;

1.2.1.2 Development of training modules, operational manuals, matrix and SOPs

1.2.1.2.1 Operational manual;

1.2.1.2.2 Operational matrix;

1.2.1.2.3 SOPs on laboratory diagnostic techniques, restocking after culling.

1.2.1.3 Surveillance, Early Warning and Response

1.2.1.3.1 Outbreak investigation:

1.2.1.3.1.1 Suspected first outbreak through preliminary detection of avian influenza type A by Central Disease Investigation Laboratory (CDIL) and confirmed as H5 by National Reference Laboratory for Avian Influenza (NRL-AI) in the country on 13 March 2007;

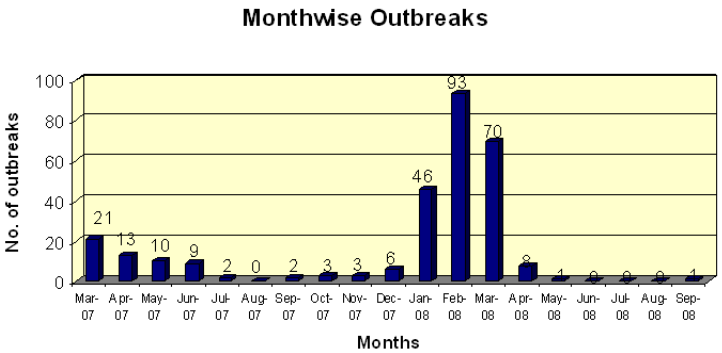
1.2.1.3.1.2 Confirmed as HPAI/H5N1 in National Institute of Animal Health (NIAH), Thailand;

1.2.1.3.1.3 Declared the first outbreak on 22nd March 2007 by the cabinet;

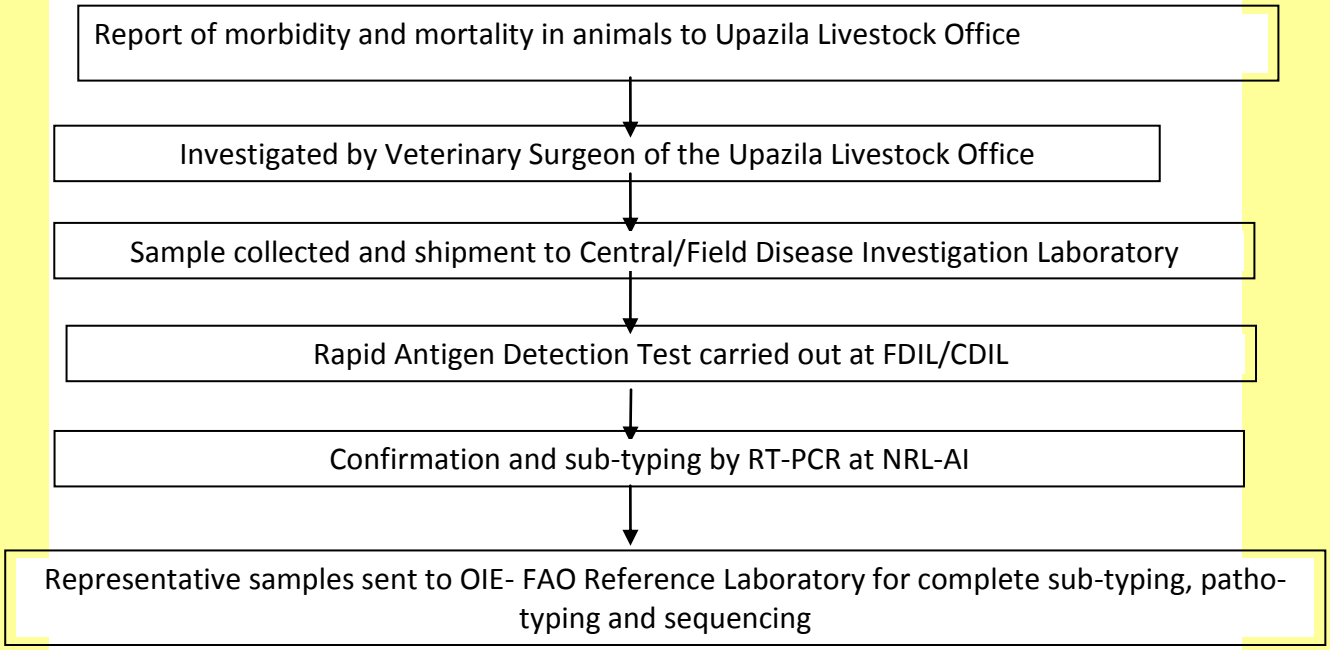
1.2.1.3.1.4 Since the 1st outbreak, 5088 suspected cases were tested and 288 HPAI cases were detected;

1.2.1.3.1.5 For sub-typing, pathotyping and sequencing 42 samples were sent to OIE – FAO reference laboratory, Weybridge, UK;

A monthly pattern of AI outbreaks is shown in Diagram below.



The approach of outbreak investigation undertaken during the 1st plan period



1.2.1.3.2 **Active surveillance*:***

1.2.1.3.2.1 HPAI surveillance was conducted in three districts with the support from FAO. Serum and virological samples were collected from ducks and wild birds and were analyzed in FDIL, CDIL and NRL-AI;

1.2.1.3.2.2 From February, 2008 to June, 2008 active surveillance was carried out in 99 risk-based upazilas with the support from FAO. From the surveillance programme 60 suspect cases were identified, of which 26 cases were HPAI positive. Details of the surveillance activities are given below:

Active surveillance in 99 Upazilas from Feb 08- Jun 08

Batch No.	No of Upazila	No of AHW	House Hold	Commercial Farm	Suspected case	Confirmed by RT-PCR
1	50	150	421011	5577	55	22
2	49	147	504990	1828	5	4
Total	99	297	926001	7405	60	26

1.2.1.3.2.3 The second phase of active surveillance of Avian Influenza is on going in 150 selected upazilas at risk with assistance of FAO. The Community Animal Health Workers (CAHW) send reports to the epidemiology unit of DLS through SMS Gate-Way;

1.2.1.3.2.4 Active surveillance is ongoing in live and wet bird market,

1.2.1.3.2.5 Surveillance of imported grand parents and parent stock day –old- chicks (DOCs), backyard poultry, commercial poultry, live and wet markets, wild and migratory birds, ducks and geese were conducted by NRL-AI with the help of DLS, BRAC and ICDDR,B.

1.2.1.3.2.6 'Support Services for Combating Avian Influenza in Bangladesh(SSCAIB)' project appointed 32 veterinary officers and 64 'Fieldman' for conducting active surveillance ;

1.2.1.3.2.7 An epidemiology unit was established at DLS with the financial support from FAO. Epidemiological software and animal disease mapping system were introduced.

1.2.1.3.2.8 Epidemiologists were trained on applied veterinary epidemiology, analytical epidemiology and disease mapping;

1.2.1.3.2.9 A SMS gateway system is established at DLS.

1.2.1.4 Prevention and Control

1.2.1.4.1 Imposed ban on importation of poultry and poultry products from infected countries since 2003; Increased vigilance in the border area;

1.2.1.4.2 Awareness created among public and farmers about avian influenza, capacity improvement of laboratories of DLS and BLRI;

1.2.1.4.3 Collection of 30,000 sets of Personal Protective Equipment (PPE) and disinfectants;

1.2.1.4.4 Collection of diagnostic kits, reagents and consumables with support from DANIDA and FAO;

1.2.1.4.5 Training on the use of PPE, outbreak investigation and outbreak response with the support of FAO;

1.2.1.4.6 Conducted biosecurity training jointly by DLS and BRAC;

1.2.1.4.7 Established disinfection facilities at important entry points with the support from private sectors;

1.2.1.4.8 Implemented area culling 1 Km radius around the infected premise and a 10 km control zone around the infected premise;

1.2.1.4.9 Redefined the culling area: only infected premise for commercial farm and 500 meters around the infected house for backyard poultry.

1.2.1.5 Sector Response

1.2.1.5.1 Upgraded and designated Poultry Disease Diagnostic Laboratory (PDDL) as NRL-AI with the support of DANIDA;

1.2.1.5.2 Developed protocol and trained staff for detection of AI by RT-PCR with the support of DANIDA;

1.2.1.5.3 Trained the CDIL and FDIL laboratory scientists on good laboratory practices and RT-PCR technique;

1.2.1.5.4 Established FAO technical Unit at DLS to provide technical support;

1.2.1.5.5 Approved, publicized and implemented compensation strategy to encourage farmers for disease reporting;

1.2.1.5.6 Disbursed about 130 million taka to the affected farmers.

1.2.1.6 Vaccination

1.2.1.6.1 During the implementation of the 1st plan Bangladesh did not opt for vaccination considering huge number of backyard poultry, weak laboratory back up to monitor circulating virus and protective level in vaccinated bird, high expense of vaccine and vaccination and experiences of other countries.

1.2.1.7 Training

Provided training to the officers, staff, farmers, journalists, traders, teachers, religious leader, NGO's etc.

1.3 Implementation status of Human Health

1.3.1 Planning and coordination

1.3.1.1 Formed and made functional committees at different level of health service;

1.3.1.2 Revised the Operational Plan of Communicable Disease Control (CDC) of Directorate General of Health Services (DGHS) under Health Nutrition and Population Sector Program (HNPSP) to accommodate the Avian/Pandemic Human Influenza as a separate component;

1.3.1.3 Collaboration of IEDCR with Center for Disease Control and Prevention, at Atlanta, USA for providing laboratory and technical support ;

1.3.1.4 High level bi-lateral consultation meeting between Bangladesh and India on Avian Influenza on 27-28 August 2008 with support of WHO.

1.3.2 Surveillance

1.3.2.1 Surveillance for Influenza like illness (ILI) at 12 hospitals by IEDCR in collaboration with ICDDR,B;

1.3.2.2 Web based disease surveillance for AI at districts with support of CDC, Atlanta is under process of implementation;

1.3.2.3 Procurement of equipments and logistics for establishing labs at 18 sentinel sites;

1.3.2.4 Procurement equipments and accessories for BSL-2 laboratory at NIC;

1.3.2.5 Procurement (Under pipeline)of prefabricated BSL-3 laboratory for NIC;

1.3.2.6 Collected information on ILI among poultry workers and owners of backyard poultry in affected 137 upazilas from Feb-April 08 by Assistant Health Inspector (AHI);

1.3.2.7 Conducted surveillance among cullers of HPAI infected poultries;

1.3.2.8 Conducted outbreak investigation (rumour verification) on four occasions.

1.3.3 Prevention and control

1.3.3.1 Distributed 251,000 antiviral (Oseltamivir), 1000 PPE sets, disinfectants and hand washing solution to district level;

1.3.3.2 Procurement of 400,000 capsule, 100000 syrups of antiviral (Oseltamivir), 50 thousand sets of PPE and 50,000 bottles (500ml) of disinfectants and 5000 bottles (100ml) of hand washing;

1.3.3.3 Establishment and functioning of "Avian Influenza ward" in Asthma Center of National Institute of Diseases of Chest and Hospital (NIDCH) at national level;

1.3.3.4 Establishment of isolation units in 64 districts by December 2008 (15 completed);

1.3.4 Sector Response

1.3.4.1 Development and production of guideline and SOP;

1.3.4.1.1 Development of SOP on different activities under AI in human;

1.3.4.1.2 Publication of Laboratory manual on Diagnosis of Avian Influenza;

1.3.4.1.3 Development of training modules;

1.3.4.1.4 Development of guideline and SOP on International health Regulation (IHR) and Public health Emergency of International Concern (PHEIC);

1.3.4.1.5 Development of guideline for case management;

1.3.4.1.6 **Resource utilization during 2006-2008**

1.3.4.1.6.1 2005-2006: Taka 7.3 million was allocated and spent from the program of emerging and reemerging diseases of CDC, DGHS.

1.3.4.1.6.2 2006-2007: Taka 11.297 million was spent;

1.3.4.1.6.3 2007-2008: Taka 121.430 million was allocated and Taka 115.0 million was spent from AI programme;

1.3.4.1.6.4 2008-2009: Taka 218.871 million allocated and 61.757 million was spent.

1.3.4.2 Training of Health personnel

1.3.4.2.1 Training of 3700 medical personnel (Members of 64 District Rapid Response Teams and 471 Upazila Rapid Response Teams) on Basics of Influenza, Case Management, Outbreak investigation and Infection Control;

1.3.4.2.2 Training of 947 physicians on AI management;

1.3.4.2.3 Training of 7565 Health staffs (HI/AHI/HA) on awareness;

1.3.4.2.4 Training of 192 Master Trainers on AI for physicians of district level;

1.3.4.2.5 Orientation of 226100 volunteers on prevention and control ;

1.3.4.2.6 Training on Laboratory diagnosis of avian Influenza for Microbiologist, Virologist and Medical Technologists (Lab);

1.3.4.2.7 Training of trainers on Rapid Containment of Pandemic Influenza at IEDCR with technical support from SEARO, WHO in June 2008.

1.3.5 Risk communication

1.3.5.1 Development and functioning of national risk communication strategy;

1.3.5.2 Development, production and dissemination of Information Education and Communication (IEC) materials using printing, electronic and other media;

1.3.5.3 Conduction of house to house awareness campaigns by trained volunteers covering approximately 28 million people.

2. Country Situation

2.1 Geographic profile

Bangladesh, located in South Asia, borders the Bay of Bengal, India and Myanmar. It occupies the apex of the arch formed by the Bay of Bengal. A large number of rivers and their tributaries crisscrossing the country drain the Bay of Bengal making it a very fertile delta. The country is mostly flat alluvial plain and hilly in southeast. Bangladesh is a tropical country with predominantly three seasons, mild winter (October to March); hot, humid summer (March to June); humid, warm rainy monsoon (June to October). It covers a total area of 147,570 sq km, divided into six divisions and 64 districts with 481 Upazilas (sub-districts). Each Upazila is further divided into on an average 10 unions. Each union is again divided into nine wards with each ward consisting of several villages. All together there are about 4,500 unions and 90,500 villages.

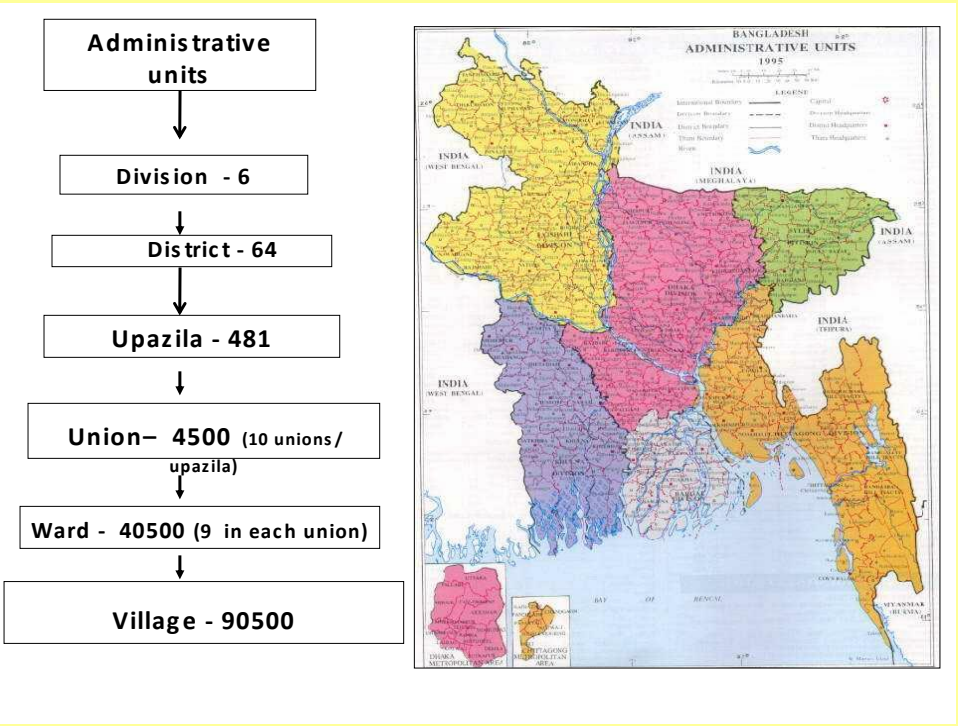
2.2 Demographic and Social Profile

Bangladesh is one of the most densely populated countries in the world with 953 people living per square kilometer. The average household size is 4.9.The estimated total population is 143 million. The estimated population per district in 2007 is 2248594 (range 344861-9849367). The majority of the population lives in rural areas (74%) and most of them depend on agriculture. Eighty percent of the rural households have backyard poultry. Adult literacy rate is 51%, life expectancy at birth 65 years and population growth rate is 1.49% (BBS 2006). The per capita income is US$ 482 (BBS 2006-2007).

2.3 Government system

The official name of Bangladesh is the People's Republic of Bangladesh. According to the constitution, the form of government is parliamentary where Prime Minister is the Chief Executive and President is the Head of the State. The legislative powers of the Republic vest in the Parliament, which consist of three hundred and thirty members among which 300 are elected by direct voting election and 30 female members, are selected by the elected members. The Cabinet is headed by the Prime Minister. The Ministries perform regulatory policy-making functions while the subordinate offices execute government policies and decisions at the field level.

Political map of Bangladesh with Administrative Units



2.4 Wild Life situation

2.4.1 Situation of Migratory and Wild Birds

About 244 species of migratory birds visit Bangladesh during winter (October to March) of which approximately 21 species may carry the HPAI/H5N1 virus. Migratory birds are considered to be one of the major biological vectors which enable the virus to travel across and between continents. The global community was alarmed by the death of 6,000 Bar-headed geese due to H5N1 in the Qinghai lake region in north-east China, and its rapid spread in water fowl in Central Asia, Russia and Eastern Europe. It is believed that, infected water fowl carry the H5N1 virus and spread it along their migratory routes and introduce the virus into the poultry flocks along these routes. Bar-headed geese, Pochard, Mallard, and some other water birds are the suspected carrier of the deadly HPAI/H5N1 virus. These water birds migrate to Bangladesh during winter season and stay in wetlands, rivers and estuaries throughout the country as illustrated in t*able* below.

Table : Winter Habitat of Migratory Water Birds in Bangladesh

Region	Sites
Central-south coast	Coastal islands of Bhola, Noakhali and Patuakhali Districts
South-west coast	Borguna, Pirojpur, Bagerhat, Satkhira and Khulna Districts
South-east coast	Coast line and coastal island of Chittagong and Cox's Bazar Districts
North-east Haor basin	Haors and Beels of Sunamgonj, Sylhet and Moulavibazar, Mymensingh, Kishoregong Districts
Central region	Surrounding Dhaka City
Lower stream of Padma and Jamuna river	Aricha, Mowa and Shaitnal of Manikgonj, Munshigonj and Chandpur Districts
High Altitude wetland	Kaptai lake of Rangamati District.

2.4.2 Wildlife Infrastructure

The Forest Department (FD) is responsible for all activities concerning wildlife. There is a Wildlife Advisory Board at the national level. The FD has four division level offices for the protection and conservation of wildlife. Under each forest division there are numbers of Range and Beat (grassroots-level) offices.

Forty four territorial divisional forest officers act as wildlife wardens in addition to their other activities. The FD has Upazila level representatives throughout the country who are mandated to execute the Wildlife Act for protection and conservation of wildlife resources and to provide extension services related to wildlife. They are currently engaged in increasing public awareness regarding risk of HPAI/H5N1 introduction through migratory birds in the country. These personnel need to be trained, but currently they are not sufficient in number to face the situation.

The FD has five educational institutions to train officials and staff. Apart from this, four national universities offer graduate courses in Forestry, which also cover wildlife education. Universities of Dhaka, Jahangir Nagar, Khulna and Bangladesh Forest Research Institute (BFRI) are conducting research on various aspects of wildlife on a limited scale.

2.5 Livestock Situation

2.5.1 Background

The economy of Bangladesh is heavily dependent on mixed agriculture that includes crops, livestock and poultry. According to National Economic Review, 2007 the contribution of agriculture to GDP is 17.68% and share of livestock to agricultural GDP is 17.70 %. The livestock sectors' share of employment in the agriculture sector is 39%. The livestock sub-sector offers employment opportunities particularly for the rural poor, many of whom dependent on livestock as their only livelihood option. The livestock sector has enjoyed a sustainable growth in last two decades. Small-scale livestock farming particularly poultry has provided self-employment to approximately 25% of total population (DLS, 2006-2007).

All the four sectors of poultry production systems classified by FAO **(Annex-1)** exist in the country. However, sectors three and four, which are characterized by small holder commercial and backyard poultry farmers, respectively, predominate in large parts of Bangladesh. Along with commercial poultry, backyard or family poultry raising plays a pivotal role in the livelihoods of the poor. The share of backyard poultry to the poultry population is considered to be approximately 50%. Backyard poultry farming is a great challenge for Bangladesh to control Avian Influenza and spread as biosecurity measures are difficult to employ in backyard settings. Ducks and geese are reared across the country but concentrated around water bodies.

The population of chicken, ducks and pigeons in Bangladesh is 206.89 million, 39.08 million and 11 million respectively. The poultry industry is estimated to have a total investment of approximately 2 billion USD. About 5 million people are directly and indirectly involved in commercial poultry. The current highly pathogenic avian influenza (HPAI) is a crisis is big challenge for sustaining growth in commercial poultry.

2.5.2 Poultry Diseases

The important diseases in Bangladesh include Avian Influenza, Newcastle disease, infectious bursal disease, fowl pox, Marek's disease, salmonellosis, colibacillosis, mycoplasmosis, duck plague and fowl cholera.

2.5.3 Animal Health Service Delivery System

Animal Health Service delivery system in Bangladesh is divided into two levels:

1. Primary level
2. Secondary level

2.5.3.1 Primary Level

Services at the primary level (the level of Upazila and below) – are provided up to Upazilas. In the Upazila, a Livestock Officer, Veterinary Surgeon, sub-technical staff and field personnel are responsible for providing animal health services. In each Upazila, there is one veterinary hospital where treatment, preventive vaccination and extension services are provided. However, there are no services available at the Union level. However, the micro-finance NGOs have outlets at grass-root levels to support small scale poultry farming across the country. Some big poultry entrepreneurs have contact growing systems in some selected areas.

2.5.3.2 Secondary Level

Secondary level Animal Health Services delivery system is mainly provided by the 63 district veterinary hospitals and the Central Veterinary Hospital, principally for diagnosis, treatment and preventive services. Each veterinary hospital is manned by a Veterinary Officer, a Veterinary Surgeon and sub-technical staff. Each district has one District Livestock Officer responsible for all administrative and extension activities within the districts. Specialized staff in epidemiology, laboratory and other relevant personnel who could provide support to surveillance and other key activities is not available at this level. In Dhaka, the central veterinary hospital has facilities for radiological and surgical interventions. The central hospital is manned by one Chief Veterinary Officer, one

Veterinary Officer, 9 Veterinary Surgeons, One Anesthesiologist, One Radiologist one Clinical Pathologist, and 29 sub-technical and support staff.

2.5.4 Surveillance System, Early Warning and Response

2.5.4.1 Epidemiology capacity:

A temporary Epidemiology Unit has been established at DLS. However, it is not integrated to organogram of DLS. The unit can conduct epidemiological investigation, study and diseases mapping. Moreover, there is serious lack of sufficient human resources with the necessary advanced training in epidemiology to lead epidemiology unit. Furthermore, shortages in funding, logistics, information technology and geographical information system (GIS) equipment require urgent attention in order to face the potential threat of Avian Influenza. Chittagong Veterinary and Animal Science University, Bangladesh Agricultural University and BLRI have limited expertise and facilities for epidemiological study and research.

2.5.4.2 Outbreak investigation:

DLS epidemiology unit and field offices of DLS carry outbreak investigation when any suspect case is reported and rumor tracking are carried out.

2.5.4.3 Passive surveillance

Farmers and any person informed about sickness or death of birds including poultry are advised to report to Upazila Livestock Office. Veterinary Surgeon of Upazila Livestock Office after primary investigation reports it to ULO livestock officer. For emergency diseases like Avian Influenza the ULO reports it to DLO and CVO by telephone or fax. The diseases other than emergency ones are reported to epidemiology unit in monthly animal diseases reporting form. The data received from the field are collected, collated and analyzed by the epidemiology unit. Immediate, follow up and six monthly reports which are appropriate are submitted to OIE.

2.5.4.4 Active surveillance

The country carried out targeted active surveillance From February, 2008 to June, 2008 active surveillance was carried out in 99 high risk Upazilas. (Ref. in 1.2.1.3.2.2)

2.5.4.5 Current Status of Veterinary Laboratory Services

2.5.4.5.1 Laboratory facilities of DLS:

The DLS has a diagnostic network of one Central Disease Investigation Laboratory (CDIL) in Dhaka, seven Field Disease Investigation Laboratories (FDIL) and sixty three District Veterinary Hospital which report to the CDIL. These laboratories all perform pathology, parasitology, and toxicology tests. All DLS laboratories are of bio-safety level-1 (BSL-1).

CDIL has antigens and antiserum for HI or HA test to diagnose avian influenza. CDIL and all FDILs have been supplied with Class II bio-safety cabinets and other safety equipments & consumable items. All DLS laboratories including CDIL, FDILs and District Veterinary Hospitals have avian influenza diagnostic facilities through Quick Antigen Detection Kit.

2.5.4.5.2 Laboratory facilities of NRL-AI, BLRI

NRL-AI is located at BLRI, Savar, 25 kilometers away from Dhaka and established by the presidential order (মপম/পস-২/ বার্ড ফ্লু/বিবিধ-১০/০৬/৫৯২, তারিখ-৬/১২/২০০৬ ইং) of the Government of the People's Republic of Bangladesh, 2006 with technical and financial support of DANIDA. Current bio-safety level of the NRL-AI is BSL-2 enhanced with modern equipments and has capacity for molecular diagnosis of HPAI through RT-PCR using Conventional as well as Quantitative PCR systems. This laboratory has capacity to carry out ELISA, HI, HA, AGPT, immuno-histo-chemistry, histology and virus culture in embryonated eggs & primary as well as continuous cell line. NRL-AI has limited number of manpower experienced in molecular diagnosis, phylogenetic analysis, vaccine development and able to conduct research activity to face the national demands.

Due to lack of BSL-3 laboratory facilities, skill of manpower and modern equipments are not utilized fully.

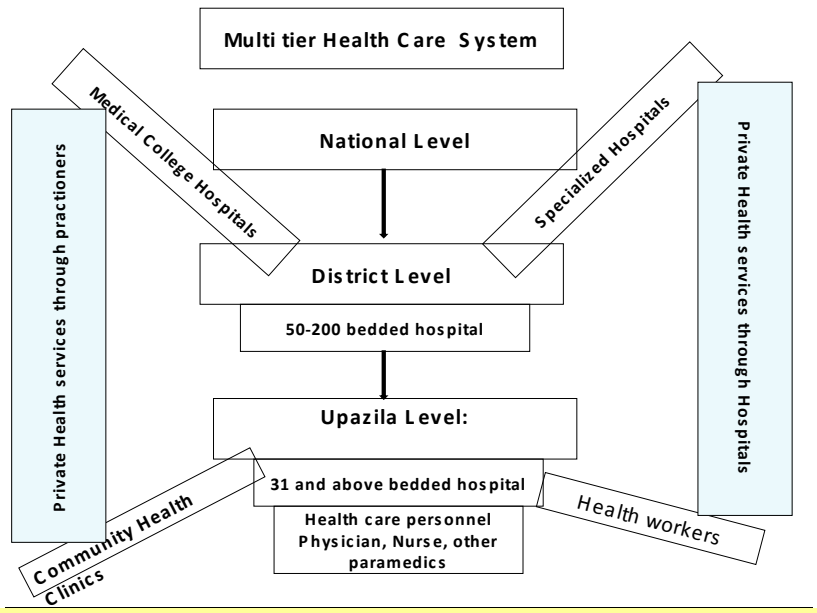
2.6 Human Health situation

Health care in Bangladesh is provided by both the government and the private sector. The government health facilities provide health care at almost free of cost including preventive, curative, and rehabilitative services, whereas the private sector provides health care with charges. The public health care system is managed by the Ministry of Health and Family Welfare (MOHF&W), headed by the Minster of MOHFW, with the Secretary MOHFW as the executive head. For implementation of health services, Director General of Health Services is the executive head. Bangladesh has well organized health infrastructure from the primary to the tertiary level. Health services in Bangladesh are extremely stressed due to large population size and over burden of diseases with emerging infections.

2.6.1 Health Services Delivery System

The system in Bangladesh is divided into three levels:

1. Primary level
2. Secondary level
3. Tertiary level



Health Facilities of Government sector:

Levels	Type of hospital	No. of hospitals	No. of beds
Tertiary Level	Medical College hospitals (including Dental and Alternative medicine)	17	8095
	Specialized Hospitals	12	2254
	Total	29	11569
Secondary level	General Hospital	13	1250
	Sadar Hospital	52	6800
	Special/Specialized Hospital	32	1121
	Total	97	9171
Primary	Upazilla Health Complex	407	14248
	Other Hospital	38	664
	Total	445	14912
	Total	**571**	**34531**

Health Facilities of Private Sector:

Levels	Type of hospital	No. of hospitals	No. of beds
	Medical College hospitals	2155	35338
	Private Hospital/ Clinics		
	GRAND TOTAL		69,869

- No of Hospital Beds: 69,869 (Government: 34,531 & Private: 35338)
- No of Registered Physicians (as of July 2007):45,723
- Population per Physician: 3,012
- Population per Bed: 2,665
- Physician to Nurse Ratio: 2:1
- Population per Nurse: 6,342
- Physician to Nurse Ratio: 2:1
- Population per Nurse: 6,342

2.6.1.1 Primary Level

The primary level (Upazila/sub-district level and below) is the principal level for health care in Bangladesh. The health personnel at Upazila level are doctors, nurses, medical assistants, sanitary inspectors, health inspectors, family planning inspectors, health assistants, technologists, and family welfare visitors /midwives. Health services at this level are coordinated and managed by the Upazila Health and Family Planning Officer (UHFPO).

In each Upazila, there is at least a 31-bed health complex. In some Upazilas they are being upgraded to 50 beds. There is a plan for all Upazila Health Complexes (UHCs) to be converted to 50 beded hospital. The UHCs provide both preventive and curative heath services. Nine medical doctors among whom four are consultants with post graduate degree in medicine, gynecology, surgery and anesthesia work at each UHC. At Union level, there is one Union Health and Family Welfare Centre (UH&FWC) /Union sub-centre (USC), where preventive, curative as well as family planning services are provided. The Union Health and Family Welfare Centre (UH&FWC)/Union health sub-centre acts as a basic health centre and the UHC as the first referral hospital.

For domiciliary services, one health assistant from health department and one family welfare assistant from family planning works for approximately four to six thousand people. For each union, there is one Family Welfare Visitors (FWV)/midwife. In each union, there is one assistant health inspector (AHI) and one family planning inspector (FPI). One

Health and sanitary inspector look after one Upazila. For disease control, vaccination and surveillance activities these health workers play a vital role.

2.6.1.2 Secondary Level

Secondary level health service delivery system is mainly provided by the district hospital principally for curative services. These are the referral hospitals for the Upazilas. Civil Surgeon (district health officer) is responsible for coordination and management of health activities including the district disease surveillance system within the districts. The district level has core human resources for health care services and laboratory services. They have basic training on surveillance and outbreak investigation. They prepare and send weekly report for EPI diseases to the EPI headquarter and monthly disease profile to Director MIS. They also report unusual cluster illnesses immediately to Director Disease Control and IEDCR.

2.6.1.3 Tertiary Level

Tertiary level hospitals are the medical college hospitals and national specialized institutes, where most facilities and services are available. These are the referral hospitals at the national level. Institutional surveillance at the tertiary levels is not yet effective in all places and need to be strengthened.

2.6.2 Vaccination program and implementation

Bangladesh has national immunization programme run by the Expanded Programme on Immunizaion (EPI). Routine recommended vaccines are BCG, DPT, OPV, Measles and HepB vaccine for children and TT for 15-49 years women are routinely given in the program. Hib vaccine will be introduced in Bangladesh from January, 2009. A standard cold chain is strongly followed from the national to union level. EPI HQ distributes vaccine to District level from where it is collected by UHC on monthly basis. From the Upazilla Health Complex, the porter carries the vaccine to the distribution point and Health assistant takes the vaccine from the porter and vaccinate children and women at the grass root level.

2.6.3 Current status disease surveillance (human)

The following disease surveillance systems are ongoing:

1) Routine disease surveillance
2) EPI disease surveillance
3) Priority communicable disease surveillance (PCDS)
4) Institutional disease surveillance (IDS)
5) Sentinel surveillance (SS)
6) Surveillance through emergency outbreak investigations(Event Based Surveillance)
7) Acute meningo-encephalitis surveillance (AMES)
8) High risk group avian influenza surveillance (among cullers)
9) Hospital based influenza surveillance
10) Nipah Surveillance

IEDCR is in charge of all the above-mentioned disease surveillances, except routine disease surveillance and EPI disease surveillance which are run by MIS of DGHS and EPI respectively. Hospital based surveillance is done in 12 hospitals (6 government and 6 private hospitals) covering all parts of Bangladesh. Out of 69 SARI samples tested, 6%

percent were found positive for influenza (75% influenza A and 25% influenza B) and out of 2975 ILI samples tested, 13% were positive for influenza (48% influenza A and 52% influenza B). None of those were H5N1 positive.
The disease surveillance systems that are planned for future and expected to start soon by IEDCR are as follows:

- High risk group avian influenza surveillance in wet markets of urban areas (among live-bird handlers)
- Sentinel surveillance for influenza-like-illness (ILI) at 18 hospitals. Three hospitals from each division will be under this surveillance
- Integrated disease surveillance
- Web based disease surveillance
- Viral pneumonia surveillance

2.6.4 Outbreak investigation

At national, district and upazilla level, Rapid Response Teams (RRT) have already been formed to conduct outbreak investigation. IEDCR is assigned for co-ordination and conduction of outbreak investigation at national level. In 2008, all together IEDCR investigated 25 reported outbreaks including four influenza like illnesses. IEDCR is also coordinating and providing training on outbreak investigation including avian influenza to all RRT members. A BSL 3 lab is being constructed at IEDCR for investigation of emerging and infectious pathogens.
The principal objectives of Case/Outbreak Investigation are to detect cases and cluster of emerging and re-emerging diseases including avian influenza in human, to determine key epidemiological, clinical, and virological characteristics of cases, to find out risk factors for transmission and to suggest measures for containment and control of the diseases.The roles and responsibilities of the RRT in Avian and Pandemic Influenza preparedness activities:

a. To analyze and act on surveillance, media and other information, concerning Avian and Pandemic Influenza
b. To plan control and response strategies for managing Avian and Pandemic Influenza
c. To identify additional resources needed for rapid response.
d. To investigate and manage the Avian and Pandemic Influenza including communication with the general public and the media.
e. To collaborate and coordinate with other relevant agencies in managing the Avian and Pandemic Influenza.
f. To evaluate the effectiveness of the response and intervention measures adopted for Avian and Pandemic Influenza.
g. To produce a detailed report to higher authorities (Director IEDCR and Director-Disease Control, DGHS).

2.6.5 The Laboratory Services system of Bangladesh

The Laboratory Services system in Bangladesh is divided into three levels:

1. Primary level
2. Secondary level
3. Tertiary level

2.6.5.1 Primary Level

The primary level – at the Upazila (sub-district) level. All 31 to 50 bed Upazila health complex (UHC) except Sadar has a small laboratory. These laboratories all perform routine investigation like X-ray, Blood TC, DC, ESR, Widal, VDRL, Microscopy of sputum for TB, Urine- RME, Stool-RME. In some Upazila laboratory have the facilities for microscopy for malarial parasite (MP) and filarial. and parasitology, and tests. The health personnel at Upazila level include graduated medical doctors, health assistants, two technologists, and sweeper have been supporting these laboratories. Health services at this level are coordinated and managed by the Upazila Health and Family Planning Officer (UHFPO). The UHC is the first referral hospital and these labs, at this level, play a vital role in surveillance activities.

2.6.5.2 Secondary level

Secondary level health laboratory services are mainly provided by the district general hospital laboratories and private hospital laboratories, principally for curative services. These are the referral hospitals for the Upazilas. Civil Surgeons (district health officers) and laboratory medicine specialist are responsible for coordination and management of laboratory activities also for district disease surveillance system. In addition to testing facilities provided by UHC, some microbiological and biochemical diagnostic facilities are available at this level. These laboratories are also doing screening test against 5 diseases (Hepatitis B, hepatitis C, HIV, Syphilis, malaria) to support safe blood transfusion.

These laboratories do also provide any rapid testing support supplied by government. However, many of the staff at this level needs proper and up-to-date training and logistical support to adequately equip them to prevent and control avian and pandemic influenza. An integrated electronic laboratory surveillance network is essential embracing all the districts and the national level to provide a rapid, significant and effective surveillance system for early warning, and appropriate intervention and containment measures.
Most of these primary and secondary level laboratories are BSL 1 standard and some of them have the standard of 0 level.

2.6.5.3 Tertiary Level

In tertiary level hospitals, significantly more modern and high technology facilities are available to conduct sophisticated laboratory diagnosis. Besides these, laboratories within the private sector are highly specialized facilities and are available up to the divisional cities.

At the national level, IEDCR is equipped with ELISA, biochemical analysis, immunofluorescence conventional and real time PCR facilities for various purposes, at bio-safety level 2(BSL2) and at bio-safety level 1(BSL1). In these facilities, bacterial isolation is possible, not virus isolation. Recently, in 2007, IEDCR has been declared as National Influenza Centre (NIC) by WHO. Installation of prefabricated BSL 3 lab in IEDCR is near completion to serve as national referral laboratory for Avian influenza in Human. It is expected that IEDCR will be able to perform virus Isolation in its own BCL3 laboratory by June 2009. Currently for detection of avian influenza virus, IEDCR has the facilities for rapid antigen detection test and PCR facilities with sequencer. Two of scientists of IEDCR have

International Air Transport Association (IATA)-approved training and certificates for safe international dispatch of samples to reference laboratories.
Currently Bangabandhu Sheikh Mujib Medical University (BSMMU) has a virology lab of BSL-2 level. Laboratory facilities at the Centre for Health and Population Research, ICDDR,B, are capable of isolating some influenza viruses other than H5N1 although the laboratory is of BSL-2 level.
Prior to full operation of these laboratories, agreements and arrangements will need to be established to safely send samples to the WHO reference laboratories.
Additionally, there are serious concerns about the availability of personal protective equipment (PPE), antiviral and vaccines for laboratory personnel, which administration should keep in mind

2.7 Legal Framework

2.7.1 Animal Health

Bangladesh Diseases of Animals Act, 2005, and Bangladesh Animal and Animal Product Quarantine Act, 2005, Bangladesh Diseases of Animals Regulation, 2008, Bangladesh Wildlife (Preservation) (Amendment) Act 1974 are the main legal instruments for keeping Bangladesh free from HPAI/H5N1 in animals and enables the control and eradication of the disease in case of an outbreak. Moreover, Bangladesh Penal Code (BPC), Bangladesh Customs Act 1969 and Imports and exports (Control) Act. 1950 Section 3A are used for quarantine and import bans respectively. According to Bangladesh Diseases of Animal Act, 2005, HPAI/H5N1 is a notifiable disease. The Wildlife Act makes killing, catching, poaching and illegal trade of wildlife a punishable offence.

While these legal instruments are in place, they are not fully implemented and enforced prior to and in the event of a scenario of rapid spread of the disease is needed. The main constraint here would be appropriately-trained personnel, and financial resources to fully implement these laws.

2.7.2 Human Health

In many cases, the current legal framework is still based on laws inherited from the colonial period. It is now imperative to review these laws within the present context. The most important public health laws are: The Bengal Prevention of Inoculation Act, 1865; the Bengal Vaccination Act, 1880; the Epidemic Disease Act, 1897; the Public Health (Emergency Provisions) Ordinance Act 1944; the Bangladesh Pure Food Ordinance, 1959 (amended in 2007); and the Bangladesh Pure Food Rules, 1967 will provide the platform for preventing and responding to avian influenza and human pandemic influenza. In support of these national laws, the International Health Regulations 2005, which came into full effect in 2007, ensures reporting any outbreaks of Avian Influenza in human to national authority, and subsequently to the World Health Organization (Ref SOP PHEIC). To ensure effective prevention and response to avian and pandemic influenza in Bangladesh, new legislation is required for social distancing, delimiting containment and buffer zone, quarantine, disinfecting transports, health measures for travelers in international border, etc. The legislations should meet IHR 2005 standard which have been promulgated by WHO and adopted by Bangladesh. The various sectors responsible for developing and

enforcing all the relevant laws must collaborate and be fully integrated in the national efforts.

2.8 Budget in Health

The budget of the health and family panning sector is BDT 42,340 million (USD 631.94 million) of which 16.5 million (USD 246,000) is allocated towards control of communicable diseases for the 2005-2006 fiscal year.

3 Avian Influenza situation

3.1 Avian Influenza in Animal Health

3.1.1 Global situation:

In mid December 2003, an epizootic of HPAI started in the Far-East, spread quickly many other countries of south-east Asia, and subsequently, to other parts of Asia, Europe and Africa. Sixty one countries reported H5N1 Avian Influenza in Domestic Poultry/Wildlife to OIE between 2003 and 2008. The number of outbreak has reduced with the joint efforts from national government and international communities. In South Asia, Afghanistan, India, Pakistan experienced outbreaks before Bangladesh. The both neighbors of Bangladesh, India and Myanmar experienced outbreaks in 2006. In accordance with the frequency of outbreak, Bangladesh stands in the 4th position in the world.

3.1.2 Bangladesh Situation:

Outbreaks recorded in both commercial and backyard poultry resulting in the culling of over 1.6 million birds. Along with 288 outbreaks, three H9N2 cases were also recorded. Bangladeshi isolates were clustered with those from middle China, South and Mid Asia, Middle East, Europe and Africa belonging to the sub-clade 2.2, which is popularly known as Qinghai lineage or Euro-Asia-Africa lineage. Two waves of outbreaks hit the poultry industry. The first wave of outbreak reached its peak in March 07, gradually declined with no case reported in August 07. The second wave of outbreaks started in September 07 and peaked in February and March 2008 with respectively 93 and 70 outbreaks. The incidence rapidly declined with only 8 cases reported in April and only one in May. The last outbreak was reported on 29 Sep 2008 after a gap of more than four months.

3.2 Human Health Situation of Avian Influenza

3.2.1 Global Situation

H5N1 is still primarily an animal disease, and cases in humans remain relatively rare but also continue to occur. Currently, there are two different groups (or clades) of H5N1 viruses circulating among poultry (clade 1, and clade 2 viruses). To date at least three subgroups or subclades of clade 2 H5N1 viruses have infected humans: subclades 2.1, 2.2, and 2.3 viruses. Most cases have been associated with direct poultry contact during poultry outbreaks.

Infections in human often have serious consequence with a high case fatality (56%), even higher in age group 10-39y (66%). Since 2003, the epidemiology of H5N1 infection in humans has shown that cases are occurring in more areas, in parallel to poultry infections. Clinically, no significant changes over the last years in terms of duration between onset and hospitalization, duration between onset and death age and sex distribution has been observed.

Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that H5N1 viruses one day could be able to infect humans more easily and spread easily from one person to another. As H5N1 viruses have not infected many humans worldwide, there is little or no immune protection against them in the human population and an influenza pandemic (worldwide outbreak of disease) could begin if sustained human to human transmission of H5N1 virus occurs.

According to the WHO, there have been a total of 387 avian flu cases among humans, with 245 fatalities www.who.Int/csr/disease/avian_ influenza. The most recent case was confirmed in Indonesia in September 2008. Most of the cases occurred in rural areas where poultry roam freely in homes and backyards. Countries with the most cases are Indonesia (112 death among 137 infected; CFR = 81.8%), Vietnam (51 death among 105 infected; CFR = 48.6%), Thailand (25 death among 31 infected; CFR= 80.7%), Egypt (22 death among 50 infected; CFR = 44.0%) and China (20 death among 30 infected; CFR = 66.7%).

3.2.2 Bangladesh situation

The Ministry of Health, Bangladesh has confirmed its first case of human infection of avian influenza H5N1 on 22 May 2008. The case was identified retrospectively as part of seasonal surveillance activities run by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDRB). The case is a 16-month-old male from Komalapur, Dhaka. He developed symptoms on 20th January 2008 and subsequently recovered. The case was confirmed as Influenza A (H5N1) by the WHO H5 Reference Laboratory, US Centers for Disease Control and Prevention (CDC). The case was exposed to live and slaughtered chickens at his home. Specimens have been collected from his family members and neighbours. All remain healthy to date.

4 Risk Factors for HPAI/H5N1 Transmission in Bangladesh

4.1 Risk Factor in Animal Health

Major risk factors in animal health are described below:

4.1.1 Backyard Poultry

A significant concern in Bangladesh is the poor biosecurity situation in the dominant backyard poultry practice. Around 50% of chicken is reared in backyard where the recommended bio-security measures to control AI are almost impossible to apply. The ducks are mainly free range and are heavily dependent on natural resources with minimum supplementary feeding. Ducks often share the same habitat as wild migratory birds, enhancing the possibility of transmission from wild birds to ducks. Chickens and

ducks are often raised together, providing a conducive environment for virus transmission between ducks and chickens. Ultimately it creates close proximity between potentially infected birds and humans and creating a possible environment for rapid cross-infection of AI to humans.

4.1.2 Commercial Poultry

Commercial poultry sector evolved and thrived in a disorganized manner without maintaining minimum standard that minimize disease transmission. The minimum distance between farms are not maintained, biosecurity measures are not employed, waste disposal system are non existent in many farms. Farms are built in densely populated area and minimum effort is taken to regulate access of man, vehicles, inputs and product. The overall situation allows easy transmission of diseases agents from animal to animal and from animal to human.

4.1.3 Live Bird and Wet Markets

There are live and wet poultry markets thorough out the country, which are largely unregulated. All the four poultry production systems supply poultry to these markets. In most of the markets, slaughtering and manual dressing are carried out in the same place where poultry are sold. The physical facilities of water supply, drainage and cleaning are either absent or very poor. There is no designated place for loading and unloading of poultry and no provision for cleaning the vehicles. Wet market and live bird market is place where virus can come different areas and sources and may again disseminate to different areas and farms. People also come in close contact with poultry and may easily be exposed to infection.

4.1.4 Poultry trading system

The poultry trading system is extensive and almost unregulated. There is no provision of poultry health monitoring, movement control and traceability giving opportunity of movement of infected birds or materials from one district to another causing rapid and wide spread of disease.

4.1.5 Pig Farming

For socio-cultural and religious reasons, the pig population is very small. Most of the pig population is in the hands of indigenous groups in the southeastern and north-central zones in the country. There is a small nomadic group that carries indigenous pig with them. Pigs are not considered as a risk factor for transmission of the virus to poultry but may present a risk for human transmission

4.1.6 Migratory Birds

Migratory birds visit Bangladesh regularly in winter season from October to March. There are about 150 temporary habitats for migratory birds in the country. The birds come from Siberian region crossing many hot spots may carry the virus. It might be a potential source of infection.

4.1.7 Importation of Poultry and Poultry Products

Bangladesh regularly imports parent and grand parent day old chicks and other poultry products as well as at a lesser extent, pet birds. While legal importation of poultry and poultry products is only allowed from non-infected countries.

4.1.8 Illegal or Informal Trade

Long porous borders with India and Myanmar have heightened the risk of illegal and informal trade of poultry, poultry related products, including caged birds, veterinary biologics and feeds. In most cases, informal trade is beyond access of veterinary or wildlife supervision of the country of origin as well as destination. The informal trade is a serious problem among the non-infected countries that share common borders.
There is frequent and substantial cross border movement of people between Bangladesh, India and Myanmar. People may carry poultry with them, increasing the chances of importing the virus both with animals as well as with humans.

4.2 Risk Factors in Human

Despite the infection of tens of millions of poultry over large geographical areas since mid-2003, 383 human cases have been laboratory confirmed. For unknown reasons, most cases have occurred in rural and periurban households where small flocks of poultry are kept. Again for unknown reasons, very few cases have been detected in presumed high-risk groups, such as commercial poultry workers, workers at live poultry markets, cullers, veterinarians, and health staff caring for patients without adequate protective equipment. Also lacking is an explanation for the puzzling concentration of cases in previously healthy children and young adults.

The greatest risk factor for bird flu seems to be contact with sick birds or with surfaces contaminated by their feathers, saliva or droppings. The World Health Organization (WHO) has confirmed a handful of cases of limited human-to-human transmission of bird flu. But unless the virus begins to spread more easily among people, infected birds or associated material presents the greatest hazard. The pattern of human transmission remains mysterious. Young children seem especially vulnerable to the virus, although some experts note that children are more likely to have contact with sick birds or to play on ground contaminated with droppings. What's more, people of all ages have contracted and died of bird flu. At this point, too few people have been infected to know all the possible risk factors for bird flu.

The World Health Organization (WHO) has stratified exposure risk into three categories; low, medium and high in the context of the H5N1 Asian strain epizootic. These categories were reviewed and modified to reflect not only the H5N1 experience in Asia but experience with other AI viruses and the Bangladeshi context. In addition, exposures to wild or non-commercial birds have been incorporated into these categories to facilitate use of this document beyond the commercial poultry outbreak setting.

4.2.1 High exposure risk groups

- Individuals with unprotected and very close exposure to a flock or group of sick or dead animals infected with AI or to particular birds that have been directly implicated in human cases (e.g., farm family member or worker who handled sick animals)
- Personnel involved in handling sick animals or decontaminating affected environments (including animal disposal) as part of outbreak control efforts (e.g., cullers)

4.2.2 Moderate exposure risk groups

- Individuals who handle single or small groups of sick or dead animals infected with AI in an open air environment which is not densely populated by animals of the same species as the infected animal (e.g., single wild bird in a park).
- Household/family contacts of a suspected or confirmed human AI patient (defined as living under the same roof as the index case for >/= 24 hrs within the period when the case is presumed to be contagious).
- Health Care Workers (HCCs) (i.e., those working in a setting where health care is being provided) who had no, or insufficient, PPE in place when 1) in close contact (i.e., within 1 meter) of a strongly suspected or confirmed human AI case, or 2) in direct contact with respiratory secretions or other potentially infectious specimens from the case.
- HCCs or laboratory personnel who might have unprotected contact (i.e., did not have or was wearing insufficient PPE) with specimens/secretions which may contain virus or with laboratory isolates.

4.2.3 Low exposure risk groups

- Personnel involved in culling non-infected or likely non-infected animal populations as a control measure (e.g., those exclusively culling asymptomatic animals in a control area outside of the infected and restricted zones)
- Individuals who handle (i.e., have direct contact with i.e. defeathering or slaughtering or preparing foods) asymptomatic animals that may be infected with AI based on species and possibly proximity to a geographic area where AI has recently been identified (e.g., bird handlers).
- HCCs who used appropriate PPE during contact with human AI cases (i.e., in the absence of significant human to human transmission)
- HCCs not in close contact (i.e., distance greater than 1metre) with suspected or confirmed human AI cases and having no direct or indirect contact with infectious material from that case(s)
- Laboratory personnel working with the influenza virus using appropriate laboratory procedures and infection control precautions.

Initially, it is expected that those most likely to be exposed would include external employees who are involved in outbreak control, culling of infected flocks or euthanasia of birds, disposal of carcasses, or cleaning of involved sites, as well as persons living and working on affected farms who have such contact.

Further research is urgently needed to better define the exposure circumstances, behaviour, and possible genetic or immunological factors that might enhance the likelihood of human infection.

Chapter II

2nd National Plan for Avian and Pandemic Influenza Preparedness and Response, 2009 - 2011

1. Goal
2. Objectives

2.1 General objectives
2.2 Objectives: Pandemic Alert
2.3 Objectives: Pandemic

3. Strategies
   - Planning and coordination
   - Surveillance
   - Prevention and control
   - Risk communication
   - Operational research

4. Committees
5. Policy framework
6. Methodology of development of the plan
7. Budget

2nd National Plan for Avian and Pandemic Influenza Preparedness and Response, 2009 - 2011

1 Goal

To prevent and control avian influenza and to prepare for the influenza pandemic to reduce morbidity and mortality in animals and humans and to minimize the socio-economic and environmental impact.

2 Objectives

2.1 General Objectives

2.1.1 To develop a multi-sectoral approach with community participation to control and prevent avian and human pandemic influenza;
2.1.2 To strengthen institutional capacity in terms of infrastructure, human resources, disease surveillance, laboratory diagnosis, clinical care, vaccine and antiviral production;
2.1.3 To conduct effective risk communication to the public and media about HPAI and influenza pandemic;
2.1.4 To progressively control and eradicate HPAI/H5N1 from Bangladesh through stamping out and other appropriate means;
2.1.5 To promote behavioural changes to reduce HPAI transmission in animals;
2.1.6 To prevent and reduce transmission of the virus among animals, from animal to human and among humans;
2.1.7 To reduce morbidity among humans and minimize negative socio-economic and environmental impact during pandemic;
2.1.8 To maintain essential services during pandemic;
2.1.9 To emphasis on strengthening bilateral, regional and international collaboration;
2.1.10 To monitor and evaluate the plan;
2.1.11 To conduct operational research.

2.2 Objectives: Pandemic Alert Period

2.2.1 To improve programme management with a focus on policy, planning and regulations
2.2.2 To strengthen disease surveillance
2.2.3 To ensure response and case management
2.2.4 To improve biosecurity, waste management and other husbandry practices
2.2.5 To establish poultry trade regulation and monitoring
2.2.6 To reduce the risk of transmission of AI/H5N1 from animal to animal, animal to human and human to human
2.2.7 To strengthen risk communication
2.2.8 To conduct operational research
2.2.9 To assess resource and risk and to plan for utilization in pandemic period

2.3 Objectives: Pandemic Period

2.3.1 To ensure coordination and mobilization of multisectoral resources
2.3.2 To ensure essential services
2.3.3 To ensure early detection, response and case management
2.3.4 To reduce the risk of transmission e.g. rapid containment, isolation, quarantine, social distancing
2.3.5 To strengthen risk communication
2.3.6 To address mortuary issues
2.3.7 To strengthen bilateral, regional and international collaboration
2.3.8 To conduct operational research

3 Strategies

The 2nd plan deals with two periods of the influenza pandemic - the pandemic alert and the pandemic period considering the current status of avian influenza in the country. The 1st plan covered all the periods of influenza pandemic. The country is currently in pandemic alert period and decision to move from pandemic alert to pandemic period will be made by the National Advisory Committee (NAC) based on declaration of Pandemic by the World Health Organization. The plan will be implemented based on following five strategies:

3.1 Planning and coordination
3.2 Surveillance
3.3 Prevention and control
3.4 Risk communication
3.5 Operational research

3.1 Planning and Coordination

The approach for the plan is multisectoral with community participation from the national to the Upazila levels. As influenza pandemic is a global concern, the plan gives emphasis on strengthening bilateral, regional and international collaboration.

Among the pandemic periods of influenza (pre-pandemic, pandemic alert and the pandemic period) we are at the pandemic alert period **(Annex 2).** At this stage, the lead role has shifted from Ministry of Fisheries and Livestock to the Ministry of Health and Family Welfare (MoH&FW). In the pandemic period, the office of the Prime Minister will take the lead role. Stakeholders will be involved in each period in different capacities as outlined in the plan.

3.2 Surveillance

Under this plan surveillance is one of the core strategies with objective for early detection of avian influenza, including novel virus both in animals and humans. Rapid response, situation monitoring, virus characterization, propagation, transmission and early warning for outbreak are important activities of this strategy. Specific activities and measures under surveillance will change according to the different pandemic stages in the country.

3.3 Prevention and control

The prevention and control strategy aims to reduce the risk of transmission of avian influenza, including novel virus from animal to animal, animal to human and human to human. Improvement of poultry husbandry system, poultry trade regulation and monitoring, live bird market and slaughter place improvement, biosecurity, waste management and stamping out of infected poultry are aimed at reducing transmission among poultry and to human. Isolation, quarantine, pharmaceutical and non pharmaceutical interventions will be implemented for reducing human to human transmission and control of the disease.

3.4 Risk Communication

A comprehensive, multi-sectoral and proactive communications strategy will be followed. Communication will be undertaken at three levels: a) Official communication during outbreak, response and control activities, b) Scientific communication among scientists and officials; c) Mass communication using IEC materials, mass media, IPC, announcement, advertisements etc. Risk communication for AI needs a strong balance between public health and socioeconomic issues.

A strong community mobilization component will be put in place which will help to create a social movement through enhanced participation and creative involvement of communities in addressing the problems by using standard messages/ materials/ instructions.

3.5 Operational Research

Operational research is needed for successful implementation of the plan and assess the evolving situation and thereby revise the strategies and activities under the plan.

4 Committees and teams

The activities under the plan will be conducted from national to upazila level through different committees and teams: National Advisory Committee (NAC), National Multisectoral Task Force (NMTF), Communication Committee (CC), Joint Technical Committee, National Technical Committees (NTC) at Directorate level (Health and Livestock), District Multisectoral Coordination Committee (DMCC) and Upazila Multisectoral Coordination Committee (UMCC). There will be a National Coordination Cell for coordination of national committees and rapid response teams at different levels for conducting outbreak investigation and response (**Annex 3-11 & 18).**

4.1 National Advisory Committee (NAC)

National Advisory Committee is the apex body with Ministers of relevant ministries as the members. Ministry of Fisheries & Livestock led the NAC during the pre pandemic period. The MoH&FW will lead the NAC in the pandemic alert period, Honorable Minister of MoH&FW chairing the Committee. However, during the pandemic period concerted activities will be carried out under the leadership of the Honorable Prime Minister of Government of Bangladesh. **(Annex 3)**

4.2 National Multisectoral Task Force (NMTF)

National Multisectoral Task Force committee comprises representatives from relevant ministries, directorates, professional bodies, business bodies, NGOs, civil society and nominated members. The MoH&FW will lead the NMTF in the pandemic alert period, Secretary of MoH&FW will chair the Committee. However, during the pandemic period concerted activities will be carried out under the leadership of Principal Secretary to Prime Minister. **(Annex 4)**

4.3 Communication Committee (CC)

The Committee will review communication materials forwarded by respective focal point of DLS and DGHS. Endorse communication materials and submit to NMTF for final approval. Monitor and evaluate the status of approved printed communication materials. **(Annex 5)**

4.4 Joint Technical Committee (JTC)

The Joint Technical Committee will look into the matters of common interest of human and livestock sectors. It will be comprised of DGs of both the directorates of Health and Livestock, Focal Points of both directorates, DG of BLRI, Director NIC, IEDCR, member secretaries of NTCs. **(Annex 8)**.

4.5 National Coordination Cell (NCC)

National Coordination Cell will provide support for the implementation of the National plan. It will be situated at MoH&FW. Members and terms of reference of the cell will be decided upon by NMTF. **(Annex 9)**

4.6 National Technical Committees (NTC) at Directorates of Health & Livestock

The National Technical Committees (NTC) formed at the Directorates of Health and Livestock will implement the respective parts of the plan and coordinate related activities **(Annex 6 & 7).**

4.7 District Multisectoral Coordination Committee (DMCC)

This committee will be responsible for coordination between sectors involved to control avian influenza in poultry and to prevent avian influenza in human. It will coordinate response process during and following outbreaks. **(Annex 10)**

4.8 Upazila Multisectoral Coordination Committee (UMCC)

This committee will coordinate between sectors involved to control avian influenza in poultry and to prevent avian influenza in human. It will coordinate response process during and following outbreaks. **(Annex 11)**

4.9 Rapid Response Teams (RRT) of Different Levels

The rapid response teams of national, district and upazila levels will conduct outbreak investigation and response both in human and animal health sectors. The teams are as follows **(Annex 12-17)**

4.9.1 National Rapid Response Team (NRRT)
4.9.2 District Rapid Response Team (DRRT)
4.9.3 Upazila Rapid Response Team (URRT)

5 Policy Framework

The constitution of the People's Republic of Bangladesh assures "health is the basic right of every citizen of the republic". The country is executing the health related activities following – the Health, Nutrition and Population Sector Program (HNPSP). The vision and target outlined in the national poverty reduction strategy paper (PRSP) of the government of Bangladesh have been taken as the overarching long-term policy framework and political commitment of the government upon which the HNPSP is developed. Bangladesh is committed to achieve the Millennium Development Goal (MDG) by 2015. Several goals of MDG directly address the health sector.

Bangladesh has adopted National Livestock Development Policy with a general objective of creating enabling environment, opening up opportunities, reducing risk and vulnerability for harnessing full potential of livestock sub-sector to accelerate economic growth for reduction of rural poverty. The policy has identified animal health as one of the major thematic area. In this part emphasis is given to strengthen veterinary service including improvement of capacities for disease surveillance, quarantine service, emergency planning to manage major disease outbreak including Avian Influenza. The policy frame work also addresses strengthening veterinary research in critical areas.

6 Monitoring and Evaluation

The implementation of the plan at various periods of the pandemic will be monitored based on indicators. Targets set would be closely monitored for progress towards achievement of objectives. Periodic evaluations of the project will be undertaken by the government with support from national and international organizations.

7 Methodology of development of the plan

The Ministry of Health and Family Welfare decided to draft the 2nd plan and formed a planning team **(Annex 25)** following proposal from the joint meeting of technical committees of health and livestock as the 1st plan ends in December 2008.

7.1 Preparatory meeting of the planning team: 9 November 2008
7.2 Drafting of the plan by the team: 10-19 November 2008
7.3 Review of the draft plan involving stakeholders: 20 November 2008
7.4 Adoption of the recommendations, amendments: 21-23 November 2008
7.5 Internal review of the draft plan by the Directorate General of Health Services and Department of Livestock Services: 23 November 2008
7.6 Adoption of the comments in the draft: 24-26 November 2008
7.7 Final review workshop involving stakeholders: 26 November 2008
7.8 Adoption of the comments and finalization of the draft: 27-30 November 2008
7.9 Review of the draft by the National Multisectoral Task Force(NMTF): 1 December 2008
7.10 Adoption of the comments in the document: 2 December 2008

7.11 Endorsement of the plan by National Advisory Committee (NAC): 3 December 2008
7.12 Submission for approval by the Cabinet……

8 **Budget** (Detailed in Annex 26)

8.1 Total Combined budget for Pandemic Alert and Pandemic Period

	Pandemic Alert	Pandemic	TOTAL
Human Health	2,058,454,000	760,040,000	**2,818,494,000**
Animal Health	3,237,400,000		**3,237,400,000**
Wild Life	627,130,000		**627,130,000**
TOTAL	**5,922,984,000**	**760,040,000**	**6,683,024,000**

8.2 Budget for Pandemic Alert Period

8.2.1 Combined Budget (Human, Animal & Wildlife)

Strategies	**Budget in BDT**		
	2009	**2010**	**2011**
Planning and Coordination	201,130,000	157,110,000	148,540,000
Surveillance	1,206,978,000	654,278,000	572,408,000
Prevention and Control	604,940,000	550,740,000	485,540,000
Risk Communication	91,500,000	71,500,000	61,500,000
Operational Research	169,180,000	148,670,000	126,900,000
NRL-AI Laboratory Activities	275,310,000	86,800,000	86,660,000
Capacity Building for Forest	125,300,000	49,000,000	49,000,000
TOTAL	**2,674,338,000**	**1,718,098,000**	**1,530,548,000**
GRAND TOTAL	**5,922,984,000**		

8.2.2 Human Health

Strategies	**Budget in BDT**		
	2009	**2010**	**2011**
Planning and Coordination	68,530,000	74,310,000	67,070,000
Surveillance	230,168,000	158,768,000	129,768,000
Prevention and Control	355,640,000	387,740,000	352,040,000
Risk Communication	36,500,000	36,500,000	36,500,000
Operational Research	41,640,000	41,640,000	41,640,000
Sub total	**732,478,000**	**698,958,000**	**627,018,000**
TOTAL	**2,058,454,000**		

8.2.3 Animal Health

Strategies	Budget in BDT		
	2009	2010	2011
Planning and Coordination	12,200,000	7,900,000	7,200,000
Surveillance	916,400,000	469,400,000	415,900,000
Prevention and Control	242,300,000	156,000,000	126,500,000
Risk Communication	55,000,000	35,000,000	25,000,000
Operational Research	127,540,000	107,030,000	85,260,000
NRL-AI Laboratory Activities	275,310,000	86,800,000	86,660,000
TOTAL	**1,628,750,000**	**862,130,000**	**746,520,000**
GRAND TOTAL	3,237,400,000		

8.2.4 Wildlife

Strategies	Budget in BDT		
	2009	2010	2011
Planning and Coordination	120,400,000	74,900,000	74,270,000
Surveillance	60,410,000	26,110,000	26,740,000
Prevention and Control	7,000,000	7,000,000	7,000,000
Capacity Building	125,300,000	49,000,000	49,000,000
Sub total	313,110,000	157,010,000	157,010,000
TOTAL	**627,130,000**		

8.3 Pandemic period (human health):

Strategies	Budget in BDT
TOTAL	**760,040,000**
Planning and Coordination	2,100,000
Surveillance	398,500,000
Prevention and Control	322,140,000
Risk Communication	12,800,000
Research	24,500,000

Chapter III

The Plan for the Pandemic Alert Period (Human Health)

1. Planning and coordination
2. Surveillance
3. Prevention and control
4. Risk communication
5. Operational research

The Plan for the Pandemic Alert Period (Human Health)

1 Planning and coordination

The implementation of the plan in the human health sector will be coordinated through different committees formed at the national, district and upazila level.

1.1 Activities

1.1.1 National Advisory Committee (NAC)

1.1.1.1 Endorsement of the National Plan before sending for approval by Cabinet;
1.1.1.2 Review and endorse amendment(s) of the National Plan;
1.1.1.3 Decision on proposals sent by NMTF;
1.1.1.4 Monitor/Review the activities under the plan.

1.1.2 National Multisectoral Task Force (NMTF)

1.1.2.1 Endorsement of the National Plan before sending for approval by Cabinet;
1.1.2.2 Support implementation of the National Plan;
1.1.2.3 Approval of communication materials reviewed by communication Committees;
1.1.2.4 Approval of policies and strategies;
1.1.2.5 Review and propose amendment of the National Plan;
1.1.2.6 Monitor and evaluate the activities within the different stages of the plan implementation.

1.1.3 National Technical Committee (NTC)

1.1.3.1 Review of the National Plan;
1.1.3.2 Coordinate NGO activities on Avian and Pandemic Influenza;
1.1.3.3 Review and propose amendment of the National Plan;
1.1.3.4 Prepare budgets for the different activities within the sector;
1.1.3.5 Review, prepare and implement proposals at the Directorate level;
1.1.3.6 Coordinate with other Directorates involved in the Plan;
1.1.3.7 Develop and review policies and strategies by different Committees;
1.1.3.8 Evaluate the activities of the plan;
1.1.3.9 Coordinate activities of the human health sector and take measures for implementation of all relevant elements of national plan;
1.1.3.10 Liaison with different countries, UN bodies and Partner organizations.

1.1.4 Joint Technical committee (JTC)

1.1.4.1 Coordinate both the technical committees;
1.1.4.2 Discuss issues concerning decisions of both technical committees.

1.1.5 National Coordination Cell (NCC)

1.1.5.1 Co-ordination of activities related to AI

1.1.5 District Multi-sectoral Coordination Committee (DMCC)

1.1.6 Coordination of District Avian Influenza activities

1.1.6.1 Monitor and evaluation of upazilas multi sectoral activities
1.1.6.2 Ensure and take measures what technical committees (Health and Livestock) recommend.

1.1.7 Upazila Multi-sectoral Coordination Committee (UMCC)

1.1.7.1 Coordination of Upazila Avian Influenza activities

1.1.7.2 Monitor and evaluation of upazilas technical committee activities

1.1.7.3 Mobilization of resources for implementation of the plan

2 Surveillance

The aim of surveillance under this plan is to develop better capacity of disease surveillance of the country for early detection of avian influenza cases and cluster, responding to outbreaks, characterization of the virus and monitoring other epidemiological aspects of the disease.

2.1 Objectives

2.1.1 To strengthen disease surveillance of the country

2.1.2 To detect avian influenza cases and cluster early and to respond to outbreaks promptly

2.1.3 To strengthen laboratory capacity for detection of avian influenza virus

2.1.4 To establish rapid communication systems using information technology, computers, appropriate software, and networking

2.2 Activities

2.2.1 **Strengthen disease surveillance of the country**

2.2.1.1 Integration of the disease surveillance systems of the country

2.2.1.2 Strengthening laboratory facilities **(Annex 19-21)**

2.2.1.3 Web based surveillance

2.2.1.4 Training of personnel involved in surveillance

2.2.2 Early detection of avian influenza cases and cluster and responding to outbreaks

2.2.2.1 Surveillance for high risk groups: among cullers, poultry workers health care personnel, live bird handlers

2.2.2.2 Establish and strengthen surveillance for Influenza Like Illness (ILI) and SARI at district level

2.2.2.3 Training of rapid response teams on epidemiologic investigation and outbreak response

2.2.3 Strengthen laboratory capacity for detection of avian influenza virus

2.2.3.1 Strengthen diagnostic capacity for avian influenza at the national level (NIC, IEDCR)

2.2.3.2 Installation of BSL 3 laboratory and introduction of real time RT-PCR at NIC

2.2.3.3 Introduction of laboratory diagnosis for avian influenza at district level with modern facilities like PCR

2.2.3.4 Training of laboratory personnel

2.2.3.4.1 Characterize influenza virus isolates

2.2.3.4.2 Share influenza virus isolates and or information on circulating strains with relevant international agencies, such as WHO

2.2.4 Establish rapid communication systems using information technology, computers, appropriate software, and networking

2.2.4.1 Ensure timely reporting and obtain detailed epidemiological, clinical and laboratory data and

2.2.4.2 Activate feedback mechanism to ensure containment measures at field levels

2.2.4.3 Promote exchange of technical know-how

3 Prevention and Control

The prevention and control strategy aims to reduce the risk of transmission of avian influenza, including novel virus from animal to human and human to human. Early detection of the cases with safe management, isolation, quarantine, social distancing, pharmaceutical and other non pharmaceutical interventions will be implemented for reducing human to human transmission and control of the disease. This plan will contribute in overall improvement of infection control practice in health service.

3.1 Objective

3.1.1 To develop and review and implementation of policy and guidelines to prevent and control avian influenza

3.1.2 To prevent animal to human transmission

3.1.3 To prevent human to human transmission

3.1.4 To strengthen capacity for diagnosis and management of patients

3.1.5 To draft, update and or to enforce of relevant laws

3.2 Activities

3.2.1 **To develop and review and implementation of policy and guidelines and drafting of relevant laws to prevent and control avian influenza**

3.2.1.1 Infection control

3.2.1.2 Antiviral and vaccine

3.2.1.3 Disinfectant and waste management

3.2.1.4 Patient and contact management

3.2.1.5 Isolation and quarantine

3.2.1.6 Social distancing –closure of school, disallow public gathering

3.2.2 **To prevent animal to human transmission**

3.2.2.1 Training of poultry handlers on personal safety and hygienic practices

3.2.2.2 Early reporting of poultry outbreak to health authority

3.2.2.3 Antiviral prophylaxis for cullers, poultry farmers and workers, veterinarians and veterinary field workers exposed to infected poultry

3.2.2.4 Vaccine prophylaxis against seasonal influenza for high risk groups of poultry related personnel

3.2.2.5 Early treatment of suspected cases among poultry related personnel

3.2.3 **To prevent human to human transmission**

3.2.3.1 Orient and refresh public and private health-care providers on infection control

3.2.3.2 Early diagnosis and prompt treatment of cases with antiviral

3.2.3.3 Antiviral and vaccine prophylaxis for high risk health personnel – clinical staff, lab personnel, members of rapid response teams

3.2.3.4 Strengthening safe clinical care with protection of health personnel

3.2.3.5 Ensure laboratory safety at all levels with adequate training, equipments and prophylactic measures.
3.2.3.6 Management of cases in isolation in hospital, home and other setting
3.2.3.7 To follow triage system in hospitals
3.2.3.8 Contact tracing and management
3.2.3.9 Social distancing with closure of school, disallow social gathering

3.2.4 Strengthening capacity for diagnosis and management of patients

3.2.4.1 Training of clinical staff on safe clinical care of human cases of avian influenza
3.2.4.2 Operationalizing the avian influenza ward at NIDCH and the isolation units at the district level
3.2.4.3 Ensuring collection, stockpiling and supply of antiviral
3.2.4.4 Stockpiling medicines, logistics and other essentials

3.2.5 Drafting, updating and or enforcement of relevant laws

3.2.5.1 Health safety for persons engaged in health/poultry sector
3.2.5.2 Quarantine and isolation,
3.2.5.3 Notification

4 Risk Communication

The aim of risk communication is to raise awareness of people on avian influenza, to inform people about their role in prevention and control of the disease and during outbreak, to reduce panic among people, to update policy makers, planners, implementers and other on current information on influenza situation, virus spread and risk to humans. The country will report outbreak of AI to WHO following IHR. Risk communication for AI needs a strong balance between public health and socioeconomic issues.

4.1 Objectives

4.1.1 To conduct behavioural change communication (BCC)
4.1.2 To increase awareness of people on avian influenza and their role in prevention and control of the disease and during outbreak;
4.1.3 To update professionals, officials and other stake holders with current information on influenza situation, virus spread and risk to humans;
4.1.4 To ensure rapid communication among different tiers of government and between government and international organizations (WHO/FAO), NGO/private sectors and other relevant sectors;
4.1.5 To develop messages and to ensure coordination among technical and communications staff regarding development of the messages;
4.1.6 To review and integrate communication strategy.

4.2 Activities

4.2.1 **To conduct behavioural change communication (BCC)**
4.2.1.1 Conduct training, workshop, open air performances, and other social mobilization activities on a regular basis and at extensive level.
4.2.1.2 Establish a community mobilization network across the country.

4.2.2 **To increase awareness of people on avian influenza and their role in prevention and control of the disease and during outbreak**

4.2.2.1 Inform people on avian influenza using mass media, interpersonal communication, group discussion, announcements etc

4.2.2.2 Raising awareness of people on their role in prevention and control of the disease

4.2.2.3 Reinforce key messages on self-protection and prevention of spread

4.2.2.4 Set up a telephone hotline and interactive website to answer public inquires and collect information as and when needed and to provide feedback.

4.2.3 **To update professionals and officials with current information on influenza situation, virus spread and risks to humans**

4.2.3.1 Update professionals of relevant sectors and all stake holders on risk and prevention through workshops, seminars and other sensitizing meetings;

4.2.3.2 Familiarize news media with national plan, preparedness activities and decision-making, related to seasonal and pandemic influenza for effective dissemination.

4.2.4 **To ensure rapid communication among different tiers of government and between government & NGO/private establishments**.

4.2.4.1 Communicate official and other agencies;

4.2.4.2 Ensure human and logistic support for effective communication;

4.2.4.3 Nominate spokesperson for AI at different sub-national level of Health sector by NTC;

4.2.4.4 Report human cases of AI to WHO.

4.2.5 **To develop messages and to ensure coordination among technical and communication staff regarding development of the messages**

4.2.5.1 Develop message based on current situation of avian influenza as well as on the key behaviours that need to be promoted;

4.2.5.2 Ensure coordination among technical and communications staff regarding development of key messages.

4.2.6 **To review and integrate communication strategy**

4.2.6.1 Monitor and evaluate communication program implemented at different level

4.2.6.2 Integrate communication strategy among different sectors and organizations

4.2.6.3 Review and refine communications strategies and systems in anticipation of imminent pandemic in light of new research which is available;

5 Operational research

5.1 Assessment of awareness and best approaches to increase awareness about avian influenza

5.2 Burden estimation

5.3 Characterization of the virus

5.4 Evaluation of the effectiveness of diagnostics, antivirals and disinfectants

5.5 Utilization of available resources for the plan

5.6 Responsiveness of the surveillance to specific situation

5.7 Epidemiological study of the disease including risk factors, clinical manifestation

Chapter IV

The Plan for the Pandemic Alert Period (Animal Health)

1. Planning and coordination
2. Surveillance
3. Prevention and control
4. Risk communication
5. Operational research

The Plan for the Pandemic Alert Period (Animal Health)

1. Planning and Coordination

The planning and coordination of livestock sector will be carried out through different committees and teams at different tiers The Chief Veterinary Officer (CVO) / officer nominated by DG DLS will act as the AI focal point of livestock sector to ensure proper planning and effective coordination among different actors of livestock sector.

1.1 Activities

1.1.1. The AI focal point will maintain an office dedicated for AI activities;
1.1.2. Focal Point will liaise with the National AI coordination cell and agencies or groups working in the field of AI related to animal health;
1.1.3. Projects, programmes and public sector organizations, NGOs working in the field of AI will submit their planned activities for the next financial year at the second half of the previous financial year to facilitate development of the work plan;
1.1.4. Develop a detailed work plan with an indicative budget at the beginning of the calendar year for the next financial year in line with the activity envisaged in the plan document;
1.1.5. The work plan developed will be placed before the National Technical Committee(livestock) for Avian Influenza and Pandemic Influenza
1.1.6. NGOs and organizations involved in AI activities in animal health sector will submit a report of activities to AI focal point;
1.1.7. Emergency budget will be allocated with maximum flexibility of disbursement of fund to facilitate outbreak investigation.

2 Surveillance

2.1 Objectives

2.1. 1 To detect disease and issue early warning
2.1. 2 To respond rapidly
2.1. 3 To identify and characterize virus

2.2 Activities

2.2.1 DLS will design a plan of AI surveillance in animals. Surveillance will be carried out in backyard and commercial chickens and ducks, live bird and wet market, pet, wild and migratory birds and animals. The approach of the plan will be rumor investigation, event based and targeted surveillance. The surveillance plan will outline the sampling frame and procedures for each category of surveillance;
2.2.2 CDIL, FDIL and DVH will be responsible for virological and serological test for samples collected through the surveillance system;
2.2.3 A representative number of virological sample will be characterized and sequenced by NRL-AI;
2.2.4 NGOs will offer support to DLS by providing responsible information and data;
2.2.5 DLS will host a website with updated outbreak and surveillance information. Major study result will be shown in the page;

2.2.6 A web-based disease reporting will be established at Epidemiology Unit. Until establishment of web based surveillance system, the SMS gateway system, introduced with the technical support of FAO will continue;

2.2.7 The Epidemiology unit will be incorporated in the permanent set up of DLS headed by a Director

2.2.8 The unit will be regularly supported from the revenue budget and donor support will be explored to continue and strengthen the present pace of work.

2.2.9 Necessary soft ware for data entry, analysis, disease mapping will be procured and utilized.

2.2.10 Epidemiology Unit will be provided with transport and other logistics to lead surveillance activity and carry out study.

2.2.11 DLS will develop a SOP on outbreak investigation, sample collection and shipment;

2.2.12 Farmers or any person after knowing about sickness or death in any poultry holdings or any place where poultry is kept will report directly or through councilor / member to Upazila Livestock Office.

2.2.13 The person reported will consider the report as a priority and Upazila Livestock Officer will take necessary action immediately to investigate the case.

2.2.14 The course of disease investigation and diagnosis will follow the flow chart of **Annex 21.**

2.2.15 The investigating officer and his assistants will follow the SOP developed by DGHS for personal safety for veterinarians and other livestock para professionals.

2.2.16 Epidemiological research like case control, cohort and cross sectional studies will be carried out among others to identify risk factors responsible for spread of the diseases.

2.2.17 The findings of surveillance and epidemiological study will be shared through national surveillance network, hosting in web page, publication of regular diseases bulletin and seminar which is appropriate.

2.2.18 A toll free hotline will be established at Central Outbreak Management Centre. The Central Outbreak Management Centre will be upgraded for supporting outbreak response of AI.

2.2.19 Manpower, transport and other logistics will be provided to the centre.

3 Surveillance (Wildlife)

3.1 Activities (to be implemented by Forest Department)

3.1.1 To plan and carryout the survey and surveillance of wild and migratory birds;

3.1.2 To identify the current routes and hot spots of migratory birds

3.1.3 To take necessary measures to keep habitats of migratory birds undisturbed

3.1.4 To inform immediately to local veterinary personnel of sickness or death of migratory/wild birds

3.1.5 To assist the rapid response team of DLS in outbreak investigation among migratory/ wild birds

3.1.6 Develop and distributes printed publicity materials to create awareness

3.1.7 Organize local and foreign training

4 Prevention and Control

Prevention of avian influenza in animal is important for reducing economic loss and possible human infection and chance of pandemic ignition. Rapid containment and control of the disease will prevent further spread of the virus in animals. For prevention and control of avian influenza the following areas will be addressed.

4.1 Objectives

4.1.1 To control spread of virus in animals
4.1.2 To reduce the risk of human infection
4.1.3 To reduce negative socio- economic and environmental impact

4.2 Activities

4.2.1 Improvement of Poultry husbandry System

To produce disease free poultry and ensure safe poultry production for human consumption, improvement of poultry husbandry system is urgent.

4.2.1.1 Development of a national database with GPS mapping of commercial poultry farms in the Epidemiology Unit of DLS. Registration of commercial poultry farms following Disease Control Act, 2005 will be continued and will be entered in the national data base;
4.2.1.2 SOP will be developed for rearing backyard poultry, small scale farmers, free ranging duck raisers and pet birds by DLS;
4.2.1.3 Backyard poultry, small scale farmers, free ranging duck raisers, pet birds will be reared following the SOP;
4.2.1.4 DLS will develop a National Biosecurity SOP for commercial poultry rearing in consultation with private sector.

4.2.2 Poultry trade Regulation and Monitoring

Poultry trade is identified as a potential source of disease outbreak. Control spreading of AI needs intervention and concerted activities in the area.

4.2.2.1 Poultry movement and transportation guideline will be developed by DLS;
4.2.2.2 Transportation of poultry in public transport will be discouraged and will only be transported in a vehicle where people and other products will not be transported;
4.2.2.3 Cleaning and disinfection of vehicles and equipment will be encouraged and designated place for cleaning and landing will be established;
4.2.2.4 Guidelines will outline a feasible monitoring process;
4.2.2.5 Imposing ban on importation of poultry and poultry product from infected countries will be continued;
4.2.2.6 Poultry sale by vendors will be discouraged;
4.2.2.7 A base line survey will be carried out to quantify the impact of vendors on disease spread and explore alternative.

4.2.3 Outbreak Response

To ensure quick response following steps will be taken to control the disease.

4.2.3.1 DLS will develop guideline and SOP for outbreak response.

4.2.3.2 ULO will instruct the Veterinary Surgeon for an immediate disease investigation and if primary investigation suggests a suspected AI case according to case definition of surveillance plan, the veterinary surgeon will record the numbers of poultry and poultry products, feed and other birds in the farm or premise and strict quarantine on the farm or premise will be imposed following the outbreak response SOP;

4.2.3.3 ULO will inform DLO, NRRT and CVO of DLS about the suspicion;

4.2.3.4 The NRRT will record the suspect events and constantly follow up the event with upward and down ward communication;

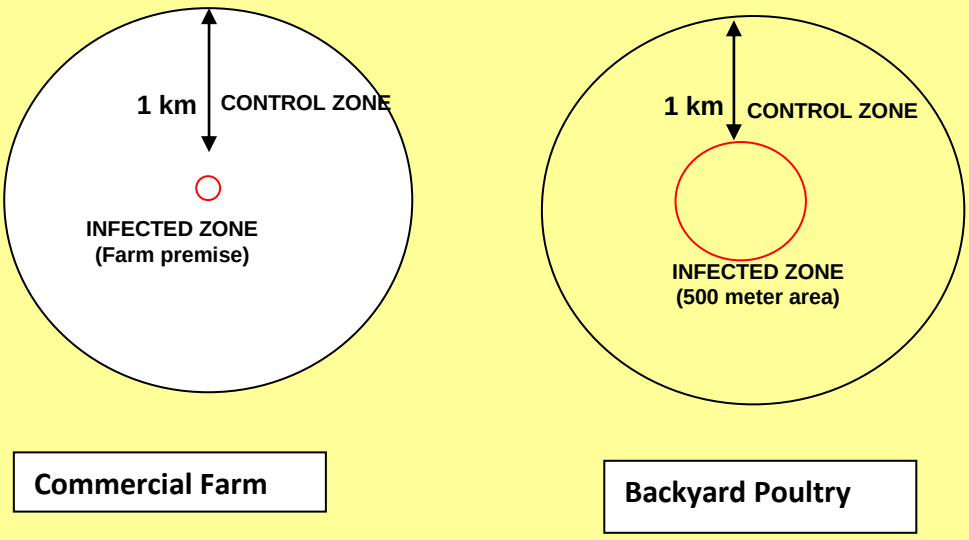
4.2.3.5 The veterinary surgeon will collect samples as outlined outbreak investigation, sample collection and shipment;

4.2.3.6 Personal safety precautions will be strictly maintained by the veterinarian and person involved during sample collection;

4.2.3.7 The sample collected will be sent to nearest Field Disease Investigation Laboratory following SOP of outbreak investigation, sample collection and shipment;

4.2.3.8 The laboratory will carry out Rapid Antigen Detection Test and if the case is found positive will immediately notify CVO about the findings over telephone followed by facsimile message.

4.2.3.9 The CVO will declare infected and surveillance area.



Poultry Infection Control Zone

4.2.3.10 In case of infection in a commercial poultry farm all type birds, eggs and animal feed kept in the farm premises will be destroyed and disposed and in case of a backyard farm same type of animals and materials kept 500 meter around the

infected premise will be destroyed and disposed following the SOP for stamping out procedure developed by DLS;

4.2.3.11 Post outbreak surveillance will be carried out around 1 km area of the infected premise for at least 21 days;

4.2.3.12 Rapid Antigen Detection Test negative samples will also be sent to NRL-AI at BLRI for RT-PCR test.

4.2.3.13 ULO will monitor and supervise the cleaning, disposal and disinfection procedure of the farm and premise following Cleaning, Disposal and Disinfection SOP.

4.2.3.14 DLS will develop SOP for cleaning, disposal and disinfection.

4.2.3.15 The farm failing to comply with the cleaning and disinfection procedure described in the SOP on developed by DLS will not be given a compliance certificate by the ULO which will be the prerequisite for getting compensation or rehabilitation support and permission for restocking from the government.

4.2.4 Live bird, wet market and slaughter house improvement

Improvement of live bird and wet market are critical in a country like Bangladesh where the facilities, infrastructure and practices are even behind the minimum standard.

4.2.4.1 Market cleaning and disinfection SOP will be developed;

4.2.4.2 The local government will take initiatives to renovate the live bird markets and the part of the wet markets where birds are sold.

4.2.4.3 Demarcate poultry selling facilities, ensuring clean water supply, providing drainage, installation of waste disposal bin, SOP for waste disposal including composting, identification of poultry loading and unloading area, cleaning facilities for poultry carrying vehicles will be done in phases in the live bird and wet market;

4.2.4.4 Poultry will be slaughtered in a designated place and sanitary practices will be ensured. The live bird market and poultry facilities at wet markets will be closed for one day in a month for facilitating cleaning in the market;

4.2.4.5 Live bird selling will be phased out. A detail phase out plan will be developed;

4.2.4.6 The plan will be implemented in phases determined by NMTF.

4.2.5 Waste Disposal

4.2.5.1 A waste disposal SOP will be developed for poultry farms and market will be developed by DLS.

4.2.5.2 Government will take initiative to motivate and train farmers and market/slaughter house workers for adopting appropriate waste disposal methods.

4.2.5.3 Provisions of waste disposal following waste disposal guideline will be prerequisite for getting or continuation of farm registration.

4.2.6 Laboratory Capacity Building and Activities

4.2.6.1 National Reference Laboratory for Avian Influenza (NRL-AI)

Strengthen/develop capacity for early detection of the novel virus and research for the prevention of spread of the disease, rapid detection and control the outbreak,

development of diagnostic & biological control tools and monitoring the changes of the virus nature will be efficiently done by the National Reference Laboratory for Avian Influenza (NRL-AI) at BLRI.

4.2.6.1.1 Establish laboratory to meet the biosafety BSL 3 enhanced with virus isolator at BLRI for priority basis for vital research and development activities.

4.2.6.1.2 Adequate manpower with Director Position as Head of the NRL-AI and adequate budget will be provided for NRL-AI at BLRI.

4.2.6.1.3 Establish laboratory network with NRL-AI covering laboratories of DLS, MoH&FW, and the ICDDR, B for sharing data and information.

4.2.6.1.4 Develop potential and preparedness of personnel of NRL-AI through provision of training/study program on research, diagnosis and promotion of technical know-how and exchange of information with other countries in combating the issues.

4.2.6.1.5 NRL-AI identify the circulating low and high pathogenic avian influenza virus in birds (wild & domestic) and other animals for the preparation of effective biological control strategy in emergency cases.

4.2.6.1.6 NRL-AI will organize livestock-technical-official-run training courses for officials and workers involved in the Laboratories of DLS, surveillance and control of avian influenza on capacity building including diagnostic technique, laboratory management and sample collection for laboratory investigation as well as monitor the status of other government and private laboratories.

4.2.6.2 CDIL, FDIL and Other Laboratories of DLS

4.2.6.2.1 CDIL will be developed as BSL- 3 and FDILs' as BSL -2 with provision of adequate skilled manpower and diagnostic facilities.

4.2.6.2.2 Diagnostic capabilities will be developed at District Veterinary Hospitals

4.2.6.2.3 Laboratories of all level will be provided with transport and other logistics

4.2.6.2.4 Establish laboratory network covering laboratories of DLS, NRL-AI, MoH&FW, ICDDR, B, regional laboratories and OIE-FAO reference laboratories for sharing data and information.

4.2.7 Compensation, rehabilitation and credit

Compensation, rehabilitation and credit are important for encouraging farmers to report the diseases and minimize the socioeconomic loss incurred to farmers during stamping out activities.

4.2.7.1 Provision of compensation will be continued to the farmer following the approved compensation strategy of the government;

4.2.7.2 National Technical Committee (Livestock) for Avian and Pandemic Influenza may revise the current compensation strategy and will be approved by MoFL.

4.2.7.3 The farmers suffered direct losses due to Avian Influenza will be supported through rehabilitation plan.

4.2.7.4 Banks and micro-credit organization will increase grace period until further restocking and reschedule the loan.

4.2.7.5 Farmers will follow the restocking SOP approved by MOFL.

4.2.8 Vaccine and vaccination

The vaccination is considered as an additional tool for protecting poultry from HPAI. Before going to vaccination in poultry, recommendation of JTC will be required.

4.2.8.1 If Government decides to go for vaccination, in that case, a vaccination policy will be initiated by DLS clearly identifying appropriate vaccine virus, circulating virus monitoring system, vaccine efficacy evaluation procedure, research on escape mutant development and exit strategy;

4.2.8.2 The policy will also clearly outline the scope of vaccination i.e which species and category and type of bird species will be vaccinated, cost sharing and planned for local vaccine production from local isolates.

4.2.8.3 Laboratory and field capacities will be developed to carry out an effective vaccination campaign should there an urgent need for vaccination.

5 Risk Communication

Risk communication for AI needs a strong balance between public health and socioeconomic issues. Nevertheless, the human health issues will never be compromised.

5.1 Risk communication in animal health will be carried out by establishing a communication cell at DLS.

5.2 The cell will draft communication material, provide communication training and maintain liaison with Technical Working Group and Communication Committee.

5.3 The cell will also design feasible communication campaign for farmers, poultry traders, wet market workers.

5.4 Campaign for awareness building to prevent possible incursion of AI from wild life will be carried out by FD.

5.5 The planned communication activities of different projects related to AI in animals will be coordinated by the cell.

5.6 CVO will supervise the activity of communication cell.

5.7 DG DLS will nominate spokes person for AI at different sub-national level

6 Operational Research

6.1 Research based study program on surveillance, epidemiology, risk factors, and husbandry system, pathogenesis of avian influenza infection and mutation & evolution of new strain of avian influenza virus will be taken by NRL-AI in collaboration with national and international laboratories.

6.2 NRL-AI will research and build capacity to develop diagnostics i.e. development of Avian influenza vaccines, AI antiviral, test kits and disinfectant.

Chapter V

The Plan for the Pandemic Period (Human Health)

1. Planning and coordination
2. Surveillance
3. Prevention and control
4. Risk communication
5. Operational research

THE PLAN FOR THE PANDEMIC PERIOD (Human Health)

1 Planning and Coordination

1.1 Activities

1.1.1 The overall command will be taken over by the Honourable Prime Minister;
1.1.2 Honourable Prime Minister will receive suggestions from Technical Committees to take necessary steps to combat pandemic.
1.1.3 Implement all relevant elements of national pandemic plan and apply emergency powers (if necessary)
1.1.4 Put in to effect the emergency contingency plan.
1.1.5 Dissemination of the National Plan and activities during Pandemic period to all level.
1.1.6 Emergency collection of drugs, vaccine, logistics and equipments.
1.1.7 Mobilize human resources, logistics, equipments and communication materials.
1.1.8 Ensure border security during pandemic period
1.1.9 All the security forces will remain alert and assist civil administration as and when called for.
1.1.10 Prime minister will monitor the activities of National Multi Sectoral coordination committee.
1.1.11 Review the pandemic situation on regular basis.
1.1.12 Liaison with different countries, UN bodies and Partner organizations.
1.1.13 Provide necessary budget to control pandemic and to perform research activities.

2 Surveillance

2.1 When Bangladesh is not affected

2.1.1 Scale-up surveillance and timely share information
2.1.2 Monitor the situation in other countries and update technical experts and policy-decision makers on measures required at national level
2.1.3 Establish cross border surveillance and for such purpose harmonize protocols for surveillance and rumor verification

2.2 When Bangladesh is affected

2.2.1 Enhance and strengthen surveillance and case investigation to identify index cases/contacts, risk factors and track geographical spread.
2.2.2 Monitor magnitude of the problem- morbidity, mortality, impact on resources, social and health services
2.2.3 Assess and monitor stocks, supplies, bed capacity and staffing needs routinely at central level and in local health facilities.
2.2.4 As disease activity intensifies and becomes more widespread, adjust surveillance and review case definition. Plan for shifting from routine base surveillance during

pandemic alert phase to pandemic phase surveillance. Assess laboratory capacity for influenza surveillance, typing, sub-typing and detection of antiviral resistance. Plan to test representative specimens from the community, transport and process specimens, practice bio-safety measures, and link laboratory data with epidemiological data

2.2.5 Assess need for emergency measures, e.g. emergency burial procedures, use of legal powers to maintain essential services

2.2.6 Assess uptake and impact of treatments and counter measures including vaccine/antiviral efficacy and safety and non-pharmaceutical interventions, etc.

2.2.7 Monitor for possible changes in epidemiology, clinical presentation and virological characteristic or modification and share information with international partners

2.3 Subsided (end of pandemic or between waves)

2.3.1 Continue surveillance for early detection of subsequent wave.
Summarize and analyze data to characterize pandemic and evaluate effectiveness of local response activities.

2.3.2 Identify the most effective surveillance and control measures for subsequent pandemic waves

2.3.3 Share experiences, best practices, and lessons through national, regional and international forum

2.3.4 Make recommendations for change and modify plan from experience learned in pandemic period

2.3.5 Evaluate resource needs for subsequent waves if they occur.

3 Prevention and Control

In addition to the measures taken during pandemic alert period, following steps to be taken and intensified:

3.1 Take measures according to all relevant contingency plan

3.2 Transmit electronic messages through radio, television and internet on preventive measures taken by health and poultry personnel for people in general

3.3 Follow the SOPs on infection control for disinfection and containment measures by health managers, clinicians, technologist and paramedics

3.4 Limit spread of infection/transmission through use of PPE, disinfectants, antiseptic, antivirals and vaccination

3.5 Orient personnel of essential services specially water, electricity power, communication, food supply etc. at national and local levels .

3.6 Early and strategic use of antivirals and implement social distancing; close schools, ban public gathering etc

3.7 Monitor health system status; adjust triage system if necessary; deploy additional trained workforces and volunteers; ensure staff supports as per contingency plan.

3.8 Provide medical and non-medical supports for affected population in non-health-care settings (schools, tornado shelters etc) if necessary;

3.9 Strengthen case management at all levels

3.10 Review guideline for case management and training of relevant health personnel
3.11 Review and ensure logistics – medicine (effective antivirals, others), equipments (ventilators, endotracheal tubes, sucker machine, oxygen cylinder etc.)
3.12 Use antivirals for early, strategic treatment of cases and prophylaxis of close contacts
3.13 Review vaccine use strategies including inventories of necessary supplies and use for mass or targeted emergency vaccination campaigns including collection and distribution of pandemic vaccine if available
3.14 Orient public and private health-care providers on case definitions, protocols and algorithms to assist with case-finding, management, and infection control;

4 Risk Communication

4.1 Objectives

4.1.1 To intensify the activities done during pandemic alert period
4.1.2 To minimize impact, such as social disorder and disruptions of economic activities,
4.1.3 To ensure effective response by providing information timely and accurately to peoples, agencies, and other stakeholders**.**

4.2 Activities

4.2.1 **To intensify the activities done during pandemic alert period**
4.2.1.1 Described earlier in pandemic alert period

4.2.2 **To minimize impact, such as social disorder and disruptions of economic activities,**
4.2.2.1 Develop mechanisms to promptly respond to rumors and inaccurate information to minimize concern, social disruption, and stigmatization and correct misinformation.
4.2.2.2 Identify target groups for delivery of key messages and develop appropriate materials.

4.2.3 **To ensure effective response by providing information timely and accurately to all stakeholders**
4.2.3.1 Use all channels to disseminate information relating to disease and methods of protection.
4.2.3.2 Explore community resources, such as hotlines and websites to respond to local questions.

Chapter VI

The Plan for the Pandemic Period (Animal Health)

1. Planning and coordination
2. Surveillance
3. Prevention and control
4. Risk communication
5. Operational research

The Plan for the Pandemic Period (Animal Health)

Activities of animal health sector will depend on the scenario of Pandemic. Activities will differ widely based on circulation of pandemic virus inside or outside the country.

1 When Bangladesh is not affected

1.1 Planning and coordination

The animal health sector will fully active in the planning and coordination process described in the plan document. A meeting of National Technical Committee (Livestock) will be convened as soon as the pandemic is declared from WHO head quarter and duly communicated by the WHO focal point in the country. The committee will quickly assess the country situation and depending on the situation will give clear directives for activities in livestock sector. The activities will depend on the foci of pandemic at that point of time. Special order will be delivered to the staff members and farmers to comply with the directives of Ministry of Health and family welfare and other government directives.

1.2 Surveillance and early warning

1.2.1 When pandemic start outside the country border and country is still unaffected, DLS will conduct surveillance in border belt area and entry points.

1.2.2 DLS staff, people working in livestock sector and their family members will be communicated the approved messages regarding pandemic.

1.3 Prevention and control

1.3.1 Imposition of ban on importation of all livestock and livestock products from pandemic affected countries.

1.3.2 Overseas missions will be discouraged

1.3.3 Sale of poultry by vendors will be strictly restricted; slaughter of any type of animals including poultry in undesignated places will be strictly restricted.

1.3.4 Sale of live birds will be restricted and only hygienically produced meat will be allowed for supply and sale.

1.3.5 Movement of personnel involved in poultry trade will be limited. Any service other than emergency activities like supply of feed and water, cleaning and disinfection, disposal of dead birds will be discouraged.

1.3.6 Movement of poultry will be restricted except needed maintenance of emergency supply to animal farms

1.3.7 Farmers will be advised to carry out activities to maintain production in farms.

1.3.8 During pandemic phase DLS will limit active surveillance and door to door surveillance will be stopped to reduce the risk of exposure and transmission of pandemic virus by surveillance workers.

1.3.9 All fairs, exhibition, gathering, seminar and conference will be postponed. Only emergency meetings could be convened but numbers of meetings will be limited to a minimum.

1.4 Risk Communication

1.4.1 Staff of DLS, BLRI, all livestock and poultry association will be instructed to strictly follow government orders and instruction.

1.4.2 The policy of the government described in Planning and coordination and prevention and control will be disseminated to all stake holders of livestock sector for implementation.

2 When Bangladesh is affected

2.1 Planning and coordination

2.1.1 The animal health sector will fully active in the planning and coordination process described in the plan document.

2.1.2 A meeting of National Technical Committee (Livestock) will be convened immediately after the affected by pandemic.

2.2 Surveillance and early warning

2.2.1 During pandemic phase DLS will depend on diseases reporting and all door to door surveillance will be stopped.

2.2.2 DLS staff, people working in livestock sector and their family members will be communicated the approved messages regarding pandemic.

2.3 Prevention and control

2.3.1 Imposition of ban on importation of all livestock and livestock products from pandemic affected countries will be continued.

2.3.2 Transport of essential inputs and supply of emergency products like milk, meat and egg will be continued.

2.3.3 Sale of live birds will be banned and only hygienically produced meat will be allowed for supply and sale.

2.3.4 Any service other than emergency activities like supply of feed and water, cleaning and disinfection, disposal of dead birds will be discouraged.

2.4 Risk Communication

2.4.1 Key messages and materials will be approved keeping the time factor into consideration so that such communication materials are ready for dissemination when a pandemic break out.

2.4.2 Staff of DLS, BLRI, all livestock and poultry association will be instructed to strictly follow government orders and instruction.

2.4.3 The policy of the government described in Planning and coordination and prevention and control will be disseminated to all stake holders of livestock sector for implementation.

Chapter VI: Annexure

Annex 1: CLASSIFICATION OF POULTRY PRODUCTION SYSTEMS ACCORDING TO FAO

Characteristics	**Poultry Production Systems**			
Parameter	**Industrial and Integrated Production**	**Commercial poultry Production**		**Village or backyard Production**
		Large Scale	**Small-Scale**	**Poultry**
Production System	System 1	System 2	System 3	System 4
Biosecurity	High	Medium	Low	Low
Market outputs	Export and urban	Urban/rural	urban/rural	Rural
Dependence on market for inputs	High	High	High	Medium
Dependence on market access	High	High	High	Medium
Location	Near capital and major cities	Near capital and major cities	Smaller towns and rural areas	Outdoors
Type of confinement	Indoors	Indoors	Indoors/Part-time outdoors	Not confined
Housing	Closed	Closed	Closed/Open	Minimal
Contact with other poultry	None	None	Yes	Yes
Contact with domestic ducks	None	None	Yes	Yes
Contact with other domestic birds	None	None	Yes	Yes
Contact with wildlife	None	None	Yes	Yes
Veterinary services	Own Veterinarian	Pays for veterinary service	Pays for veterinary service	Irregular
Source of medicine and vaccine	Market	Market	Market	Government, Market
Source of technical information	Company and associates	Sellers of inputs	Sellers of inputs	Govt. extension service
Source of financing	Banks and own	Banks and own	Banks and private	Private, occasionally Banks
Breed of poultry	Commercial	Commercial	Commercial/ Indigenous	Indigenous
Food security of owner	High	High	High	Variable

Annex 2: Pandemic phases (proposed by WHO)

Pre-pandemic period:Preparedness, Planning and Co-ordination Stage

Phase 1: No animal influenza virus known to have caused infection in humans has been identified in animals.

Phase 2: No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.

Pandemic alert period: Alert Response

Phase 3: An animal or hybrid animal-human influenza virus has caused sporadic cases or small clusters of disease in people but has not resulted in human-to-human transmission sufficient to cause community level outbreaks.

Phase 4: Small cluster(s) with limited human to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.

Phase 5: When a virus that "has established human-to-human transmission in two or more non-contiguous countries in one geographical region."

Pandemic period: Emergency Response

Phase 6: When a virus that has caused clusters of disease in at least two of the following geographical regions: Africa, Asia, Europe, Americas, and Oceania.

Post-peak period: Cases in most countries have dropped from peak levels.

Period of possible new wave: Flu activity is rising again

Post-pandemic period: Cases have returned to the normal range for seasonal flu

Annex 3: NATIONAL ADVISORY COMMITTEE (NAC)

Members (Not according to warrant of precedence):

1. Minister, Ministry of Health and Family Welfare (Chairperson)
2. Minister, Ministry of Fisheries and Livestock
3. Minister, Ministry of Commerce
4. Minister, Ministry of Environment and Forest
5. Minister, Ministry of Finance
6. Minister, Ministry of Law, Justice and Parliamentary Affairs
7. Minister, Ministry of Defense
8. Minister, Ministry of Home
9. Minister, Ministry of Foreign Affairs
10. Minister, Ministry of Education
11. Minister, Ministry of Information
12. Minister, Local Government, Rural Development and Cooperative
13. Minister, Ministry of Agriculture
14. Minister, Ministry of Food and Disaster Management
15. Minister, Ministry of Civil Aviation and Tourism
16. Minister, Ministry of Social Welfare
17. Minister, Ministry of Religious Affairs
18. Representative of Honorable Prime Minister
19. Secretary, Ministry of Health and Family Welfare (Member Secretary)

** In the event of preoccupation of Honorable Minister(s), their representatives will act on their behalf.*

Terms of reference (TOR)

1. Endorsement of the National Plan before sending for approval by Cabinet.
2. Review and endorse amendment(s) of the National Plan
3. Decision on proposals sent by MTF
4. Support implementation of the National Plan
5. Monitor/review the activities under the plan
6. Convene at least once in a year, and as & when required
7. Co-opt member (s) when necessary

Annex 4: NATIONAL MULTI-SECTORAL TASK FORCE (NMTF)

Members (Not according to warrant of precedence):

1. Secretary, Ministry of Health and Family Welfare (Chairperson)
2. Secretary, Ministry of Fisheries and Livestock
3. Secretary, Ministry of Commerce
4. Secretary, Ministry of Environment and Forest
5. Secretary, Ministry of Finance
6. Secretary, External Resource Division
7. Secretary, Ministry of Law, Justice and Parliamentary Affairs
8. Secretary, Ministry of Defense
9. Secretary, Ministry of Home
10. Secretary, Ministry of Foreign Affairs
11. Secretary, Ministry of Education,
12. Representative from Prime Minister Office
13. Secretary, Ministry of Information
14. Secretary, Local Government, Rural Development and Cooperative
15. Secretary, Ministry of Agriculture
16. Secretary, Ministry of Food and Disaster Management
17. Secretary, Ministry of Civil Aviation and Tourism
18. Secretary, Ministry of Social Welfare
19. Secretary, Ministry of Religious Affairs
20. Director General of Health Services
21. Director General of Livestock Services
22. Chief Conservator of Forest, Forest Department
23. Director General of BLRI
24. Director General Medical Services (Ministry of Defense)
25. Director General of BDR
26. Inspector General of Police
27. Director General of Ansar and VDP
28. Director General, NGO Bureau
29. Focal point Avian Influenza, MoH&FW
30. Focal point Avian Influenza, MoFLS
31. Focal person, Avian Influenza DGHS
32. Focal person, Avian Influenza DLS
33. Director, Institute of Epidemiology, Disease Control & Research (IEDCR) & National Influenza Center (NIC)
34. In-charge, National Reference Laboratory for AI, BLRI
35. Representatives from NGOs as nominated by NGO Bureau
36. Representative from FBCCI
37. Representative from Bangladesh Poultry Industries Association (BPIA)
38. Representative from Bangladesh Medical Association (BMA)
39. Representative from Bangladesh Veterinary Association (BVA)
40. Representatives of relevant UN bodies
41. Focal Point, Avian Influenza, Donor Agencies

Terms of reference

1. Endorsement of the National Plan before sending for approval by Cabinet.
2. Decision on proposals sent by technical committees
3. Coordinate NGO activities on Avian and Pandemic Influenza through Technical Committee of respective directorate
4. Support implementation of the National Plan
5. Reorganization of communication wing
6. Approval of communication materials reviewed by communication wings
7. Approval of vaccination and antiviral strategy.
8. Review and propose amendment of the National Plan
9. Monitor and evaluate the activities within the different stages of the plan implementation
10. Meet every six month and when the country situation requires
11. Co-opt member (s) when necessary

Annex 5: Communication Committee (CC)

Members (Not according to warrant of precedence):

1. Joint Secretary, (Public Health and WHO), Chair person
2. Director, Disease Control, DGHS, Member
3. Director, MIS, DGHS
4. Director (Animal Health and Admin), DLS
5. Director , IEDCR/NIC
6. Chief , Health Education Bureau, DGHS
7. Representative from Dept. of Forest
8. Deputy Director, Fisheries & Livestock Information Department (FLID), MOFL
9. Representative from Ministry of Information(BTV/Bangladesh Betar)
10. Representative from NGO selected by NGO Bureau
11. Deputy Secretary(Live Stock), MOFL
12. Deputy Secretary(Public Health and WHO),MOHFW
13. Representative from UNICEF
14. Representative from WHO
15. Representative from FAO
16. Focal Point, Avian Influenza, Donor Agencies
17. Representative from Bangladesh Poultry Industries Association (BPIA)

Terms of Reference:

1. Review the communication strategy.
2. Review communication materials forwarded by respective focal point of DLS and DGHS.
3. Endorse communication materials to NMFT for final approval.
4. Monitor and evaluate the status of approved printed communication materials
5. Meet at least quarterly, and when necessary
6. Co-opt member if necessary

Annex 6: National Technical Committee (Health)

Members (Not according to warrant of precedence):

1. Director General of Health Services (Chairperson)
2. Director General, Department of Livestock Services
3. Additional Director General, Planning and Development, DGHS
4. Director, Disease Control and Focal Point, Avian Influenza, DGHS
5. CVO/ Director (Animal Health and Administration), (Focal Person, Avian Influenza), DLS
6. Director (Hospital), DGHS
7. Director (PHC), DGHS
8. Director, Planning and Research, DGHS
9. Director, IEDCR
10. Director, NIPSOM
11. Director, NIDCH
12. Director, IPH
13. Representative ,DGMS, Ministry of Defence
14. Chief, Health Education Bureau, DGHS
15. Head, Dept of Medicine, DMC
16. Head, Dept of Pediatrics, DMC
17. Chairman, Dept of Virology, BSMMU
18. Head, Dept of Epidemiology, NIPSOM
19. Representative of Bangladesh Institute of Tropical & Infectious Diseases (BITID), Chittagong
20. Chief Health Officer, Dhaka City Corporation
21. Chief Scientific Officer, Virology, IEDCR
22. Chief Scientific Officer, Epidemiology, IEDCR
23. Representative, UNICEF
24. Representative, ICDDR,B
25. NPO (Epidemiology) and CSR Focal Point, WHO
26. Focal Point, Avian Influenza, Donor Agencies
27. Subject specialist from Bangladesh Medical Association (BMA)
28. Representative, Red Crescent Society, Bangladesh
29. Program Manager (Communicable Disease Control), DGHS
30. Deputy Program Manager, Avian Influenza, DGHS (Member Secretary)

Terms of Reference:

1. Review National Plan
2. Implementation of respective section of the National Plan (Human Health)
3. Review communication materials.
4. Prepare budgets for the different activities within the sector;
5. Review, adopt and implement proposals at the Directorate level;
6. Coordinate with other Directorates involved in the Plan;
7. Develop and review vaccination and antiviral strategy
8. Monitor and evaluate the activities of the plan
9. Develop, review and adoption of SOPs
10. Coordinate activities of relevant non government sectors (i.e. NGOs)
11. Meet quarterly and when the country situation requires
12. Co-opt member (s) if necessary

Annex 7: National Technical Committee (Livestock)

Members (Not according to warrant of precedence):

1. Director General, Department of Livestock Services (Chairman)
2. Director General of Health Services
3. Director General, Bangladesh Livestock Research Institute (BLRI)
4. CVO/ Director (Animal Health and Administration), (Focal Person, Avian Influenza), DLS
5. Director, Disease Control and Focal Point, Avian Influenza, DGHS
6. Director (Research, Training and Evaluation), DLS
7. Director (Extension) DLS
8. Director (Production) DLS
9. Conservator of Forest, Wild Life and Nature Conservation Circle, Ban Bhavan, Dhaka
10. Principal, Officers Training Institute, Savar
11. Chief Scientific Officer (CSO), Animal Health Research Division, BLRI
12. Chief Veterinary Officer (CVO), Central Veterinary Hospital, Dhaka
13. Principal Scientific Officer (PSO), Central Disease Investigation Laboratory (CDIL), Dhaka
14. Laboratory-in-charge, National Reference Laboratory for Avian Influenza, BLRI
15. Epidemiologist, Epidemiology Unit, DLS
16. Representative, Bangladesh Agricultural Research Council (BARC) (Not below the rank of CSO)
17. Representative, Remount Veterinary and Farm Corps, Bangladesh Army
18. Deputy Director, Animal Health and Administration-2,DLS
19. Assistant Director (Animal Health & Administration), DLS
20. Dean, Faculty of Veterinary Science, BAU, Mymensingh
21. Dean, Faculty of Veterinary Medicine, CVASU, Chittagong
22. Dean, Faculty of Veterinary Medicine, Sylhet Agricultural University, Sylhet
23. Veterinary Officer, Dhaka City Corporation
24. Subject specialist from Bangladesh Veterinary Association (BVA)
25. Deputy Director, Animal Health and Administration-1, DLS - Member Secretary

Terms of reference

1. Review of the National Plan
2. Implementation respective section of the National Plan (Animal health)
3. Proposal of communication materials.
4. Review and propose amendment of the National Plan
5. Prepare budgets for the different activities within the sector;
6. Develop and review vaccination strategy
7. Review, adopt and implement proposals at the Directorate level;
8. Develop, review and adoption of SOPs
9. Coordinate with other Directorates involved in the Plan;
10. Ensure the effective stamping out of infected or in-contact poultry;
11. Monitor infection control measures in wet market, live bird market, pet and game bird market
12. Monitor and evaluate the activities of the plan
13. Coordinate activities of relevant non government sectors (i.e. NGOs)
14. Meet monthly and when the country situation requires
15. Co-opt member(s) if necessary

Annex 8: Joint Technical Committee (JTC)

Members (Not according to warrant of precedence):

1. Director General of Health Services (Chairperson)
2. Director General, Department of Livestock Services
3. Focal Point, Avian Influenza, DLS
4. Director General, BLRI
5. Director, IEDCR
6. Member Secretary, NTC (Health)
7. Member Secretary, NTC (Livestock)
8. Focal Point, Avian Influenza, DGHS (Member Secretary)

Terms of reference:

1 Decide matters arising from issues concerning decision of both National Technical Committee
2 The committee will sit when required
3 Co-opt members if needed

Annex 9: National Coordination Cell (NCC)

It will be situated at MoH&FW. National Coordination Cell will provide support for the implementation of the National plan. It will be situated at MoH&FW.

Members and terms of reference of the cell will be decided upon by NMTF.

Annex 10: DISTRICT MULTISECTORAL COORDINATION COMMITTEE (DMCC)

Members (Not according to warrant of precedence):

1. Deputy Commissioner (Chairman)
2. Mayor of the Pouroshova of the district headquarter
3. Chairman, Sadar Upazila
4. Superintendent of Police
5. Civil Surgeon (Member Secretary)*
6. District Livestock Officer (Member Secretary)*
7. Deputy Director, Agriculture extension
8. District Family Planning Officer
9. District LGED Officer
10. Divisional Forest Officer
11. District Primary/Secondary Education Officer
12. District Social Welfare Officer
13. District Information Officer
14. District Adjutant of Ansar and VDP
15. Upazila Nirbahi Officer (Sadar)
16. Upazila Health & Family Planning Officer (Sadar)
17. Upazila Livestock Officer (Sadar)
18. Representative from Sector BDR (if any)
19. Representative from Army Medical Corps (if any cantonment in that district)
20. Representatives from Local NGOs
21. President, local Chamber of Commerce
22. President, Local Poultry Industries Association
23. President, Local Bangladesh Medical Association (BMA)
24. President, Local Bangladesh Veterinary Association (BVA)
25. President, Local Press club

**According to situation of outbreak in animal/human DLO/CS will act as Member Secretary*

Terms of Reference:

1. Coordination of District Avian Influenza activities
2. Implement district Avian Influenza activities
3. Monitor and evaluation of upazilas multi sectoral activities
4. Implement activities whatever National Multisectoral Coordination Committee directs
5. Take appropriate measures to control cross border spreading of avian influenza (in border districts)
6. Taking timely measures of stamping out activities
7. Ensure and take measures what technical committees (Health and Livestock) recommend.
8. Meet quarterly, and whenever necessary.
9. Co-opt member (s) if necessary

Annex 11: UPAZILA MULTISECTORAL COORDINATION COMMITTEE (UMCC)

Members (Not according to warrant of precedence):

1. Upazila Chairman (Chairman)
2. Mayor of Pouroshova
3. Upazila Nirbahi Officer (Coordinator) **
4. Upazila Health & Family Planning Officer (Member Secretary)*
5. Upazila Livestock Officer (Member Secretary)*
6. Upazila Agricultural Officer
7. Upazila Engineer, LGED
8. Officer in-charge, Thana
9. Upazila Ansar & VDP Officer
10. Forest Ranger
11. Upazila Primary Education Officer
12. Upazila Family Planning Officer
13. Upazila Social Welfare Officer
14. Union Parishad Chairman (All)
15. Representatives, NGOs
16. Representatives, Poultry Industries Association
17. Representative, Local Press Club

**According to situation of outbreak in animal/human ULO/UHFPO will act as Member Secretary*

***In absence of Upazila Chairman, UNO will act as chairperson*

Terms of Reference:

1. Coordination of Upazila Avian Influenza activities
2. Implement Upazila Avian Influenza activities
3. Monitor and evaluation of upazilas technical committee activities
4. Implement activities whatever District Multisectoral Coordination Committee direct
5. Taking timely measures of stamping out activities
6. Ensure and take measures what technical committees (Health and Livestock) recommend.
7. Meet monthly, and whenever necessary.
8. Co-opt member (s) if necessary

Annex 12: National Rapid Response Team (NRRT) Health

Members (Not according to warrant of precedence):

The NRRT consists of members from different departments of IEDCR and partner institutes with Director of IEDCR as Convener and one senior officer of IEDCR as Member Secretary

Director, IEDCR (Convener)
CSO, Epidemiology, IEDCR (Member Secretary)
Members

1. PSO, Epidemiology, IEDCR
2. PSO, Microbiology, IEDCR
3. PSO, Virology, IEDCR
4. PSO, Parasitology, IEDCR
5. PSO, Entomology, IEDCR
6. PSO, Medical Sociology, IEDCR
7. PSO, Biostatistics, IEDCR
8. Clinician (Medicine, Pediatrics, Psychiatry)/Relevant personnel from other partner institutions/sectors (when and where needed)

Terms of Reference:

1. Surveillance for Influenza and Avian Influenza
2. Conduct Outbreak investigation of avian influenza in the country
3. Surveillance of High Risk group
4. Send specimens to reference laboratories when necessary
5. Undertake risk communication strategy and dissemination
6. Conduct research related to the outbreak
7. Provide technical support to National Technical Committee

Annex 13: DISTRICT RAPID RESPONSE TEAM (DRRT) Health

Members (Not according to warrant of precedence):

1. Civil Surgeon (Convener)
2. Superintendent of other government hospital (if present)
3. Deputy Civil Surgeon
4. Medical Officer, Civil Surgeon (Member Secretary)
5. Resident Medical Officer (RMO)
6. Consultant, Medicine
7. Consultant, Pediatrics
8. Consultant, Pathology
9. Upazila Health & Family Planning Officer (Sadar)
10. Surveillance Medical Officer (SMO)
11. District Immunization Medical Officer (DIMO)
12. Public Health Nurse
13. Chief Laboratory Technician

Terms of Reference:

1. Investigation for suspected Avian Influenza patient
2. Monitoring the High Risk group surveillance after stamping out of poultry
3. Ensure the drug distribution to the High risk group after stamping out of poultry
4. Prepare District Hospital for Avian Influenza patient and their management
5. Coordinate with District RRT (Livestock)
6. Provide technical support to District Multi Sectoral Coordination Committee

Annex 14: UPAZILA RAPID RESPONSE TEAM (URRT) Health

Members (Not according to warrant of precedence):

1. Upazila Health & Family Planning Officer (UH&FPO) (Convener)
2. Resident Medical Officer (RMO)
3. Medical Officer (Disease Control) (Member Secretary)
4. Consultant, Medicine
5. Consultant, Pediatrics
6. Nursing Supervisor

Terms of Reference:

1. Investigation for suspected Avian Influenza patient
2. Monitoring the High Risk group surveillance after stamping out of poultry
3. Ensure the drug distribution to the High risk group after stamping out of poultry
4. Coordinate with Upazila RRT (Livestock)
5. Provide technical support to Upazila Multi Sectoral Coordination Committee

Annex 15 National Rapid Response Team (NRRT) Livestock

Members (Not according to warrant of precedence):

1. Deputy Director, Animal Health and Administration-1- Chairman

2. Chief Veterinary Officer- Central Veterinary Hospital
3. Principal Scientific Officer- CDIL
4. Epidemiologist- Epi. Unit, DLS
5. PD-Avian Influenza Preparedness and Response Project.
6. Principal Scientific Officer- Veterinary Public Health
7. Principal Scientific Officer- FDIL (Nearest outbreak area)
8. Principal Scientific Officer- Newcastle Disease Section, LRI
9. Principal Scientific Officer- Quality Control of Vaccines and Drugs Section, LRI
10. Assistant Director, Animal Health- Member secretary

Terms of Reference:

1. Conduct Outbreak Investigation of Avian Influenza in the country.
2. Technical assistance to District and Upazila Rapid Response Teams.
3. Provide technical support to National Technical Committee.
4. Monitoring and supervision of the stamping out procedure
5. Collection of sample (if necessary)
6. Co-opt members (when necessary)

Annex 16: DISTRICT RAPID RESPONSE TEAM (DRRT) Livestock

Members (Not according to warrant of precedence):

1. District Livestock Officer- Chairman
2. Additional Livestock Officer
3. Upazila Livestock Officer (all)
4. Representative, Forest Department
5. Veterinary Surgeon (all)
6. Veterinary Surgeon, District Veterinary Hospital
7. Upazila Livestock Officer (Sadar)- Member secretary

Terms of Reference:

1. Technical Coordination
2. Communication
3. Supervision and Monitoring of the Stamping out activities
4. Recommendation to District Multi Sectoral Coordination Committee to take appropriate measures.
5. Co-opt member (if necessary)

Annex 17: Upazila Rapid Response Team (URRT) Livestock

Annex: Upazila Rapid Response Team (URRT):

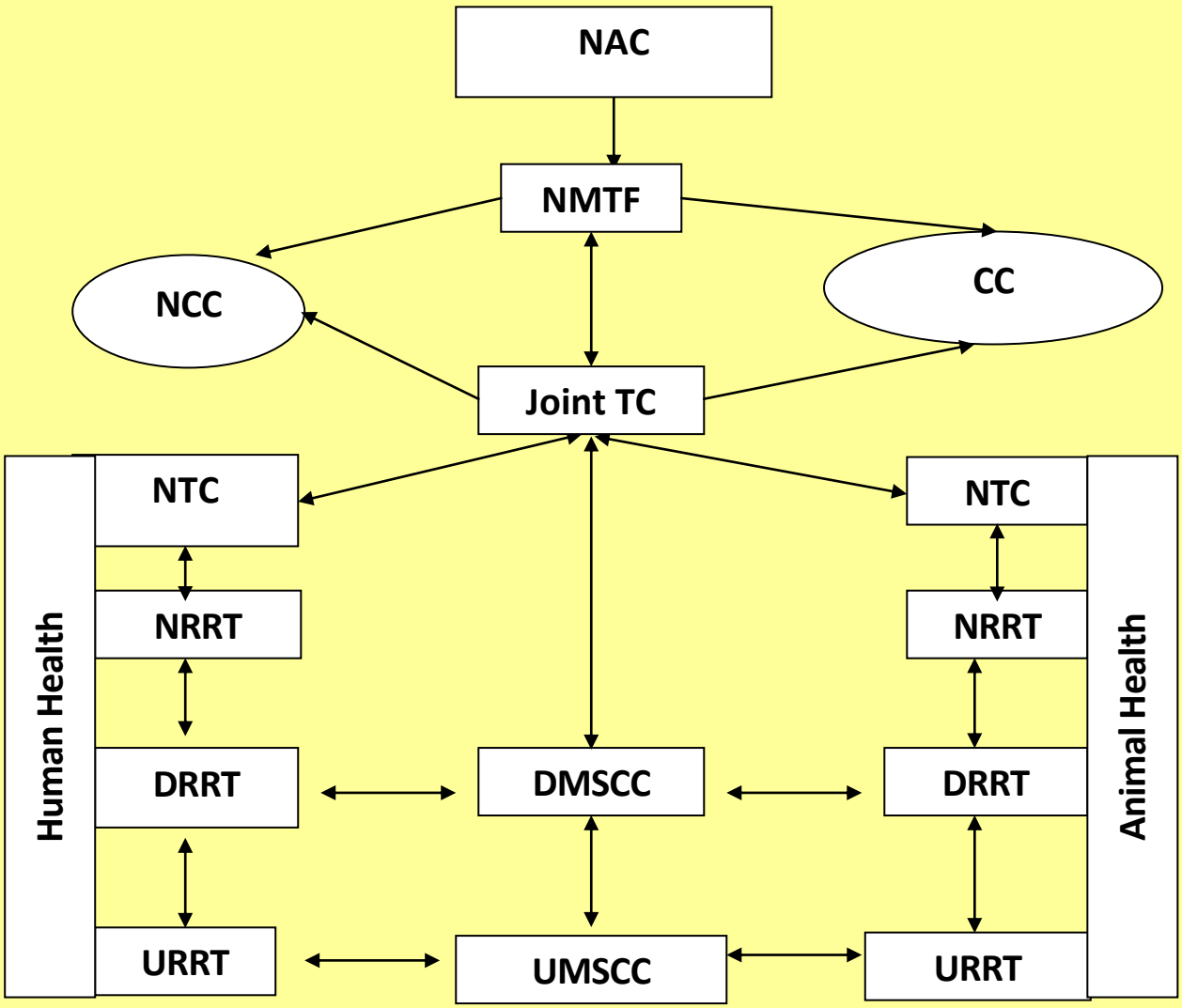
Members (Not according to warrant of precedence):

1. Upazila Livestock Officer- Chairman
2. Upazila Livestock Assistant
3. Veterinary Field Assistant
4. Compounder
5. Dresser
6. Veterinary Surgeon- Member secretary

Terms of Reference:

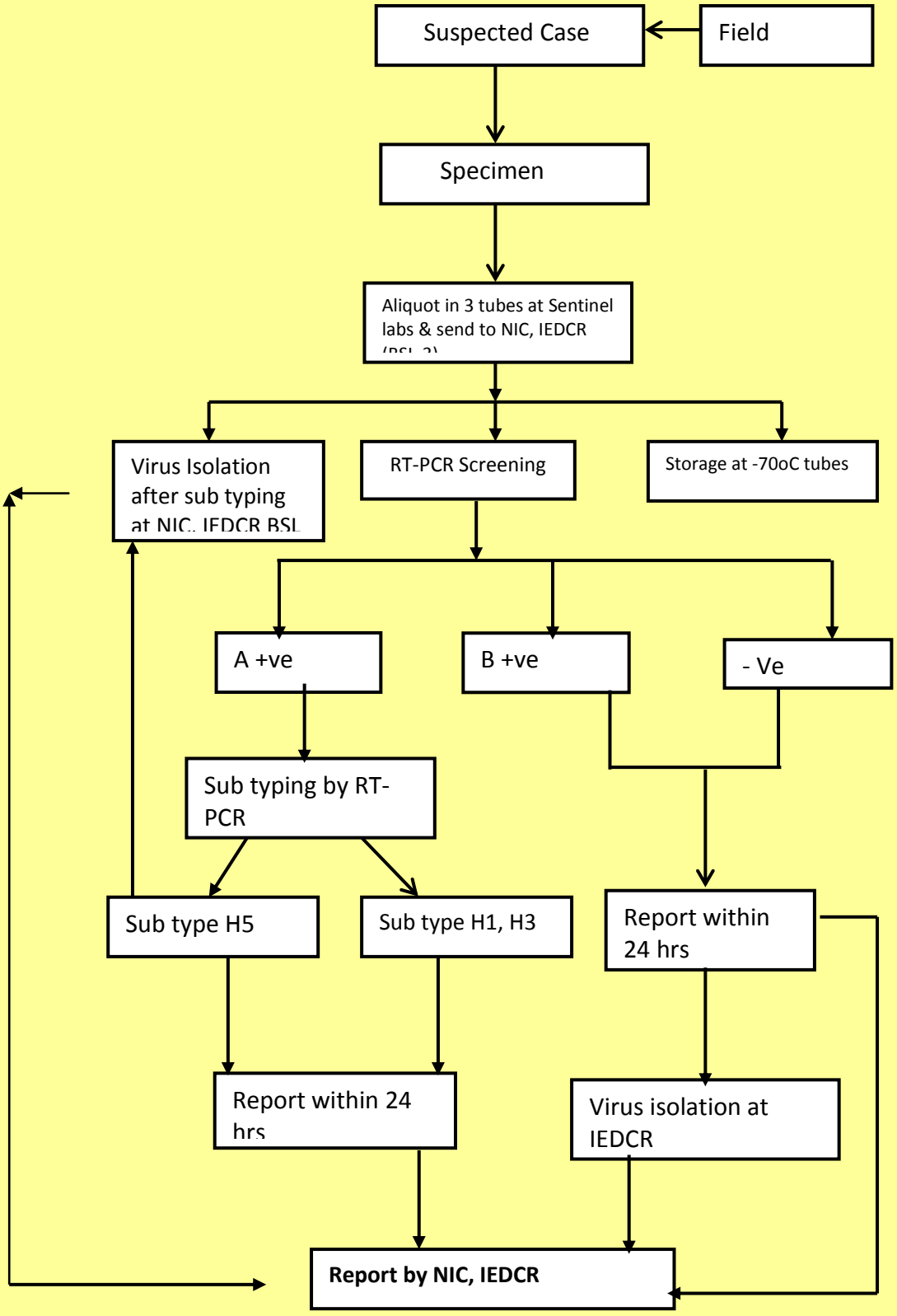
1. Outbreak management of Avian Influenza
2. Post outbreak surveillance
3. Collection of sample
4. Monitoring post outbreak activities
5. Communication with Upazila Multisectoral Coordination Committee
6. Coordination with the Upazila Rapid Response Team (Human)
7. Co-opt members (when necessary)

Annex 18: Flow chart of Committees at Different Levels for Avian and Pandemic Influenza

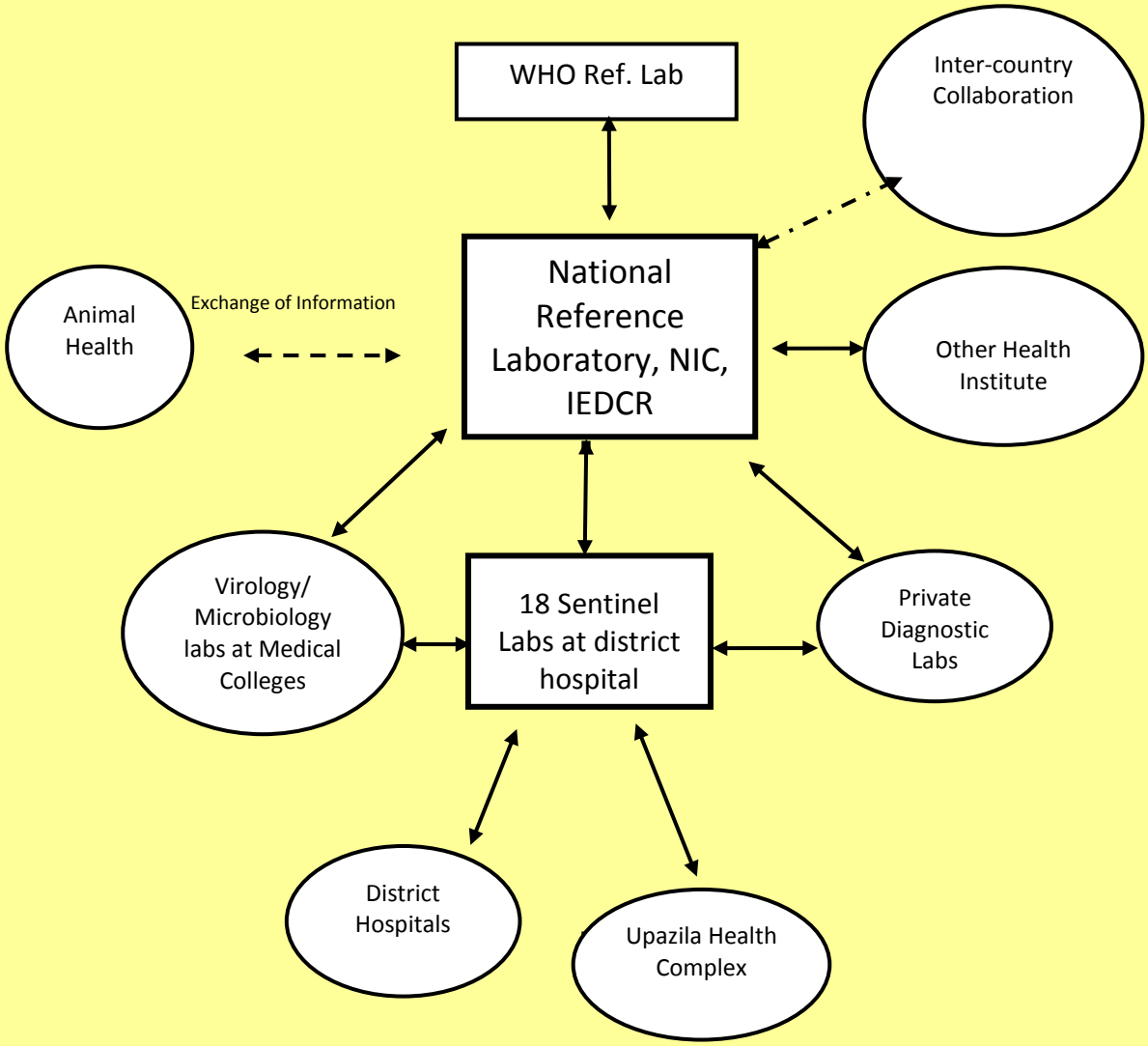


NAC: National Advisory Committee
NMTF: National Multi-Sectoral Task Force
CC: Communication Committee
NCC: National Coordination Cell
NTC: National Technical Committee
JTC: Joint Technical Committee
NRRT: National Rapid Response Team
DMCC: District Multisectoral Coordination Committee
DRRT: District Rapid Response Team
UMCC: Upazila Multisectoral Coordination Committee
URRT: Upazila Rapid Response Team

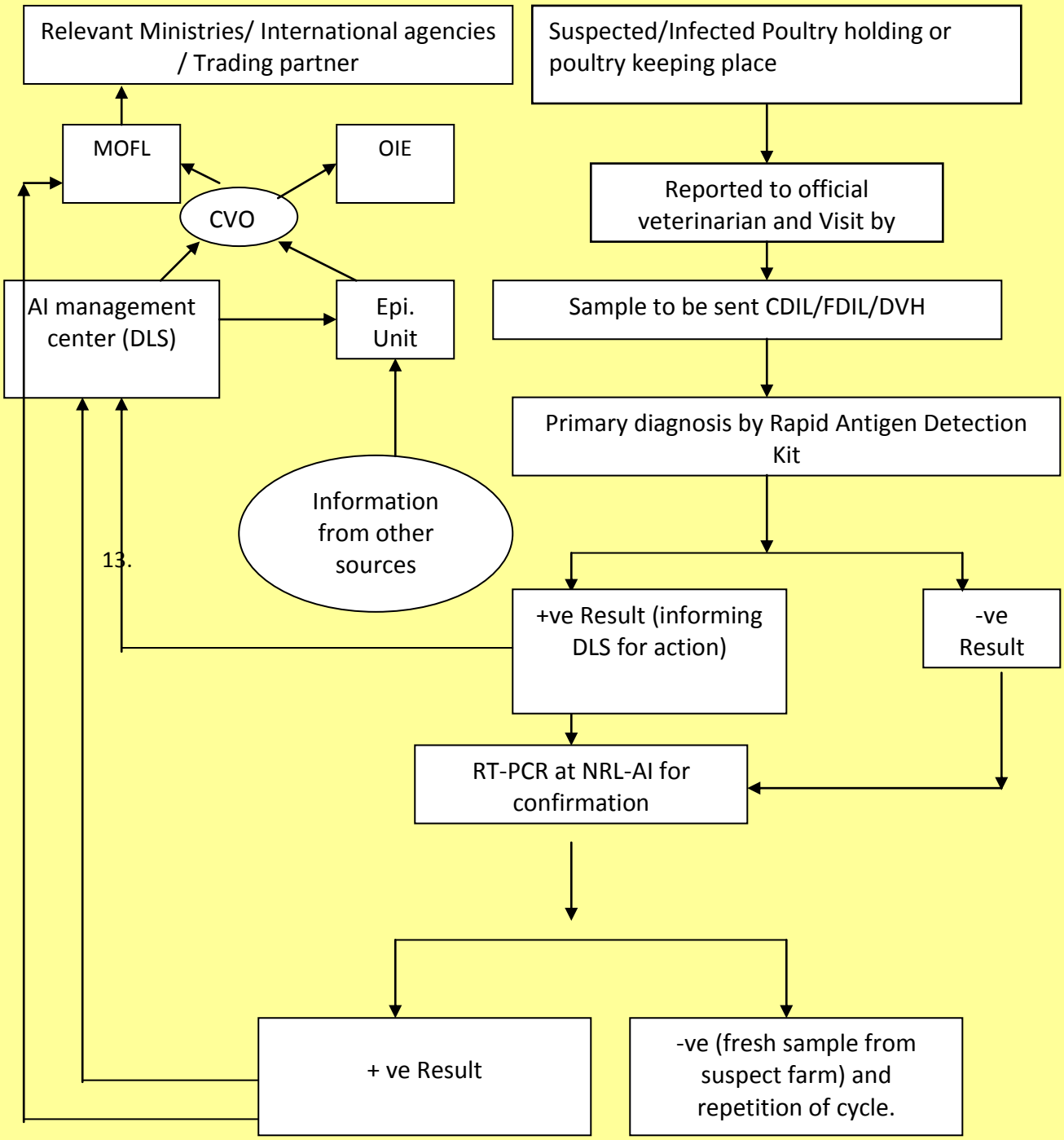
Annex 19: DETECTION PROCEDURES FOR HUMAN SAMPLES



Annex 20: NATIONAL DIAGNOSTIC NETWORK AND DETECTION PROCEDURES FOR HUMAN SAMPLE



Annex 21: NATIONAL DIAGNOSTIC NETWORK AND DETECTION PROCEDURES FOR ANIMAL SAMPLES



Annex 24: GLOSSARY

1. **BSL1**: The BSL1 laboratory is appropriate for working with microorganisms that are not known to cause disease in human. It is the type of laboratory found in municipal water-testing labs, in high school, and in some community colleges teaching introductory microbiology classes where agents are not considered hazardous.
2. **BSL2:** The BSL2 laboratory is designed to maximize safe working conditions for laboratorians working with agents of moderate risk to personnel and the environment. There are a number of immunizations recommended for persons at high risk of exposure to blood and blood products before working with specific agents e.g. hepatitis B virus. These agents are generally transmissible following ingestion, parenteral exposure or exposure of mucus membrane. Eating, drinking, & smoking are prohibited and extreme precautions are taken while handling sharp instruments.
3. **BSL3**: The BSL3 laboratory is specially designed to work with infectious agents that may cause serious or potentially lethal diseases in human as a result of exposure by the inhalation route e.g. avian influenza virus, nipah virus, St. louis encephalitis etc. In BSL3 laboratories, particular attention is given to air movement, as the agents manipulated here are transmissible by the aerosol route. These laboratories should be located away from high traffic areas.
4. **Characterization:** Identification of genetic specification of a microorganism.
5. **FAO:** A specialized agency of the United Nations concerned with agriculture and animal health.
6. **H1N1:** A strain of influenza type A virus that caused the pandemic infection of 1918-1919 and that continues to circulate in humans. H3N2 A strain of influenza type A virus that caused the pandemic infection of 1968-1969. Of the three influenza viruses that currently circulate in humans, this type causes the greatest morbidity and mortality.
7. **H5N1:** A strain of influenza type A virus that moved in 1997 from poultry to humans. While the outbreak of this virus was rapidly contained, it produced significant morbidity and mortality in persons who became infected, probably from

direct contact with infected poultry.

8. **Epidemic:** An outbreak of infection that spreads rapidly and affects many individuals in a given area or population at the same time.
9. **Epidemiology:** The study of the occurrence, distribution and determinants of a disease (including other health-related events) in a specified population and application of the study to control disease and health problems.
10. **Flu:** Another name for influenza infection and or illness.
11. **GPS:** It is the Global Navigation Satellite System (GNSS) developed by the United States Department of Defense and is the only fully functional GNSS in the world. It uses a constellation of between 24 and 32 Medium Earth Orbit Satellites that transmit precise microwave signals, which enables GPS receivers to determine their current location, the time, and their velocity. The GPS-Satellite constellation is managed by the US Air Force 50th Space Committee. Civilians often use it as a navigation system.
12. **Health status**: The state of health of an individual or a population, as in community health status.
13. **Hemagglutinin**: An agglutinating protein antigen spiking from the surface of the influenza virus. Differences in the amino acid sequencing of the HA antibody give rise to the different subtypes of type A virus.
14. **High-Risk Groups**: Those groups defined on the basis of their collective exposure in which epidemiologic evidence indicates there is an increased risk of contracting a disease.
15. **Immunity**: Ability of an individual to resist infection with a microorganism through an effective immune response. Immunity is either conferred naturally by exposure to the organism (which may or may not include development of disease) or artificially by vaccination.
16. **Infection**: Condition in which virulent organisms are able to multiply within the body and cause a response from the host's immune defences. Infection may or may not lead to clinical disease.
17. **Infectious**: An infected individual who is able to transmit the infection-causing organism to another healthy individual, with or without developing clinical disease themselves.

18. **Infectious**: disease A disease caused by a microorganism that is capable of being transmitted from one human being to another.
19. **Influenza A**: highly contagious, febrile, acute respiratory infection of the nose, throat, bronchial tubes, and lungs caused by the influenza virus. It is responsible for severe and potentially fatal clinical illness of epidemic and pandemic proportions.
20. **Isolate A:** pure specimen obtained by culture of a microorganism for virus characterization purposes (see characterization).
21. **Morbidity**: Departure from a state of well-being, either physiologic or psychological illness.
22. Morbidity Rate The number of cases of an illness (morbidity) in a population divided by the total population considered at risk for that illness.
23. **Mortality**: Death, as in expected mortality (the predicted occurrence of death in a defined population during a specific time interval).
24. **Mortality Rate:** The number of people/animal who die during a specific time period divided by the total population.
25. **MOU**: Memorandum of Understanding
26. **Mutation:** A permanent, transmissible change in the genetic material of a cell.
27. **Neuraminidase**: A hydrolytic protein antigen (enzyme) spiking from the surface of the influenza virus. It dissolves the protective viscosity of cellular mucous lining, allowing release of new viruses into the respiratory tract.
28. **Neuraminidase inhibitors**: A new class of antiviral agents that selectively inhibit neuraminidase activity in both influenza type A and type B viruses, while having no effect on human neuraminidase.
29. **OIE**: World organization of animal health, specialized international organization who deals with matters related to animal health.
30. **Outpatient**: An individual who receives health care services without being admitted to a health care facility.
31. **Pandemic**: Referring to an epidemic disease of widespread prevalence in several countries around the world.
32. **Pathogen:** Any disease-producing microorganism.
33. **Pathogenesis**: The natural evolution of a disease process in the body without intervention (i.e., without treatment); Description of the development of a

particular disease, especially the events, reactions and mechanisms involved at the cellular level.

34. **PCR (Polymerase Chain Reaction):** A highly sensitive test that is used to amplify the specific parts/sequence of DNA or complimentary DNA of an RNA of viruses or other organisms. PCR works by repeatedly copying genetic material using heat cycling, and enzymes similar to those used by cells.
35. **Resistance**: The development of strains of a pathogenic microorganism that are able to evade the effects of an antimicrobial agent.
36. **Respiratory tract**: Structures contained in the respiratory system, including the nasopharynx, oropharynx, laryngopharynx, larynx, trachea, bronchi, bronchioles, and lungs.
37. **RT-PCR:** It is a laboratory technique for amplifying a defined piece of a RNA molecule. The RNA strand is first reverse transcribed into its complementary DNA followed by amplification of the resulting DNA using Polymerase Chain Reaction (PCR).
38. **SARS**: Severe Acute Respiratory Syndrome
39. **Strain**: A group of organisms within a species or type that share a common quality. For example, currently circulating strains of influenza include type A (H1N1), type A (H3N2), and type B (H3N2).
40. **Subtype A**: classification of the influenza type A viruses based on the surface antigens hemagglutinin (H) and neuraminidase (N).
41. **Symptoms:** Any perceptible, subjective or objective change in the body or its functions that indicates disease or phases of disease, as reported by the patient.
42. **Triage A**: system whereby a group of casualties or patients is sorted according to the seriousness of their illness or injuries, so that treatment priorities can be allocated among them. In emergency situations it is designed to maximize the number of survivors.
43. **Type:** A classification of influenza viruses based on characteristic internal proteins.
44. **Vaccine:** A substance that contains antigenic components from an infectious organism. By stimulating an immune response (but not disease), it protects against subsequent infection by that organism.
45. **VDRL:** It is a blood test for syphilis that detects an antibody, which is present in the

blood when a patient has syphilis. But false negative and false positive results can be encountered in different conditions.

46. **Virology**: The study of viruses and viral disease.
47. **Virus**: A group of infectious agents characterized by their inability to reproduce outside of a living host cell. Viruses may subvert the host cells' normal functions.
48. **Widal Test:** It is the presumptive serological test for Enteric fever or Undulant fever. In case of Salmonella infection, it is a demonstration of agglutinating antibodies against O-somatic and H-flagellar antigens in blood, whereas in Brucellosis, only O-somatic antigen is used.
49. **World Health Organization (WHO)**: A specialized agency of the United Nations concerned with public health and health care.
50. **Ministry of Health and Family Welfare (MoH&FW)**: Includes all the various subdirectorates and directorates under Government of Bangladesh Ministry of Health
51. **Ministry of Fisheries and Livestock (MF&L**): Includes all the various concerned departments under Ministry of fisheries and livestock.

Annex 25: Planning Team

Health Sector

1. Prof. M A Faiz, Director General of Health Services, DGHS. Dhaka
2. Prof. Dr. Moazzem Hossain, Director, Disease Control and Line Director (CDC), DGHS, .Dhaka
3. Prof. Mahmudur Rahman, Director, IEDCR, Dhaka
4. Prof. Dr. Md. Zafor Ullah Chowdhury, Director, NIPSOM, Dhaka
5. Dr. Be-Nazir Ahmed, Assoc. Prof. (PSO, Parasitology), IEDCR,Dhaka
6. Dr. Md. Shafiqul Islam, Assoc. Prof., (Epidemiology), NIPSOM, Dhaka.
7. Dr. M. Mushtuq Husain, SSO (Medical Social Science), IEDCR, Dhaka
8. Dr. Sultana Shahana Banu, PSO, Virology, IEDCR, Dhaka.
9. Dr. Kh. Mahbuba Jamil, Asst. Prof. (SSO, Virology), IEDCR, Dhaka
10. Dr. ASM Alamgir, OSD (Virologist), IEDCR, Dhaka
11. Dr. Mohammad Sabbir Haider, MO, Virology, IEDCR, Dhaka
12. Dr. Harun Ar Rashid, CDC, DGHS, Dhaka
13. Dr. Mamun- Ar- Rashid, DPM (AI), CDC, DGHS, Dhaka

Livestock Sector

1. Mr. Sunil Chandra Ghosh, Director General, DLS, Dhaka.
2. Dr. Muhammad Salehuddin Khan, Director (Animal Health and Admin), DLS, Dhaka
3. Dr. Bidhan Chandra Das, AD (Animal Health and Admin) DLS, Dhaka.
4. Dr. Md. Mehedi Hossain, DPD, AI-PRP, DLS, Dhaka.
5. Dr. Md. Abul Kalam, ULO, (Leave reserve), DLS, Dhaka.
6. Dr. Md. Giasuddin, SSO, Lab. In-Charge, NRL-AI, BLRI, Savar, Dhaka
7. Dr. Mohammed Abdus Samad, SO, NRL-AI, BLRI, Savar, Dhaka
8. Dr. ASSM Zubery, STO, SSCAIB Project, DLS, Dhaka
9. Dr. TABM Muzaffar Goni Osmani, Epidemiology Unit, DLS, Dhaka
10. Dr. Md. Abu Sufian, AIPRP, DLS, Dhaka

Wildlife Sector (Forest Department)

1. Ms Shirina Khatun, Deputy Conservator of Forests, Wildlife & Nature Conservation Circle, Forest Dept.
2. S M Alauddin, Sr. Research Officer, Forest Dept. Dhaka
3. Hoq Mahbub Morshed, Assistant Conservator of Forests, Forest Department, Dhaka

Technical Assistance Team

1. Dr. Biswas M. K. Zaman, NPO (Epidemiology), WHO, NDSC, Dhaka
2. Dr. Mujaddeed Ahmed, National Consultant (Sur.), WHO, NDSC.
3. Dr. Selina Khatun, National Consultant (Trang. & Risk Com.), WHO, NDSC.
4. Dr. Mahfuzul Bari, National Consultant, FAO Technical Unit for AI.
5. Dr. AKM Mahbubul Hoque, National Consultant, FAO Technical Unit for AI
6. Dr. Md. Jahangir Hossain, Assistant Scientist, CSD, ICDDR'B, Dhaka

Annex 26: Budget

BUDGET: PANDEMIC ALERT PERIOD
Combined Budget (Human, Animal & Wildlife)

Strategies	Time frame	Budget in BDT		
		2009	2010	2011
Planning and Coordination	2009-2011	201,130,000	157,110,000	148,540,000
Surveillance	2009-2011	1,206,978,000	654,278,000	572,408,000
Prevention and Control	2009-2011	604,940,000	550,740,000	485,540,000
Risk Communication	2009-2011	91,500,000	71,500,000	61,500,000
Operational Research	2009-2011	169,180,000	148,670,000	126,900,000
NRL-AI Lab Activities	2009-2011	275,310,000	86,800,000	86,660,000
Capacity Building for Forest	2009-2011	125,300,000	49,000,000	49,000,000
TOTAL		**2,674,338,000**	**1,718,098,000**	**1,530,548,000**
GRAND TOTAL		**5,922,984,000**		

Total Budget (Human Health):

Strategies	Time frame	Budget in BDT		
		2009	2010	2011
Planning and Coordination	2009-2011	68,530,000	74,310,000	67,070,000
Surveillance	2009-2011	230,168,000	158,768,000	129,768,000
Prevention and Control	2009-2011	355,640,000	387,740,000	352,040,000
Risk Communication	2009-2011	36,500,000	36,500,000	36,500,000
Operational Research	2009-2011	41,640,000	41,640,000	41,640,000
Sub total		**732,478,000**	**698,958,000**	**627,018,000**
TOTAL		**2,058,454,000**		

Total Budget (Animal Health):

Strategies	Time frame	Budget in BDT		
		2009	2010	2011
Planning and Coordination	2009-2011	12,200,000	7,900,000	7,200,000
Surveillance	2009-2011	916,400,000	469,400,000	415,900,000
Prevention and Control	2009-2011	242,300,000	156,000,000	126,500,000
Risk Communication	2009-2011	55,000,000	35,000,000	25,000,000
Operational Research	2009-2011	127,540,000	107,030,000	85,260,000
NRL-AI Laboratory Activities	2009-2011	275,310,000	86,800,000	86,660,000
TOTAL		**1,628,750,000**	**862,130,000**	**746,520,000**
GRAND TOTAL		3,237,400,000		

Total Budget (Wildlife):

Strategies	Time Frame	Budget in BDT		
		2009	2010	2011
Planning and Coordination	2009-2011	120,400,000	74,900,000	74,270,000
Surveillance	2009-2011	60,410,000	26,110,000	26,740,000
Prevention and Control	2009-2011	7,000,000	7,000,000	7,000,000
Capacity Building	2009-2011	125,300,000	49,000,000	49,000,000
Sub total		313,110,000	157,010,000	157,010,000
TOTAL		**627,130,000**		

TOTAL BUDGET OF HUMAN, ANIMAL, and FOREST DEPARTMENT

Strategies	2009			2010			2011		
	HUMAN	ANIMAL	FOREST	HUMAN	ANIMAL	FOREST	HUMAN	ANIMAL	FOREST
Planning and Coordination	68,530,000	12,200,000	120,400,000	74,310,000	7,900,000	74,900,000	67,070,000	7,200,000	74,270,000
Surveillance	230,168,000	916,400,000	60,410,000	158,768,000	469,400,000	26,110,000	129,768,000	415,900,000	26,740,000
Prevention and Control	355,640,000	242,300,000	7,000,000	387,740,000	156,000,000	7,000,000	352,040,000	126,500,000	7,000,000
Risk Communication	36,500,000	55,000,000		36,500,000	35,000,000		36,500,000	25,000,000	
Operational Research	41,640,000	127,540,000		41,640,000	107,030,000		41,640,000	85,260,000	
NRL-AI Activities and Operational Research		275,310,000			86,800,000			86,660,000	
Capacity Building for Forest			125,300,000			49,000,000			49,000,000
TOTAL (Sector wise)	**732,478,000**	**1,628,750,000**	**313,110,000**	**698,958,000**	**862,130,000**	**157,010,000**	**627,018,000**	**746,520,000**	**157,010,000**
TOTAL (Yearly)	**2,674,338,000**			**1,718,098,000**			**1,530,548,000**		
Grand Total	5,922,984,000								

HUMAN HEALTH:
PLANNING AND COORDINATION

Illustrative Activities/Titles	Time frame	Main responsible agency/department	Indicators	Budget in BDT		
				2009	2010	2011
TOTAL				**68,530,000**	**74,310,000**	**67,070,000**
Review and update the national influenza pandemic contingency plan at different level	2009-2011	NAC/NMTF/NTC /JTC	National contingency plan reviewed	1,000,000	1,000,000	1,400,000
Printing and distribution of the National Plan	2009-2011	NTC/DGHS	No. of copies published	2,500,000	500,000	500,000
Exercise (Table top, simulation, Drill) of the National Plan to stakeholders	2009-2011	DGHS/IEDCR	Exercise done	2,500,000	10,000,000	2,500,000
Functioning of various committees (NAC, NMTF, JTC, NTC)	2009-2011	MoH &FW /DGHS	Number of workshops/meetings held	2,100,000	1,400,000	1,400,000
Establish and Functioning of National coordination cell at NIC, IEDCR	2009-2011	NIC, IEDCR	Coordination cell established and functioning	2,500,000	2,500,000	2,500,000
Functioning of District Multi sectoral Coordination committee (DMSCC)(Meeting/quarterly/district)	2009-2011	DGHS	No. of meeting held	8,050,000	8,050,000	8,050,000

Illustrative Activities/Titles	Time frame	Main responsible agency/department	Indicators	Budget in BDT		
				2009	2010	2011
Functioning of Upazila Multi sectoral Coordination committee(UMSCC) (meeting/quarterly /upazila)	2009-2011	DGHS	No. of meeting held	30,000,000	30,000,000	30,000,000
Communication (Phone, Fax, courier, messenger) among different bodies – national & international	2009-2011	DGHS	Communication done	3,500,000	3,500,000	3,500,000
Monitoring, supervision and evaluate the activities of different committees in different stages and levels	2009-2011	DGHS/IEDCR	No. of report submitted	2,800,000	2,100,000	2,100,000
National Consultant (Level VIII) for regulatory frame work and response for emergencies	2009-2011	DGHS	Consultancy procured	1,400,000	1,540,000	1,750,000
Short Term Consultant (STC), International Technical Assistance (ITA) for developing periodic assessment scheme (Evaluation of health services/needs assessment)	2009-2011	DGHS	Consultancy procured	1,400,000	1,400,000	1,400,000
National Consultant (Level VIII) for developing periodic assessment scheme (Evaluation of health services/needs assessment)	2009-2011	DGHS	Consultancy procured	1,400,000	1,540,000	1,750,000

Illustrative Activities/Titles	Time frame	Main responsible agency/department	Indicators	Budget in BDT		
				2009	2010	2011
STC, ITA for Development and dissemination of guidelines and protocols	2009-2011	DGHS	Consultancy procured	1,400,000	1,400,000	0
STC, ITA for Pandemic planning and table top field simulation exercise	2009-2011	DGHS	Consultancy procured	1,400,000	1,400,000	1,400,000
National Consultant (Level VIII) for Pandemic planning, development of guidelines and protocols and table top field simulation exercise	2009-2011	DGHS	Consultancy procured	1,400,000	1,540,000	1,750,000
National Consultant (Level VIII) as IT coordinator at IEDCR	2009-2011	DGHS	Consultancy procured	1,400,000	1,540,000	1,750,000
Office operations and maintenance like Computers, A/C, Furniture, hiring of transport, fuel, stationery and other utilities for consultants and technical expertise	2009-2011	DGHS	Procured	1,680,000	2,450,000	2,520,000
Periodic Assessment	2009-2011	IEDCR	Assesment done	2,100,000	2,450,000	2,800,000

SURVEILLANCE

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Indicators	Budget in BDT		
				2009	2010	2011
TOTAL				**230,168,000**	**158,768,000**	**129,768,000**
Strengthen disease surveillance of the country & Strengthen laboratory capacity for detection of avian influenza virus				**200,665,000**	**133,465,000**	**105,465,000**
Integration of disease surveillance				**5,003,000**	**5,003,000**	**5,003,000**
Development of Strategies, SOPs, training, workshops, refresher courses	2009-2011		Number of person trained, Number of workshop	5,003,000	5,003,000	5,003,000
Strengthen diagnostic capacity for AI at national level (NIC, IEDCR)				**1,700,000**	**1,700,000**	**1,700,000**
Supplies and reagents	2009-2011	IEDCR	Supplied	500,000	500,000	500,000
Instruments	2009-2011	IEDCR	Supplied	1,000,000	1,000,000	1,000,000
Training	2009-2011	IEDCR	No. of person trained	200,000	200,000	200,000
Installation and Maintenance of BSL 3 Laboratory, Real Time PCR at NIC, IEDCR				**13,500,000**	**4,500,000**	**4,500,000**
Installation of BSL 3 Laboratory	2009	IEDCR	Installed	5,000,000		
Maintenance & Operation cost of BSL 3 Laboratory	2009-2011	IEDCR	Functioning of Laboratory	3,500,000	3,500,000	3,500,000
Procurement of Platform of Real Time PCR at NIC	2009-2011	IEDCR	Procured & Installed	5,000,000		

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Indicators	Budget in BDT		
				2009	2010	2011
Maintenance & Operation cost of rRT PCR at NIC	2009-2011	IEDCR	rRT PCR functioning		1,000,000	1,000,000
Strengthening of Laboratory Facilities at divisional level (Medical Colleges)				60,000,000	9,000,000	9,000,000
Establishment of BSL-2 Laboratory at 6 division in medical colleges with modern diagnostic facilities e.g. PCR, ELISA, Immunofluorescence etc.	2009	IEDCR	No. of BSL-2 Laboratory established	60,000,000		
Maintenance of BSL-2 Laboratory at 6 division in medical colleges	2010-2011	DGHS	BSL-2 Laboratory functioning		9,000,000	9,000,000
Establishment of BSL-2 laboratories with Immunofluroscence, ELISA facilities at district level (@ 3300000/centre) 1st year 6 centres, 2nd year 6 centres, 3rd year 6 centres.	2009-2011	DGHS, IEDCR	Number of districts having capacity of Rapid diagnostic tests	**20,000,000**	**20,000,000**	**20,000,000**
Maintenance & Operation cost of BSL-2 laboratories at district level (@ 800000/centre)			Functioning of Laboratory	**5,000,000**	**10,000,000**	**15,000,000**
Training of laboratory personnel	2009-2011	IEDCR		**5,855,000**	**5,855,000**	**5,855,000**

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Indicators	Budget in BDT		
				2009	2010	2011
Training of laboratory personnel for specimen collection, shipment, diagnosis and disposal	2009-2011	IEDCR	Number of personnel trained	2,450,000	2,450,000	2,450,000
International Training of Laboratory Medicine specialist	2009-2011	IEDCR	Number of person trained	3,405,000	3,405,000	3,405,000
Share influenza virus isolate with relevant international agency (Shipment cost)	2009-2011	DGHS, IEDCR	No. of unit sent	**1,200,000**	**1,200,000**	**1,200,000**
Maintenance of Web based surveillance				**47,500,000**	**42,500,000**	**17,500,000**
Maintenance of Web surveillance by IEDCR	2009-2011	IEDCR	No. of Regular reporting	2,500,000	2,500,000	2,500,000
Extension of web based surveillance at upazila level	2009-2011	IEDCR	Number of upazila extended for web based surveillance	30,000,000	25,000,000	
Operation cost at upazila level (Toner, Paper, Repair) @ 30000	2009-2011		Number of upazila reporting through web	15,000,000	15,000,000	15,000,000
Training of personnel involved in surveillance at national level				**45,907,000**	**43,707,000**	**40,707,000**
Trainee allowance (500person/5days in 20 batches)	2009-2011	DGHS, IEDCR, NIPSOM	Number of training provided	2,503,000	2,503,000	2,503,000

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Indicators	Budget in BDT		
				2009	2010	2011
Trainer allowance (2 training per month, each training for 5 days)	2009-2011	DGHS, IEDCR, NIPSOM		2,401,000	2,401,000	2,401,000
Early detection of avian influenza cases and cluster and responding to outbreaks				**29,503,000**	**25,303,000**	**24,303,000**
Surveillance among high risk group	2009-2011	IEDCR		**5,750,000**	**6,750,000**	**5,750,000**
Culler (perdiem for monitoring, sample collection & testing, data sending and handling) @ 30000 for 150 outbreaks	2009-2011	IEDCR	Report with Number of cullers monitored	450,000	450,000	450,000
Poultry workers of affected areas for 20 sites @ 120000/site/year	2009-2011	IEDCR	Report with Number of investigation done	2,400,000	2,400,000	2,400,000
Active surveillance among live bird handlers in wet markets in six city corporation area (for training, sample collection, sample testing, transportation)	2009-2011	IEDCR	Report with Number of people under surveillance of the system	2,000,000	3,000,000	2,000,000

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Indicators	Budget in BDT		
				2009	2010	2011
Health care personnel involved in outbreak investigation, laboratory diagnosis and patient care (development of strategy, guidelines training)	2009-2011	IEDCR	Strategy developed Number of trainees	900,000	900,000	900,000
ILI and SARI surveillance at District level				**18,000,000**	**12,800,000**	**12,800,000**
Establish and strengthen surveillance at 64 districts (development of strategy, guidelines training)(@ 200000/site/year)	2009-2011	IEDCR	Report with Number of districts having the capacity of ILI and SARI surveillance	18,000,000		
Operational cost	2009-2011	IEDCR	Number of investigation of suspected cases		12,800,000	12,800,000
Epidemiological investigation and outbreak response				**5,753,000**	**5,753,000**	**5,753,000**
Orientation/Training of RRT members	2009-2011	IEDCR	No. of personnel trained	753,000	753,000	753,000
Conduction of Outbreak Investigation (perdiem, transport, lab investigation @ 50000/investigation for 10 investigations)	2009-2011	IEDCR	No. of report submitted	5,000,000	5,000,000	5,000,000

PREVENTION AND CONTROL

Illustrated Activities/Titles	Time frame	Main responsible agency/ department	Indicators	Budget in BDT		
				2009	2010	2011
PREVENTION AND CONTROL				**355,640,000**	**387,740,000**	**352,040,000**
Development of protocols, SOPs, training modules and guidelines (case management, infection control, vaccination, antivirals use, etc) - [number of copies according to need]	2009-2011	DGHS/IEDCR/NIPSOM/Others	Protocol, SOP and guidelines developed	3,500,000	2,100,000	1,400,000
Operation cost for isolation unit @ 100000/centre for incidental cost	2009-2011	DGHS/ IEDCR / NIDCH	No. of isolation unit functioning	7,000,000	7,000,000	7,000,000
PPE (80000 units)	2009-2011	DGHS	PPE collected and distributed	70,000,000	70,000,000	35,000,000
Antiviral (200000 capsule @ 100 Tk)	2009-2011	DGHS	Antiviral collected and distributed	20,000,000	20,000,000	20,000,000
Seasonal Influenza vaccine for people at risk (600000 courses)	2009-2011	DGHS	Vaccine collected and administered	168,000,000	168,000,000	168,000,000
Hypochlorite: (total 7200bottle/year)	2009-2011	DGHS	collected and distributed	3,500,000	3,500,000	3,500,000
Absolute alcohol: (7200bottle/year)	2009-2011	DGHS	collected and distributed	15,120,000	15,120,000	15,120,000

Illustrated Activities/Titles	Time frame	Main responsible agency/ department	Indicators	Budget in BDT		
				2009	2010	2011
Detergents: (total 7200bottle/year)	2009-2011	DGHS	collected and distributed	2,520,000	2,520,000	2,520,000
Workshop on infection control for health managers, clinicians, technologists and paramedics: 600 one day work shop (140000tk/ 30 person/ for a total of 560 govt and 40 private health centres)	2009-2011	DGHS/IEDCR /NIDCH	Skilled and knowledgeable personnel on infection control	28,000,000	28,000,000	28,000,000
Workshop on Management of cases(clinicians to work in isolation unit)	2009-2011	DGHS/IEDCR	No. of workshops & no. of personnel	35,000,000	70,000,000	70,000,000
Social distancing including ban gathering , closure of school etc (Development of strategies, guideline, operation cost)	2009-2011	DGHS/IEDCR	Strategy & guidelines developed	1,000,000	500,000	500,000
Mortuary issues (Development of strategies, guidelines on safe handling and disposal of carcasses)	2009-2011	DGHS/IEDCR	Strategy & guidelines developed	1,000,000	500,000	500,000

Illustrated Activities/Titles	Time frame	Main responsible agency/ department	Indicators	Budget in BDT		
				2009	2010	2011
Training on mortuary issues, social distancing	2009-2011	DGHS/IEDCR	No. of training conducted & no. of trainees	1,000,000	500,000	500,000

RISK COMMUNICATION:

Illustrated Activities/Titles	Timeframe	Main responsible agency/department	Indicators	Budget in BDT		
				2009	2010	2011
TOTAL				**36,500,000**	**36,500,000**	**36,500,000**
Monitor and evaluate Communication program	2009-2011	DGHS	No. of reports	2,000,000	2,000,000	2,000,000
information sharing with stakeholders at district level (for 50 person/district twice in year)	2009-2011	DGHS	No. of workshops & no. of trainees	7,500,000	7,500,000	7,500,000
Mass media campaign for general population (bill board, posters, tv advertisement)	2009-2011	DGHS/HEB	Mass media campaign materials (No. and description) developed and circulated	10,000,000	10,000,000	10,000,000

Illustrated Activities/Titles	Timeframe	Main responsible agency/department	Indicators	Budget in BDT		
				2009	2010	2011
Development, Production and Dissemination of health messages and educational materials	2009-2011	DGHS/HEB	Messages and Education material developed and disseminated(No. and description)	10,000,000	10,000,000	10,000,000
Training of Media personnel single day training in 17 batches total 500 journalist	2009-2011	DGHS/IEDCR/ PIB	No. of Workshop conducted & no. of trainees	2,000,000	2,000,000	2,000,000
Hot line and interactive website to answer public inquires (development of guideline, operation cost)	2009-2011	DGHS/IEDCR	Functioning of Hot Line and developed of interactive website	5,000,000	5,000,000	5,000,000

OPERATIONAL RESEARCH:

Illustrated Activities/Titles	Time frame	Main responsible Agency(s)	Indicators	Budget in BDT		
				2009	2010	2011
OPERATIONAL RESEARCH				**41,640,000**	**41,640,000**	**41,640,000**
Assessment of best approaches to increase awareness about AI	2009-2011	IEDCR, NIPSOM & ICDDR,B	No. of research report	**16,200,000**	**16,200,000**	**16,200,000**
Burden Estimation	2009-2011	IEDCR, NIPSOM & ICDDR,B	No. of research report	**6,000,000**	**6,000,000**	**6,000,000**

Illustrated Activities/Titles	Time frame	Main responsible Agency(s)	Indicators	Budget in BDT		
				2009	2010	2011
Characterization of the virus	2009-2011	IEDCR/ICDDR,B	No. of research report	**3,000,000**	**3,000,000**	**3,000,000**
Evaluation and compare the dignostic methods, compare the effect of antivrial durgs and disinfectants.	2009-2011	IEDCR/ICDDR,B	No. of research report	**7,140,000**	**7,140,000**	**7,140,000**
Utilization of available resources for the plan	2009-2011	DGHS, IEDCR, NIPSOM	No. of research report	**1,200,000**	**1,200,000**	**1,200,000**
Responsiveness of the surveillance to specific situation	2009-2011	DGHS, IEDCR, NIPSOM	No. of research report	**1,200,000**	**1,200,000**	**1,200,000**
Eidemiological study including incidence, burden and risk factors	2009-2011	IEDCR, ICDDR,B, NIPSOM	No. of research report	**6,900,000**	**6,900,000**	**6,900,000**

ANIMAL HEALTH:

PLANNING AND COORDINATION (Animal Health)

Illustrative Activities/Titles	Time frame	Main responsible agency/department	Budget in BDT		
			2009	2010	2011
TOTAL			**12,200,000**	**7,900,000**	**7,200,000**
Workshop and meeting for reviewing, updating, printing and distributing the national AI Compensation Policy to stakes.	2009-2011	DLS	2,000,000	1400000	1400000

Illustrative Activities/Titles	Time frame	Main responsible agency/department	Budget in BDT		
			2009	2010	2011
Development and functioning of AI focal point Office	2009-2011	DLS	2,000,000	700000	700000
Communication (Phone, Fax, courier, messenger) among different bodies – national & international	2009-2011	DLS	500,000	500,000	500,000
Development of protocol, SOP, training module and guidelines (lab diagnosis, surveillance, AI control, poultry husbandry system, poultry trade regulation and monitoring, live bird wet market, slaughter house improvement, waste disposal, research etc)	2009-2011	DLS	3,500,000	2100000	1400000
Establish and Functioning of Communication cell at DLS	2009-2011	DLS	2,500,000	1,500,000	1,500,000
Functioning of National Technical Committee (Animal Health)(Meeting/monthly/National)	2009-2011	DLS	600,000	600,000	600,000
Operational cost for National Rapid Response Team(NRRT)	2009-2011	DLS	2,000,000	2,000,000	2,000,000
Operational cost for District Rapid Response Team(DRRT	2009-2011	DLS	300,000	300,000	300,000
Operational cost for Upazila Rapid Response Team(DRRT)	2009-2011	DLS	200,000	200,000	200,000

SURVEILLANCE:

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Budget in BDT		
			2009	2010	2011
TOTAL			**916,400,000**	469,400,000	415,900,000
Surveillance by DLS			**108,700,000**	**104,900,000**	**105,400,000**
Development of guideline and SOP for surveillance of backyard and commercial chicken and duck, live bird and wet market Conduction of Outbreak Investigation	2009-2011	DLS	1,000,000		500,000
Procurement of service for surveillance	2009-2011	DLS	50,000,000	50,000,000	50,000,000
Logistics and transport support for surveillance	2009-2011	DLS	6,500,000	4,000,000	4,000,000
Training/workshop/refresher course	2009-2011	DLS	50,000,000	50,000,000	50,000,000
Data entry, analysis and reporting (Operator, analyst, phone , fax)	2009-2011	DLS	1,200,000	900,000	900,000
Establishment and Maintenance of Web based surveillance in Epidemiology Unit			16,700,000	5,500,000	3,500,000
Establishment of web based surveillance.	2009-2011	DLS	10,000,000	5,000,000	3,000,000
Internet installation and networking	2009-2011	DLS	2,000,000	200,000	200,000
Development of GIS and GPS.	2009-2011	DLS	4,000,000	100,000	100,000

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Budget in BDT		
			2009	2010	2011
Epidemiological software	2009	DLS	500,000		
Web page development	2009-2011	DLS	200,000	200,000	200,000
Vehicles and equipments for surveillance activity			211,000,000	111,000,000	111,000,000
Computer with other inputs	2009-2011	DLS	30,000,000	20,000,000	10,000,000
Hot line establishment in outbreak management center	2009-2011	DLS	1,000,000	1,000,000	1,000,000
Vehicles for District Livestock Offices, FDILs, CDIL, Epi unit	2009-2011	DLS	150,000,000	50,000,000	50,000,000
Maintenance and operational cost for vehicles	2009-2011	DLS	30,000,000	40,000,000	50,000,000
Strengthen laboratory facilities			**290,000,000**	**124,000,000**	**98,000,000**
Strengthen diagnostic capacity for AI at CDIL, FDIL and DVH			84,000,000	83,000,000	80,000,000
Supplies and reagents	2009-2011	DLS	25,000,000	25,000,000	25,000,000
Instruments	2009-2011	DLS	50,000,000	50,000,000	50,000,000
RT-PCR system for FDILs	2009-2010	DLS	4,000,000	3,000,000	
Training(National/International)	2009-2011	DLS	5,000,000	5,000,000	5,000,000
Installation and Maintenance of BSL- 3 Laboratory, Real Time PCR at CDIL			159,000,000	3,000,000	3,000,000
Establishment of BSL 3 Laboratory in CDIL	2009	DLS	150,000,000		

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Budget in BDT		
			2009	2010	2011
Maintenance of BSL-3 Laboratory	2009-2011	DLS	2,000,000	2,000,000	2,000,000
Procurement of Real time PCR at CDIL	2009	DLS	6,000,000		
Maintenance of Real time PCR at CDIL	2009-2011	DLS	1,000,000	1,000,000	1,000,000
Upgradation of Regional Laboratory			39,000,000	32,000,000	11,000,000
Upgradation of 7 FDILs with BSL-2 level facilities	2009-2010	DLS	28,000,000	21,000,000	
Improvement of diagnostic capability of 63 District Veterinary Hospital	2009-2011	DLS	10,000,000	10,000,000	10,000,000
Developing communication networking facilities between the laboratories and Epidemiology Unit	2009-2011	DLS	1,000,000	1,000,000	1,000,000
Studies and Higher Training (Epidemiological , Applied research etc of AI) in home and abroad	2009-2011	DLS	8,000,000	6,000,000	4,000,000

PREVENTION AND CONTROL

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Budget BDT		
			2009	2010	2011
TOTAL			**242,300,000**	**156,000,000**	**126,500,000**
Prevention and Control of HPAI					
Improvement of Poultry Husbandry Practice		DLS	30,000,000	20,000,000	20,000,000
Motivational Program		DLS	15,000,000	10,000,000	10,000,000
Model farm Development		DLS	15,000,000	10,000,000	10,000,000
Improving Biosecurity in Poultry Production and Trade	2009-2011	DLS/LGED	18,000,000	10,000,000	4,000,000
Designated Slaughter Place in Wet market		DLS/LGED	4,000,000	3,000,000	1,500,000
Establishment and maintenance of model Poultry slaughter house at DCC		DLS/LGED	10,000,000	4,000,000	1,000,000
Biosecurity Practice(waste disposal bin, water supply, drainage)		DLS	4,000,000	3,000,000	1,500,000
Outbreak Response		DLS			
Operational cost for culling, disposal and disinfection (staff hired, PPE, sacs/bags, fencing, flag, lime, contingencies)	2009-2011	DLS	8,000,000	5,000,000	3,000,000
Equipments and Appliances for culling operations including covered van	2009-2011	DLS	25,000,000	3,000,000	2,000,000
Waste Disposal (Model pit , disinfectants, wages)	2009-2011	DLS	8,000,000	3,000,000	2,500,000
Compensation Programme		DLS	140,000,000	115,000,000	95,000,000

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Budget BDT		
			2009	2010	2011
Rehabilitation of Backyard poultry farmer	2009-2011	DLS	20,000,000	15,000,000	15,000,000
Compensation for culling	2009-2011	DLS	120,000,000	100,000,000	80,000,000
Vaccination Programme	**2009**	**DLS**	**13,300,000**		

RISK COMMUNICATION

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Budget in BDT		
			2009	2010	2011
TOTAL			**55,000,000**	**35,000,000**	**25,000,000**
1. Official Communication during outbreak response and control activities	2009-2011	DLS	500,000	500,000	250,000
2. Advocacy and collaboration with stakeholders: i) Meeting, Training, workshop, press conference ii) Participation in international events iii) Partnership building activities iv) Research and survey activities.	2009-2011	DLS	15,000,000	10,000,000	7,500,000
3. Production and dissemination: i) print materials, ii) video materials, iii) Audio materials.	Jan09-Dec11	DLS	36,500,000	22,500,000	15,250,000

Illustrated Activities/Titles	Time frame	Main responsible Agency (s)	Budget in BDT		
			2009	2010	2011
iv) National and regional social mobilization campaign v) Mass communication through Radio,Television, news paper, traditional folk etc. 4.Developing community based communication pilots: i) Group formation, ii) Community based programs iii) school based communication			3,000,000	2,000,000	2,000,000

OPERATIONAL RESEARCH

Illustrated Activities/Titles	Time frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
TOTAL			**127,540,000**	**107,030,000**	**85,260,000**
Operational Research and research based study program of NRL-AI			126,000,000	105,000,000	84,000,000
Isolation and characterization of circulating strains of Avian Influenza in birds (wild and domestic birds) for appropriate vaccine development/ selection.	2009-2011	NRL-AI, BLRI			
Laboratory supplies and logistics for gene sequencing at Reference Laboratory					
Research based study program on surveillance, epidemiology, risk factor and husbandry systems					

Illustrated Activities/Titles	Time frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
Research on pathogenesis , mutation and evolution of new strains of avian influenza in Bangladesh					
Research on development of appropriate vaccine					
Development of diagnostic tools					
Seminar and Publication			1,540,000	2,030,000	1,260,000
Seminar, Workshop & Meetings	2009-2011	NRL-AI, BLRI	490,000	630,000	700,000
Booklets, Posters, Leaflets			700,000	1,050,000	140,000
Journal publications of scientific document			350,000	350,000	420,000

NRL-AI LABORATORY ACTIVITIES, BLRI

Illustrated Activities	Time Frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
TOTAL			**275,310,000**	**86,800,000**	**86,660,000**
Infrastructure and Equipments			218,050,000	28,000,000	16,100,000
Establishment of BSL 3 enhanced Laboratory with virus Isolator	2009	NRL-AI, BLRI	217,000,000		
Operatioal & Maintenance cost of BSL 3 Lab.	2010-2011	NRL-AI, BLRI		10,500,000	14,000,000
Equipments	2009-2011	NRL-AI, BLRI	1,050,000	17,500,000	2,100,000
Laboratory supplies and Logistics			8,050,000	14,000,000	17,500,000

Illustrated Activities	Time Frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
Biological, Chemicals, reagents, Disinfectants and Consumables items (RT-PCR, Real time RT-PCR)	2009-2011	NRL-AI, BLRI	7,000,000	14,000,000	17,500,000
Disposal of Laboratory Waste (Incinerator)	2009	NRL-AI, BLRI	1,050,000		
Laboratory maintenance and Sample shipment cost			980,000	980,000	980,000
Oil cost for 24 hrs power supply	2009-2011	NRL-AI, BLRI	980,000	980,000	980,000
Computer ink & paper,					
Sample shipment to abroad					
Others					
Procurement of vehicle for emergency response & monitoring others AI Lab	2009	NRL-AI, BLRI	8,400,000		
Human Resource Development			35,000,000	41,300,000	48,300,000
Salary and allowance for office staff	2009-2011	NRL-AI, BLRI	5,600,000	6,300,000	10,500,000
Training/fellowship and Study tour NRL-AI staffs on updated technology in home and abroad (Laboratory biosafety practice, Diagnostic technique)	2009-2011	NRL-AI, BLRI	10,500,000	11,200,000	11,200,000
Local and International Consultant on Virology & Molecular technique	2009-2011	NRL-AI, BLRI	3,500,000	4,200,000	5,600,000
Medium and Long term study program	2009-2011	NRL-AI, BLRI	15,400,000	19,600,000	21,000,000

Illustrated Activities	Time Frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
Developing Laboratory network Covering DLS, MoH&FW and ICDDR,B sharing data and information	2009-2011	NRL-AI, BLRI	1,400,000	700,000	700,000
Human and laboratory capacity building of DLS Laboratories			3,430,000	1,820,000	3,080,000
Development of Protocol, SOP (Diagnostic Technique, Lab. Management, Sample collection & transportation etc)	2009-2011	NRL-AI, BLRI	490,000	140,000	140,000
Livestock-technical-official-run training course for DLS lab. Personnel's on diagnostic (RT-PCR) and laboratory management (Biosafety) capacity building	2009-2011	NRL-AI, BLRI	2,100,000	1,400,000	1,400,000
Adaptation and dissemination of diagnostic & other technology to DLS Laboratories	2009-2011	NRL-AI, BLRI	700,000	140,000	1,400,000
Monitoring the status of DLS and Private laboratories	2009-2011	NRL-AI, BLRI	140,000	140,000	140,000

FOREST DEPARTMENT:
PLANNING AND COORDINATION

Illustrated Activities	Time Frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
TOTAL			**120,400,000**	**74,900,000**	**74,270,000**
Organize committees at local different level	2009	Forest Department and NGOs	2,800,000	0	0
Formation of groups at Upazila, Union and Village level	2009	Forest Department and NGOs	3,500,000	0	0
Organize public meeting at Hat. Bazar and other public places	2009-2011	Forest Department and NGOs	8,400,000	7,700,000	7,700,000
Development & printing of publicity materials and distribute the same	2009-2011	Forest Department and NGOs	8,400,000	7,700,000	7,700,000
Organize local motivational training to the concerned stakeholders	2009-2011	Forest Department and NGOs	97,300,000	59,500,000	58,870,000

SURVEILLANCE

Illustrated Activities	Time Frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
TOTAL			**60,410,000**	**26,110,000**	**26,740,000**
Migratory birds watching including their routes	2009-2011	Forest Department and NGOs	44,800,000	10,500,000	10,500,000
Keep habitats of migratory undisturbed	2009-2011	Forest Department and NGOs	910,000	910,000	910,000
Collection of dead birds and sends them to the Livestock Department.	2009-2011	Forest Department and NGOs	4,200,000	4,200,000	4,830,000

Illustrated Activities	Time Frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
Carry out bird census	2009-2011	Forest Department and NGOs	10,500,000	10,500,000	10,500,000

Prevention and Control

Illustrated Activities	Time Frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
TOTAL			**7,000,000**	**7,000,000**	**7,000,000**
Raising Awareness to prevent catching, poaching, selling according to wild life act	2009-2011	Forest Department	3,500,000	3,500,000	3,500,000
Disposal of dead birds	2009-2011	Forest Department and NGOs	1,500,000	1,500,000	1,500,000
Logistics (Office supplies, fuels, stationeries, Travel allowance)	2009-2011	Forest Department	2,000,000	2,000,000	2,000,000

CAPACITY BUILDING OF FOREST DEPARTMENT:

Illustrated Activities	Time Frame	Main responsible Agency(s)	Budget in BDT		
			2009	2010	2011
TOTAL			**125,300,000**	**49,000,000**	**49,000,000**
Engagement of local and foreign consultant	2009-2011	Forest Department	23,800,000	21,000,000	21,000,000
Training Foreign and Local	2009-2011	Forest Department	42,000,000	28,000,000	28,000,000
Procurement of vehicle and equipment including Audiovisual Van	2009	Forest Department	59,500,000	0	0

PANDEMIC PERIOD:

Strategies	Time frame	Budget in BDT
TOTAL		**760,040,000**
Planning and Coordination	During Pandemic Period	2,100,000
Surveillance		398,500,000
Prevention and Control		322,140,000
Risk Communication		12,800,000
Research		24,500,000

PLANNING AND COORDINATION:

Illustrative Activities/Tasks	Timeframe	Main responsible agency/ department	Indicators	Budget in BDT
TOTAL				**2,100,000**
Review and update the national influenza pandemic contingency plan	2 weeks from outbreak alert	National Multi-sectoral Task Force/DGHS	National contingency plan reviewed and updated	1,050,000
Meeting/Workshops at national and other levels	During Pandemic Period	National Multi-sectoral Task Force/DGHS	Making all concerned alerted and action oriented	1,050,000

SURVEILLANCE:

Illustrated activities	Time frame	Main responsible Agency(s)	Indicators	Budget in BDT
TOTAL				**398,500,000**
When Bangladesh is not Affected				**18,500,000**
Scale up surveillance	During Pandemic Period, when Bangladesh is not affected	IEDCR, DGHS, ICDDR,B,	Early case detection, reporting	10,000,000
Cross border surveillance		IEDCR, DGHS, ICDDR,B,	Early case detection, reporting	5,000,000
Monitoring the situation and exchange information		DGHS, IEDCR	Meeting at national level, sharing information	3,500,000

Illustrated activities	Time frame	Main responsible Agency(s)	Indicators	Budget in BDT
When Bangladesh is Affected				**350,000,000**
Enhance and strengthen surveillance and case investigation to identify initial cases/ contacts, risk factors and track initial geographical spread	During Pandemic Period, When Bangladesh is affected	IEDCR, DGHS		100,000,000
Monitor magnitude of the problem- morbidity, mortality, impact of resources, social and health services		IEDCR		50,000,000
Identifying typing & subtyping of virus, mutation, drug response		IEDCR, ICDDR,B		100,000,000
Research on vaccine of avian influenza		IEDCR, DGHS		50,000,000
Antiviral efficacy and safety and non pharmaceutical interventions		IEDCR, DGHS		50,000,000
When pandemic subsided (End of the pandemic or between waves)				**30,000,000**
Continue surveillance for early detection	Post pandemic period	IEDCR		10,000,000
Summarize and characterize the data to characterize pandemic and evaluate the effectivene of response activities		IEDCR		5,000,000

Illustrated activities	Time frame	Main responsible Agency(s)	Indicators	Budget in BDT
Share experience, best practices and lessons through national, regional and international forum		IEDCR, DGHS		5,000,000
Recommendations for change and modification of plan from experience learned in pandemic period		IEDCR, DGHS		5,000,000
Evaluation resource needs for subsequent waves if needed		IEDCR, DGHS		5,000,000

PREVENTION AND CONTROL:

Illustrative Activities/Tasks	Timeframe	Main responsible agency/department	Indicators	Budget in BDT
TOTAL				**322,140,000**
PPE (100000 units including n95 mask @ 700tk)	During Pandemic Period	DGHS, WHO	PPE collected	17,500,000
Antiviral (200000 capsule @ 100tk)		DGHS, WHO	Antiviral collected	70,000,000
Seasonal Influenza vaccine for people at risk (200000course @ 850tk)		DGHS, WHO	Vaccine collected	56,000,000
Disinfectants and antiseptics		DGHS,WHO	Disinfectants and antiseptics	
Hypochlorite: (7200bottle)			collected	3,500,000
Absolute alcohol: (7200bottle/year)				15,120,000
Detergents: (total 7200bottle/year)				2,520,000
Review and ensure upgrading of existing laboratory facilities for laboratory diagnosis at central and peripheral levels (physical facilities, equipments, reagents, and human resource development)		DGHS/IEDCR	DGHS/IEDCR	17,500,000
All out measures for management of cases (medicines, equipments, MSR, transport), workshop and training of clinicians etc)		DGHS		140,000,000

RISK COMMUNICATION:

Illustrated Activities/Titles	Timeframe	Main responsible agency/department	Indicators	Budget in BDT
TOTAL				**12,800,000**
Monitor and evaluate Communication program	During Pandemic Period	IEDCR	Monitoring and evaluation protocol and instrument developed	500,000
Training of Media personnel		IEDCR	Workshop conducted	2,000,000
Mass media campaign for general population		HEB	Mass media campaign materials developed and circulated	100,000
Communication of information to stake holders		IEDCR	Information sharing workshop conducted	1,800,000
Publication of booklet and leaflet, development of common health messages and education materials.		HEB	Education material developed	1,000,000
Hotlines and websites		IEDCR	Phone bank developed	1,000,000
For Official communication				6,400,000

OPERATIONAL RESEARCH:

Illustrative Activities/Tasks	Timeframe	Main responsible agency/department	Indicators	Budget in BDT
TOTAL				**24,500,000**
Drug resistant strains etc.	During Pandemic Period	IEDCR	Identification of resistant strains	3,500,000
Surveillance system & preventive measures		IEDCR	Identification of best approach	3,500,000
Characterization of local H5N1 isolates for appropriate vaccine selection		IEDCR	Isolates characterized	7,000,000
Disseminate appropriate messages to different audiences		DGHS/Health Education	Timely press releases and number of media message	10,500,000