

**Preparedness and Response Plan
for
Avian and Human Pandemic Influenza
2005-2006**

Republic of Ghana

**December 2005
(Revised February 2006)**



FOREWORD

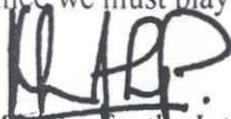
The Government of Ghana and its development partners are carefully monitoring global developments with respect to Avian influenza (AI). During 2005, the disease spread from Asia to a number of countries in Eastern, Central and Northern Europe, with the prospect that it could eventually reach Africa. A significant concern is that if the H5N1 virus that causes AI is able to “reassort” and become transmissible between humans, this would trigger a worldwide pandemic of human influenza with great human, social and economic consequences.

In response to the AI risk, during the last quarter of 2005 the Government of Ghana supported a risk assessment and development of this Avian and Human Pandemic Influenza Preparedness Plan. Ghanaian and international experts contributed to the Plan. It will serve as a tool to guide the preparations necessary to enable the country to detect and treat animal and/or human cases caused by the Avian influenza viruses should they occur in Ghana.

I want to express my gratitude to the members of the Avian Influenza Working Group (AIWG) for the important work they have done on the Risk Assessment and Preparedness Plan. The AIWG has enjoyed broad, multi-sectoral representation, including wildlife, veterinary, human health and disaster management perspectives in Ghana, as well as development partners such as the World Health Organization, UN Food and Agriculture Organization, and the U.S. Agency for International Development. The document includes cost estimates that serve as a basis for resource mobilization and implementation of the plan.

The findings of the risk assessment and elements of the Preparedness Plan were shared in a multi-sectoral meeting attended by the media on December 6, 2005. As a country, we will continue to pursue with urgency the task of informing persons in positions of leadership as well as Ghanaians from all walks of life about the risk and the national response to the Avian and human pandemic influenza.

While we all hope and pray that the Avian and human pandemic influenza does not evolve into a worst-case scenario, we cannot afford to be unprepared. Please join me in studying this plan and supporting its implementation in whatever capacity you can, since we must play our role as a nation in this global era.


Minister for the Interior
December 2005

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ACRONYMS

AI avian influenza
AIWG Avian Influenza Working Group
CBO Community-Based Organisation
DADU District Agricultural Development Unit
DDMC District Disaster Management Committee
DHD District Health Directorate
DHMT District Health Management Team
DVS Director of Veterinary Services
EOC Emergency Operations Centre
FAO Food and Agriculture Organization
GHS Ghana Health Service
GPRS Ghana Poverty Reduction Strategy
HIPC Highly Indebted Poor Countries
HPAI Highly Pathogenic Avian Influenza
HPU Health Promotion Unit
IDSR Integrated Disease Surveillance and Response
MDA Ministries, Departments and Agencies
MOH Ministry of Health
MOFA Ministry of Food and Agriculture
MOI Ministry of the Interior
MLFM Ministry of Lands, Forestry and Mines
NCC National Coordinating Committee
NGO non-governmental organisation
NMIMR Noguchi Memorial Institute for Medical Research
NTCC National Technical Coordinating Committee

NADMO National Disaster Management Organization
 NSU National Surveillance Unit
 OIE World Organisation for Animal Health
 PHRL Public Health Reference Laboratory
 PRO Public Relations Officer
 RADU Regional Agricultural Development Unit
 RHMT Regional Health Management Team
 SARS Severe Acute Respiratory Syndrome
 UN United Nations
 USAID United States Agency for International Development
 WHO World Health Organization

TABLE OF CONTENTS

| | |
|---|------------|
| FOREWORD | ii |
| ACKNOWLEDGEMENTS | ii |
| ACRONYMS | iii |
| EXECUTIVE SUMMARY | 1 |
| I. INTRODUCTION | 3 |
| II. BACKGROUND | 5 |
| III. DEVELOPMENT OF THE PLAN | 7 |
| IV. NATIONAL PREPAREDNESS AND RESPONSE PLAN | 9 |
| 1. Planning and Coordination | 10 |
| 2. Surveillance, Situation Monitoring and Assessment | 12 |
| 3. Prevention and Containment | 14 |
| 4. Health System Response | 16 |
| 5. Communications | 17 |
| Annex 1: WHO Recognized Phases of Pandemic Influenza | 18 |
| Annex 2: Detailed Workplans by Area | 21 |

EXECUTIVE SUMMARY

The H5N1 strain of avian influenza (AI) has led to 125 total reported human cases and 64 deaths in Indonesia, Vietnam, Thailand, and Cambodia since December 2003 (WHO, 1 November 2005). The disease is currently spreading along avian migration routes from its initial focus in Southeast Asia into Central Asia and Eastern Europe. The Food and Agriculture Organization (FAO) of the United Nations recently noted that the H5N1 strain of avian influenza could spread through migratory birds to northern and eastern Africa during winter 2005 (and eventually to western and southern Africa as well).

Strong surveillance in both animal and human populations is a critical component for early detection of the disease and timely response; this will minimize the extent and impact of outbreaks and widespread transmission of the virus. Strengthening the capacity for surveillance for human disease can build upon existing infectious disease surveillance systems. The FAO and WHO are particularly concerned that poor surveillance and disease control capacities in African countries, combined with the close proximity between

people and animals in rural areas, could create an ideal breeding ground for the virus in both animal and human populations.

In the current global situation there are not enough vaccines and antiviral drugs to prevent and treat avian influenza. The world currently lacks production capacity to make enough vaccines or drugs, and countries in Africa are most vulnerable because of a virtual absence of any production capacity.

The risk of relatively limited bird-to-human transmission among individuals closely associated with poultry production is real and has been documented in Asia. Widespread human-to-human transmission is not currently a threat; however, countries must plan for such an eventuality. Many countries are currently assessing their existing veterinary surveillance systems to detect and localize the arrival of the virus in both migratory and domestic animal populations (mainly poultry and swine).

Ghana has to take decisive and concrete actions to prepare for the eventual arrival of the virus in the sub-region, as other African countries are doing. As a first step in the development of a preparedness and response plan, in October 2005 the key technical ministries involved (Ministry of Health/Ghana Health Service, Ministry of Food and Agriculture and Ministry of Land, Forestry and Mines), along with key international partners (FAO, WHO and USAID) created an inter-agency Avian Influenza Working Group (AIWG) to coordinate the development of the country's plans and actions to address the threat of an AI pandemic.

Prior to the development of the plan, the AIWG conducted a rapid assessment existing systems and structures that would respond to the arrival of avian influenza in Ghana. The assessment concluded that Ghana currently possesses many of the capacities necessary to respond the AI pandemic threat (such as surveillance and response to threats in both animal and human populations). However, Ghana does not currently have the *capability* to mount an adequate pandemic AI response. Ghana must move quickly and decisively to address the gap between capacity and capability if it is to be sufficiently prepared to limit the pandemic's potential impact on human, social and economic systems.

The objectives of this *Preparedness and Response Plan for Avian and Pandemic Influenza* are:

To define clearly the actions and resources necessary to build the capacity in Ghana to adequately prepare for and respond to the threat of pandemic avian influenza by strengthening existing structures and their capabilities.

Currently no evidence indicates that the H5N1 strain of AI is present in either birds or humans in Ghana. A number of scenarios, based upon worldwide epidemiologic information, describe the arrival of the virus in the country. This *Plan* has been developed to respond to the flowing scenario: The current strain of the virus arrives in Ghana via migratory birds and quickly infects local domestic bird populations in specified geographic foci. Due to the low rate of bird-to-human transmission of the virus, relatively few human cases are detected (among those living/working closely with infected birds). This would mark the arrival of pandemic Phase 3 in Ghana.

In responding to this scenario, Ghana will put in place all of the requisite structures and protocols to respond to the AI threat. Other scenarios will require additional incremental resources to respond to increased numbers of cases.

Ghana's *Preparedness and Response Plan for Avian and Pandemic Influenza: 2005-2006* was developed using a framework recommended by the WHO and FAO based on global experiences and current best practices. The *Plan* is organized according to the following themes:

A) Planning and coordination

The highest proposed body for overall planning and coordination is the National Coordinating Committee (NCC). The NCC is to be constituted under NADMO's structure and shall include high level officials (not below the rank of Chief Director or equivalent) from all relevant MDAs and development partners, including MOH, MOFA, security agencies, trade, and aviation. The functions are: overall coordination of preparedness and response to pandemic threat, providing policy direction and strategic planning, ensuring accountability, providing enabling environment and resources for effective implementation of preparedness plan, and **providing highest level political support**. Under the NCC shall be the multi-sectoral technical coordinating committee made up of technical heads of corresponding agencies.

B) Surveillance, situation monitoring and assessment

The GHS /Ministry of Health shall be responsible for establishing systems for surveillance, situation monitoring and assessment activities of the pandemic in humans. The Ministries of Food and Agriculture/Land, Forestry and Mines shall be responsible for establishing systems for surveillance, situation monitoring and assessment activities of the pandemic in animals. Veterinary Services and the Wildlife Division shall be the principal agencies.

C) Prevention and containment

The MOH/GHS is responsible for establishing and implementing systems for the prevention and containment of human influenza. Noguchi Memorial Institute for Medical Research is designated as the 'national influenza center' and is responsible for ensuring procedures for rapid analysis and sharing of specimens or isolates for virus characterization and development of diagnostics and vaccine. The Ministries of Food and Agriculture/Land, Forestry and Mines shall be responsible for establishing systems for prevention and containment of the pandemic in animals, with Veterinary Services and the Wildlife Division as the principal agencies.

D) Health system response

Public, private, mission and security health care workers at all levels shall be trained in diagnosis, management and control of the disease in response to a human pandemic in Ghana.

E) Communications

The Health Promotion Unit of the Ghana Health Service shall coordinate the communication actions of the lead technical Ministries (GHS/MOH, MOFA, MLFM) and their public relations units and other MDAs (especially Ministry of Information) on behalf of the AIWG. Multiple channels of communication shall be adopted, including press briefings and releases. The objective is to ensure that the general populace receives correct, specific and relevant information regarding the pandemic and steps/actions to be taken.

The overall cost of the plan is estimated at **USD 6,281,525**. This estimate allows Ghana to build upon existing systems and capacities to acquire the capability to detect and respond to the current threat of avian and human pandemic influenza. Actual occurrences will require adjustments in the number of cases and outbreak sites (as well as total costs) projected in this plan.

I. INTRODUCTION

In 2003, the World Health Assembly expressed concern for the overall lack of preparedness for an influenza pandemic and urged Member States to prepare and implement national pandemic influenza preparedness plans through resolution WHA56.19. The same resolution requested the Director-General to continue providing leadership in pandemic preparedness, particularly by strengthening global influenza surveillance. Since January 2004, events affecting both human and animal health have brought the world closer to an influenza pandemic giving the global community an unprecedented warning that a pandemic may be imminent. Among the epidemiological and virological evidence are the development and spread of Highly Pathogenic Avian Influenza (HPAI) of the H5N1 strain in parts of Asia, Europe and the Mediterranean, posing a threat of potential global significance. On the other hand, this delay of the H5N1 viral strain to adapt itself in humans and be capable of efficient human-to-human transmission has created an unprecedented opportunity to enhance pandemic preparedness to minimize its impact.

It is important to recognize that an influenza pandemic is not a single event that will affect the entire world simultaneously. The pandemic, and its impact on countries, will evolve over time. The phases that the pandemic will take, however, can be predicted even if the timing or the progression from one phase to the next cannot. WHO has characterized the phases that pandemic influenza is likely to assume, summarized in Table 1 below, and described in detail in Annex 1.

Current surveillance information places the world in Phase 3 of the pandemic.

Table 1: WHO Recognized Phases of Pandemic Influenza

| | | |
|-------------------------------------|--------------|--|
| <i>Inter-pandemic phase</i> | Phase | No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low. |
| | Phase | No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease. |
| <i>Pandemic alert period</i> | Phase | Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact. |
| | Phase | 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 | Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk). |
| <i>Pandemic period</i> | Phase | Pandemic phase: increased AND sustained transmission in general population |
| <i>Post-pandemic period</i> | | Return to inter-pandemic period. |

The H5N1 strain of the avian influenza (AI) virus has led to 125 total reported human cases and 64 deaths in Indonesia, Vietnam, Thailand, and Cambodia since December 2003 (WHO, 9 November 2005). Since that time, cases in bird populations have been confirmed in a number of other countries in Europe. The number and location of both bird and human cases is being actively monitored by international organizations such as the UN Food and Agriculture Organization (FAO) and the World Health Organization (WHO) and is changing on an almost daily basis. The disease is currently spreading along avian migration routes from its initial locus in Southeast Asia into Central Asia and Eastern Europe. FAO has recently noted that AI is likely to spread through migratory birds to northern and eastern Africa (and eventually to western and southern Africa). Widespread human-to-human transmission of the current strain of the virus is not currently a threat; however, countries must plan for such an eventuality, especially considering the virulence of the current strain—approximately 50% mortality rate—in human cases seen to date.

Even with the recognition of these pandemic phases on a global scale it is not possible to precisely predict the course that the pandemic will take in Ghana. It must also be noted that while the world will progress through these phases Ghana will not necessarily do so. However it is possible to identify several scenarios based upon the phases of the pandemic for the arrival of AI in Ghana:

Scenario 1: In this scenario, the current strain of the virus arrives in Ghana via migratory birds and quickly infects local domestic bird populations in specified geographic foci. Due to the **low rate of bird-to-human transmission** of the virus, relatively few human cases are detected (and only among those living/working closely with infected birds). This would mark the arrival of pandemic **Phase 3** in Ghana.

Scenario 2: In this scenario, the world has progressed to pandemic **Phase 4**; the virus is now capable of **human-to-human transmission**. The virus would arrive (as in scenario 1) via migratory birds and rapidly infect domestic bird populations in specified foci. Bird-to-human transmission and subsequent human-to-human transmission would result in geographically localized clusters of human cases.

Scenario 3: The scenario would result from the world progressing to **Phase 5** of the pandemic with the appearance of a viral strain capable of **rapid and effective human-to-human transmission**. In this scenario the virus could arrive in Ghana via migratory birds but also (and perhaps more plausibly) by the arrival in Ghana of infected individuals traveling from other countries.

Which scenario will play out in Ghana is not clear, and may be determined by events elsewhere. This complicates the planning process, as Ghana must simultaneously prepare for each of the three scenarios without knowing which plans will need to be implemented. The resource requirements for each of the scenarios' response plans vary greatly.

It is clear, however, that a number of steps/actions will be called for under any scenario. In its planning, therefore, Ghana should identify and implement those steps immediately, while creating the structures to allow for the rapid deployment of resources called for by the actual evolution of the situation globally and nationally. This national *Preparedness and Response Plan*, therefore, will outline the steps and resources necessary for Ghana to respond to scenario 1 above. In doing so it will create the necessary capacities and capabilities to allow Ghana to respond to other scenarios as called for by the evolving threat(s). It will outline the actions and resources necessary for Ghana to move from a scenario 1 response to more extreme scenarios should that become necessary.

II. BACKGROUND

Situated on the west coast of Africa, Ghana is undergoing socioeconomic reforms resulting in improved macroeconomic stability and an economic growth rate of 5.2% in 2003 against a target of 4.7%. Nevertheless, an estimated 44% of the population lives on less than one dollar per day, with 68% of those living in the three Northern regions of Ghana, and smaller pockets of poverty throughout the country. The Government's priorities are human resource development, private sector development and good governance. As a Heavily Indebted Poor Country (HIPC), Ghana has qualified for resources which enable it to address key socioeconomic priorities and complement the Ghana Poverty Reduction Strategy (GPRS).

Pandemic AI clearly poses significant economic, social, and human health risks to a country like Ghana. Preliminary projections of the direct health threat, based upon WHO estimates of the virus' predicted attack rate, indicate that the number of clinical cases in Ghana in the event of a Phase 5 pandemic (scenario 3 above) could range from 3.15 million to 8.4 million human cases (see Table 2). Scenarios 1 and 2 would yield considerably fewer cases in Ghana, depending largely upon the country's ability to detect the appearance of infections, mount rapid and effective local responses, and limit the epidemic to relatively few cases in those foci.

Table 2: Estimated Number of Clinical Cases of Human Pandemic Influenza Based on Population and Attack Rate Estimates (estimated population of Ghana: 21,000,000)

| Population | Estimated Number of Cases by Attack Rate (%) | | | | | |
|-------------------|--|------------------|------------------|------------------|------------------|------------------|
| | 15% | 20% | 25% | 30% | 35% | 40% |
| 1,000 | 150 | 200 | 250 | 300 | 350 | 400 |
| 100,000 | 15,000 | 20,000 | 25,000 | 30,000 | 35,000 | 40,000 |
| 1,000,000 | 150,000 | 200,000 | 250,000 | 300,000 | 350,000 | 400,000 |
| 10,000,000 | 1,500,000 | 2,000,000 | 2,500,000 | 3,000,000 | 3,500,000 | 4,000,000 |
| 21,000,000 | 3,150,000 | 4,200,000 | 5,250,000 | 6,300,000 | 7,350,000 | 8,400,000 |

It is also possible to estimate the number of deaths that may occur in these cases. Using an estimated base population of 21 million for Ghana, gross attack rates between 15% and 40 %, and case fatality rates (CFR) between 0.6% and 1.5%, the estimated number of deaths due to pandemic influenza in Ghana are shown in Table 3.

Table 3: Estimated Number of Deaths in Ghana Due to Human Pandemic Influenza Based on Gross Attack Rate and Case Fatality Rate Estimates

| CFR | Estimated Number of Deaths by Attack Rate (%) | | | | | |
|------|---|--------|--------|--------|---------|---------|
| | 15% | 20% | 25% | 30% | 35% | 40% |
| 0.6% | 18,900 | 25,200 | 31,500 | 37,800 | 44,100 | 50,400 |
| 0.7% | 22,050 | 29,400 | 36,750 | 44,100 | 51,450 | 58,800 |
| 0.8% | 25,200 | 33,600 | 42,000 | 50,400 | 58,800 | 67,200 |
| 0.9% | 28,350 | 37,800 | 47,200 | 56,700 | 66,150 | 75,600 |
| 1.0% | 31,500 | 42,000 | 52,500 | 63,000 | 73,500 | 84,000 |
| 1.5% | 47,250 | 63,000 | 78,750 | 94,500 | 110,250 | 126,000 |

Even the most conservative model/scenario (attack rate = 15%, case fatality rate = 0.6%) shows the potential for significant mortality (18,900 deaths) in the event of a pandemic.

This volume of cases would clearly overwhelm the ability of health services to provide necessary care and treatment to infected individuals¹. In addition, such a case overload will also severely compromise the ability of the health system to provide care to patients with *other* serious illnesses who will continue to become ill during the pandemic period resulting in, perhaps, higher than normal rates of mortality for those other diseases.

In addition to the potentially severe toll on human health, AI will have significant economic and social impact on the country. High rates of worker absenteeism due to illness will affect delivery of social services in the public, civil and private sectors. It may be necessary to close schools and restrict internal movement and travel within the country. Trade and transportation outside the country will be restricted/curtailed severely.

Ghana's economy is largely based on agriculture (including forestry) which contributes 40% of the national Gross Domestic Product and accounts for over 70% merchandise exports. Over 65% of the labor force is engaged full time in agriculture.

The share of the livestock sector in agriculture GDP is estimated at 9%. The estimated numbers of livestock in Ghana for 2005 are:

cattle- 1,344,216
 sheep- 3,015,190
 goats- 3,559,838
 pigs – 303,259
poultry 2 26,394,462

Much of this poultry production is carried out on a small scale. If AI is detected in domestic birds, control and containment measures such as culling of birds will have a profound impact on both small local farmers as well as the larger poultry and food industries³.

Poultry live and breed in close proximity to humans in all areas of the country, increasing the likelihood of bird-to-human⁴ transmission of the virus in the event that bird populations become infected. The potential for the spread of the virus by common wild (non-migratory) birds such as the ubiquitous cattle egret is unknown, making case containment difficult and presenting a potential mechanism for widespread and rapid spread of the virus throughout the country.

¹ Assumes total population size of 21 million and attack rates ranging from 15-40%.

² Poultry is highlighted here as current information suggests that this animal population is most at risk. It should be noted, however, that swine populations are also susceptible to AI infection although the risk to swine of the current H5N1 strain does not appear to be documented.

³ The financial cost to the Government of Ghana of large scale culling of domestic bird populations, as has been done in Asia to contain and control the virus, could be significant.

⁴ Or even bird-to-swine and then swine-to-human transmission.

⁵ It is more important at this time to detect every possible case of AI infection, even at the cost of investigating a number of false positive cases.

⁶ Health service delivery facilities do treat cases of human influenza if they present at a facility.

III. DEVELOPMENT OF THE PLAN

In response to the global call for enhanced preparedness, many countries have taken steps to prepare for the worst, while at the same time closely monitoring the situation. In October 2005, the key technical ministries at the frontline of responding to an AI pandemic threat in Ghana (Ghana Health Services/Ministry of Health, Veterinary Services/Ministry of Food and Agriculture, and Ministry of Land, Forestry and Mines), along with key international partners (FAO, WHO and USAID), created the Avian Influenza Working Group (AIWG). The AIWG is charged with coordinating the development of a comprehensive, multi-sectoral country plan and identifying specific actions that Ghana can undertake immediately to address the threat of an AI pandemic.

As this group worked together to develop plans it became clear that a higher level entity, capable of

coordinating all Ghanaian ministries and institutions, would be necessary. Ghana already has such a structure in place—the National Disaster Management Organization (NADMO)—situated within the Ministry of the Interior (MOI). Therefore, NADMO was quickly added to the AIWG to maximize the plan’s success in responding to AI threats across all sectors and segments of Ghanaian society.

As an initial step, the AIWG conducted a rapid assessment of animal and human epidemic surveillance and response systems that would form the basis for Ghana’s response to an AI pandemic. By identifying gaps in the existing structures, the assessment helped the AIWG to identify actions to strengthen key systems and improve the country’s ability to respond quickly and appropriately to the disease in birds or humans. Such actions will help Ghana to contain and control the spread of the virus and thereby reduce potentially disastrous health and economic impacts.

The rapid assessment concluded that Ghana already has many of the technical components of systems required to detect and respond to health threats in both human and animal populations. However, while the capacity to respond exists within current systems, the capabilities required to mount an adequate response specific to the AI threat are not yet fully defined or in place. Thus, the objective of AIWG’s efforts to create a national preparedness and response plan is to define the resources and actions necessary to respond adequately to the threat. The plan was largely based on the WHO’s recommended actions at the national level.

A. Rapid Assessment of Avian and Human Pandemic Influenza Preparedness in Ghana

The AIWG interviewed key officials and made field visits to regional, district and sub-district facilities.

The assessment concluded the following:

“Strong surveillance in both bird and human populations is a critical component of early detection of the disease and response, minimizing the extent and impact of potential outbreaks and widespread transmission of the virus and disease. Coordination structures at the highest level of government must be engaged to manage a response that will most certainly cut across all sectors of society.

Strengthening the capacity for surveillance for human disease can build upon the country’s existing infectious disease surveillance system. Likewise, countries must quickly assess how they can build upon existing veterinary surveillance systems to detect and localize the arrival of the virus in both migratory and domestic bird populations. Sentinel surveillance sites may need to be developed and strengthened to ensure the early detection and investigation of any human or animal cases that arise. The health, wildlife and agriculture/veterinary sectors will need to work in close collaboration to ensure that surveillance and response activities are coordinated.

Ghana currently has in place many of the technical components of systems to detect and respond to health threats in both animal and human populations. The Veterinary Services Department currently monitors the occurrence of important disease threats such as Newcastle’s Disease, rinderpest and swine fever in animal populations and the GHS/MOH monitors (among other diseases) meningitis, cholera, acute flaccid paralysis and other priority diseases in humans. These existing detection and accompanying response systems function at different levels of sensitivity (the ability to capture all true cases) and specificity (the ability to limit the number of false positives reported). In the current context it is recommended that detection systems must be highly sensitive.

None of the existing systems currently detect, report or respond to cases of influenza. Clearly, however, there is an opportunity to exploit this capacity, strengthen these systems to include influenza and feasibly build the capability to detect and respond to possible influenza outbreaks.

The over-arching conclusion of the rapid assessment is that currently Ghana possesses many of the capacities necessary to respond to the AI pandemic threat (such as surveillance and response to threats in both animal and human populations). However, this conclusion must be interpreted with the understanding that while it has the capacities necessary it does not currently have the capabilities to mount an adequate pandemic AI response.

B. Rapid Assessment Recommendations

Activate and energize the existing, national multi-sectoral command emergency and disaster response structure (NADMO) as the appropriate, high-level/multi-sectoral unit to take responsibility for the overall coordination of Ghana’s response to the pandemic. This should be done immediately and in advance of the arrival of the virus in Ghana. In doing so, Ghana will join a number of other countries in the forefront of pandemic preparedness and comply with the clear and urgent recommendations of international organizations such as WHO, FAO, OIE, etc.

Identify existing resources and mobilize necessary additional resources from all sources including existing line ministry budgets, other national and/or special budget sources, partners and external donor sources.

Undertake activities to expand the capabilities of disease detection and response structures in wildlife, animal and human populations to include influenza.

Ensure the capability to confirm suspected cases of AI in both animal (wild and domestic) and human populations by expanding the capabilities of laboratory structures to include identification of the AI virus and its various sub-types.

Establish a multi-sectoral communications committee/working group to identify audiences, messages and strategies to ensure clear, correct and proper information about the pandemic and actions to be taken.

Based upon the national preparedness plan, establish additional multi-sectoral committee/working groups in the areas of planning and coordination (NADMO), surveillance, situation monitoring and assessment, prevention and containment and health system response. These working groups will be tasked with further, detailed planning for the response (including estimation of resources required) and monitoring the implementation of the plan.

Continue to review existing capacities and plan additional steps to strengthen national capability to respond in all sectors.

IV. NATIONAL PREPAREDNESS AND RESPONSE PLAN

The AIWG was guided by WHO technical documents in the development of this national *Preparedness and Response Plan*. WHO documents *WHO Global Influenza Preparedness Plan* (WHO/CDS/CRS/GIP/2005.4) and *WHO Checklist for Influenza Preparedness Planning* (WHO/CDS/CRS/GIP/2005.4) provided an appropriate framework for the Ghanaian plan. These documents outline possible response actions by phase of the pandemic. They also organize/group actions into five key areas:

- Planning and Coordination
- Surveillance, Situation Monitoring and Assessment
- Prevention and Containment
- Health System Response
- Communications

It should be noted that while these areas provided a logical and convenient framework to organize the work of the AIWG, the categories are not mutually exclusive; there is clearly overlap across areas. This should not limit the comprehensiveness or feasibility of the plan.

The AIWG divided itself into technical, multi-sectoral sub-groups based upon the five areas of the plan. Each group worked intensively to create action plans for their area using a common framework which identified activities, timing, resources and responsible persons/institutions (see Annex 2).

A. Objectives of the Plan

The objectives of the national *Preparedness and Response Plan for Avian and Human Pandemic Influenza 2005-2006* are:

To clearly define the actions and resources necessary to build the capacity in Ghana to adequately prepare for and respond to the threat of pandemic avian influenza by strengthening existing structures and their capabilities.

The budget estimates contained in the *Plan* are consistent with scenario 1 described earlier and are based upon infections identified in 10 sites/districts with a total of 500 human cases.

B. Cost Estimates for the Plan

The overall cost of the *Plan*, as presented, is estimated at **USD 6,281,525**. This estimate allows Ghana to build upon existing systems and capabilities to strengthen detection and response systems for the current threat of avian and pandemic influenza. Global and regional events may require adjusting the projected number of cases, outbreak sites and estimated costs anticipated in this plan.

C. Key Elements of the Plan

The key elements of the *Plan* are presented below. These sections summarize the detailed workplans, attached as Annex 2 to this document. By organizing the plan around the five areas, actions affecting many sectors appear together (i.e., 'situation monitoring and assessment' includes steps to introduce/strengthen capacities for AI surveillance in migratory bird, domestic bird and human populations). Proposed actions in the Planning and Coordination area cut across all sectors.

1. Planning and Coordination

All planning and coordination activities will take place under the auspices of NADMO located within the Ministry of the Interior. NADMO is the recognized agency charged with the multi-sectoral management of responses to all disasters (including human health). NADMO was, for example, a key part of Ghana's comprehensive response planning during the SARS outbreak in 2003. Actions outlined below should be initiated immediately under all of the possible scenarios outlined for the arrival of pandemic AI in Ghana.

Specific Objectives: Planning and Coordination

1. To develop and maintain national influenza pandemic contingency plans which are consistent with international plans.
2. To promote national and regional capacity to respond to early reports of new influenza virus strains.
3. To develop plans for ongoing assessment of impact and resource needs during the pandemic period.
4. To develop a strategy regarding stockpiling of antivirals and criteria for deployment/use.
5. To maintain an appropriate level of awareness among government and other essential partners.

General Description: Planning and Coordination

The plan calls for NADMO to create a National AI Coordinating Committee (NCC) responsible for:

- Overall coordination of preparedness and response to the pandemic threat;
- Providing policy direction and strategic planning;
- Ensuring accountability from all sectors;
- Providing an enabling environment and allocation/solicitation of necessary resources for effective implementation of the preparedness plan; and
- Providing high level political support.

The NCC will fall under NADMO's authority and be made up of high level officials (preferably Ministerial level but not below Chief Director level) from all relevant MDAs and development partners, including GHS/MOH, MOFA, MLFM, MOI, security agencies, trade, Aviation/Transportation and Commerce. The NCC should include representatives of government, public, bilateral agencies and professional associations and intergovernmental international organizations. It will also coordinate the actions of other organizations which are not part of the NCC but under its authority. These include (but are not limited to):

- National and regional public health authorities including
 - Preventive, curative and diagnostic services
 - The national drug regulatory authority (Food and Drugs Board – FDB)
 - The national influenza center (NMIMR)
 - Representatives of associations (Ghana Medical Association, Pediatrics association, pharmacy division)
- Virologists and epidemiologists
- Veterinary health services authorities
- Monitoring team of the MOH/GHS or private sector (health indicators, use of health-care facilities and pharmaceuticals)
- Representatives of pharmaceutical manufacturers or distributors
- Representatives of social service administrations
- Representatives of military or other emergency response organizations or teams (NADMO, NSU)
- Representatives of NGOs and Red Cross
- Representatives of telecommunications and media relations experts

The NCC shall create and support a national technical coordinating committee (NTCC) consisting of the technical heads of all relevant agencies to perform the following broad functions:

- Provide technical backup to NCC;
- Plan and execute all technical preparedness and response actions (surveillance, prevention, containment, health system's response and communication) for avian/human flu; and
- Monitor and evaluate performance.

The NTCC members shall allocate sufficient technical resources to implement all activities. Many of these technical resources are already engaged in AI preparedness and response planning through the existing AIWG. The NTCC will periodically review the status of the plan and its implementation and recommend necessary changes to the NCC.

Similar response coordination committees shall be established at regional and district levels using NADMO's existing structures and in collaboration with regional and district administrations and relevant technical MDAs. These committees will be critical to rapid response, as foci of AI cases (in animal and human populations) are recognized. The ability to quickly respond at the local level is a key element of an effective containment

strategy when and where the disease may appear in Ghana. Close coordination and communication between sectors (especially veterinary and health services) will be essential and these regional and district committees will play such a role.

Summary of Key Actions: Planning and Coordination

- Appointment of a “Special Advisor to the President” for Avian Influenza, to be responsible for coordinating and monitoring all actions implemented under the plan.
- Establishment and activation of NCC by/within NADMO as the high level overall coordinating agency for AI preparedness and response (this includes identification/allocation of resources necessary for the operation of the NCC).
- Establishment of the NTCC of relevant technical partners by the NCC to take primary responsibility for planning and actual implementation of steps outlined by the preparedness and response plan (this includes identification/allocation of resources necessary for the operation of the NTCC).
- Establishment and activation of regional and district coordinating bodies/committees by NADMO to coordinate and manage preparedness and response at those levels.
- Establishment of a national operations center and regional and district operations centers consistent with the appearance of foci of infections within the country.

Cost Summary: Planning and Coordination is estimated at USD 292,872.

2. Surveillance, Situation Monitoring and Assessment

The basic principles of surveillance and response (in bird or human populations) provide an appropriate model for the organization of a response to the pandemic AI threat. Ghana has created both animal and human disease surveillance systems around those basic principles.

The seven functions of surveillance are:

- Identify cases
- Report cases
- Analyze and interpret data
- Investigate and confirm suspected cases
- Respond
- Provide feedback

- Evaluate and improve on the system

This *Plan's* focus is on the first five functions in order for Ghana to address the current threat of AI. Strengthening systems for feedback and evaluation are not as high a priority at this time. The *Plan's* actions will not only prepare Ghana in the face of the current pandemic AI threat but will also strengthen surveillance systems and their ability to protect populations from other health threats as well.

Due to the epidemiology of the threat and the current world pandemic situation (Phase 3), Ghana must build sufficient surveillance capacity in the areas of migratory bird, domestic bird and human populations. Relevant agencies in each of these sectors currently possess capabilities in the area of surveillance. The *Plan* seeks to expand this capacity to enable monitoring the appearance and spread of the virus (in animals and humans) in Ghana.

Specific Objectives: Surveillance, Situation Monitoring and Assessment

1. To put in place a sufficiently sensitive surveillance system in all the regions to detect the appearance of AI in migratory bird, domestic animal, and human populations

General Description: Surveillance, Situation Monitoring and Assessment

Migratory Bird Populations

Officials of the Wildlife Division of the MLFM, at each of seven foci recognized as a principal landing site for migratory bird populations in Ghana, will increase monitoring of the wetlands. In addition to the routine counting of birds, capture of representative species will be done to determine country/continent of origin (some birds have tags). Any dead birds observed will be immediately referred to the DVS, MOFA for testing and confirmation of the presence of AI. Communication links with MOFA and GHS/MOH will be essential in the event of bird deaths and confirmation of the AI virus' presence.

Wildlife and Veterinary Services will work together to conduct sampling and testing of apparently healthy migratory birds in order to establish baseline estimates of AI virus infections and provide a more sensitive indicator of the virus' arrival in Ghana via those birds. NMIMR will assist with the analysis of samples where necessary.

Domestic Animal Populations

The Veterinary Services Department of MOFA will be responsible for strengthening existing domestic animal systems to allow for the detection of unusual number of deaths in domestic animal populations. Case definitions and protocols for sampling of potential cases will be developed and disseminated to staff nationwide. Capabilities for active case detection (in the event of suspected or confirmed cases) will be strengthened in order to accurately gauge the extent of infection in defined geographic foci.

Human Populations

The GHS/MOH shall be responsible for establishing systems for surveillance, situation monitoring and assessment activities of the pandemic in humans. The NSU/PHD shall be the principal unit responsible for this under the Director of Public Health.

The existing structures of the GHS, from community to national levels, shall investigate and respond to any rumors or suspected cases of human influenza. At the community level, volunteers and CBOs shall report any unusual events or rumors to sub-district and district health officers who will initiate investigations according to national guidelines and report to the regional health directorate and national surveillance unit. The NSU will then communicate with the NCC and the Minister of Health. Specimens shall be transported to NMIMR (designated as a "national influenza center") using specified procedures for confirmation and determination of the viral strain of influenza present. The NSU will be responsible for reporting on AI with WHO.

Summary of Key Actions: Surveillance, Situation Monitoring and Assessment

Surveillance of Migratory Bird Populations

1. Procurement of equipment for bird capture, ringing and testing.
2. Procurement of personal protective equipment for staff.
3. Procurement of vehicles for increased surveillance at seven landing sites.
4. Increased surveillance and supervision/support visits to seven landing sites.

Surveillance of Domestic Animal Populations

1. Training of staff in recognition of AI and likely cases.
2. Training of staff in response to likely cases including testing and proper transport of specimens.
3. Strengthening of laboratory capacity to provide for case confirmation through testing for AI.
4. Procurement of personal protective equipment for staff.

Surveillance of Human Populations

1. Update the list of priority diseases for IDSR to include “human influenza caused by pandemic strain,” develop standard case definition for influenza and strengthen national systems for influenza surveillance in humans.
2. Strengthen systems to ensure reporting of routine and unusual surveillance findings/ occurrences in human populations to relevant national and international authorities.
3. Establish systems for rapid investigation and responding to rumors of suspected outbreaks of the disease in humans.
4. Establish a “national influenza center” with the support of partners to characterize and share influenza virus isolates and information on circulating strains with WHO, FAO, OIE, etc.
5. Develop contingency plan for ongoing monitoring, analysis and interpretation of information, for assessment of impact and resource needs during the pandemic phase (e.g., morbidity, mortality, workplace absenteeism, regions affected, risk groups affected, health care workers and other essential workers’ availability, health care supplies, bed occupancy/ availability, admission, use of alternative health facilities, and mortuary capacity).

Cost Summary: Surveillance, Situation Monitoring and Assessment

The cost of strengthening surveillance systems for

- *migratory bird populations* is estimated at USD 234,957.
- *domestic animal populations* is estimated at USD 307,100.
- *human populations* is estimated at USD 1,494,370.

3. Prevention and Containment

Specific Objectives: Prevention and Containment

1. To develop containment strategies to limit the spread of infection among domestic bird populations
2. To prepare contingencies to implement containment strategies.
3. To agree on containment strategies and develop a strategy regarding stockpiling and use of antivirals
4. To minimize the risk of human infection from contact with infected animals
5. To reduce the risk of co-infection in humans and thereby minimize opportunities for virus re-assortment
6. To contain and reduce transmission among humans and limit morbidity and mortality

General Description: Prevention and Containment

Prevention and Containment in Domestic Animal Populations

As AI is readily transmitted via fomites, strict control of movement of anything that may have become contaminated with virus, and immediate imposition of tightly controlled quarantine on all places suspected of being infected, is essential to a successful eradication program. Quarantine should be imposed on all farms on which infection is either known or suspected and should be strictly policed to ensure that no one—owners, staff and other visitors—leaves without changing clothes and footwear. Particular attention needs to be paid to workers on poultry farms who keep backyard poultry at home. Strict on-farm bio-security and hygiene is

needed to control spread of the disease from wild birds. Access of wild birds to commercial poultry sheds and flocks should also be considered during depopulation operations.

The principles of an effective control or eradication program for highly, mildly or lowly pathogenic AI are as follows:

- Comprehensive, integrated national surveillance and diagnostic programs;
- Enhanced bio-security practiced at all levels of production and processing by all employees of companies, diagnostic laboratories and government agencies that have contact with poultry or equipment from poultry operations;
- Education of poultry farmers and other workers about AI control and sharing of information on surveillance and control strategies at all levels in the production process;
- Quarantine or controlled movement of AI-infected poultry;
- Stamping-out or slaughter for all virulent and some mild or low pathogenic outbreaks.

Effective quarantine of an area requires around-the-clock security to ensure that only authorized personnel in protective clothing are allowed to enter. Security personnel will need to supervise the movements of residents onto and off the property and ensure that all pets are confined.

Prevention and Containment in Human Populations

The MOH/GHS is responsible for establishing and implementing systems for the prevention and containment of human influenza. NMIMR is designated as ‘national influenza center’ and is responsible for ensuring procedures for rapid analysis and sharing of specimens or isolates for virus characterization and development of diagnostics and vaccine.

Whenever a suspected case is reported in a health facility, the appropriate quarantine procedures shall be instituted, including infection control measures, barrier nurses, etc., using protective gears. The necessary specimens shall be taken and transported to NMIMR and appropriate management procedures instituted according to national treatment protocols. The national surveillance unit shall immediately be informed even before confirmation of the reported case. All health workers who are potentially at risk will have the first preference for vaccination (if available) and of anti-viral medication as indicated.

Summary of Key Actions: Prevention and Containment (as required by epidemiology)

Prevention and Containment in Domestic Animal Populations

1. Investigate rumors of animal deaths/unusual events, collect and analyze samples, and report to the DVS.
2. Assess situation in outbreak area to verify rumors, determine extent of spread of the disease and provide reliable statistics of the outbreak.
3. Institute quarantine and standstill measures as required.
4. Meet with all stakeholders to discuss eradication measures and compensation.
5. Identify infected farms and move to affected area.
6. Destroy and burn and/or bury affected and in-contact animals.
7. Pay compensation to owners of destroyed domestic animals.
8. Decontaminate and disinfect premises, vehicles, etc.
9. Establish active and passive surveillance.
10. Initiate ongoing (5 years) sero-surveillance/epidemiology-surveillance.

Prevention and Containment in Human Populations

1. Produce interim case-finding, treatment and management protocols and algorithms; infection control guidelines; guidance on triage; and staffing strategies for human health sector.
2. Develop detailed implementation plans that ensure that proposed interventions are discussed with responsible decision-makers in and outside the health sector (transport, education, etc.), and estimate and

address resource implications for their implementation.

3. Develop a strategy to ensure access to antivirals, vaccines, laboratory reagents, etc. for rapid national deployment (e.g., stockpiling); ensure availability of data to project likely needs during subsequent phases of the pandemic (including the legal/regulatory basis for their importation into Ghana).

4. Develop and agree upon strategies, priorities and criteria for deployment and use of antivirals and vaccines during pandemic alert and pandemic periods.

5. Ensure procedures for specimen collection, transportation, rapid analysis and sharing of specimens or isolates for virus characterization and development of diagnostics and vaccine.

Cost Summary: Prevention and Containment

The cost of prevention and containment for

- *domestic animal populations* is estimated at **USD 1,218,878.**

- *human populations* is estimated at **USD 1,602,708.**

4. Health System Response

With the appearance of human cases in Ghana, the health system must be prepared to treat them. The system must also be able to limit the spread of infection and protect its health care workers.

Specific Objective: Health System Response

1. To ensure that if human infections occur, they will be quickly recognized and that the health system can respond appropriately to limit spread and mortality of the virus. .

General Description of the Plan: Health System Response

The public, private, mission and security health care providers shall be part of the health system preparedness and response to the human pandemic in Ghana. Relevant health associations, such as the Ghana Medical Association and Ghana Registered Nurses Association, shall be brought on board.

The Korle Bu Teaching Hospital and Komfo Anokye Teaching Hospital, as well as all regional, military and police hospitals, shall be supported as referral centers for the management of human influenza cases. Adequate isolation and treatment facilities must be created in these hospitals which do not currently have the necessary capacity to isolate and treat AI patients. Health care workers at all levels shall be trained in diagnosis, management and control of the disease.

Summary of Key Actions: Health System Response

1. Prepare the health system using the WHO checklist for influenza pandemic preparedness planning, and identify and institute actions to address deficiencies/gaps according to national resources. Mobilize additional resources from possible donor partners to fill these gaps.
2. Ensure that authorities, responsibilities and pathways are clearly identified for command and control of health systems in the event of a pandemic.
3. Ensure that authorities, responsibilities and pathways are clearly identified for command, coordination and control between sectors (MOH, MOFA, MLFM, MOI) in the event of a pandemic.
4. Identify priorities and response strategies for public and private health-care systems for each stage including triage systems, human and material resource management.
5. Ensure routine laboratory bio-safety, safe specimen handling, and hospital infection control policies.
6. Ensure availability/viability and operational nature of mechanisms for safe and effective specimen transport and analysis.
7. Estimate pharmaceutical and other material supply needs; make arrangements to secure supply.
8. Increase awareness and strengthen training of health-care workers on pandemic influenza.

Cost Summary: Health System Response

The cost of actions necessary to prepare the health care delivery system to respond to the appearance of human AI cases is estimated at USD 709,750.

5. Communications

The success of the plan will rest on clear and consistent communication about the pandemic and its risks to the Ghanaian population as well as the status of response activities to and among all stakeholders (including the general population). Specific target groups must be identified and media created to transmit those messages efficiently and effectively. The communications strategy must cover all sectors and not be limited to those involved on a technical basis (GHS/MOH, MOFA, MLFM).

Specific Objectives: Communications

1. To ensure that mechanisms exist for coordinated and consistent routine and emergency communications between authorities in all sectors, within and between government agencies, with other organizations and with the public.
2. To ensure that populations/communities receive correct, specific and relevant information regarding the pandemic and steps/actions to be taken.

General Description: Communications

Educational messages and materials will be prepared on human and avian influenza, and disseminated to the public through a variety of media. These materials will provide background on the avian influenza situation, the current situation in Ghana, and recommended means of communication and action for people who develop signs and symptoms of influenza, or who observe sick wild birds, local birds, or disease outbreaks in poultry.

The Health Promotion Unit (HPU) and PRO of GHS shall coordinate the communication actions for GHS/MOH under the direction of the National Technical committee. Multiple communication channels shall be adopted, including press briefings and releases, and use of mass media (radio, television).

The HPU must coordinate closely with MOFA and MLFM units to develop a comprehensive communications strategy addressing all information issues in migratory bird, domestic animal and human populations. Lack of coordination among these units will lead to the possibility of disseminating unclear and/or mixed messages to the population and authorities.

Annex 1: WHO Recognized Phases of Pandemic Influenza

Phases of pandemic

| | | |
|----------------------|--|---|
| Inter-pandemic phase | No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low. | It is likely that influenza subtypes that have caused human infection and/or disease will always be present in wild birds or other animal species. Lack of recognized animal or human infections does not mean that no action is needed. Preparedness requires planning and action in advance. |
| Phase 1 | No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease. | The presence of animal infection caused by a virus of known human pathogenicity may pose a substantial risk to human health and justify public health measures to protect persons at risk. |
| Phase 2 | Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact. | The occurrence of cases of human disease increases the chance that the virus may adapt or reassort to become transmissible from human to human, especially if coinciding with a seasonal outbreak of influenza. Measures are needed to detect and prevent spread of disease. Rare instances of transmission to a close contact – for example, in a household or health-care setting – may occur, but do not alter the main attribute of this phase, i.e. that the virus is essentially not transmissible from human to human. Examples: <ul style="list-style-type: none"> • One or more unlinked human cases with a clear history of exposure to an animal source/non-human source (with laboratory confirmation in a WHO-designated reference laboratory). • Rare instances of spread from a case to close household or unprotected health-care contacts without evidence of sustained human-to-human transmission. |
| Phase 3 | Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans | <ul style="list-style-type: none"> • One or more small independent clusters¹ of human cases (such as family members) who may have acquired infection from a common source or the environment, but for whom human-to-human transmission cannot be excluded. |
| Phase 4 | Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk). | Virus has increased human-to-human transmissibility but is not well adapted to humans and remains highly localized, so that its spread may possibly be delayed or contained. Examples: <ul style="list-style-type: none"> • One or more clusters involving a small number of human cases, e.g. a cluster of <25 cases lasting <2 weeks. • Appearance of a small number of human cases in one or several geographically linked areas without a clear history of a non-human source of exposure, for which the most likely explanation is considered to be human-to-human transmission. |
| Phase 5 | | Virus is more adapted to humans, and therefore more easily transmissible among humans. It spreads in larger clusters, but spread is localized. This is likely to be the last chance for massive coordinated global intervention, targeted to one or more foci, to delay or contain spread. In view of possible delays in documenting spread of infection during pandemic phase 4, it is anticipated that there would be a low threshold for progressing to phase 5. Examples: <ul style="list-style-type: none"> • Ongoing cluster-related transmission, but total number of cases is not rapidly increasing, e.g. a cluster of 25–50 cases and lasting from 2 to 4 weeks.⁴ • Ongoing transmission, but cases appear to be localized (remote village, university, military base, island). |

- In a community known to have a cluster, appearance of a small number of cases whose source of exposure is not readily apparent (e.g. beginning of more extensive spread).

- Appearance of clusters caused by same or closely related virus strains in one or more geographical areas without rapidly increasing numbers of cases.

Pandemic period
Phase 6
Pandemic phase: increased AND sustained transmission in general population

Major change in global surveillance and response strategy, since pandemic risk is imminent for all countries. The national response is determined primarily by the disease impact within the country.

Post-pandemic period
Return to inter-pandemic period.

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| regional disaster management committee (RDMC) | meeting available | week of Dec 05 | | | | | | | | | | | | | | | | Regional Coordinator | | at the regional level and travel for national level teams |
| 5. Activate district disaster management committee (DDMC) | No. of meetings | All districts activated by 1 st qtr. of 2006 | | | | x | | | | | | | | | | | | District Chief Executive w/ NADMO-District Coordinator | 50,000 | 138 districts x 10 persons at the district level and travel from region to districts |
| 6. Establish a multi-sectoral national pandemic monitoring and response committee | Minutes of the meeting available | by 29/11/05 | | x | | | | | | | | | | | | | | NADMO-Coordinator | | |
| 7. Establish and operate national level emergency operations center (EOC) | | Based upon arrival of virus | | | | | | | | | | | | | | | | NADMO-coordinator | 18,720 | USD \$720/wk of operation for estimate 26 weeks |
| 8. Establish and operate regional level emergency operations center (EOC) | | Based upon arrival of virus | | | | | | | | | | | | | | | | NADMO-coordinator-regional teams | 92,300 | \$355/wk X 10 regions X 26 weeks |
| 9. Establish and operate district level emergency operations center (EOC) | | Based upon arrival of virus | | | | | | | | | | | | | | | | NADMO-coordinator-regional teams-district teams | 96,600 | \$50/wk X 138 districts X 14 weeks |
| 10. Identify resources to support implementation of planned actions | Resources identified | by Feb 06 | | | | | x | | | | | | | | | | | NDMC/ NADMO | | |
| 11. Provide assistance to regional, district and local authorities (including private essential | Reports from support visit(s) | at least 2 visits at this phase | | | | x | | | | | | | | | | | | DDMC | | |

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| services) in implementing interventions | | | | | | | | | | | | | | | | | | | | |
| 12. Coordinate implementation of interventions to reduce disease burden in the initial geographic foci and contain or delay the spread of infection | | as relevant | | | | | | | | | | | | | | | | NADMO | | |
| 13. Brief appropriate officials in all relevant government departments at all phases of the pandemic flu | Briefing reports | | | | | | | | | | | | | | | | | NADMO/ Relevant Sector | 14,880 | Provide for weekly press briefings involving 20 persons for 3 months. |

Workplan: Health System Response

| Activity | Indicator/ Source of verification | Target | Time Frame | | | | | | | | | | | | | Person responsible & Collaborators | | | | |
|---|---|--|------------|---|---|------|---|---|---|---|---|---|---|---|---|---|---|--|--|-------------------------------------|
| | | | 2005 | | | 2006 | | | | | | | | | | | | | | |
| | | | O | N | D | J | F | M | A | M | J | J | A | S | O | | N | | | |
| 72. Provide free medical care | Once outbreak is confirmed | Free medical care to public (see the standard) | | | | | | | | | | | | | | | | | | MOH-GHS-NSU-DHMTs/Health Facilities |
| 73. Review contingency plans at all levels of health care delivery | Plans reviewed at various levels | National/Regions/Districts (ongoing updates) | | x | x | | x | x | | | | x | x | | | x | x | | | |
| 74. Identify, mobilize and train (as necessary) key personnel to be mobilized in case of emergence of a new influenza virus strain. (Train health care workers) | Trainings conducted | Public and private practitioners targeted | | | x | x | | | | | | | | | | | | | | N.S.U./Regions/Districts |
| 75. Ensure both public and private health care providers understand updated case definitions and treatment algorithms | Supervision/verification | Visit selected facilities | | | | x | x | x | | x | | | | | | | | | | |
| 76. Develop and implement rigorous and effective infection-control procedures /guidelines to prevent nosocomial transmission | Guidelines developed | Guidelines available in facilities | | | | | | | | | | | | | | | | | | MOH-GHS (Clinical Care)/ NSU |
| 77. Update and | Standard messages | Standard messages | | | | | | | | | | | | | | | | | | Health Promotion |

