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**CONTINGENCY PLAN FOR AN INFLUENZA PANDEMIC**

# **PAHO Strategic and Operational Plan for Responding to Pandemic Influenza**

September 23, 2005

## **Introduction**

The World Health Organization (WHO) has prepared a strategic plan describing activities for influenza preparedness planning to prepare the world for the next influenza pandemic and mitigate its impact once international spread has begun. The strategic plan of the Pan American Health Organization (PAHO) operates within this framework to direct Technical Cooperation activities to be carried out to prepare the countries of the Region for an influenza pandemic.

## **Background**

Influenza is a viral disease that affects millions of people worldwide and kills approximately one million people annually. The higher burden of disease occurs in children in their first two years of life and adults older than 60 years of age. It is also believed that the burden is higher in developing countries.

There are three types of influenza virus: A, B, and C. The most important strains of human influenza are types A and B, which are responsible for major outbreaks each year. Influenza A virus has two surface glycoproteins: hemagglutinin (HA) and neuraminidase (NA) which define viral subtypes. Subtypes circulating in humans in the last two decades have been H1N1, H3N2, and recently, H1N2. Wild aquatic waterfowl are the natural reservoir for all known influenza A subtype viruses. Other animals can also serve as reservoirs to some influenza A subtypes viruses, which can be transmitted between animals and from animals to humans.

Influenza viruses are continuously evolving, and periodically, HA and NA surface antigens undergo changes. Constant, usually small, changes in antigenic composition, known as antigenic drift, cause annual outbreaks and require influenza vaccine composition to be changed annually. Data available for the Region of the Americas for 2004 indicate that incidence rates of influenza-like illnesses (ILI) varied from 862 cases of ILI per 100,000 population in Chile to 2833 cases per 100,000 population in Paraguay. Extrapolating those figures to the Latin America and Caribbean population (2004) a total of 4.7 – 15 million cases of ILI could be expected in any given year.

Major antigenic changes can occur and are a result of human and animal influenza A viral genetic reassortment. Antigenic “shift” refers to the emergence of a novel influenza A subtype in humans. This can occur through genetic reassortment or through direct animal-to-human transmission (e.g., poultry-to-human transmission). When a new strain of influenza virus emerges and adapts to enable transmission from person-to-person, the disease can quickly spread far and wide, resulting in a pandemic. The lack of previous exposure to this virus renders the world population susceptible which facilitates the spread of the virus. Outbreaks of influenza in animals, especially when happening simultaneously with annual outbreaks in humans, increase the chances of a pandemic, through the reassortment of animal and human influenza A viruses.

In the last century three pandemics occurred. The most devastating was the Spanish Flu of 1918-1919 (A/H1N1 virus), with an estimated 50 million deaths world-wide. The other two pandemics occurred in 1957-1958 (Asian Flu, A (H2N2) virus) and 1968-1969 (Hong Kong Flu, A (H3N2) virus), each one responsible for an estimated excess mortality of 4 million people when compared to previous non-pandemic years.

It is impossible to predict when the next influenza pandemic will occur. Nevertheless, it has been almost 37 years since the last pandemic, and the longest recorded inter-pandemic interval is 39 years. The burden of the next pandemic influenza burden is also difficult to predict, with estimates of at least 2-7 million deaths and tens of millions requiring medical attention in a matter of several months.

Type A Influenza is also responsible for outbreaks in animals, particularly in poultry. It is possible for avian influenza A viruses with pandemic potential to become endemic in poultry farms, particularly non-commercial production, small-scale commercial poultry farms, backyard flocks, and places where live poultry is traded. However, some poultry outbreaks of avian influenza viruses to date have demonstrated a surprising level of aggressiveness, surpassing biosafety precautions in larger-scale poultry farms with adequate sanitary precautions.

According to Food and Agriculture Organization (FAO) estimates, the Americas are responsible for the production of 46.9% of the 67 billion tons of poultry produced worldwide, being the largest poultry exporting region in the World (58.3% of 7.7 billion tons). Industrial production is concentrated in 12 countries which produce 98% of total poultry in the region (USA, Brazil, México, Canada, Argentina, Venezuela, Colombia, Peru, Chile, Ecuador, Guatemala, and Bolivia). Nevertheless, only 5 countries are responsible for 99% of total exports (USA, Brazil, Canada, Argentina, and Chile). In 2004, FAO estimated that there were approximately 16 billion chickens in Latin America in the Caribbean.

Also, several important activities are directly or indirectly dependent on poultry industry such as grain production, trade, farming services, poultry transportation, among others. Considering poultry production scale, outbreaks of highly pathogenic avian influenza A viruses (e.g., H7 or H5) with high transmissibility, morbidity, and mortality would imply a major economic impact for the region. Emergency control activities such as culling, quarantine, and commercial restrictions would also incur a significant cost. In addition, massive culling could have an impact on the environment as a consequence of disposing of large quantities of organic matter.

Recent cluster of severe infection of humans with an avian influenza A virus was first documented in Hong Kong in 1997, with H5N1 virus causing respiratory disease in 18 humans, of whom 6 died. This cluster coincided with an epidemic of highly pathogenic avian influenza A (H5N1) in Hong Kong's poultry population. Extensive investigation of that outbreak determined that close contact with live infected poultry was the source of human infection. From December 2003 until August 2005, a total of 112 H5N1 cases with 57 deaths were reported to the WHO in Viet Nam (90), Thailand (17), Indonesia (1) and Cambodia (4), indicating a very high case fatality rate of 51% among reported cases to date. Probable, limited, person-to-person transmission has been reported in Thailand.

All that is necessary for a pandemic to occur is for the H5N1 virus to become adapted to sustained person-to-person transmission. Experts agree that the unprecedented epizootics of avian flu in Asia, the possibility for the H5N1 to adapt to person-to-person transmission, and recent virological and surveillance findings are signs that a pandemic may be imminent. Human global spread is likely to occur more rapidly than in previous pandemics due to increased travel and urbanization.

Influenza H5N1 virus is being disseminated among domestic poultry and possibly migratory birds. The spread of the virus in birds beyond their initial focus in South East Asia to China, Russia, and Kazakhstan in July 2005 emphasizes the virus' ease of mobility and the potential risk for the Region of the Americas.

The population of Latin America and the Caribbean is estimated for 2005 to be around 560 million people (approximately 9% of the world population and close to 15% of the population of the developing world, excluding China); 77% of this population is urban. The World Bank estimates that 11% of the population of Latin America lives below the international poverty line and around 130 million people live in rural areas, most of them in direct contact with chickens and pigs that provide a major source of protein for rural inhabitants. The impact of a pandemic in the Region will be not only a public health problem, but an economic disaster for the poorest population in rural areas and for national economies.

Influenza pandemics have historically taken the world by surprise, leaving minimal time for health services to prepare for the abrupt increases in cases and deaths that characterize these events and make them so disruptive. The present situation is markedly different as the world has been warned in advance. This advance warning has brought an unprecedented opportunity to prepare for a pandemic and develop ways to mitigate its effects even in areas with problems of access to basic health services.

## **Justification**

The 56<sup>th</sup> World Health Assembly and the 44<sup>th</sup> Pan American Health Organization Directing Council held in 2003 issued resolutions urging countries to strengthen their capacity to prevent, detect, and diagnose influenza virus infection, and to be prepared to respond to a pandemic situation. The Governing Bodies also requested that WHO and PAHO provide the necessary support to countries in order to reach those objectives. These contingency plans must be put in place now, during the inter-pandemic period, to better respond to this widespread threat that may have catastrophic consequences worldwide.

Preparedness for a potential influenza pandemic needs to have an intersectoral collaboration among the health, agriculture, and other government sectors, international organizations, universities and research centers, as well as the private sector. PAHO has the mandate to support ministries of health efforts to lead the response to a pandemic and mobilize additional financial resources for this purpose. This will be accomplished by developing new approaches for the integration of capacities to resolve a common problem beyond institutional and intersectoral limits.

As vaccination is the most important intervention for preventing influenza and reducing its health consequences during a pandemic, various short- and long-term strategies engaging several manufacturers are being pursued for the development of a vaccine against the potentially pandemic influenza virus H5N1. Although development of a pandemic flu vaccine has moved forward, it has not been at an adequate speed given the urgency of the situation. Since no specific vaccine is currently available for an influenza pandemic, one of the greatest challenges will be its production and supply.

Pending the availability of a pandemic vaccine, antiviral agents will be important to respond to an influenza pandemic. Antiviral agents have an important, but different role both

before and at the inception stages of a pandemic. However, their usefulness is constrained by high costs and limited supplies. Several countries are now stockpiling antiviral medications, and these advance orders are expected to drive expansion of manufacturing capacity for the future. Increased production capacity will place the world in a better position to respond to any future pandemic caused by any influenza virus.

Given these potential limitations, strengthening health-care services will be vital during pandemic preparedness as even health-care systems which function efficiently under ordinary circumstances are not likely to have sufficient surge capacity in the event of a pandemic. Countries with inadequate service delivery networks or health-care access gaps and lack of multi-sectoral involvement are particularly vulnerable. Quality of care and infection control are also issues to be addressed.

Finally, information management and risk communication should be active components of pandemic planning.

By May 2005, the three objectives for the international public health response to influenza summarized by WHO were: to avert a pandemic; to control human outbreaks and prevent further spread, and to conduct the research needed for better preparedness and response, including the immediate development of a vaccine against the pandemic virus. The subsequent evolution of events has forced reconsideration of these three objectives, and the development of new ones, outlined in this plan.

## **Opportunities to intervene**

As the conditions favoring another pandemic have been unfolding, countries, the international community, and PAHO/WHO have several opportunities to intervene, moving from a pre-pandemic situation, through emergence of a pandemic virus, to declaration of a pandemic and its subsequent spread. A phase-based approach involves a mix of immediate measures that address critical problems with longer-term sustained measures that improve the Region's capacity to protect itself against the recurring pandemic threat.

PAHO's governing bodies have requested the provision of support to countries in preventing and preparing for pandemic influenza through its technical cooperation. This strategic and operational plan details necessary activities for fulfilling this mandate.

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## **Objectives**

National influenza pandemic preparedness plans should be developed so that they provide a framework for the adequate response to threats and occurrences of pandemic influenza. In parallel to drafting national influenza pandemic preparedness plans, several supporting actions need to be put in place to reach the objectives listed below. Full implementation of the plan is only feasible once these objectives have been reached. The objectives of the strategic and operational plan correspond to the principal opportunities to intervene and are likewise phase-specific.

Most objectives are to be achieved during the pre-pandemic phase when national influenza pandemic preparedness plans are developed and supporting actions are put in place. Once a pandemic influenza virus emerges, planned activities should be implemented early to contain viral spread. Emergency response mechanisms that have been planned during the pre-

pandemic phase should be fully operational once a pandemic is declared and is spreading internationally.

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Phase: pre-pandemic

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- 1. Promote the development of national influenza pandemic preparedness plans**
  - 2. Strengthen surveillance through early warning systems**
  - 3. Support countries in making available pandemic vaccine and antiviral drugs**
  - 4. Plan for health-care services and infection control**
  - 5. Reduce opportunities for human infection**
  - 6. Implement a communication strategy and raise awareness to encourage pandemic planning**
  - 7. Estimate potential impact of an influenza pandemic and assess additional information gaps to guide policy-making**
  - 8. Build partnerships and strategic alliances in support of an effective response to pandemic influenza**
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Phase: emergence of a pandemic virus

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- 9. Contain or delay early spread of the virus**
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Phase: pandemic declared and spreading internationally

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- 10. Reduce morbidity, mortality, and social disruption through a coordinated response**
- 11. Quantify and monitor pandemic impact and epidemiology**

## **Key accomplishments**

Several activities for prevention and control of influenza have already been carried out in the Region as part of PAHO's ongoing Technical Cooperation.

In 2005, WHO updated its 1999 guidelines to assist countries in the development of influenza pandemic preparedness plans. Several other related documents were also published late in 2004, and are available on the Organization's web site. PAHO has translated these reference documents and is disseminating them in the Region. In addition, WHO is developing a "Model National Plan", which is a template document intended to assist countries in the development of their own plans.

Ongoing technical cooperation activities have set the groundwork for implementation of preparedness activities at the Regional and country level. Among these, the following are included:

- Influenza has been included in the agenda of all meetings of the Southern Cone, Amazon Region, and Central America Emerging Infectious Diseases Surveillance Networks.
- Meeting held in Chile in July 2002, with the participation of Argentina, Brazil, Chile and Uruguay, to discuss and initiate the development of national pandemic preparedness plans for those countries.
- Six workshops on influenza laboratory diagnosis and viral characterization in Lima (1999), Argentina (2000, 2002 and 2005), Havana (2002) and Panama (2004).
- Influenza has been included in the agenda of all subregional meetings of the Expanded Immunizations Program (EPI).
- The annual "Vaccination Week of the Americas" has helped diminish inequities in access to vaccines, including influenza, throughout the Region.
- Influenza vaccine has been included in the PAHO Revolving Fund (RF) portfolio in 2004. The lower price afforded through this fund will foster the introduction of the vaccine in many countries.
- Workshop held in Brazil in April 2004 on Surveillance and Response to Epidemic Prone Viral Respiratory Diseases: the Experiences with SARS and Avian Influenza, which included a simulation exercise of a worldwide emergency caused by a respiratory disease. Participating countries included 13 Latin American countries.
- A survey was carried out in April 2005 to determine current status of development of National Influenza Preparedness Plans for 14 countries of the Andean, Central American, and Spanish-Speaking Caribbean.
- A workshop on Influenza Epidemiology and Surveillance held in Atlanta (2005) integrating laboratory and surveillance coordinators from 14 countries of Latin America.
- Provisions made for the shipment of influenza viral isolates from countries to the regional reference laboratory for antigenic characterization of circulating viruses
- Influenza vaccination was a topic included in the agenda of the 16th Technical Advisory Group (TAG) Meeting on Vaccine Preventable-Diseases held in November, 2004 in Mexico.
- Avian Influenza was included in the agenda of the 14<sup>th</sup> Inter-American Meeting at the Ministerial Level on Health and Agriculture (RIMSA) organized by PAHO and hosted by Mexico in April 2005.



- Workshop on molecular diagnosis and viral characterization of influenza, SARS-associated coronavirus and human metapneumovirus directed to laboratory personnel in the country level in Argentina, May 2005.
- Regional strategies for addressing Highly Pathogenic Animal influenza in Latin America and the Caribbean were drafted.
- Action Plan presented at a conference on the sanitary situation of animal influenza and the 32<sup>nd</sup> meeting of the South American Commission for the Control of Foot-and-Mouth Disease (COSALFA) held in Lima, Peru (March, 2005). The Plan was approved by the official representatives of veterinary services of the South American countries.
- PANAFTOSA participated in a simulation exercise of avian influenza epizootic organized and conducted in Argentina in August 2005, and will share lessons learned with other countries.
- Regional survey to identify actions taken on Animal influenza and assess countries' needs for technical cooperation has been planned. Development of standardized questionnaire completed.
- Networking with potential partner organizations: FAO, OIRSA, OIE, FIOCRUZ–Ministry of Health Brazil, Canadian Central Animal Dis. Lab. of Agriculture, Avian Influenza Program at the Univ. of Maryland, USA and Chiefs Veterinary Officers in several countries in the Region.

As a result of these efforts, tangible progress on influenza surveillance and prevention has been made. The disease is becoming a priority topic in the human and veterinary health agenda of several countries in the Americas.

Many countries have developed national surveillance networks. Influenza virologic surveillance has been strengthened and surveillance targets have been expanded to include monitoring of human morbidity in several countries of the region through surveillance of influenza like illnesses (ILI). Participants from all countries in the Region have been trained at least once in surveillance and diagnosis of influenza. Concurrent training of laboratory personnel and epidemiologists has promoted their integration thus increasing Regional capacity for influenza surveillance. The number of countries performing viral isolation in the Region has increased from 11 in 2003 to 18 in 2004-2005. Furthermore, the number of samples shipped to the regional reference laboratory for viral characterization has increased significantly since 2000 as a result of the funding of sample shipments and the yearly provision of WHO standard reagents.

Following PAHO's Technical Advisory Group on Vaccine Preventable Diseases (TAG) recommendation for countries to utilize influenza vaccine in high-risk population, yearly influenza vaccine is being gradually introduced in the region having achieved high vaccination coverage. After inclusion of influenza vaccine in PAHO's Vaccine Revolving Fund (RF), the countries' costs for vaccine purchase was lowered. This has resulted in increased access to vaccine and will facilitate the introduction of the vaccine in countries which have still not included influenza vaccination into their routine immunization program.

In the Region of the Americas, Argentina, Canada, Chile, Mexico, United States, and Uruguay have already developed national plans to address a potential influenza pandemic. Some countries have begun the process of developing a national plan through the organization of Influenza Pandemic Committees, which is the necessary first step for preparedness planning. Furthermore, countries in the Region have already begun working on

the development of the animal health component of their National Influenza Pandemic Preparedness Plans.

In general, public health authorities in the Region recognize the risk of an influenza pandemic and its potential impact on the population. However, the development of a Influenza Pandemic Preparedness Plan is not always a priority. Pandemic preparedness competes with many other current public health issues and many countries lack the human resources needed to dedicate time and effort to a potential threat that is not as tangible as other current pressing problems. PAHO will continue its efforts to raise awareness among Member States to increase their preparedness for an eventual pandemic.

The Director of PAHO has established an internal Task Force on Epidemic Alert and Response, whose activities include the development and implementation of this strategic and operational plan directing PAHO technical cooperation in the preparation and response to a pandemic under the framework of the recently adopted International Health Regulations (2005). The phase-specific objectives of this strategic and operational plan (Document CE137/INF/1) correspond to the principal opportunities to intervene.

## **PHASE: PRE-PANDEMIC**

### **1. Promote the development of national influenza pandemic preparedness plans**

The new International Health Regulations (IHR-2005) establish a new international legal framework for relations among the member countries of the World Health Organization, sets standards for reporting risks and diseases, and recommends that countries develop their necessary core capacities to detect and respond to potentially epidemic diseases like influenza. Strengthening countries' core capacities will be necessary to help countries develop and sustain the implementation their National Influenza Pandemic Preparedness Plans. The most important capacities on which pandemic preparedness activities will be built are the generic core capacities which include the ability to define policies, norms, regulations, and institutional responsibilities; exchange and disseminate information; and investigate outbreaks.

In light of this, capacity in the following areas should be strengthened a) steering and regulatory capacity; b) communication, coordination, and cooperation; c) field investigation; and d) detection and intervention. In all of these areas, a preliminary estimate of the basic useful standards and requirements for efficient operations should be prepared. The technical and administrative coordination of this effort should be the responsibility of a high-level office in the Ministry of Health that has the influence and steering capacity for decision-making.

Identifying the country's existing capacity should be viewed as a participatory process whereby strategies and plans of action will be generated to reduce or eliminate the problems identified. Assessment of the status of current services should look not only at Ministry of Health surveillance and laboratory services, but the different programs in the areas of disease and vector control, water, food, zoonoses, social communications, etc. Infectious disease services and hospital medical care should also be a priority.

The effectiveness of National Influenza Pandemic Preparedness Plans will be highly dependent on the level of development of the public health capacities that countries have reached. Pandemic preparedness builds on existing processes and programs and cannot be disconnected from routine and existing activities, both at national and sub-national levels. Conversely, the development of National Influenza Pandemic Preparedness Plans could booster the strengthening of such capacities.

A pandemic preparedness plan should be a "living" document. To achieve this, countries should conduct different levels of simulations starting with table top exercises which make it possible to detect issues of authority for specific actions leaders may wish to consider. These simulations also need to happen at different levels including facility and local jurisdictions and should include actors beyond health sector. PAHO Headquarters (HQ) and country offices should be part of the simulation exercises. When conducted at different levels, simulations enable the testing of contingency plans for patient care to deal with surges and delivery of services where there are problems of access. In addition, it is important to organize national debriefing on response whenever a country has experienced an outbreak with pandemic potential and conduct periodic reviews of the plan to include new evidence

and technical developments. Existing structures such as hospital preparedness committees should be considered in pandemic planning and simulations.

Since availability of vaccine and antiviral drugs is likely to be insufficient, “non-pharmaceutical” public health interventions to contain, delay spread, and reduce the impact of disease caused by a novel human influenza subtype will be important and have to be planned in advance. These interventions will vary according to virus transmission patterns, pandemic phase, and local extent of illness. Interventions directed to prevention and control of pandemic influenza will occur at national and community levels as well. Engagement of the local level and private sector in planning and developing National Influenza Pandemic Preparedness Plans will be crucial since their implementation will only be possible with their support.

The specific objectives and actions recommended for national authorities to be considered within their National Influenza Pandemic Preparedness Plans, are divided into five categories, as proposed in WHO Global Influenza Preparedness Plan: (1) planning and coordination; (2) situation monitoring and assessment; (3) prevention and containment; (4) health system response; and (5) communications. Certain objectives and actions are specific to influenza, whereas others address preparedness for and response to many health emergencies that affect large numbers of people. Although many countries already have contingency plans for disasters or other health emergencies, some such measures are included to ensure completeness in pandemic influenza planning as contingency planning will be an integral part of influenza pandemic preparedness planning. The extent its implementation will depend on available resources.

The 2005 survey of 14 countries in the Region to determine National Influenza Preparedness Plans’ development status was responded by 12 countries. None reported having a national preparedness plan finalized but 78% had already established a responsible body or person to work on influenza pandemic preparedness planning. It is noteworthy that most countries had either not started or had very recently started the activities listed as essential for the development of a plan.

### **Expected results**

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***ERI.1 Countries in the Region will have developed National Influenza Pandemic Preparedness Plans which adequately incorporate human and veterinary health services, including surveillance, prevention and response, and allocation of resources to confront the pandemic***

#### Indicator

- 21 countries of Latin America and CAREC for the Caribbean subregion will have developed National Influenza Pandemic Preparedness Plans.
- PAHO-HQ and at least 21 countries in the Americas will have multi-sectoral emergency response mechanisms in place to confront the pandemic influenza.

#### Key activities

- Adapt the template document “Model National Preparedness Plan” developed by WHO Global Influenza Program in Geneva to the reality of the Americas.
- Train a cadre of PAHO country level staff and national professionals in pandemic influenza and prepare them to assist countries in the development of National Influenza

Pandemic Preparedness Plans, which will compose a rapid response team to assist affected countries.

- Conduct a Caribbean workshop to develop National Influenza Pandemic Preparedness Plan for that subregion.
- Organization of subregional workshops to prepare the regional plan, with agriculture and health sectors representatives from the countries, experts and representatives of the private sector.
- Establishment of a network of management of information and communication for the agriculture sector.
- Elaborate a PAHO contingency plan and standard operational procedures to support countries in case of pandemic influenza.
- Incorporate pandemic influenza in regular disaster preparedness and response meetings and train national emergency and disaster personnel to develop a multisectoral action plan for preparedness and response to pandemic influenza.
- Mobilize partners from various other relevant sectors such as agriculture, national disaster coordination entities, law enforcement, military, civil aviation, transportation, financial institutions and education.
- Establish an Emergency Operation Center (EOC) at regional level and assist member countries in establishing or strengthening their EOC.
- Establish regional and national multidisciplinary response teams for quick deployment to complement national response capacity.
- Develop agreements, emergency logistic procedures and mechanisms for rapid transport and distribution of vaccines, antiviral drugs and other medical supplies.

***ER1.2 Simulation exercises developed and tested in at least 10 countries of over 1 million inhabitants to assess the practicality and feasibility of the plans***

Indicator

Ten simulation exercises conducted in an equal number of countries, covering all PAHO subregions.<sup>1</sup>

Key activities

- Convene a group of experts to develop a simulation exercise that is applicable in the Americas.
- Develop indicators to evaluate effectiveness and practicality of simulation.
- Conduct a regional meeting to prepare national professionals to conduct simulation exercises at national and sub-national levels.
- Conduct a simulation exercise in 10 countries, at least 1 from each of PAHO's subregions, including actors from and beyond the health sector.
- Conduct simulation exercise for PAHO Headquarters (HQ) and country offices.
- Evaluate results of simulation and modify plans accordingly.
- Supporting the countries in the development of subregional simulation exercise with the agriculture sector.

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<sup>1</sup> PAHO subregions include: Andean Area, Brazil, Central America, Latin Caribbean, Mexico, Non-Latin Caribbean North America, and Southern Cone.

### ***ER1.3 Guidelines for non-pharmaceutical public health interventions will be developed***

#### Indicator

Guidelines for non-pharmaceutical public health interventions during the pandemic phase developed.

#### Key activities

- Conduct a consultation workshop with regional and international partners to consolidate proposals for non-pharmaceutical public health interventions considering the best available evidence.
- Develop Regional guidelines on implementation of non-pharmaceutical public health interventions.
- Support countries in framing legislation for implementation of activities proposed in the influenza pandemic preparedness plans.

## **2. Strengthen surveillance through early warning systems**

To comply with the International Health Regulations (IHR-2005), countries should immediately notify to WHO any human influenza A case caused by a new viral subtype, since this is classified as one of four diseases in which a single case would be considered unusual and may have serious public health impact.

As part of its influenza prevention and control efforts, WHO implemented a global influenza virus surveillance network (FluNet) in 1947. Its main objectives are to identify circulating influenza virus strains and ultimately recommend vaccine composition based on this information. Participating countries have one or more National Influenza Centers (NICs) which receive samples collected in sentinel sites from flu-like illnesses and process them for viral diagnosis, isolation, and typing. There are currently more than 110 laboratories worldwide in 83 countries which send influenza viruses and specimens to four international referral laboratories located in Atlanta (USA), London (UK), Melbourne (Australia), and Tokyo (Japan), where viral characterization and genomic sequencing of identified strains are conducted.

The Americas Region has 24 NICs, of which 17 periodically report influenza virus activity to FluNet. In the last three years, the number of countries performing influenza virus isolation and the number of samples shipped to the Regional Reference Laboratory (Centers for Disease Control and Prevention, CDC) have increased and are expected to increase even further. This has been a result of the support that PAHO, with the collaboration of CDC, is providing to strengthen surveillance, laboratory diagnosis, and funding of sample shipment. In addition, each year the NICs receive WHO standard reagents necessary for identification of circulating influenza and other respiratory virus strains.

Until recently, the main objectives of influenza surveillance both worldwide and in the region have been the early detection of a new influenza virus strains and the ongoing analysis of viral circulation patterns at both the regional and national levels. Of particular relevance, is the better understanding of viral circulation patterns in tropical areas and implications for vaccination.

The need to expand influenza surveillance to include other objectives has become evident in recent years. Determining the burden of disease caused by influenza virus infections is important to guide decision-making regarding the introduction of vaccine, adequate vaccine formulation, timing of its administration, and subsequently measuring the impact of the intervention. PAHO's technical cooperation has promoted the implementation of surveillance of human morbidity due to influenza incorporating sentinel influenza-like illnesses (ILI) to existing surveillance systems, in addition to strengthening of existing virological surveillance.

All countries of Central and South America plus Jamaica, Cuba, Puerto Rico, Dominican Republic, and CAREC have participated in at least one laboratory training activity in the last three years and are capable of diagnosing of respiratory viral infections by immunofluorescence techniques. Most countries are also capable of performing influenza virus isolation and identification. Laboratories in Argentina and Chile are collaborating in providing hands-on training to professionals from several countries. In addition, several workshops have been carried out in all subregions since 1999 focusing on epidemiologic surveillance of ILI. All these training activities have been sponsored by grants from WHO and the U.S. Centers for Disease Control and Prevention (CDC).

When cases of avian influenza A virus infection occur in humans, information on the extent of influenza infection in animals as well as humans and on circulating influenza viruses is urgently needed to aid the assessment of risks to public health and to guide the best protective measures. Thorough investigation of each case is also essential. While PAHO/WHO and the members of the global influenza network, together with other international agencies, can assist with many of these activities, the successful containment of this public health risk also depends on the epidemiological and laboratory capacity of affected countries and the adequacy of surveillance systems already in place.

The subregional emerging and re-emerging infectious disease surveillance networks in the Amazon, Southern Cone, Central America and the Caribbean have provided for information sharing, standardization of laboratory procedures, exchange of technical expertise and strengthened ties between clinical, laboratory and surveillance services. Several networks have had influenza as a priority disease for surveillance.

Regarding animal influenza and its surveillance, the Veterinary Public Health Unit, through its Pan-American Center for Foot and Mouth Disease (PANAFTOSA) is developing a proposal for a technical cooperation program for the surveillance, diagnosis, prevention, and control of animal influenza in the Region. The plan will operate within the directives of the global human influenza surveillance program and pandemic preparedness plans. The first step of this initiative will be a situation analysis assessing actions taken by countries, based on a questionnaire that has been prepared. A proposal for integrating animal and human health surveillance is underway, and PAHO is networking with pertinent partners.

## **Expected results**

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### ***ER 2.1 Virological and epidemiological surveillance of influenza-like illnesses and other respiratory viral infections implemented Region-wide***

#### Indicators

- Virological surveillance of influenza and other respiratory viral infections strengthened in the region; with 21 countries of Latin America<sup>2</sup> and the Caribbean Epidemiology Center (CAREC)<sup>3</sup> reporting weekly to FluNet.
- Epidemiological surveillance of influenza-like illnesses implemented in 21 countries of Latin America and CAREC.

#### Key activities

- Establish National Influenza Centers (NIC) in countries of the Region that still lack influenza laboratories, including the activation of NICs that are not operational.
- Ensure that one NIC in each country is performing indirect immunofluorescence for Influenza (IFI), viral isolation, and shipment of isolates to the regional reference laboratory (CDC).
- Ensure periodic shipment of viruses and samples from NICs to regional reference laboratory.
- Develop regional laboratory network capacity, including the establishment of sub-regional reference laboratories, to identify and characterize influenza virus strains in a timely manner through molecular laboratory techniques.
- Introduce rapid diagnostic testing technology for influenza diagnosis in severe respiratory disease clusters, enabling timely treatment.
- Collaborate with countries to develop, implement, and monitor effectiveness of influenza like illness (ILI) national sentinel surveillance systems and plan for influenza surveillance during a pandemic.
- Develop surveillance standards for ILI and determine quality indicators for surveillance to enable continuous evaluation of surveillance data, in conjunction with WHO and CDC.
- Collaborate with countries to include the timely report and investigation of acute severe febrile respiratory illnesses admitted as respiratory emergencies into health-care facilities into the influenza surveillance systems.
- Develop guidelines for investigation of clusters of acute respiratory severe syndromes in health-care institutions and collaborate with countries to ensure their implementation.
- Develop, in collaboration with WHO and collaborating centers, new methods for detecting animal influenza virus in environmental samples.
- Provide training in sample collection, transportation, and shipment of animal samples.
- Improve laboratory biosafety conditions and implement good laboratory practices.
- Translate, adapt, and distribute the following WHO publications, pending publication:

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<sup>2</sup> The 21 countries of Latin America include: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Uruguay, and Venezuela.

<sup>3</sup> The 21 CAREC Member States are: Anguilla, Antigua & Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, Netherlands Antilles, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, Suriname, Trinidad and Tobago, and Turks & Caicos.



- Updated WHO manual for surveillance and laboratory diagnosis of influenza (Nov 05)
- Updated WHO manual on animal influenza surveillance and diagnosis (Dec 05)
- Guidelines on national influenza surveillance during influenza pandemics (Dec 05)
- Guidelines on seasonal influenza surveillance (Nov 05)
- Description of roles of National Influenza Centers at different phases of interpandemic, pandemic alert, and pandemic periods (Nov 05)
- National assessment tools for influenza surveillance (Nov 05)
- WHO recommendations on laboratory biosafety in handling H2N2 viruses

### ***ER 2.2 Implementation of animal influenza and influenza epizootics surveillance***

#### Indicator

Countries of Latin America and CAREC will be capable of detecting new outbreaks in animals and will actively seek human cases or clusters of severe respiratory infection in the epizootic region.

#### Key activities

- Structure a regional surveillance system in highly pathogenic avian influenza using the existing Continental Information and Surveillance System (SIVCONT), PANAFTOSA/PAHO.
- Create a situation room for the monitoring of highly pathogenic avian influenza in animals in Latin America and the Caribbean.
- Establish a network for the laboratory diagnosis of highly pathogenic avian influenza in animals and training in the collection and shipment of samples.
- Create and train a team of veterinary field epidemiologists for the investigation of epizootics.
- Promote the active search of human cases or clusters of severe respiratory infection in the epizootic region.
- Develop strong collaboration between animal and human health laboratories to ensure the constant surveillance of both human and animal influenza viruses.
- Develop strong collaboration between human health and veterinary services for the risk management of human infection in areas where there is occurrence of highly pathogenic avian influenza in birds.
- Develop training materials and a model of training methodologies on pandemic flu detection and treatment for local health personnel.

## **3. Support countries in making available pandemic vaccine and antiviral drugs**

The yearly vaccine for seasonal influenza will not protect against a pandemic strain. If a new pandemic virus strain emerges it will be critical to identify the first cases, isolate the virus and then use this virus to rapidly develop an effective vaccine. It will be a number of months before a vaccine is available, and when vaccines are available, they will be in very short supply.

H5N1 is presently considered the most likely virus to ignite the next pandemic. The increasing spread and evolution of H5N1 viruses in Asia have brought the world closer to

another pandemic than at any time since 1968, when the last of the previous century's three pandemics began. WHO will closely follow the development, protective effect, and safety of both the A/H5N1 and any other new pandemic vaccine and will make recommendations as soon as the product is available.

In November 2004, WHO held a meeting to explore ways to speed up the development of vaccines against pandemic viruses. This meeting specifically examined what private industry, regulatory agencies, governments, and WHO should do to ensure that these vaccines are available quickly and in the greatest possible quantities. The 115th Session of the WHO Executive Board recommended the wholesale production and stockpiling of pandemic vaccines.

Several aspects should be considered when producing a vaccine with a pandemic virus, namely:

- Cutting vaccine production time, which would include early preparation of the viral seeds for the production of the vaccines and early preparation of reagents to test the potency of the vaccine, or other time-saving approaches;
- Investigating strategies to economize antigen use. This should be a priority, as should the production of monovalent vaccines and the inclusion of adjuvants to boost efficacy using low doses of antigen, even though immunologically virgin populations may likely require two doses to guarantee protection;
- Developing alternative production methods. Since egg orders for vaccine production using the current technology must be placed 6 months in advance of production start-up, other production methods using fermentation technology should be explored--for example, growth of the virus in tissue culture or antigen production with recombinant DNA technology.

A consultation with companies manufacturing H5N1 vaccine will take place in early December 2005 in Geneva to estimate total manufacturing capacity and required doses to confer immunity. PAHO has promoted meetings with potential producers of the influenza vaccine in the Region of the Americas to determine the availability of regional productive infrastructure. It is estimated that at least two producers will be available in the Region in the medium term.

Given the almost certain shortages, it should be underscored that the best way to guarantee an adequate supply of vaccine for a pandemic is to promote national or sub-regional vaccine production, thus avoiding dependence on external sources. The potential of vaccine and antiviral drug production nationalization during a pandemic must be taken into consideration. Actions pertaining to the supply and distribution of both of these products should be included within the National Influenza Preparedness Plans, taking into consideration regional needs and inequalities. Guidelines for equitable distribution and rational use of antiviral drugs will be important as supply is limited and antiviral resistance is likely to occur.

Two classes of antiviral agents to prevent or treat influenza virus infections are available: the M2 ion channel inhibitors (cyclic amines) such as amantadine and rimantadine; and the neuraminidase inhibitors such as oseltamivir and zanamivir. Although M2 ion channel inhibitors could potentially have some effectiveness against other new emerging influenza A virus strains, initial analysis of influenza viruses isolated from the recent human cases of A/H5N1 indicates that only the neuraminidase inhibitors are effective, at least in

laboratory studies, against influenza virus A/H5N1. Among them, the only drug easily deliverable (orally, in capsules) is oseltamivir, known in its only commercial form as Tamiflu®. As current evidence suggests that the development of resistance is less likely with neuraminidase inhibitors, despite being more expensive, they are currently the choice for mass utilization within standard treatment guidelines.

PAHO is currently engaged in the exploration of possible mechanisms to build up a regional stockpile of oseltamivir, including the means for its financing. Also, PAHO is currently exploring joint initiatives for local production of antiviral drugs.

If pandemic influenza were to occur today, antiviral drugs and pandemic vaccines would not be available. Taking this into consideration, PAHO activities to support countries in making pandemic vaccine and antiviral drugs available will consider different scenarios which are dependent on production capacity and availability of vaccines and antiviral drugs.

### **Expected results**

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#### ***ER3.1 Selected countries' capacity to produce pandemic influenza vaccine strengthened and stockpiles available when possible***

##### Indicator

- Pandemic influenza vaccine produced by at least two Latin American manufacturers available.
- Depending upon regional availability, Latin America countries and CAREC will have supplies of pandemic influenza vaccine to high risk populations.
- Contingency licensing mechanisms for influenza pandemic vaccine will be in place and agreed upon by National regulatory agencies.

##### Key activities

- Promote research and development to enable the use of smaller antigen dose in influenza vaccines, including development, production, and clinical testing (i.e. adjuvants, delivery strategies) in collaboration with WHO and other partners.
- Assess existing manufacturers' production capacity, cost, and time-frame for delivery of pandemic vaccine in its final form and in bulk.
- Assess the regional capacity for bulk pandemic vaccine processing and supply.
- Identify selected manufacturers in Latin America and support the transfer of technology to assist in the development and manufacture of influenza pandemic vaccine (potential candidates: Brazil and Mexico).
- Establish agreements with influenza vaccine manufacturers in Europe and the United States to assure supply of stocks of vaccine for Latin America and the Caribbean.
- Mediate agreements between influenza vaccine manufacturers and countries for the transfer of technology for vaccine production.
- Promote scaling-up of pandemic vaccine manufacture in two countries in the Region.
- Develop mechanisms for contingency licensing for pandemic influenza vaccine.
- Promote stockpiling of pandemic strain bulk vaccine, as recommended by the 115th session of the WHO Executive Board.
- Support countries in enhancing their capacity for distributing pandemic vaccine at all levels of the health system.

***ER3.2 Availability and scaling up capacity of antiviral drugs production assessed and selected countries' production capacity strengthened if needed***

Indicator

- Regional supply and potential production capacity of antiviral drugs has been assessed.
- All countries have identified the supplier of antiviral drugs in the Region.
- All countries in the Region have set up information systems and the capacity to track stockpiling, distribution, and use of antiviral medicines in their health systems.

Key activities

- PAHO will promote availability of antiviral drugs in the region and countries by doing the following activities in sequential order:
  - Assess existing manufacturers' production capacity, cost, and delivery time-frame for delivery of antiviral drug in its final form.
  - Assess existing manufacturers' production capacity, cost, and time-frame for delivery of bulk antiviral drug.
  - Assess regional capacity for processing bulk antiviral drug for supply of drug in its final form.
  - Assess local technological capacity to develop and manufacture antiviral drugs as an alternative supply source.
  - Mediate agreements between antiviral drug manufacturer and countries for the transfer of technology for antiviral drug production.
  - Develop mechanisms for contingency licensing mechanisms for antiviral drugs put in place exclusively during pandemic influenza.
- Assist countries to ensure their adequate supply and distribution system, as well as accurate information on stockpiling, distribution, and rational use of antiviral medicines.

***ER3.3 Procurement of vaccine and antiviral drugs during the pandemic planned and assessed considering likely scenarios***

Indicator

- 80% of countries have included in the preparedness plan the details on vaccine purchase and distribution, detailing responsibilities by institutions.
- 80% of countries have assessed vaccine use evaluating different scenarios depending upon vaccine availability.
- Regional antiviral drugs procurement mechanisms in place.

Key activities

- The Vaccine Revolving Fund will continue to consolidate vaccine requests from the countries, including those for pandemic influenza vaccine if available, in order to assess the regional need for and to prepare for vaccine purchasing through special bid solicitation process.
- Initiate procurement of antiviral drugs, including product specifications, demand forecast, potential suppliers, and availability.

## **4. Plan for health-care services and infection control**

An influenza pandemic will create significant challenges for the health care system, as not only patients will require healthcare but infection is likely to occur among health care workers and their family members resulting in shortages of trained staff to care for others. Particularly during the period before vaccine becomes available, quality health care will be the primary intervention to limit adverse health outcomes.

In addition to guaranteeing equitable access to health-care, which is already a regional concern during the pre-pandemic phase, an influenza pandemic is likely to demand an additional surge need. This need will test the health-care system's ability to rapidly expand beyond normal services to meet the increased demand for qualified personnel, medical care, and public health. Advance surge capacity planning will prove crucial to an adequate response to a pandemic. Physical resources, such as hospital beds and protective equipment may not be sufficient to meet demand. An ethical framework for decision of allocation of medical services and devices will be important to support healthcare professionals. Likewise, given occupational exposure of health-care workers, high rates of work absenteeism are likely to occur. Therefore, staffed hospital beds may be a more limiting factor than bed availability alone.

One aspect which will influence the final death toll is the level of local, regional, and national preparedness. Health-care services response will play a central role in reducing this impact and planning to maintain health-care systems operational will be especially crucial. The healthcare system must be able to provide care as needed at the appropriate point of service-urgent care, primary care and hospital care. Special situations involving referral of patients with complications to other Regions or other countries must be addressed, since a significant proportion of the population of Latin America and the Caribbean do not currently have access to services. Cultural aspects including self and family care practices, use of community resources (traditional healers, pharmacies, informal caregivers) and perspectives on death and dying also influence how demand for health care services during pandemics can be anticipated and managed. Such plans need to be both strong and flexible to address possible scenarios including the special needs of population sub-group for which healthcare access is not readily available (indigenous, displaced, and urban marginalized populations).

Infection control must also be reflected in preparedness plans, as specific policies and procedures are needed to minimize the risk of spreading infection. Human influenza is transmitted primarily through respiratory droplets. Transmission occurs when virus-containing droplets generated from the infected person are propelled through the air and deposited on the host's conjunctivae, nasal mucosa, or mouth. Because droplets do not remain suspended in the air, special air handling and ventilation are not required to prevent droplet transmission. Therefore, precautions for influenza prevention include standard and droplet precautions.

Notwithstanding the precautions directed to non-pandemic influenza, WHO has recommended the use of high-efficiency masks (e.g. N95 respirator or higher) in addition to droplet and contact precautions for H5N1 infection control precautions. This recommendation takes into consideration the current uncertainty about the exact modes of human transmission of avian influenza, high mortality observed with the current H5N1, and the possibility of viral mutation. In addition to airborne precautions, a negative pressure room

– if available – is recommended. These precautions should be implemented while the patient is infectious and include hand washing and antiseptics (hand hygiene); use of personal protective equipment (PPE) when handling blood, body substances, excretions and secretions; appropriate handling of patient care equipment and soiled linen; prevention of needlestick injuries; environmental cleaning and spills-management; and appropriate handling of waste.

Droplet precautions suffice to prevent transmission of annual epidemics of human influenza virus. Airborne precautions may be considered in the pandemic alert-period and definitely should be used for aerosol-generating procedures, but the feasibility or supporting evidence is still unclear for use of airborne precautions once the pandemic is spreading internationally. Provision of equipments and materials required to implement these recommendations are to be in place. Also, additional healthcare products and a broader collection of commodities will be needed during a pandemic and should be catalogued in advance to facilitate their procurement.

It is important to plan for delivery mechanisms of antiviral drugs and influenza vaccine during the pandemic, strengthening delivery mechanisms already in place. In addition, surveillance systems for antiviral drugs' susceptibility and influenza vaccine adverse events will need to be functioning during a pandemic since vaccine/antiviral safety issues are activities that should be closely monitored in the global and regional level.

## **Expected results**

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### ***ER4.1 Health-care services assessed and provisions for service scaling-up in place***

#### Indicator

- Tools for surge capacity determination in the country level validated and available to trained health-care personnel in countries of Latin America and CAREC.
- Countries of Latin America and CAREC have health-care services assessed and provisions for scaling up services for pandemic in place considering different realities of access to services.

#### Key activities

- Support the assessment of health-care services facilities, networks, and personnel for all phases of pandemic, including provision for scaling up services in non-traditional sites and considering potential illness of healthcare personnel.
- Make provisions for special situations including procurement of services from other regions and countries, considering national and regional inequalities.
- Assist countries in ensuring adequate stocks of healthcare supplies (i.e., syringes, needles, respirators, etc.), initiating procurement including product specifications, demand forecast, potential suppliers, and availability.
- Assist countries in developing mechanisms for recruiting additional professionals (i.e., retired healthcare workers) able to provide care during a pandemic.
- Develop and disseminate guidelines for prioritizing health-care needs and service delivery during a pandemic.
- Develop and disseminate detailed regional, national, and facility-level plans for providing health services, including the provision of vaccines and antiviral drugs during a pandemic.

- Adapt available methodologies to prepare or update census of health facilities including current and estimated surge capacity, which also identifies types and numbers of providers in reserve pool.
- Make available and train national and country-level PAHO staff in the use of tools for determination of surge capacity, especially publicly available software and other tools in the plan (i.e., FluSurge, FluAid) to plan for healthcare services considering different attack rates and likely scenarios.
- Develop prototype manuals for the organization and functioning of non-traditional sites for health services-mobile hospital; private resources such as hotels; temporary shelters in public facilities including staffing by non-traditional providers.
- Incorporate pandemic influenza in the Hospital Disaster Planning training activities currently in place.

***ER4.2 Delivery mechanisms of antiviral drugs during the pandemic planned and assessed considering likely scenarios and delivery mechanisms of influenza vaccine strengthened.***

Indicator

- Countries of Latin America and CAREC have delivery mechanisms for antiviral drugs in place.
- Countries of Latin America and CAREC have routine vaccine delivery mechanisms enhanced to support pandemic influenza vaccine delivery.

Key activities

- Plan delivery mechanisms for influenza anti-viral drugs in collaboration with national health authorities and industry.
- Plan vaccination strategies for pandemic influenza vaccine considering countries' experiences with massive vaccination campaigns.

***ER4.3 Supply and distribution of antimicrobials and diagnostic test kits during the pandemic planned and assessed***

Indicator

Countries of Latin America and CAREC have supply procurement and delivery mechanisms in place.

Key activities

- Assess supply of antimicrobials for treatment of influenza complications.
- Assist countries in ensuring adequate supply and distribution system, as well as accurate information on stock-piling, distribution, and rational use of antimicrobials.
- Assist countries in assessing their need for influenza laboratory diagnostic equipment including kits for rapid testing.
- Assist countries in ensuring adequate supply and distribution system for influenza diagnostic kits.
- Initiate procurement of antimicrobials and diagnostic kits, including product specifications, demand forecast, potential suppliers, and availability.
- Translate, adapt, and distribute the following WHO publication:
  - WHO recommendations on the use of rapid testing for influenza diagnosis

***ER4.4 Case management and surveillance systems for antiviral drugs' susceptibility and influenza vaccine adverse events prepared and assessed***

Indicator

Countries of Latin America and CAREC have case management protocols and surveillance systems for susceptibility of antiviral drugs and adverse events to pandemic influenza vaccines prepared.

Key activities

- Assist countries in the development of surveillance system for influenza susceptibility to antiviral drugs.
- Assist countries in the enhancement of existing vaccine adverse events surveillance systems to monitor adverse events related to influenza pandemic vaccine.
- Develop and disseminate simple algorithms for primary clinics with minor resources for triage, diagnosis of complications, and therapy.
- Develop and disseminate self-care guidelines.
- Translate, adapt, and distribute the following WHO publications, pending publication:
  - Updated recommendations on case management and clinical diagnosis including development of clinical case definition
  - Clinical guidelines for the prevention and treatment of influenza and complications including triage of cases at different levels of care/location of service.

***ER4.5 Infection control measures and supply/distribution of infection control supplies, including personal protective equipment be planned and assessed throughout the health-care delivery system***

Indicator

National pandemic preparedness plans have included appropriate strategies for infection control.

Key activities

- Collect and disseminate information through a virtual platform (Sharepoint) on best practices/lessons learned during previous respiratory diseases episodes of pandemics/outbreaks (i.e., SARS in Canada).
- Support countries in planning for infection control strategies in the community and outpatient settings.
- Assist countries in estimating needs for infection control supplies and plan for their stockpiling.
- Assist countries in ensuring adequate supply and distribution system for infection control supplies.
- Initiate procurement of personal protective equipment (PPE), including product specifications, demand forecast, potential suppliers, and availability.
- Make available a cadre of informed experts prepared to provide consultation to countries which need to strengthen infection control programs for a pandemic.
- Translate, adapt, and distribute the following WHO publication:
  - Influenza A (H5N1):WHO Interim Infection Control Guidelines for Health Care Facilities



## 5. Reduce opportunities for human infection

Avian influenza was first identified more than 100 years ago and is characterized as an infection of birds caused by type A influenza viruses. All birds are thought to be susceptible in varying degrees to infection with avian influenza viruses. Infection causes a wide spectrum of symptoms in birds, ranging from mild illness to a highly contagious and rapidly fatal disease resulting in severe epidemics. The latter is known as “highly pathogenic avian influenza” and is characterized in animals by sudden onset, severe illness, and rapid death, with mortality that can approach 100%. Sixteen subtypes of influenza A viruses are known to infect birds, thus providing an extensive reservoir of influenza viruses potentially circulating in bird populations.

Migratory waterfowl – most notably wild ducks – are the natural reservoir of all influenza A viruses, and historically have carried low-pathogenic viruses without showing symptoms or succumbing to disease. Domestic poultry, including chickens and turkeys, are particularly susceptible to epidemics of highly pathogenic influenza. Direct or indirect contact of domestic flocks with wild migratory waterfowl has been implicated as a frequent cause of epidemics. Live bird markets have also played an important role in the spread of epidemics.

Highly pathogenic viruses can survive for long periods in the environment, especially when temperatures are low. Avian influenza A viruses are readily transmitted from farm to farm by mechanical means, such as by contaminated equipment, vehicles, feed, cages, or clothing. However, stringent sanitary measures on farms can confer some degree of protection.

To date, all outbreaks of the highly pathogenic virus have been caused by influenza A viruses of subtypes H5 and H7. From 1959 to 2003, only 21 outbreaks<sup>4</sup> of highly pathogenic avian influenza had been reported worldwide. In the same period, four outbreaks have been reported in the Region of the Americas— H5N9 in Canada, 1966; H5N2 in USA, 1983-1985; H5N2 in Mexico, 1994-1995; H7N3 in Chile, 2002. In 2004, two additional outbreaks occurred in USA (H5N2) and Canada (H7N3). These outbreaks prompted the implementation of emergency control activities, such as massive culling of poultry and quarantine which are standard control measures aimed at preventing spread to other farms and eventual establishment of the virus in a country’s poultry population.

Several measures can help minimize the global public health risks that could arise from large outbreaks of highly pathogenic avian influenza in birds. An immediate priority is to halt further spread of epidemics in poultry populations. This means reducing opportunities for human exposure to the virus. Genetic reassortment of human and avian influenza viruses can occur in humans co-infected with current human H1 or H3 subtypes of influenza A and an avian influenza virus acquired from poultry. Vaccination of persons at high risk of exposure to infected poultry with human influenza vaccine can reduce the likelihood of co-infection of humans with avian and influenza strains, minimizing the risk of genetic reassortment. It is

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<sup>4</sup> Scotland 1959 (H5N1), England 1963 (H7N3), Canada 1966 (H5N9), Australia 1976 (H7N7), Germany 1979 (H7N7), England 1979 (H7N7), USA 1983-1985 (H5N2), Ireland 1983 (H5N8), Australia 1985 (H7N7), England 1991 (H5N1), Australia 1992 (H7N3), Australia 1994 (H7N3), Mexico 1994-1995 (H5N2), Pakistan 1994 (H7N3), Australia 1997 (H7N4), Hong Kong-China 1997 (H5N1), Italy 1997 (H5N2), Italy 1999-2000 (H7N1), Hong Kong-China 2002 (H5N1), Chile 2002 (H7N3), Netherlands 2003 (H7N7)

known that the pandemic viruses of 1957 and 1968 were reassortants of human and avian subtypes of influenza A.

Influenza vaccines are normally made by growing the seed viruses in fertilized chicken eggs. The time between the identification of the strain and the availability of the vaccine is 6-8 months. Twice a year (in February for the Northern Hemisphere and September for the Southern Hemisphere), WHO holds a consultation with the directors of the Collaborating Centers and representatives from the national laboratories to issue recommendations on the composition of the trivalent vaccine, containing two type A virus subtypes (H3N2 and H1N1), and a type B virus. Since 1972, WHO has recommended 39 changes in the influenza vaccine composition. Global vaccine production currently stands at around 300 million doses and is concentrated in Australia, Europe, Japan, and North America, and WHO has strongly recommended strengthening national capacities in other regions to address vaccine shortages.

Annual influenza vaccine is 70%-90% effective for preventing influenza infection in young adults and 30%-40% in the institutionalized elderly. In this group, the vaccine reduces the severity and incidence of complications by 50%-60% and mortality by 80%. Vaccine effectiveness is dependent upon matching of the circulating and vaccine strain, being higher when the vaccine antigen is very similar to the strains of the circulating virus. In the non-institutionalized elderly, the vaccine is 58% effective in reducing influenza infections and 30-70% effective in reducing hospitalization and pneumonia. A recent clinical trial has demonstrated that vaccination in non-institutionalized individuals aged 65 and older reduced hospitalization for cardiac disease by 19%, stroke by 16-23%, and death due to all causes by 48-50%. Another reason to make better use of the seasonal vaccine is that it will help boost productive capacity to respond to a pandemic.

Annual immunization of human high-risk populations has proven to be a very cost-effective intervention. Economic studies conducted in the United States of influenza vaccination in persons aged 65 years and over demonstrated overall societal cost savings and substantial reductions in hospitalizations and deaths. One study demonstrated that vaccination resulted in net savings per quality-adjusted life year (QALY) gained in elderly and resulted in costs of \$23-\$256 per QALY among younger age groups.

In November 2004, PAHO's Technical Advisory Group on Vaccine Preventable Diseases (TAG) recommended that countries should utilize the yearly influenza vaccine in their population aged 60 years and over, chronically ill individuals, immunodeficient populations, health professionals, and pregnant women. TAG has also recommended that countries conduct studies on disease burden and the economic impact of annual influenza epidemics to support influenza immunization policies in the context of other national health priorities. The yearly influenza vaccine is gradually being introduced in the Region. In a survey carried out in 2004 by the PAHO's Immunizations Unit (FCH/IM), 13 countries reported that the vaccine is being used in their immunization routine mainly targeting the elderly. In addition Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Panama, and Uruguay have introduced influenza immunization for health-care workers and the chronically ill. The countries of the Southern Cone have a long tradition of immunizing against influenza. Recently, Costa Rica and El Salvador have successfully introduced the vaccine for the high-risk groups recommended by WHO. Costa Rica, El Salvador, and Uruguay are in the process of introducing the vaccine for children from 6-24 months.

In order to assure the supply of quality influenza vaccines to countries in the Region, PAHO's Vaccine Revolving Fund (RF) has added these biologicals to the list of products available to countries on a regular basis. The lower price of the vaccine supplied through the RF will hopefully foster the introduction of the vaccine in many countries. Increasing the utilization of influenza vaccine will help not only in decreasing the morbidity and mortality caused by influenza virus, but also in expanding manufacturing capacity, making more vaccine available in case of an emergency due to an influenza pandemic.

In December 2003, laboratory tests confirmed the presence of H5N1 avian influenza virus in human cases of severe respiratory disease in the northern part of Viet Nam. Until September 23<sup>rd</sup> 2005, a total of 115 H5N1 human cases with 59 deaths were reported to the WHO. H5N1 is of particular concern as it mutates rapidly and has a documented propensity to acquire genes from viruses infecting other animal species. Birds that survive infection excrete virus for at least 10 days, orally and in feces, thus facilitating further spread at live poultry markets and by migratory birds. Also, H5N1 has a documented ability to pass directly from birds to humans. Moreover, once in humans, H5N1 causes severe disease with very high mortality. These features combine to make H5N1 of concern for a greater reason: its potential to ignite an especially severe pandemic.

Evidence indicates that avian H5N1 is now endemic in parts of Asia, having established a permanent ecological niche in poultry and also expanding its mammalian host range. Another surprising finding is the detection of highly pathogenic H5N1 in dead migratory birds, suggesting a change in the role of migratory waterfowl in the evolution and maintenance of highly pathogenic H5N1.

Asymptomatic domestic ducks have recently been shown experimentally to excrete H5N1 in its highly pathogenic form, suggesting an important silent role in maintaining transmission. As these ducks can excrete large quantities of lethal virus without the warning signal of visible illness, it has become difficult to give rural residents realistic advice on how to avoid exposure. The role of domestic ducks may help to explain why several recent human cases could not be traced to contact with diseased poultry. It is also highly likely that apparently healthy ducks play a role in maintaining transmission by silently seeding outbreaks in other poultry.

The present concentration of poultry outbreaks in rural areas, where most households maintain free-ranging flocks and ducks and chickens mingle freely, is of particular concern, especially as many households depend on these birds for income and food. Such outbreaks may escape detection, are difficult to control, and increase the likelihood of human exposures, which may occur when children play in areas shared by poultry or when families slaughter or prepare birds for consumption.

FAO and OIE have developed recommendations for the establishment of plans for the prevention, control, and eradication of the H5N1 avian influenza epidemic in Asia. These organizations also warn that specific recommendations are necessary for other regions of the globe, according to their respective needs and conditions.

WHO recommends targeted administration of seasonal influenza vaccine to selected groups at increased risk of exposure to the H5N1 avian influenza virus currently circulating in Asia, specifically in countries currently experiencing outbreaks of highly pathogenic H5N1 avian influenza in poultry, as one of several measures for reducing opportunities for the

simultaneous infection of humans with avian and human influenza viruses. Although vaccination with current inter-pandemic vaccine will not protect humans from infection with avian H5N1 influenza, it minimizes the risk of co-infection and genetic reassortment of human and avian influenza viruses in humans.

When a potential pandemic virus with limited human to human transmission is occurring, important public health interventions include aggressive ascertainment of potentially infected human cases, followed by adequate implementation of infection-control isolation precautions in health-care settings, and quarantine of contacts, accompanied by antiviral therapy.

Poultry farming in Region of the Americas involves high concentrations of birds and sizable numbers of people in direct contact with these birds. These characteristics could lead to the virus becoming endemic in the Region, with a serious impact on the economy as well as on public health. Influenza pandemic preparedness requires the integration of the public health and agriculture sectors. The ample regional experience with integrated work between the animal health sector and the poultry industry has facilitated surveillance of highly infectious diseases such as New Castle and avian influenza and efforts to eliminate foot-and-mouth disease. Such experience is extremely valuable in the establishment of integrated national influenza pandemic preparedness plans. The joint preparation of pandemic preparedness plans would offer an opportunity to seek new approaches for integration beyond the institutional and intersectoral limits.

### **Expected results**

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#### ***ER 5.1 Regional collaboration of animal and human public health sectors will be intensified***

##### Indicator

Countries of Latin America and CAREC will have implemented prevention, early detection, and control strategies of highly pathogenic avian influenza.

##### Key activities

- Support the establishment of a regional highly pathogenic avian influenza prevention program through the strengthening of poultry health programs in countries.
- Support a regional survey to estimate the avian population in the Region.
- Implement quarantine systems and veterinary border control activities in compliance with international regulations.
- Strengthen regional capacity to investigate and diagnose the occurrence of epizootics when avian influenza is suspected.
- Train national professionals to put control measures into action immediately if an epizootic of avian influenza is suspected.
- Promote vaccination of poultry workers exposed to infected poultry with seasonal vaccine.
- Improve communication and information systems to facilitate the timely dissemination of information in the Region when epizootics possibly caused by animal influenza are identified to promptly adopt recommended international measures.
- Develop risk communication guidelines and materials targeted multiple audiences including small-scale poultry producers to be utilized during the investigation and/or the implementation of control measures during a suspected and confirmed epizootics caused by animal influenza.

- Promote integration activities with veterinary health organizations such as the OIE, FAO, and USDA.

***ER 5.2 Influenza vaccine introduced into the routine annual immunization schedule in high-risk populations in the Region***

Indicator

21 countries in the Americas will have introduced annual influenza routine immunization into high-risk populations by 2007.

Key activities

- Support countries in determining target populations and estimating needed doses of influenza vaccine.
- Continue to include influenza vaccine in the revolving fund portfolio and allow countries to purchase needed vaccines at lower prices.
- Support countries in conducting studies on disease burden and the economic impact of annual epidemics.
- Evaluate impact of the vaccine introduction in countries and share lessons learned.
- Analyze and monitor vaccine coverage data in order to identify areas of low vaccine coverage and propose targeted strategies.
- Increase number of suppliers and capacity of existing suppliers offering vaccine to participating countries in the Revolving Fund.
- Continue to promote the “Vaccination Week of the Americas”, which has diminished inequities in access to vaccines, including influenza, throughout the Region.

## **6. Implement a communication strategy and raise awareness to encourage pandemic planning**

Communications efforts will be critical both before and during a pandemic, and strategies within human and animal health sectors should be integrated. In the pre-pandemic phase they must be aimed at raising awareness among the public, government agencies, and poultry producers of the potential impact of an influenza pandemic and the measures that can be taken to mitigate it. During this phase, the health sector has the responsibility to raise awareness and help the rest of society make adequate preparations, including issues related to contingency planning, business and government continuity, and other measures to mitigate major societal disruption. The agricultural sector has the responsibility to communicate with poultry producers, both small and large-scale, about the risks of avian influenza and to promote awareness in rural areas.

During a pandemic, the primary communication is to build, maintain or restore trust between the health community and the public. Communications need to acknowledge uncertainty while avoiding excessive reassurance. Thus, risk communication must maintain trust and respond to public demand even when the full picture is not known. Failure to act honestly, timely, and empathically during times of crisis can create chaos. During outbreaks fear tends to increase as trust decreases.

Authoritative messages to the public must be timely even if based on partial information. Transparency and easily understood messages are crucial, as is the need to respond to media

requests and interviews. It is also essential that communication is done as an integrated effort between Global, Regional, and National levels. Messages should offer potential actions about what the public can do to prepare, prevent, and provide care in the event of an influenza pandemic. In addition to messages to the public, communications will also need to be targeted to non-health areas involved in the response (i.e. drugstores, police, and emergency personnel) and communications strategies should reflect this demand. Trained communication specialists should act as spokespersons and ideally representatives from the community should be brought into the decision-making and explanation phases.

The health communication field traditionally has not had to focus on trust issues because medical professionals are viewed as trustworthy, acting in the public's best interest. Risk communication has usually focused on situations in which people were overly alarmed about small hazards. Nevertheless, in the event of pandemic influenza such hazards will be significantly increased and there will be a need to spur the public into rational action. The risk communication plan and preparations must be started before the pandemic occurs to help mitigate some of the expected social and economic disruption while maintaining a credible response and provide technical cooperation in information during an outbreak. Senior managers must be a part of that process. Plans must be flexible to allow for ongoing evaluation and midcourse corrections.

### **Expected Results**

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#### ***ER6.1 Communication strategies developed to disseminate information and encourage preparedness among health, agriculture and other government officials and private sector leaders***

##### Indicator:

- Regional communication strategies developed for the promotion of pandemic influenza awareness in health, agriculture, and other government officials of 21 countries of Latin America and CAREC countries.
- Ministries of Health and Agriculture of the Region have key personnel trained in risk communication.

##### Key activities

- Create an inventory of crisis and risk communication plans from throughout the Organization, Member States and other agencies.
- Work with the countries to develop communications plans including consistent pre-pandemic preparedness messages.
- Prepare communication materials including a web portal targeted to people with any level of responsibility for preparedness, health, government operations, private business, and others, with the aim of encouraging individual agency, company, and area contingency planning. This would make PAHO and other agencies' materials available.
- Develop communications expertise, materials and activities specifically geared for border and rural areas and animal producers, incorporating expertise from Ministries of Agriculture.
- Enhance capacity throughout the Organization and the Member States by providing training in outbreak and risk communication.
- Work with Member States to create a consistent overall communication plan that builds trust and transparency.

- Develop a communication program to disseminate recommendations for healthy behaviors to prevent pandemic flu.
- Develop training for personnel of the health and agriculture sectors, in risk communication for pandemic influenza issues.

***ER6.2 Communication strategies developed to educate people involved in risk communication, including key journalists, in basic pandemic influenza issues, covering prevention, planning, and response.***

Indicator

Communications strategy with specific messages developed, validated, and distributed.

Key activities

- Develop a comprehensive Web portal on influenza pandemic preparedness, linking with key web pages including WHO, CDC, FAO and others.
- Develop consistent preparedness messages and influenza communications materials covering print, broadcast and community level materials in appropriate languages. These materials will be freely available on the web portal.
- Develop a series of workshops for journalists in the countries on pandemic influenza, incorporating responsible Health Ministry officials in training for officials from the health and other sectors to outline communications strategies, lines of communication, key messages, and dissemination
- Develop network of information officers and journalists in the countries to advance the knowledge base on pandemic influenza and assist in disseminating information.
- Work to create a virtual community for exchange of information and experiences among experts, doctors, veterinarians, educators, business persons, and journalists.

## **7. Estimate potential impact of an influenza pandemic and assess additional information gaps to guide policy making**

Central to preparedness planning is to estimate what the likely impact of the next pandemic would be, including associated morbidity and mortality. Tentative estimates to this fundamental question have ranged from 2 million to over 50 million deaths and there are several reasons for this variation. Some estimates are based on extrapolations from past pandemics, whereas the most precise predictions are based on the 1968 pandemic, for which estimates also vary from one to four million deaths. Similarly, the number of deaths from the Spanish flu pandemic of 1918 has been estimated to range from 20 to over 50 million.

The specific characteristics of a future pandemic virus cannot be predicted. It has been suggested that it may affect between 20-50% of the total population. It is also unknown how pathogenic a novel virus would be, and which age groups will be most affected. Even in the best-case scenario, during the next pandemic 2-7 million people would die and tens of millions would require medical attention. If the next pandemic virus is a very virulent strain, deaths could be dramatically higher.

Influenza vaccines are essential for an adequate response to an influenza pandemic. However, in all likelihood, it will be impossible to have vaccines for the initial phase of the pandemic, and when vaccines are available, they will most likely be in short supply. The

potential use of antiviral agents for prophylaxis and treatment has been evaluated and may be of greatest use in the earliest phases of a pandemic to retard the spread of the virus.

Given these constraints, countries should prioritize the interventions to certain population groups. Setting goals and priorities involves logistical, ethical, cultural, political, and legal considerations, as well as continuous analysis of the epidemiological situation to target measures to most-affected groups. During a pandemic the definition of high-risk groups may change based on epidemiologic evidence and should take into account availability of antiviral drugs and vaccine. Regional guidelines for prioritization may provide guidance and could facilitate priority-setting at the national level.

It should be noted that groups most affected by pandemic virus may not be the same as those affected yearly by seasonal influenza. Monitoring the course of the pandemic will provide this information and guide decision-making. The groups to consider for vaccination are:

1. Essential services personnel (to prevent interruption of services during the pandemic): clinical health workers; personnel essential for vaccine and drug production; staff of nursing homes and long-term care facilities; the police; firefighters; the armed forces; and the staff responsible for the operations of other public utilities;
2. People at higher risk of mortality from influenza: traditionally, residents of nursing homes or long-term care facilities; people aged 65 with chronic heart and lung disease; pregnant women in the second and third trimester; children aged 6-23 months; children 6 months to 18 years under a chronic aspirin regimen; other vulnerable groups, such as indigenous people living in isolated communities; etc.;
3. Individuals in close contact with people at high risk: health workers and nursing home staff; family members in daily contact with people at risk; and people in daily contact with children aged 0-5 months;
4. Preschool and elementary schoolchildren, who are considered to be frequent transmitters of the disease in the community;
5. People without risk factors for complications: This is the largest population group and includes healthy adults and children. The main objective is to lower the demand for medical services and enable individuals to continue their daily activities and avoid greater social disruption. This decision depends on the availability of the vaccine and the epidemiological situation.

The following interventions, listed in descending order of priority, can be used as a guide for planning and triggering antiviral drug use, but may be re-examined at any time.

1. Treatment of persons hospitalized for influenza
2. Treatment of ill health-care and emergency services workers
3. Treatment of ill high-risk persons in the community
4. Prophylaxis of health-care workers
5. Control of outbreaks in high-risk residents of institutions (nursing homes and other chronic care facilities)
6. Prophylaxis of essential service workers
7. Prophylaxis of high-risk persons hospitalized for illnesses other than influenza
8. Prophylaxis of high-risk persons in the community

Countries should rely on the National Pandemic Preparedness Committees, in which all the sectors are widely represented, to help policymakers set goals and priorities. Before the pandemic emerges, country pandemic preparedness plans should already indicate the amount



of vaccine and antiviral drugs required, the groups to vaccinate and/or receive antiviral drugs, proposed strategies for use and supply of both vaccines and antiviral drugs. This information will provide the data and incentives needed to increase global production.

Guidelines for operational research to be conducted during the pandemic should be developed and partnerships established in advance, as well as planning for the dissemination of research results.

## **Expected results**

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### ***ER7.1 Potential health impact of an influenza pandemic estimated, including economic impact to guide policy-making***

#### Indicator

- Studies estimating Regional morbidity, mortality, and economic impact due to pandemic influenza conducted.
- Framework for country level estimation of health and economic impact of influenza pandemic developed, validated and disseminated to the 21 countries of Latin America and CAREC.

#### Key activities

- Develop and validate tools for country level estimation of health and economic impact of influenza pandemic.
- Conduct modelling studies of pandemic virus emergence considering possible pathways for viral emergence.
- Conduct modeling studies to estimate burden of an influenza pandemic.
- Conduct modeling studies to assess economic impact of an influenza pandemic.
- Translate, adapt, and distribute the following WHO publications, pending publication:
  - Generic protocol for population-based surveillance to estimate the disease burden of influenza and other ARI from vaccine preventable or potentially preventable agents.
- Develop an operational research agenda to be put in place once pandemic influenza emerges with defined roles for all partners involved (PAHO, WHO, collaborating centers, research institutions and governments).

### ***ER7.2 Criteria to be considered for setting priority groups determined and strategies for vaccination and antiviral drugs administration included in National Plans***

#### Indicator

- Regional guidelines and criteria for identification of priority groups to receive antiviral drugs developed and available.
- 80% of countries have identified their groups at risk to be targeted as the first priority during the pandemic.

#### Key activities

- Train PAHO and health-care personnel at the country level on priority setting for use of vaccines and antiviral drugs during influenza pandemics.
- Support countries in documenting strategies and best practices in vaccinating large groups at risk

- Survey the countries regarding groups at risk to be prioritized for vaccination during the pandemic.
- Conduct modeling studies to estimate the impact of vaccination considering scenarios of vaccinating different high risk groups.
- Review lessons learned from annual vaccination campaigns in different countries in the region in order to share best practices.
- Translate, adapt, and distribute the following WHO publication:
  - WHO guidelines on the use of vaccines and antivirals during influenza pandemics.

## **8. Build partnerships and strategic alliances in support of an effective response to pandemic influenza**

Facing a pandemic influenza situation will require the active involvement of global, regional, and country-level partners, including international organizations, sub-regional integration systems, multilateral organizations active in developing countries and transition economies, professional standards setting bodies, and the private sector. This larger community should be included in the planning phase, as they will be involved during a pandemic. Advocacy among non-health leaders should be carried out as early as possible to garner the required support for implementation.

Coordination between organizations leads to more effective use of resources and marshalling of efforts internationally. As pandemic preparedness is a complex, multifaceted process, it should consider the roles of the public sector, private sector, and other stakeholders. Strategic alliances must take place at the global, regional and country levels for pandemic preparedness to be effective. Partnerships could assist in the search for culturally appropriate development approaches tailored to specific communities. New alliances should also consider lessons learned from innovative groups who already have plans in place including in the private sector.

Effective partnerships at the local and regional level directed towards public health activities are already in place. The Inter-agency Coordination Committees (ICC) is one example that has demonstrated effectiveness in gathering efforts for immunization activities in several countries in the region. Pandemic preparedness planning should take advantage of these effective existing structures as well as forming new alliances, when applicable. For examples, new partnerships will need to be established to ensure implementations of the core capacities set forth by the adopted IHR-2005, especially those pertaining to designated airports, ports, and ground crossings<sup>5</sup>. Both PAHO and WHO have begun resource mobilization efforts to allow for the implementation of influenza activities.

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<sup>5</sup> See WHA58.3

## **Expected Results**

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### ***ER8.1 Regional and sub-regional partnerships will be operational***

#### Indicator

Regional/sub-regional inter-agency groups in place, considering existing structures

#### Key activities

- Mapping of key regional/sub-regional partners including their potential contribution to an effective response.
- Gathering of key regional/sub-regional partners to explore/define their specific role(s) in responding to the pandemic, including the group's internal decision making process, coordination and communication mechanisms.
- Institutionalize inter-agency group.
- Develop inter-agency collaboration plan which includes implementation of the IHR and resource mobilization strategies.

### ***ER8.2 Country level partnerships have been established and will be operational***

#### Indicator

Country level inter-agency groups in place, considering existing structures

#### Key activities

- Support the mapping of key country level partners including their potential contribution to an effective response.
- Support the gathering of key country level partners to explore/define their specific role(s) in responding to the pandemic, including the group's internal decision making process, coordination and communication mechanisms.
- Support the institutionalization inter-agency group.
- Support the development of inter-agency collaboration plan and resource mobilization strategies.

## PHASE: EMERGENCE OF A PANDEMIC VIRUS

### 9. Contain or delay early spread of the virus

Once a potential influenza A pandemic strain has developed improved human-to-human transmissibility, a pandemic virus is considered to have emerged. All efforts should then aim to change the early history of the pandemic. The window of opportunity for taking action to contain or delay the transmission of the pandemic virus 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. At the same time accurate communication efforts are essential to contain early spread.

WHO has suggested that aggressive measures, specially the prophylactic use of antiviral drugs, might contain a pandemic at its source or at least slow its spread, thus gaining time to put emergency measures in place and augment vaccine supplies. For this purpose, WHO has been donated a strategic stockpile of antiviral drugs (currently 3 million treatments available) which will be used to contain the spread of a pandemic in its early phases once it emerges but is still localized in one region.

Since the effectiveness of interventions to contain pandemic viral spread at their source are still not known, regions of the world other than the one in which the pandemic virus has emerged should scale-up preparedness activities during this phase.

Despite evidence indicating that H5N1 currently circulating in Asia is the most probable influenza virus subtype to evolve into a pandemic strain, pandemic viruses can emerge anywhere in the world.

Pandemic virus transmission characteristics will not be known in advance, but difficulties in influenza control will include infectivity early in illness, short interval between disease onset in cases, and viral transmissibility from individuals with incubating disease or asymptomatic infection.

#### **Expected results**

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#### ***ER9.1 Production of pandemic influenza vaccine drugs scaled- up***

##### Indicators

- Available pandemic influenza vaccine will be supplied to countries.
- The Vaccine Revolving Fund is supporting priority countries and those without vaccine production or purchase capacity to facilitate vaccine acquisition.

##### Key activities

- PAHO will encourage that final stages of manufacture are completed for the total Regional vaccine requirement.
- PAHO will oversee the procurement and final distribution of pandemic influenza vaccine.
- PAHO will support priority countries and those without vaccine production or purchase capacity to acquire vaccine.

### ***ER9.2 Production of antiviral drugs scaled-up***

#### Indicators

- Adequate Regional supply of antiviral drugs will be available.

#### Key activities

- PAHO will promote the availability of antiviral drugs for distribution and use according to previously determined presentation.
- PAHO will oversee the procurement and final distribution antiviral drugs.
- PAHO will support priority countries and those without production of antiviral drug or purchase capacity to acquire them.

### ***ER9.3 Health-care services delivery scaled-up and supplies available***

#### Indicators

21 countries are implementing plans and have access to supplies, tools and expertise necessary to deal with the pandemic as it evolves

#### Key activities

- Procurement and final distribution of antimicrobials and diagnostic kits (rapid tests).
- Establish contracts with courier services for the expedited transportation of samples from countries to the regional reference laboratory.
- Initiate procurement of laboratory supplies and reagents needed for molecular diagnosis of influenza in selected countries.
- Maintain consultant pool and provide consultation to countries as needed for addressing health service delivery issues.
- Monitor effectiveness of innovations for service delivery in non-traditional sites and using alternative providers and disseminate findings.

### ***ER9.4 Infection control measures implemented throughout the health-care delivery system***

#### Indicators

Adequate infection control activities being conducted in health-care system.

#### Key activities

- Provide technical assistance to countries on strengthening infection control programs.
- Manage international stockpile of infection control supplies.
- Procurement and final distribution of personal protective equipment.
- Monitor effectiveness of infection control interventions and disseminate findings.

### ***ER9.5 Risks will be communicated to authorities, health professionals, and general public***

#### Indicators

Accurate information prepared and distributed to target audiences

#### Key activities

- Use communication channels that reach communities and allow them to access and share information.
- Create and distribute accurate messages on avian influenza risks for citizens.

- Identify and train credible spokespersons to deal with the media.
- Monitor and evaluate message delivery and acceptance to adequate messages.
- Form intersectoral team with experts in risk communication, educators, epidemiologists, researchers, press officers, and personnel from health and agriculture sectors.
- Identify specific needs for information in various groups and communities.
- Collaborate and integrate information activities with other agencies and groups to ensure credibility and continuity of messages.

***ER9.6 International monitoring of the evolving pandemic, with real-time information exchange***

Indicator

All countries will have received real-time information on the evolution of the pandemic.

Key activities

- Continue to support WHO Global Alert and Response Network (GOARN).
- Support countries in the generation of real-time information and its dissemination globally.

## **PHASE: PANDEMIC DECLARED AND SPREADING INTERNATIONALLY**

### **10. Reduce morbidity, mortality and social disruption through a coordinated response**

Once pandemic influenza have spread beyond its initial focus and human cases are reported in different regions of the world a pandemic will be declared and countries will have activated national multi-sectoral response mechanisms to confront the pandemic. Almost all countries have national disaster prevention and response systems, with the participation of all sectors, whose mission is to respond to moderate and large emergencies and disasters. In case of pandemic influenza, this mechanism should be operating under the technical leadership of the health sector.

During this phase interventions will aim to reduce morbidity, mortality, and social disruption. Countries with pandemic plans validated and rehearsed in advance through simulation exercises, will be better prepared to make decisions and take rapid actions. The most probable scenario will be characterized by a lack of vaccines in the first several months as it is expected to take at least six months to develop a new vaccine after a pandemic flu appears. Antiviral drugs would be used in this phase to minimize disease and mortality but its supply is likely to be limited as well.

After sustained pandemic influenza transmission in the general population of one country, worldwide spread is virtually inevitable. The international spread of pandemic influenza is characterized by “waves” of transmission. In 20th century pandemics, these waves were separated by months, with a second wave of influenza activity occurring from 3 to 12 months after the first wave. In a future pandemic, the interval between waves is predicted to be shorter due to increase and rapid travel and transport and urbanization worldwide.

Evidence suggests that in past influenza pandemics, screening and quarantine of entering travelers at international borders did not significantly delay introduction, except in some island countries. Such measures would likely to be less effective in the modern era. Instead, WHO recommends health alert notices for international travelers and exit screening of travelers departing countries with transmissible human infection. The principal focus of interventions against pandemic influenza should be at national and community levels, rather than international borders. Additional interventions may include travel restrictions and non-essential domestic travel to affected areas should be deferred if significant areas of a country remain unaffected.

Pandemic influenza can spread rapidly causing outbreaks around the world and affecting as much as 20% to 50% of the population since most or all people would not have immunity to a new pandemic virus. At this time, the focus of interventions shifts to delaying spread and reducing impact through population-based measures.

Ill persons should be advised to remain at home at the first symptoms, but forced isolation and quarantine are ineffective and impractical. Hand and respiratory hygiene should be routine; mask use based on risk, including exposure frequency and closeness of contact. Household disinfection of contaminated surfaces should be considered. If the pandemic is

severe, measures to increase social distance (e.g., school closure) should be considered. Non-health authorities will be critical for enforcing these interventions in the beginning of the pandemic. Field assessments during the pandemic will be important to maintain updated recommendations.

As an explosive surge in the number of illnesses and deaths is expected, governments will need to convert health services, including emergency and intensive care units and morgue capacity to cope with a sudden and large increase in demand. The better hygiene, nutritional status, and drugs for treating the secondary complications of influenza seen today in many parts of the world, can be expected to mitigate some of the health consequences of a pandemic. Another consequence will be increased absenteeism in all sectors of the labor force, with capacity temporarily reduced in such essential services as health-care, law enforcement, transportation, utilities, and telecommunications.

### **Expected results**

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#### ***ER 10.1 Regional and national emergency response mechanisms implemented***

##### Indicator

PAHO and at least 21 countries of Latin America and the Caribbean countries mobilized all key actors to execute coordinated multisectoral interventions to reduce morbidity, mortality and social disruption due pandemic influenza.

##### Key activities

- Implement the PAHO Contingency Plan for Pandemic Influenza
- Activate Emergency Operation Centers (EOC) at PAHO HQ and in Country Offices.
- Assign specific responsibilities for staff from each key sector, institution, area and unit to the EOC.
- Convene emergency/disaster task force coordination meetings at regional and country levels.
- Mobilize the capacity of national disaster institutions, military, Red Cross, local governments, transport, law enforcement and others for quick readiness and response.
- Activate and mobilize emergency response teams to high-risk countries and/or areas.
- Mobilization of financial resources for pandemic flu response.
- Implement emergency logistic procedures and mechanisms for rapid transport and distribution of vaccines, antiviral drugs and other medical supplies based upon pre-arranged agreements.

#### ***ER10.2 Risk communication strategies implemented and effective***

##### Indicator

Timely and accurate information will be made available to target groups.

##### Key activities

- Establish a variety of communication channels for the public and for specific target groups, using internet, media access, television, and radio to disseminate trustworthy information.
- Elaborate specific recommendations for nominated pandemic spokesperson in the countries



- Distribute accurate messages on pandemic influenza to target groups.
- Distribute information on personal respiratory hygiene and transmission risk reduction in the community.
- Establish schedule for interviews, presentations, and other vehicles to keep a constant flow of information about influenza going to target publics.
- Use intersectoral team of experts in risk communication, educators, epidemiologists, researchers, press officers, and personnel from health and agriculture sectors to design, update, and disseminate accurate information.
- Continue to collaborate and integrate information activities with other agencies and groups to ensure credibility and continuity of messages.
- Review and update pandemic influenza published information materials.

***ER10.3 Health services will have provide adequate medical assistance to pandemic flu patients.***

Indicator

21 countries of Latin America and CAREC have scaled up their overall health services capacity to reduce morbidity and mortality due pandemic influenza.

Key activities

- Facilitate inter-country sharing of resources including experts and health care teams where shortages exist.
- Evaluate the impact of approaches to scale-up services for pandemic including non-traditional sites and providers as well as self and family care
- Activation of health services emergencies and disaster plans.
- Scale-up services for pandemic including non-traditional sites and providers.
- Assist countries to monitor the compliance with established priorities, protocols and clinical guidelines for the prevention and treatment of influenza and its complications.
- Disseminate new information/guidance regarding changes in prevention and management of influenza and its complications.

***ER10.4 Influenza vaccine is administered to high risk populations***

Indicators

- Countries will be conducting mass campaigns targeting specific high-risk groups, according to national plans.
- Vaccine coverage in countries will reach 80% of target population.

Key activities

- PAHO will oversee the ongoing procurement and distribution of pandemic influenza vaccine.
- PAHO will support countries to monitor implementation of planned delivery mechanisms for influenza vaccines in collaboration with national health authorities and industry.
- PAHO will oversee ongoing monitoring of coverage, compliance, and effectiveness of vaccines.
- PAHO will evaluate compliance with prioritization for influenza vaccination.

***ER10.5 Antiviral drugs is administered to ill and high risk population.***

Indicators

Affected countries put in place all previously planned delivery mechanisms for antiviral drugs

Key activities

- Support the scale up production, procurement and distribution of antiviral drugs for pandemic influenza
- Monitor implementation of planned delivery mechanisms for influenza antiviral drugs in collaboration with national health authorities and industry.
- Provide for ongoing monitoring of the coverage, compliance, and effects of the use of antiviral drugs alone or with other control measures such as quarantine or movement restrictions.
- Monitor implementation of priorities for antiviral drugs and for implementing priorities including communication strategy.

***ER10.6 Non-pharmaceutical interventions introduced***

Indicators

Countries implement public health measures to prevent the spread of the disease

Key activities

- Provide technical cooperation to the countries to establish quarantine and social distancing measures.
- Ensure adequate implementation of travel and trade restrictions are taken.
- Elaborate practical and clear recommendations for international transport companies on how to handle with pandemic influenza cases on board.
- Promote the implementation of international travel/movement restrictions as indicated in the current IHR.

Effectiveness of non-pharmaceutical public health measures implemented in the past or estimated through modeling studies will be important to guide policy-making.

## **11. Quantify and monitor pandemic impact and epidemiology**

It is important to consider that once pandemic emerges, epidemiologic tools and operational research will be crucial to increase knowledge on preparation, prevention, and control of influenza pandemics. Information generated will be important for country-level decision making and can direct activities in other public health emergencies in the future.

Effectiveness of vaccine and antiviral drug use as well as non-pharmaceutical public health measures implemented will be important to guide recommendations.

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## **Expected results**

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### ***ER11.1 Impact and epidemiology of evolving pandemic monitored***

#### Indicator

21 countries of Latin America and CAREC will be continuously monitoring the impact of the pandemic and effectiveness of interventions.

#### Key activities

- Monitor the number of people being seen in out-patient clinics or sentinel sites, admitted with severe respiratory infections, or dying with severe respiratory infections.
- Assess the epidemiological characteristics of the ongoing pandemic.
- Evaluate the health and economic impact of the pandemic.
- Monitor the effectiveness of public health interventions.
- Monitor the effectiveness of non-pharmaceutical interventions.
- Conduct operational research for the assessment of the effectiveness of combined interventions in different contexts.

### ***ER11.2 Surveillance of antiviral susceptibility conducted***

#### Indicators

80% of countries with surveillance systems for adverse reactions established

80% of countries with surveillance systems for viral resistance established.

#### Key activities

- Setting up Information system to notify the suspected cases of viral resistance and adverse reactions.
- Investigation of notified cases of viral resistance and adverse reactions.

### ***ER11.3 Surveillance of pandemic influenza vaccine adverse events conducted***

#### Indicators

80% of vaccine adverse events notified and studied (investigated)

#### Key activities

- Health worker's trained in surveillance of pandemic influenza vaccine during the preparedness of the vaccine campaigns.
- To include the vaccine safety component highlighting the early adverse events notification and their investigation.
- To implement a surveillance system for vaccine adverse events.



