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# Regional Influenza Pandemic Preparedness Plan (2006–2008)

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# CONTENTS

	<i>Page</i>
<i>Executive Summary</i> .....	<i>v</i>
1. BACKGROUND AND RATIONALE.....	1
2. JUSTIFICATION AND OPPORTUNITIES TO INTERVENE.....	4
3. SEARO/WHO INITIATIVES SO FAR .....	5
4. REGIONAL PANDEMIC PREPAREDNESS PLAN .....	8
5. KEY OBJECTIVES AND ACTION PLANS.....	10
6. IMPLEMENTATION FRAMEWORK .....	28
7. MONITORING AND EVALUATION .....	29
8. WORKPLAN AND BUDGETARY REQUIREMENTS .....	30

## **Annexes**

1. Pandemic Phases .....	31
2. Regional Workplan for Avian Influenza 2006–2008 .....	34



## EXECUTIVE SUMMARY

The current outbreak of H5N1 avian influenza affecting an unprecedented number of countries is a cause for major concern worldwide and most importantly for Asia. The virus has gradually expanded the host range from wild, migratory to domestic birds and animals and is becoming more pathogenic. Since December 2003, more than 17 countries have reported outbreaks among poultry. The recent infections reported among bird populations and human cases have brought the world closer than ever before to the imminent threat of an influenza pandemic. As of 10 January 2006, a total of 147 confirmed A/H5N1 cases and 78 deaths have been reported to WHO – all of them in Asia. It is anticipated that the next pandemic virus is likely to emerge from Asia.

Several reasons highlight the extreme vulnerability of countries in the South-East Asia Region: two Member States, namely Indonesia and Thailand, have reported outbreaks in both poultry and humans; there is an intense human and poultry interface; and countries are along the path of migratory birds. Given the poor health infrastructure, most countries are least able to cope at present to the emerging threat of the influenza pandemic, although all countries are both concerned about the situation of avian influenza and are committed to preventing and responding to the pandemic threat. It is obvious that countries with pandemic preparedness plans and pre-existing core capacities would be better able to respond promptly to limit the transmission and curb the adverse impact of a pandemic.

To respond to the evolving situation of avian influenza outbreaks, the Regional Director of the WHO South–East Asia Region (WHO/SEAR) has set aside an emergency fund of USD 500 000, out of the limited Regional Office regular budget and set up an inter–departmental Task Force on avian influenza. The Regional Office (WHO/SEARO) has been assisting Member States in outbreak investigation and through country missions to assist in preparation of pandemic preparedness plans. To ensure a uniform process of planning, the Regional Office has developed guidelines on the step–by–step approach for preparing national pandemic preparedness plans.

In order to plan, prepare and sustain support to the Member States and given the enormity of the task and the vastness of the needs of countries with global implications of the influenza pandemic, WHO/SEARO has prepared a Regional Pandemic Preparedness Plan. This Plan envisages to complement the national efforts and assist Member States in capacity building to be able to quickly detect, verify and diagnose infection through surveillance and early warning; an event and information management system including rapid response; and strengthening of the health system response including stockpiling of antivirals and ensuring surge capacity of hospitals and health facilities. The Plan shall be executed by WHO/SEARO with the Communicable Diseases Department as the focal technical unit.

The objectives of the Regional Plan correspond to the principal opportunities to intervene phase–wise, with key activities identified accordingly to assist Member States. The pre–pandemic phase would include activities like reduction of opportunities for human infection and to strengthen the early warning system. The phase of

emergence of a pandemic virus would include activities related to pre-empting, containing or delaying the spread of the virus at the source through early, and strategic use of antivirals. The phase of a declared pandemic with international spread would include activities like reduction of morbidity, mortality and social disruption.

The main areas where WHO plays a key role in responding to avian influenza and pandemic preparedness include advocacy with high level national authorities for cost-effective public health measures including effective use of communication and public education strategies; capacity building; human resource capacity at the national and sub-national levels; facilitating information sharing and collaboration among countries and across Regions; ensuring shipment and transportation of laboratory specimens; and, most critically, in coordinating technical support through provision of guidelines, training materials, and best practice models.

The implementation of the plan will be monitored and evaluated on the basis of a systems approach which consists of inputs, processes, outputs and outcomes. The processes will be carefully monitored on the basis of assessment of key indicators.

The Regional Plan and its implementation is expected to contribute towards better preparedness and response capacity in the South-East Asia Region in collaboration with OIE/FAO and the Member States. This would lead to strengthened collaboration between animal and public health sectors, enhanced capacity for early detection of H5N1, and community action facilitated by education and communication strategies – making the

communities aware of the risks and public health measures to reduce them.

A summary of the budgetary estimates in US\$ is shown in the Table below:

<b>Strategic elements</b>	<b>Immediate 2006</b>	<b>Medium-term 2007–2008</b>	<b>Total</b>
Reduce human exposure to H5N1	621,500	791,000	<b>1,412,500</b>
Strengthen early warning system	1,339,050	1,163,900	<b>2,502,950</b>
Intensify rapid containment operations	5,480,500	1,460,900	<b>6,941,400</b>
Build capacity to cope with a pandemic	3,333,500	15,876,500	<b>15,710,000</b>
Research	565,000	565,000	<b>1,130,000</b>
<b>Total</b>	<b>11,339,550</b>	<b>19,857,300</b>	<b>27,696,850</b>
			<b>27.7 million</b>

## 1. BACKGROUND AND RATIONALE

The world has witnessed an average of three pandemics of influenza occurring at intervals ranging from 10 to 50 years. They started abruptly without warning, engulfed the globe with ferocious speed and caused illness in more than 25% of the total population. An estimated 40–50 million persons died during the great influenza pandemic of 1918–19 in less than one year. The pandemics that began in 1957 and 1968 killed 1–4 million people each.

Since January 2004, events affecting both human and animal health have brought the world closer to an influenza pandemic than at any time since 1968. The current outbreaks of H5N1 were first detected in poultry in the Republic of Korea in December 2003. Since then the virus has been gradually expanding the host range (domestic, wild and migratory birds, and animals such as pigs, cats and tigers) and spreading geographically to other countries as well as in the affected countries. To date, outbreaks in poultry or wild birds have been reported from the Republic of Korea, Viet Nam, Japan, Thailand, Cambodia, China, Laos, Indonesia, Malaysia, Russia, Kazakhstan and Mongolia. Romania and Turkey reported H5N1 infection in birds during September–October 2005. The pattern is quite obvious. The virus is appearing insidiously in several countries.

Apart from poultry, deaths in migratory birds have also been reported from China, Russia, Kazakhstan and Mongolia. Many

countries in South–East Asia including India, Bhutan and Nepal are on the flyways of the migratory birds from Siberia and China. The H5N1 virus has also jumped to humans in Cambodia, China, Turkey, Indonesia, Thailand and VietNam. As of 10 January 2006, 147 laboratory confirmed human cases of avian influenza have been reported, of which 78 have died.

Avian influenza viruses are not natural pathogens of human beings and are not easily transmitted to humans. Hence, there are three pre–requisites to start an influenza pandemic: (i) emergence of a novel virus to which all are susceptible, (ii) the new virus is able to replicate and cause disease in humans; (iii) the new virus is transmitted efficiently from human–to–human. The first two pre–requisites have been met by the current H5N1 outbreaks in birds in Asia. Every human case of H5N1 infection increases the odds that a deadlier strain will emerge – one with a genetic make up that is better suited to human hosts and will trigger efficient human–to–human transmission.

If the human–to–human transmission is not contained quickly the modern means of transportation will rapidly seed a pandemic. Experts estimate that the next pandemic may cause more than 1 billion cases and up to 7.4 million deaths. During the current H5N1 outbreaks more than 150 million birds have been destroyed or died and the direct economic costs to affected countries amount to \$ 8–12 billion. A modest pandemic lasting over one year might cause a loss as high as 3% of Asian GDP and 0.5% of world GDP. This is presently equivalent to about \$ 150–200 billion in GDP. Therefore, in addition to high morbidity and mortality, the next pandemic may cause massive social, political and economic disruption.

The 11 Member States of the South–East Asia Region cover only 5% of the global land mass which houses around 1.5 billion people – 25% of the global population. This high population density carries an increased potential for spread of disease from person–to–person. More than 522 million people in the Region live in abject poverty with an income of less than a dollar a day. They have no financial means and are unaware of the risk factors to protect themselves against avian influenza. Moreover, in Asia, human beings live closely with animals. This coexistence is intense, continuous and close and provides frequent encounters of human beings with H5N1 infections originating from poultry/animals. In rural areas, most households maintain free–ranging flocks where ducks and chickens mingle freely. This is of particular concern, especially as households depend on these birds for income and food. Taken together, these changes in the ecology of the disease and behaviour of the virus have created multiple opportunities for a pandemic virus to emerge in Asia.

The public health system in Asian countries has, as of now, a limited capacity to effectively respond to the pandemic. A large number of public health institutes are in operation in the Region; the need for strengthening these is paramount. The Region does not have any capacity to produce seasonal influenza vaccines. Though a strong base of pharmaceutical infrastructure is available, the patent barriers and scarcity of raw material hamper generic economic production of oseltamivir, while several indigenous manufacturers are in dialogue with Roche to overcome these barriers, the commercial availability of adequate quantity of this drug will take several months.

It is obvious that the countries with pandemic preparedness plans and pre-existing core capacities would respond promptly and limit the adverse impact of a pandemic. Effective preparedness would ensure that all the needed resources, expertise and services are mobilized and deployed rapidly to reduce the morbidity, mortality and social disruption to the minimum. Establishment/strengthening of core capacities to preempt and control the next pandemic would also be useful in dealing with other epidemic and public health emergencies. The countries need to accelerate strengthening their response mechanisms and to fill-up the existing gaps.

Recognizing the enormity of the task ahead, the vastness of the needs of the countries and the global implications of influenza pandemic and effective contributions that WHO can make in South-East Asia Region, a Regional Influenza Pandemic Preparedness Plan has been formulated. This Plan is to complement the national efforts and enhance the capacity of the Member States to respond rapidly and effectively to pre-empt the influenza pandemic as well as to mitigate the misery a full blown pandemic is likely to inflict on humanity. WHO's support to developing countries of the SEA Region shall be critical and is believed to be the single vital factor that could make the difference.

## **2. JUSTIFICATION AND OPPORTUNITIES TO INTERVENE**

It is strongly believed that an opportunity to pre-empt the pandemic exists. If the surveillance system for animal health can detect infection in poultry quickly, followed by rapid and safe

culling of infected and exposed poultry, and the surveillance system for human health is able to detect first human cases quickly, followed by rapid containment measures *inter alia* including chemoprophylaxis by antivirals, the pandemic could be averted.

The global commitment to prevent an influenza pandemic is reflected in the World Health Assembly Resolution, endorsed in 2005, that articulates the need for global action and strengthening of national capacity to respond to the threat of a pandemic.

In 2005, the WHO Regional Committee for South–East Asia endorsed the Asia Pacific Strategy on Emerging Diseases and reiterated the call of the World Health Assembly.

There is also a growing realization that a pandemic can be better fought collectively. Regional organizations such as SAARC and ASEAN, established with the central objective of economic cooperation between countries, are now being utilized to extend collaboration in public health as well.

The Health Ministers of South–East Asia were briefed in September 2005 by WHO. Similarly, at the meeting of Health Secretaries from South–East Asia Region, the issue of a pandemic threat was thoroughly discussed. This advocacy by WHO has resulted in activating preparations by the national public health machinery with the formulation of National Pandemic Preparedness Plans as the first fundamental step that outlines the roadmap for effective response.

### **3. SEARO/WHO INITIATIVES SO FAR**

A Global Influenza Programme has been established in WHO HQ. Five strategic actions have been articulated as part of the global strategy to combat a pandemic during all its phases.

While the WHO Regional Office for South–East Asia is located in New Delhi, all 11 Member States of this Region have WHO offices which are manned by experienced and qualified professional staff. The Regional Office, as well as country offices, operate in close collaboration with national health authorities.

WHO continuously supports countries in the planning, implementation, monitoring and review of national response to epidemics and potential pandemics. WHO also collaborates with various other international agencies especially OIE and FAO, to support the countries in containing emerging infectious diseases. Guidelines and technical documents which enhance country capacity are continuously developed, disseminated and also posted on WHO websites ([www.who.sea.org/cds](http://www.who.sea.org/cds)). In this perspective, WHO activities contained in the plan are an extension of those for which WHO is fully geared.

Within the Regional Office, the Department of Communicable Diseases shall take the lead in coordinating and implementing the activities detailed in this plan. The following activities have been undertaken recently.

- (1) Regional Director established an emergency fund of USD 500,000 for avian influenza.
- (2) Health Ministers of all Member States were briefed in September 2005 on avian influenza, on the implications of a pandemic and the need for accelerating preparations.

- (3) Technical docket with simple one-pagers and FAQs were prepared and shared with all Member States.
- (4) WHO Missions were sent to DPR Korea and Indonesia for outbreak investigation and to Bangladesh, Bhutan, Indonesia, India, Myanmar, Nepal, and Sri Lanka to assist in drafting National Pandemic Preparedness Plans.
- (5) A Technical Review Panel was established in SEARO to review the draft National Plans and to make suggestions to enhance the merit of the national plans.
- (6) An interdepartmental working group was constituted in SEARO to coordinate several activities related to avian influenza including food safety, environmental issues, use of antivirals and development of vaccines.
- (7) A Bi-Regional (SEARO and WPRO) meeting on antivirals and development of influenza vaccines was held in August 2005.
- (8) A Regional Meeting on avian influenza and pandemic preparedness was organized in Bangkok from 21 to 24 November 2005.
- (9) A training course on laboratory techniques has been planned to take place in Hong Kong in February 2006; a consultant was recruited for Myanmar.
- (10) Laboratory reagents were procured from WHO Collaborating Centres and provided to national laboratories.
- (11) Some stockpiles of antivirals and personal protective equipment (PPE) are being maintained at the Regional

Office. Stockpiles are also being maintained in DPR Korea, Indonesia, India, Thailand and Timor–Leste.

- (12) Draft guidelines for management of stockpiles have been developed and are being finalized.
- (13) Information on outbreaks is shared with other countries through Outbreak Updates which is issued regularly. Relevant information is also posted on the SEARO website. With heightened media interest, information on the status of avian influenza in various countries as well as on prevention and control tools is being disseminated through the media.
- (14) WHO has initiated dialogues with several international agencies and donors to mobilize resources.
- (15) WHO has been working closely with national authorities to obtain bilateral funding to strengthen health systems and response at country level.

A workplan for additional activities has been developed.

#### **4. REGIONAL PANDEMIC PREPAREDNESS PLAN**

The Plan is a process to provide comprehensive and systematic support to the countries to meet their needs for countering the unpredictable pandemic of influenza. Financial and technical constraints are the main hurdles in implementing the programme on influenza at country level.

This Plan serves as a roadmap and needs to be reviewed and updated with evolving situation of avian influenza and the possible influenza pandemic. Similarly, in an event of an pandemic, the

strategies have to be adjusted and adapted, based on experiences and lessons from the response in other countries and from emerging evidence and scientific developments. Apart from enhancing technical capacity of the countries, WHO shall also act as an efficient interface between the countries to coordinate activities, share information and expertise with countries for global benefit.

To ensure a uniform process of planning, WHO/SEARO has developed guidelines on the step-by-step approach for preparing national pandemic preparedness plans as well as guidelines on managing the stockpile of the antiviral, oseltamivir. Other activities planned include capacity building of human resource, facilitating information sharing and collaboration among countries and across regions, and ensuring shipment and transportation of lab specimens for testing and genetic characterization.

A regional plan for South-East Asia is being developed with a view to strengthen the public health capacities of the resource-poor countries to deal with the pandemic threat effectively.

### **Goals and Objectives**

To support all Member States to respond efficiently to an influenza pandemic so that, there will be minimal impact, on not only the health of the nation but also societal structures.

The objectives of the strategic plan correspond to the principal opportunities to intervene and are likewise phase-wise.

#### **Phase : pre-pandemic**

- (1) Reduce opportunities for human infection

- (2) Strengthen the early warning system

**Phase : emergence of a pandemic virus**

- (3) Contain or delay spread at the source

**Phase : pandemic declared and spreading internationally**

- (4) Reduce morbidity, mortality, and social disruption

- (5) Conduct research during the pandemic

## 5. KEY OBJECTIVES AND ACTION PLANS

Expected results have been identified for each of the objectives and they are supported by action plans that translate the objectives into key actions. For ease of reference, Table 1 provides an overview of the five objectives and their expected results.

*Table 1: Summary of objectives and expected results*

Objectives	Expected Results
<b>Objective 1</b> <b>Reduce opportunities for human infection</b>	ER 1 Reduced opportunities of human infection from animals through support to OIE/FAO control and prevention strategies  ER 2 Reduced opportunities of human infection from animals through strong collaboration between the animal health and public health sectors  ER 3 Reduced opportunities of human infection from animals through risk communication to the communities to make them aware of the risks and possible measures to reduce them
<b>Objective 2</b>	ER 1 Strengthened early warning systems through improving the early detection of human cases

<b>Objectives</b>	<b>Expected Results</b>
<b>Strengthen the early warning system</b>	<p>ER 2 Coordinated and integrated surveillance systems between animal health and public health sectors</p> <p>ER 3 Strengthened local capacity for surveillance through National Influenza Centres or designated institutes</p> <p>ER 4 Strengthened applied research to better understand the epidemiology</p>
<b>Objective 3 Contain or delay spread at the source</b>	<p>ER 1 Established regional stockpiles of antivirals and personal protective equipment (PPE)</p> <p>ER 2 Strengthened capacity to assure rapid delivery of antiviral drugs to pre-empt pandemic</p> <p>ER 3 Strengthened antiviral resistance development mechanism</p>
<b>Objective 4 Reduce morbidity, mortality, and social disruption</b>	<p>ER 1 Strengthened capacity to implement non-pharmaceutical interventions</p> <p>ER 2 Strengthened monitoring of pandemic to understand its dynamics and institution of appropriate measures</p> <p>ER3 Augmented vaccine supply and assured equitable access</p>
<b>Objective 5 Conduct research during the pandemic</b>	<p>ER 1 Accelerated development and production of influenza pandemic vaccine</p> <p>ER 2 Refined interventions to improve their effectiveness to combat evolving pandemic</p>

### **Objective 1 – Reduce opportunities for human infection**

The H5N1 virus is now endemic in several countries, with increasing infection among birds. Hopes that the virus could be

rapidly eliminated from poultry have not been realized, and the situation is causing grave concern. The risk that a pandemic virus will emerge depends on opportunities for human exposure and infections. These opportunities will persist as long as the H5N1 virus continues to circulate in animals. The aim of this objective is to reduce the risk of humans acquiring H5N1 infection from birds (especially poultry), through support to the OIE/FAO strategy for prevention and control of infection in poultry, strengthened collaboration with the animal health sector and creating awareness amongst the communities through risk communication strategy.

**ER 1 Reduced opportunities for human infection from animals through support to the OIE/FAO control and prevention strategies**

***Action Plan***

Control of the disease in animals is the principal way to reduce opportunities for human infection and thus reduce opportunities for a pandemic virus to emerge. It is a complex and difficult task. However, despite these difficulties, control of the disease in poultry remains a feasible objective and a high priority. FAO and OIE have issued detailed technical recommendations and a draft global strategy for control in affected Asian nations.

The key actions to achieve this result are to provide support to Member States to:

- Support the OIE/FAO control strategy for prevention and containment of infection in birds by using guidelines on veterinary public health

- Sensitize the health sector on the implementation mechanism of the OIE/FAO strategies and initiation of veterinary public health activities through Ministry of Health
- Promote coordination between the health and veterinary sectors at various levels through regular interactions between both animal health and public health officials at various levels

**ER 2 Reduced opportunities for human infection from animals through strong collaboration between the animal health and public health sectors**

***Action Plan***

Historically, the animal health and public health sectors have been working independently of each other. Bringing them together will be challenging and will require a broad, multisectoral approach over the medium to long-term period. The required actions will entail close collaboration between local and national health, agriculture, wildlife and food safety authorities.

Key actions to achieve this result must recognize the local cultural and economic factors influencing the patterns of human–animal interaction, and the ecological changes associated with land usage and animal husbandry practices that increase the frequency and intensity of human exposure to animal reservoirs of disease. It is recognized that in some situations the groups at highest risk of animal–to–human transmission are poorly defined and may require targeted interventions that are culturally and socially acceptable

(e.g. interventions for women and children as risk groups for human infection with avian influenza).

The key actions to achieve this result are to provide support to Member States to:

- Conduct comprehensive risk assessments to identify the animal–human interfaces where transmission of infectious agents occur and the feasibility of risk reduction interventions.
- In collaboration with partners in the relevant agriculture, animal health and food safety sectors, develop evidence–based policy and action plans, supported by legislation if required, to assure a reduction in the incidence of zoonotic diseases in humans (and animal populations wherever possible).
- Promote high–level political commitment to coordinate collaborative programmes or project–based activities (such as joint training activities) between national health authorities and other key ministries responsible for agriculture, livestock, wildlife and food safety.
- Drive an appropriate research agenda on the determinants of inter–species transmission of disease, for policy development and evidence–based prevention and control activities.

**ER 3 Reduced opportunities for human infections from animals through risk communication to the communities to make them aware of**

## **the risks and possible measures to reduce them**

### ***Action Plan***

Effective risk communication builds public trust, empowers the public and other stakeholders to assist outbreak control efforts through the adoption of personal protective measures and compliance with community-based control efforts, reduces the social impact by strengthening community resilience, and reduces the economic and political impact of outbreaks. As the vast majority of human cases have occurred in rural areas, advice to farmers and their families on how to avoid exposure is another way to reduce the risk of emergence of a pandemic virus.

The key actions to achieve this result are to provide support to Member States to:

- Develop a Risk Communication Plan for national-level implementation.
- Include in risk communication plan, a risk communicator to assist in the design and conduct of community assemblies, and coordinate risk communications.
- Develop prototype material for use in risk communication and employ all means of communication appropriate to local needs
- Develop and pilot standard operating procedures for the formulation of media policies, information exchange and risk communications.
- Identify and train national, sub-national and local level spokespersons with responsibility for all media

presentations.

- Collaborate in risk communications with other key sectors involved in the national response as well as regional and global partners as required.

## **Objective 2 – Strengthen the early warning system**

The aim of this Objective is to reduce the risk of emerging diseases through early detection of significant public health events by means of early warning systems, rapid laboratory diagnosis and effective event management to pre-empt the pandemic. Development, strengthening and implementing early warning and response functions within integrated national disease surveillance systems are critical steps in building the core capacities for early detection. Implementation of this Objective will depend on the strength of current national surveillance systems that will vary considerably between (and in some situations within) countries in the Region. WHO will work towards strengthening this core capacity to improve the early warning system for avian influenza.

### **ER 1 Strengthened early warning systems through improving the early detection of human cases**

#### ***Action Plan***

Efficient response to the pandemic warrants establishment of an extensive surveillance system that can readily pick up initial cases and initiate measures to pre-empt the pandemic. Effective management of the initial cases shall pre-empt the pandemic. It is essential that surveillance and reporting in affected countries improves. The present inadequacy in surveillance has two reasons. First, some countries lack the requisite epidemiological and

laboratory capacity. Second, data essential for risk assessment have become increasingly difficult to obtain.

The key actions to achieve this result are to provide support to Member States to:

- Review existing laboratories at different levels, including national laboratories, to identify gaps for a medium-to-long-term laboratory development plan.
- Allocate sufficient human and financial resources, equipment and supplies, to support influenza laboratory functions, including provisions for surge capacity and appropriate levels of bio containment to support diagnostic activities.
- Support research and development of rapid diagnostic tests, including point-of-care tests, for surveillance purposes.
- Develop and strengthen community-based surveillance systems that are supported by community health workers and community members and linked to local area, sub-national and national surveillance and early warning systems.
- Train primary public health level staff in the core requirements of data analysis and interpretation for timely outbreak detection, risk assessment and implementation of preliminary control measures.

## **ER 2 Coordinated and integrated surveillance systems between the animal health and public health sectors**

### ***Action Plan***

In implementing this activity, countries are encouraged to utilize existing national structures and resources to meet their core capacity requirements, and build on good practice, accumulated knowledge and expertise within the country and regionally through partnerships.

The key actions to achieve this result are to:

- Develop mechanisms for networking and regular feedback of surveillance data to all sectors contributing to disease surveillance (primary health care providers, hospital-based clinical services, laboratories, environmental, animal health and food safety experts etc) as well as culturally appropriate feedback to communities about trends in their burden of emerging diseases.
- Map existing integrated and disease-specific national surveillance systems (community-based, within health care facilities and other sentinel surveillance systems) in both public health and animal health sectors to identify gaps and duplication.
- Integrate and coordinate surveillance systems following the situational analysis.
- Develop, implement and train all surveillance staff in the use of integrated surveillance systems in accordance with national surveillance requirements.

### **ER 3 Strengthened local capacity for surveillance through National Influenza Centres or designated institutes**

#### ***Action Plan***

Several Member States have WHO–designated national influenza centres which need activation. WHO will support the training of their staff and provision of reagents as well as developing a Regional Network that will be part of the WHO network (FLUNET). The surveillance activities on influenza can be harmonized through these centres. Another approach will be to contribute data collected by national influenza centres into the national surveillance mechanism.

WHO will provide the training, diagnostic reagents, and administrative support for external verification needed to improve the speed and reliability of case detection. To date, the vast majority of cases have been detected following hospitalization for respiratory illness. An infrastructure needs to be developed to complement national testing with rapid international verification in WHO–certified laboratories, especially as each confirmed human case yields information essential to risk assessment. The capacity to do so already exists. WHO offers countries rapid administrative support to ship samples outside affected countries. Such forms of assistance become especially critical when clusters of cases occur and require investigation.

To achieve this result, the following key activities shall be undertaken:

- Support to countries to investigate outbreaks of influenza and establish its aetiology.
- Provide guidelines to countries to facilitate outbreak investigation.
- Improve the detection of human cases through trained human resources and efficient laboratory support.

- Combine detection of new outbreaks in animals with active search for human cases.
- Support epidemiological investigation of any suspected human cases and ascertain the responsible risk factors.
- Review capacity of existing national influenza centres to identify the gaps and provide support to activate the centres.
- Impart training on various aspects of surveillance and early diagnosis to different categories of staff.
- Link the national surveillance programme with national influenza centres.
- Work with regional and global partners for knowledge and skills transfer and create opportunities for public health staff to participate in regional and global outbreak responses, including less experienced professionals.
- Conduct modelling studies of virus emergence and promote “mock” exercises to strengthen capability to combat it.

#### **ER 4 Strengthened applied research to better understand the epidemiology**

##### ***Action Plan***

Many activities defined in global and national pandemic response plans are triggered by changes in the behaviour of the virus. Detection of these changes and interpretation of their significance depend on timely and reliable epidemiological, clinical, and virological data. Every single human case yields evidence essential

for risk assessment. Analyses of viruses, collected during surveillance, by WHO reference laboratories can detect changes in the virus and likewise determine whether these indicate improved transmissibility, thus working to substantiate clues gleaned from epidemiological and clinical observations. Equally important, studies of recently collected viruses are needed to ensure that work on vaccine development stays on course.

The following activities are planned to achieve this result:

- Coordinate applied research in various facets of avian influenza to understand its epidemiology.
- Develop new approaches to environmental detection of the virus for early detection and prevention of its spread.
- Conduct modelling studies of virus emergence and promote “mock” exercises to strengthen capability to combat it.

### **Objective 3 – Contain or delay spread at the source**

#### **ER 1 Established regional stockpiles of antivirals and personal protective equipment (PPE)**

##### ***Action Plan***

WHO needs to establish a stockpile of the antiviral drugs which shall be deployed rapidly to contain the initial cases. This is also based on the assumptions that the first chains of human-to-human transmission of H5N1 might not reach the efficiency needed to initiate and sustain pandemic spread. Should this happen, early detection of clusters of cases, followed by aggressive

containment measures, including the prophylactic use of antiviral drugs, might prevent further improvements in transmissibility of the virus or at least hold the disease at bay, thus gaining time to augment vaccine supplies.

The following activities are planned to achieve this result:

- Establish a regional stockpile of antiviral drugs and advocate establishment of similar national stockpiles.
- Establish a stockpile of personal protective equipment at the Regional Office and advocate establishment of similar stockpiles within the countries as well.

## **ER 2 Strengthened capacity to assure rapid delivery of antiviral drugs to pre-empt pandemic**

### ***Action Plan***

The window of opportunity for the effective use of antivirals to pre-empt the pandemic closes very quickly. Under the best possible conditions, characterized by excellent surveillance and reporting, intervention must take place within around two weeks following the emergence of a virus with improved transmissibility. This will require not only the establishment of a stockpile of antivirals but also identification of the needs as well as logistics to make the antivirals reach the designated place.

The following key activities will facilitate to achieve this result:

- Formulate guidelines to ensure equitable distribution of the stockpile of antiviral drugs within the Region.
- Develop mass delivery mechanisms for antiviral drugs to

assure quick access to the needy and to pre-empt the pandemic.

- Develop a model for the countries to adapt to ensure rapid delivery of antivirals where they are needed.

### **ER 3 Strengthened antiviral resistance development mechanism**

#### ***Action Plan***

All viruses have the capability to develop resistance through spontaneous mutations. The peculiar nature of the genome of the influenza virus makes it more prone to develop resistance. It is essential that the emergence of resistance should be monitored closely so that rational drug use can be ensured and promoted. The surveillance of drug resistance can be at the country level as well as at the global level through the WHO Network of Reference Laboratories for H5N1 viruses.

The following activities are proposed:

- Support surveillance of antiviral susceptibility in the strains of virus that are prevalent in the Region in designated laboratories.
- Facilitate international shipment of viruses to WHO Reference Laboratories for ascertaining resistance to drugs.
- Share information with the national authorities about the status of resistance of the virus.

### **Objective 4 – Reduce morbidity, mortality, and social disruption**

#### **ER 1 Strengthened capacity to implement non-pharmaceutical interventions**

### ***Action Plan***

The current global scenario on antiviral drugs predicts that the developing countries will not have access to sufficient quantities of antivirals and the vaccines, as and when the latter become available. This makes non-pharmaceutical interventions extremely important to reduce morbidity, mortality, and social disruption. While neither the timing nor the severity of the next pandemic can be predicted, history shows that these events consistently bring an explosive surge in the number of illnesses and deaths, sufficient to temporarily paralyse public services and economic productivity. All governments need to be prepared to convert health services, including emergency and intensive care units and morgue capacity, to cope with a sudden and large increase in demand. Another consequence will be increased absenteeism in all sectors of the labour force, with capacity temporarily reduced in such essential public services as health care, law enforcement, transportation, utilities, and telecommunications.

Once a pandemic has begun, political leaders will be under great pressure to protect their citizens. Countries with pandemic response plans, ideally rehearsed in advance, will be in the best position to make decisions and take actions rapidly, as described in Annex 1. In addition, countries should ensure that legislation is in place that allows authorities to introduce and enforce extraordinary measures.

As soon as a pandemic is declared, health authorities will need to start a continuous process of risk communication to the public. Many difficult issues – the inevitable spread to all countries, the shortage of vaccines and antiviral drugs, justification for the selection of priority groups for protection – will need to be addressed. Effective risk communication, supported by confidence

in government authorities and the reliability of their information, may help mitigate some of the social and economic disruption attributed to an anxious public.

WHO support shall be provided to the countries in the following activities:

- Strengthening capacity to implement non-pharmaceutical interventions, and to collaborate with other stakeholders.
- Communicate risks to the public with the emphasis on mechanisms of social distancing and on having mock exercises.
- Ensuring protection of priority groups as per nationally-accepted guidelines.

## **ER 2 Strengthened monitoring of the pandemic to understand its dynamics and institution of appropriate measures**

### ***Action Plan***

Several non-pharmaceutical interventions have been recommended to reduce the local and international spread of a pandemic and lower the rate of transmission. While many of these interventions have proved useful in the prevention and control of other infectious diseases, their effectiveness during a pandemic has never been comprehensively evaluated. More information is needed on their feasibility, effectiveness, and acceptability to populations.

Several activities planned in this context include:

- Establish study sites and develop study protocols to evaluate various interventions.
- Analyse data generated on efficacy of these interventions

at local, national, and international levels. Comparative data on the effectiveness of different interventions shall also be generated as several measures are associated with very high levels of social disruption.

- Monitor the evolving pandemic in real time and understand its dynamics with the objective of developing and instituting appropriate control measures.
- Assess the epidemiological characteristics of an emerging pandemic and rapidly develop strategies that can yield effective results.
- Monitor the effectiveness of health interventions during the first wave of the pandemic and modify these to augment their efficacy in subsequent waves.
- Evaluate the medical and economic consequences.

### **ER 3 Augmented vaccine supply and assured equitable access**

#### ***Action Plan***

WHO shall support accelerated research in the development and mass production of vaccines so that, within the shortest possible time, the immunity of the susceptible population can be boosted to confer protection.

The activities in this area would include:

- Augment vaccine supplies as and when it becomes available and ensure its use as per agreed protocol.
- Ensure equitable access to vaccines.

### **Objective 5 – Conduct research during the pandemic**

## **ER 1 Accelerated development and production of influenza pandemic vaccine**

Vaccines are undisputed effective public health tools. The development and production of a pandemic vaccine shall commence with the onset of the pandemic and establishment of immunological characters of the virus subtype. Though considerable ground work has been done by WHO Collaborating Centres in preparing a prototype seed strain which can be used to develop the pandemic vaccine, mass production shall warrant an accelerated and fast-track approach at the onset of the pandemic.

The following activities are envisaged to achieve this result:

- Facilitate availability of virus isolates during pandemic to the WHO Collaborating Centres and provide them with relevant epidemiological data.
- Accelerate the development and production of influenza pandemic vaccine so as to make it available to the countries as soon after the initiation of pandemic as possible.
- Support national regulatory authorities in establishing a fast tract mechanism for registration of vaccine and its approval within the country.
- Strengthen vaccine delivery and administration system at country level.

## **ER 2 Refined interventions to improve their effectiveness to combat evolving pandemic**

### ***Action Plan***

At the start of a pandemic, policy-makers will immediately need epidemiological data on the principal age groups affected, modes of transmission, and pathogenicity. Such data will support urgent decisions about target groups for vaccination and receipt of antiviral drugs. They can also be used to support forecasts on local and global patterns of spread as an early warning to help national authorities intensify preparedness measures.

In this regard, WHO will support the following activities:

- Identify epidemiological centres for collecting these data.
- Develop standardized research protocols.
- Assess medical and economic loss
- Disseminate the data to other partners and countries for refinement of interventions for implementation in subsequent waves of the pandemic.

## **6. IMPLEMENTATION FRAMEWORK**

Regional Office support to Member States will be carried out by the CSR Unit in close collaboration with many other departments such as Health Systems Development, the Laboratory Unit, Public Information and Advocacy Unit, etc. An in-house avian influenza task force has been set up to coordinate work in different departments.

A Strategic Health Operation Centre (SHOC) room has been established to facilitate rapid information exchange within the Organization and with Member States. Daily contact with WHO country offices is maintained to respond to country requests for outbreak investigation and for formulation of pandemic plans. Recognizing the need to develop strategic approaches to address

emerging diseases like avian influenza, the Western Pacific Regional Office, in collaboration with the WHO Regional Office has developed the Asia–Pacific Strategy on Emerging Diseases. This joint strategy provides a framework for action and collaboration between the two Regions, as well as for utilization of resources in a most cost–effective manner.

The several activities planned will be implemented as per the Workplan which can be seen at Annex 2.

## **7. MONITORING AND EVALUATION**

Monitoring and evaluation is based on a systems approach which consists of inputs, processes, outputs and outcomes. All inputs, processes, outputs and outcomes will be monitored carefully, based on an assessment of key indicators during the progress of the pandemic from one phase to the other. Some of the indicators are:

- Countries with a national influenza pandemic preparedness plan.
- Percentage of laboratory specimens shared from national laboratories with WHO Collaborating Centres.
- Number of outbreaks detected, investigated and managed.
- Number of treatment courses of oseltamivir stockpiled at strategic locations.
- Number of technical staff trained in laboratory diagnosis.
- Number of technical staff trained in desk top modeling/ simulation.
- Number of countries with documented risk communication strategy.

- Number of countries with at least one hospital fully equipped with isolation facilities.

## 8. WORKPLAN AND BUDGETARY REQUIREMENTS

A comprehensive workplan has been developed (Annex 2). The total funds required to implement the workplan are USD 27.7 million, over a period of three years commencing 2006. A brief summary of the budgetary estimates is shown below. The details can be seen in Annex 2.

The summary of the budgetary estimates is shown in the Table below:

<b>Strategic elements</b>	<b>Immediate 2006</b>	<b>Medium- term 2007–2008</b>	<b>Total</b>
Reduce human exposure to H5N1	621,500	791,000	<b>1,412,500</b>
Strengthen early warning system	1,339,050	1,163,900	<b>2,502,950</b>
Intensify rapid containment operations	5,480,500	1,460,900	<b>6,941,400</b>
Build capacity to cope with a pandemic	3,333,500	15,876,500	<b>15,710,000</b>
Research	565,000	565,000	<b>1,130,000</b>
<b>Total</b>	<b>11,339,550</b>	<b>19,857,300</b>	<b>27,696,850</b>
			<b>USD 27.7 million</b>

## Annex 1

### PANDEMIC PHASES

Period	Phases	Transmission	Objectives	Major Strategic Actions
<b>Pre-pandemic preparedness and Planning</b>	1	Influenza virus subtype in animals only (risk to humans low)	Strengthen pandemic preparedness at all levels	<ul style="list-style-type: none"><li>• Prepare Pandemic Preparedness Plan</li><li>• Establish surveillance in animals</li><li>• Establish collaboration between human and animal sector</li><li>• Establish Human influenza surveillance</li></ul>

Period	Phases	Transmission	Objectives	Major Strategic Actions
	2	Influenza virus subtype in animals only (risk to humans substantial)	Minimize the risk of transmission to humans; Detect and report rapidly, if it occurs	<ul style="list-style-type: none"> <li>• Enhance animal surveillance and aggressive response to animal outbreaks</li> <li>• Prevent importation of infection in unaffected countries</li> <li>• Strengthen human surveillance</li> <li>• Stockpile antiviral, PPE etc</li> <li>• Collaborate between different sectors and WHO/OIE/FAO</li> <li>• Develop &amp; implement risk communication strategy</li> <li>• Prepare health &amp; essential service contingency plan</li> </ul>
<b>Emergency Response and pre-emptive</b>	3	Human infection (Transmission in close contacts only)	Ensure rapid characterization of new virus Detect, notify and respond to additional cases.	<ul style="list-style-type: none"> <li>• Enhance animal surveillance and aggressive animal outbreak containment</li> <li>• Enhance human surveillance and aggressive outbreak management</li> </ul>

Period	Phases	Transmission	Objectives	Major Strategic Actions
	4	Limited human-to-human spread; small clusters <25 cases lasting <2 weeks	Contain the virus or delay its spread	<ul style="list-style-type: none"> <li>Identify all possible contacts quickly, early &amp; strategic use of antivirals</li> <li>Strengthen infection control practices in health facilities</li> <li>Implement risk communication strategy &amp; social distancing</li> <li>Issue alert for quick implementation of health &amp; essential service contingency plan</li> </ul>
	5	Localized human-to-human spread; Larger clusters 25-50 cases over 2-4 weeks	Maximum efforts to contain or delay the spread	
<b>Pandemic</b>	6	Widespread in general population	Minimize the impact of pandemic	<ul style="list-style-type: none"> <li>Implement health &amp; essential service contingency plan</li> <li>Risk communication</li> <li>Treat cases with antivirals, if available</li> <li>Social distancing: close schools, ban gatherings</li> <li>Administer vaccine if available.</li> </ul>

## Annex 2

### REGIONAL WORKPLAN FOR AVIAN INFLUENZA 2006–2008

#### National Pandemic Preparedness Strengthened

No	Activity	Type	2006				2007				2008				Respon- sible RA	Budget (USD)
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
1	Technical support to 10 countries through Missions to formulate/update national pandemic preparedness plans (10 missions x 14 days)	STC	XX												CSR	200000
2	Development of country-specific workplans	LCS	XX												CSR WR	50000
3	Regional meetings of national representatives of various agencies to formulate coordination mechanisms and review (25x5 daysx3)	GEA	XX				XX				XX				CSR	150000
4	Strengthening of lab capacity at national level (27 man months)	STC	XX	XX	XX		XX	XX	XX		XX	XX	XX		BCT	300000
5	Development of lab operational	APW	XX	XX							XX				BCT	50000

No	Activity	Type	2006				2007				2008				Respon- sible RA	Budget (USD)
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
	guidelines for SEAR															
6	Regional consultation on review of lab capacity and networking	GEA	XX											BCT	50000	
7	Hands-on training course on lab techniques in avian influenza (1x20x10days)	GEA		XX										BCT	65000	
8	Hands on training workshop on biosafety practices and waste disposal (1x20x5 days)	GEA			XX									BCT	50000	
9	Regional consultation on improving physical infrastructure of laboratories to BSL3 (2x20x5 days)	GEA				XX				XX				BCT	100000	
10	Annual review meeting of lab programme managers (3x15x4 days)	GEA			XX			XX				XX		BCT	100000	
11	Regional stockpile of reagents, PPE and other lab material and shipment of infectious material to WHO Reference Labs	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	BCT	300000	
12	Regional consultation to review	GEA	XX											CSR	50000	

No	Activity	Type	2006				2007				2008				Respon- sible RA	Budget (USD)
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
	surveil-lance capacity and networking (1x25x4days)															
13	Technical support to countries to strengthen surveillance systems (27 man months)	STC	XX	XX	XX		XX	XX	XX		XX	XX	XX		CSR	300000
14	Development of surveillance operational guidelines for SEAR	APW	XX	XX							XX				CSR	50000
15	Annual review meeting of surveillance programme managers (3x15x4 days)	GEA				XX				XX				XX	CSR	100000
16	Development of computer software for desktop modelling	APW	XX	XX											CSR/ISM	100000
17	Hands-on training on use of desktop modeling and data management (1x20x5 days)	GEA			XX										CSR/ISM	50000
18	Technical support to countries to strengthen veterinary public health (27 man months)	STC	XX	XX	XX		XX	XX	XX		XX	XX	XX		CDC/BCT	300000
19	Development of veterinary public health operational guidelines for	APW	XX	XX							XX				CDC/ BCT	50000

No	Activity	Type	2006				2007				2008				Respon- sible RA	Budget (USD)
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
	SEAR															
20	Regional consultation to review VPH capacity and networking (1x25x4days)	GEA	XX												CDC/ BCT	50000
21	Training of trainers to ensure intersectoral coordination between public health and animal health sectors at different levels (1x20x5 days)	GEA			XX										CDC/ BCT	50000
22	Technical support to countries to strengthen case and hospital care (18 man months)	STC	XX	XX	XX	XX	XX	XX							CSR	200000
23	Development of guidelines for hospital infrastructure, infection control practices and case management	APW	XX	XX											CSR	50000
24	Training of national trainers in case management and infection control practices for medical officers (1x25x5 days)	GEA			XX										CSR	50000

No	Activity	Type	2006				2007				2008				Respon- sible RA	Budget (USD)
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
25	Training of national trainers in case management and infection control practices for nurses and other healthcare workers (1x25x5 days)	GEA			XX										CSR	50000
26	Stockpile of hospital material, PPE, medicines etc.	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	1000000
27	Technical support to countries to strengthen risk communication and media coordination (27 man months)	STC	XX	XX	XX		XX	XX	XX		XX	XX	XX		CSR	300000
28	Guidelines on risk communication and generic strategy	APW	XX	XX											CSR	50000
29	Regional workshop on risk communication tools and implementation (1x25x5 days)	GEA			XX										CSR	50000
30	Strengthening WHO Country Offices to continuously support Member States in implementation of National Pandemic Preparedness Plan (1x11x3 years)	NPO	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CDC	900000
31	Stockpile of tamiflu (oseltamivir) at	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	6500000

No	Activity	Type	2006				2007				2008				Respon- sible RA	Budget (USD)		
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
	strategic locations in SEA Region 500,000 treatment courses																	
32	Guidelines and incidentals for immediate shipment of tamiflu (oseltamivir) to affected areas	APW	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	50000
33	Support for research for vaccine development and understanding epidemiology of avian influenza	APW	XX	XX	XX	XX	XX	XX									CSR	500000

**REGIONAL WORKPLAN FOR AVIAN INFLUENZA 2006–2008**  
**Containment of Outbreaks to Pre-empt Pandemic Supported**

No	Activity	Type	2006				2007				2008				Respon- sible RA	Budget (USD)		
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
1	Technical support to Member States for investigation of suspected outbreaks		XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	1000000
2	Stockpile/procurement of pandemic vaccines as and when they become available	S&E					XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	5000000
3	Rapid deployment of tamiflu (oseltamivir) and other supplies and their utilization to pre-empt pandemic	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	100000
4	Rapid shipment of laboratory reagents and clinical material for confirmation of diagnosis	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	BCT	100000
5	Implementation of risk communication strategy, dissemination of tools and use of media	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	200000



## REGIONAL WORK PLAN FOR AVIAN INFLUENZA 2006–2008

### Morbidity, Mortality and Socio-economic Impact of Pandemic Reduced

No	Activity	Type	2006				2007				2008				Respon- sible RA	Budget (USD)
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
1	Support to health systems with medicines, infection control tools and patient care	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR HSD	5000000
2	Implementation of risk communication strategies through all media and tools	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	200000
3	Implementation of guidelines on waste disposal (including dead bodies) and social distancing	S&E	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	50000
4	Support to programme management and evaluation	S&E	Xx	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	CSR	200000