

**REGULATORY MEASURES
AGAINST OUTBREAKS OF
HIGHLY PATHOGENIC
AVIAN INFLUENZA**

JESSICA VAPNEK

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About the Author

Jessica Vapnek is a former Legal Officer of the FAO Development Law Service. This paper builds on an earlier paper entitled "Institutional and Legal Measures to Combat African Swine Fever," FAO Legal Paper Online No. 3 (1999), available at www.fao.org.

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I. INTRODUCTION

Avian influenza (AI) refers to a large group of viruses that affect birds. AI viruses are all influenza viruses of type A¹, and are classified according various combinations of the two main surface antigens, haemagglutinin and neuraminidase. There are 16 haemagglutinin (H) antigens (H1 to H16) and 9 neuraminidase (N) antigens (N1 to N9). A virus that has H type 1 and N type 1, for example, is classified as an H1N1 virus. Though not all H and N combinations are considered avian influenza, all known subtypes of influenza A viruses can be found in birds.

AI viruses are also classified according to specific pathogenic criteria set by the World Organisation for Animal Health (OIE) based on the genetic features of the virus and the severity of the disease in poultry. If a particular virus has a low capacity to infect and cause disease, it is considered low pathogenic avian influenza (LPAI). Conversely, strains that belong to subtypes H5 or H7 and are considered virulent are classified as highly pathogenic avian influenza (HPAI).

Domestic poultry populations have been very susceptible to HPAI infection, although some species such as ducks do not show symptoms. Birds can get infected through direct contact with infected birds or through contact with secretions or faeces of an infected bird or blood of a slaughtered infected bird. The conditions in the production environments in which most domestic birds are raised contribute to the rapid disease spread amongst them once the virus establishes a presence. Biosecurity² measures, transportation of birds and bird products, trade and live bird markets are factors that explain disease spread locally or over long distances.

The current global concern about HPAI flows from its H5N1 subtype, which has quickly spread throughout the world and has been reported in more than 60 countries. This situation and the number of infected birds create two very significant areas of concern.

¹ The "A" refers to the "genus" of the virus, and serves to differentiate it from types B and C, which are typically less lethal and not as prevalent in animals.

² The term "biosecurity" is used to refer to the implementation of measures that reduce the risk of the introduction and spread of disease agents (OIE et al., 2008).

First, H5N1 HPAI is considered a threat to human health although bird to human transmission is rare. Humans that have regular contact with infected birds, their faeces or other excretions can be infected with H5N1 HPAI virus, which has proved to be highly lethal. The first human cases were reported in Hong Kong in 1997, where six people died. Since then, there have been more human deaths – in Hong Kong and in the Netherlands in 2003, and more recently in Southeast Asia, Central Asia and Africa. The World Health Organization (WHO) has reported 442 cases in humans and 262 deaths since the end of 2003. Given its high fatality rate, should H5N1 HPAI ever evolve into a strain easily transmitted among humans, the effects could be global and devastating. The H1N1 pandemic in 2009, although it has to date not proven to have a high mortality rate, has demonstrated the potential of human disease to spread widely across the globe.

Second, the disease can have enormous economic consequences, in particular affecting the livelihoods of backyard and small producers. By mid-2006 at least 200 million domestic birds had died or been culled as a result of H5N1 HPAI. Whilst many poultry producers have received compensation for culled birds, compensation schemes frequently do not compensate for the full value of the birds and do not include birds that have died from the disease. Steep declines in demand for poultry in areas affected by H5N1 HPAI further affect poultry production. If H5N1 HPAI becomes contagious among humans, the World Bank estimates that it could cost the global economy about 3.1 percent of the world GDP, or around US \$ 1.25 trillion.

There are measures that can be taken both before and after the appearance of an outbreak of H5N1 HPAI that can drastically reduce its scope and limit the harm it causes. This paper outlines the major legal and institutional elements that governments should consider in preparing for and reacting to such an outbreak. The paper does not describe the current situation in at-risk countries nor does it tell governments what to do. The former would be difficult because with the upsurge in international travel and global commerce, potentially H5N1-infected goods are easily spread throughout the world, and thus every country is at risk. Moreover, the latter is neither feasible nor desirable, since the political, cultural and economic landscape in each country will affect the choices that policy-makers have available and may decide upon.

Rather, the information contained in this paper should be considered a checklist for planners interested in improving their ability to plan for and to respond rapidly and effectively to an outbreak of H5N1 HPAI. Although the paper outlines measures that are specific to H5N1 HPAI, others may be useful for governments dealing with other diseases. Policy-makers may find the need to address the H5N1 HPAI threat an opportune moment to carry out a broader re-examination of their general animal health policies and planning processes.

This paper is divided into sections addressing the various elements recommended for a government to combat H5N1 HPAI. The first section examines the development of a contingency plan. Next, the paper analyses the legislative framework required to support and implement such a plan. The following section reviews possible methods of funding, and the paper then covers the importance of public awareness campaigns and finally, the need for international communication and regional coordination.

Some countries will be able to implement all of the recommendations or may already have put most of them in place. Other countries will succeed with only a few. The rapidity with which countries are able to act and the scope of their reactions will vary due to the specific circumstances at play in a country or region of the world. For example, countries with good veterinary services and strong surveillance systems and disease response capacities already in place can more easily control and eradicate HPAI. Countries with less-developed veterinary capacities coupled with major risk factors such as high poultry densities and poor biosecurity levels are most likely to be affected by the disease. Such countries, especially those that have smallholder production sectors with high duck populations, are also at risk for serving as a reservoir for the virus, greatly increasing the possibility of future epidemics. Whatever their capacities, countries will face the challenge of developing policies and a supportive legislative framework for the poultry industry, which is a dynamic system.

The first step in preparing for an outbreak is to develop a contingency plan, which is addressed in the next section.

II. DEVELOPMENT OF A CONTINGENCY PLAN

Developing a contingency plan before the occurrence of an HPAI outbreak ensures that it is not just when disaster strikes that government and citizens decide who will take action and what action they should take. Rather, the implicated players and their roles are considered and defined in the plan in advance, which facilitates quick action. Planning ahead means that activities can unfold methodically and that time is not lost making decisions that could have been made ahead of time. The FAO publication *Manual on the Preparation of National Animal Disease Emergency Preparedness Plans* is a useful tool for countries wishing to develop a contingency plan for avian influenza. Although not specific to HPAI, the manual applies broad principles of disease control and recommends general strategies for policy-makers wishing to establish a contingency plan. Another useful resource is the multimedia programme entitled "Good Emergency Management Practices" (GEMP), which was developed by FAO's Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES). GEMP is intended to serve as a code of practice for dealing with animal disease emergencies.

The task of developing a contingency plan may be assigned to an established agency or body such as a national disaster organization, emergency preparedness committee or regional disease protection organization. If such an organization does not already exist it may have to be created. It is essential that poultry producers, including smallholders and local organizations, be involved in the preparation of the plan from the outset to ensure that if an outbreak does occur they understand the threat and do not feel that measures are imposed on them in a top-down fashion. This will foster greater compliance with the plan and better results overall.

A. Elements of a Plan

Although each country's plan for HPAI will differ, some elements should always be included. For example, there should be a detailed description of the disease and its status within the country, a resource inventory (of personnel, equipment and existing legislative instruments), a synopsis of government policy with respect to the disease, an action plan and a budget. The contingency

plan should specify the composition of the emergency agency or committee and should clearly define each participant's role. The emergency agency or committee will be responsible for the overall coordination and mobilization of measures to be taken against the disease.

Responsibility for each of the measures will have to be assigned to the relevant agencies and groups. For example, the veterinary service may be responsible for inspecting poultry markets, the police service may be required to monitor quarantined areas and the Ministry of Agriculture may be mobilized to do outreach to poultry producers. Some plans are extremely detailed in the allocation of responsibilities: for example, Papua New Guinea's *National Contingency Plan for Preparedness and Response to an Influenza Pandemic* lists roles and responsibilities of organizations ranging from the Prime Minister's Office to the Papua New Guinea Council of Churches.

The contingency plan should also contain detailed information about the components of the action plan. For example, because a surveillance programme and epidemiological sampling (both discussed below) are essential components of the strategy to combat HPAI, the plan should incorporate the procedures required for each of these. India's *Contingency Plan for Management of Human Cases of Avian Influenza* contains a list of the required items to be included in a veterinary officer sampling kit, as well as an exemplar of an epidemiological inquiry form and precise guidelines for collecting samples from potentially infected persons. These details should be addressed and decided upon ahead of time and included in the contingency plan.

The best plans embody a two-part strategy: how to be ready for the disease when it appears and how to react effectively after the outbreak. In the parlance of emergency effectiveness, these two elements are *early detection* and *early response*. As the terms suggest, a legal and administrative environment must be created so that when the disease appears it can be quickly identified and the relevant information can be passed to the necessary persons or agencies for action. The plan should provide for at least the following elements to facilitate early detection: sensitized poultry keepers; well-trained, mobile and active field staff; and a surveillance system. Early response consists of the activities that follow the identification of a given

animal disease. These activities should be supported by a legal and administrative framework that facilitates rapid disease reporting; a committee or organization with the clear mandate to control the disease; and a series of standard operating procedures which are elaborated based on an inventory of the resources available and which will be applied when the disease appears.

B. Institutional and Other Considerations

As suggested earlier, the precise elements of a country's contingency plan to deal with HPAI will depend on many factors, from economic to cultural and social. When developing the contingency plan, countries should consider whether any of the following factors in the national system may affect the plan's contents and implementation:

1. Government Administration

The nature of the plan, or for that matter whether there is to be only one plan or several, will depend on the country's system of government. Where there is a strong central government, a single/unitary plan is most likely to ensure an effective emergency response. By contrast, in a federal system or in a decentralized system, regions, states or districts may wish or need to develop their own plans, in line with the degree of autonomy that they generally exercise and that they could be expected to exercise in an emergency. Unless the country is so vast that central coordination is difficult, the optimal strategy is for the smaller political subdivisions to cede control of an emergency response to the national authority. But even where each state or region has its own plan, the plans should be closely coordinated with the national one. Effective and comprehensive action requires that regions, districts or states not exercise autonomy during an emergency.

2. Chain of Command

In some countries, veterinary officials – whether veterinarians, veterinary para-professionals or veterinary assistants – are spread throughout the hierarchy of the agriculture ministry and the regions of the country, which means that knowledgeable people are in place in case of an emergency. In other countries, certain regions may lack veterinary expertise, such as rural areas where veterinarians are unwilling to be assigned or where specific veterinary extension agents have been replaced with general field staff who

may not have the training to recognize an animal disease problem. In either case, it is important to assess how well the chain of command is likely to function in the case of an emergency. Is it possible that in the absence of a veterinary expert, the initial appearance of the disease will not be recognized with the alarm it should? Are ministry staff sufficiently sensitized to seriously consider a poultry keeper's report that many birds are sick or dying?

To ensure that the chain of command facilitates both early detection and early response, the government should first implement continual training and awareness programmes to inform veterinary workers (public and private) and field staff of the disease, its signs and its seriousness. Second, the government should prepare standing orders informing those field staff exactly whom they should notify if the disease appears and how that notification should take place. The standing orders should also contain instructions on immediate measures that can be taken to address the disease outbreak according to the action plan whilst awaiting further instructions from the central authority. Coordination and rapid communication with key stakeholders including diagnostic laboratories, research institutions and private veterinarians can play an important role in this chain of command, including in the operational and logistical aspects of the response.

3. Biosecurity

Proper biosecurity practices help to decrease the risk of an HPAI outbreak, and for that reason contingency plans often require an assessment and improvement of preventive biosecurity measures at farm level or industry level. Although the structure of each production sector and the available resources will affect the attainable biosecurity level, there are a number of general goals that all sectors can work towards and that can be included in the plan.

For example, access to farms and poultry yards should be controlled as strictly as possible (bioexclusion), with few people having regular contact with birds in order to limit the spread of the infection. Care should be taken that those people who do have contact with birds on one farm do not also have regular contact with other poultry flocks, and that they wash their hands and change their clothing and shoes before entering and upon leaving a poultry yard.

In addition to how poultry are raised and kept, biosecurity measures must address methods of transportation and sale as well as slaughter and preparation for cooking, since rules for all of these can prevent or limit infection. The FAO Manual *Preparing for Highly Pathogenic Avian Influenza* sets out more specific biosecurity measures.

The contingency plan should also address the heightened biosecurity measures required in case of a disease outbreak (biocontainment), such as the potential need to reorganize markets and abattoirs and to prohibit or restrict the movement of birds and poultry products from affected areas. There will also be a need to establish conditions for the culling of birds and disposal of carcasses.

4. Cultural and Societal Factors

In most cases, HPAI will strike countries in which a large portion of the population living in rural areas keeps poultry in village or backyard production systems. Therefore, traditional customs and practices may be relevant. Some of the issues that should be considered are:

- Gender and age: are the poultry keepers male or female and has outreach taken this into consideration? Are poultry-keeping registration requirements a barrier for women to engage in poultry production, if they are unable to write? Could other issues exist, such as the presence of widows or predominantly poor women with children whose only means of support is their poultry, and who would therefore be reluctant to notify authorities about sick birds? Are children the ones usually taking care of birds?
- Hospitality: in some cultures, a visit by an important stranger requires that the host give a gift in gratitude. Are poultry keepers hesitating to call the veterinary officer to look at sick poultry because they know that they must then give a bird or two in return? Or are infected birds given to visitors who then take the birds back to their homes and communities?
- Village life: where are poultry kept and under what conditions at village level? How free are birds to wander and intermingle with other flocks (e.g. where the poultry sector developed without much regulation)? Is equipment ever shared or loaned out? Is it regularly disinfected? Are poultry transported and how are they sold? How linked are villages to marketing systems?
- Cock fighting: cock fighting can expose both humans and birds visiting from other provinces or countries to infected materials. Is cock fighting a significant pastime? Is it localized or are there large national or international tournaments? Is cock fighting legal? Are fighting cocks registered? Do they require vaccinations?
- Environment: are there environmental factors that affect the spread of disease and the efficacy of control measures? Are there water bodies that are used for domestic needs but that also accommodate potentially ill or infected wild migratory birds? Do free range poultry use the same water bodies or wetlands as the wild birds? Is there sufficient land in an infected zone to quarantine birds or to dispose of a large number of dead or culled birds without endangering groundwater supplies?
- Cross-border activities: is there a lot of contact between groups on either side of a porous national border? Is there informal cross-border trade or live poultry markets near the border? Is there a lot of cross-border movement for weddings or cultural or religious events? What is the cultural, political and economic climate on the other side and what would happen in the case of an infection? Is it possible to create cooperative agreements and plans between national authorities?
- Attitude toward government: what is the reputation of the government and the veterinary service? Do people in the area view government representatives as outsiders or corrupt? Would government officers be able to gain the people's trust in order to implement preventative and response measures? Can government representatives be trusted to carry out their duties with accountability?

By assessing whether any of the above factors are relevant in the local context, planners will be able to determine the appropriate measures to include in the contingency plan to make it the most effective. Box 1 highlights the potential success of a well-targeted and organized disease response.

Box 1: H5N1 HPAI in Thailand

Thailand first reported H5N1 in January 2004 and more than half of the country's 76 provinces were quickly affected. Millions of chickens, ducks and geese across the country either died of the disease or were destroyed. Seventeen people were infected and 12 died from the disease. Thailand quickly began to mount a response to the disease, and with assistance from FAO, WHO and the OIE, the government organized a containment effort that relied upon coordination amongst 13 government agencies, the army and the police. The disease has subsequently been brought under control, and not one person has been infected since 2006. In February 2009, Thailand declared itself free from HPAI. According to Dr Oraphan Pasavorakul of the Thailand Bureau of Disease Control, the most important steps taken in Thailand's response were "intense and constant surveillance, . . . fair compensation for culled birds, continuous poultry inspection and control of all poultry movement in the country."

III. LEGISLATIVE FRAMEWORK

A. Assessment of Current Legislation

In most jurisdictions, implementation of a number of the measures discussed in this paper will require legislative backing. Some countries may already have the necessary legislative instruments and procedures in place, whilst others must work to develop a legal framework to govern disease-fighting activities. Generally, existing legislative measures apply broadly to all animal diseases and do not need to be specific to HPAI. The first step will be to collect the existing legislation – parliamentary-level as well as subsidiary instruments and local by-laws – relevant to the control of HPAI.

Once the existing legislation has been collected, it should be reviewed and assessed to determine whether it covers the important issues or whether there are overlaps or gaps. What follows is a guideline for carrying out an assessment of legislative frameworks to combat HPAI. Governments must assess their existing legislation and determine whether all required personnel, veterinary officers, health inspectors and officials, police services and outreach workers are identified, prepared and have their roles and duties defined in the case of an outbreak of HPAI. If the current legislation does not cover all of the contingency plan requirements, these must be addressed before an emergency situation occurs in order to ensure a successful response. The Development Law Service of the FAO Legal Office provides assistance to FAO member countries in the assessment and

evaluation of their veterinary legislative frameworks, whilst also assisting with legislative drafting to cover any gaps. Most recently FAO has worked in Rwanda, Timor-Leste and Central America on veterinary legislative matters, and assisted two regional organizations in Francophone West Africa on the harmonization of veterinary legislative frameworks.

An assessment of existing legislation pertaining to an outbreak of HPAI should ask the following general questions:

- *What type of animal health legislation is in place? Is there an Animal Disease Act? An Animal Quarantine Act? An Importation of Animals Act?*

Depending on their legal systems, histories, legislative structures and veterinary policies, different jurisdictions will have different types of laws in place. No one framework is better than another: the key will be whether the constellation of existing laws empowers the government to carry out the needed prevention and response activities, or whether there are overlaps and gaps.

- *Is the existing legislation comprehensive, i.e. does it provide for all the required powers and measures necessary to fight an H5N1 HPAI outbreak?*

Section B will outline the details of these powers and measures.

- *Is the legislation up to date?*

Any legislation that is comprehensive and effective is good legislation regardless of when it was enacted. On the other hand, depending on the age of the legislation it may not be in accord with the rules of international or regional organizations of which the country is a member, such as the World Trade Organization (WTO). If the country is a member of the WTO, for example, any animal health measures would have to be scientifically justified and based on risk assessment or they could violate the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), which came into force in 1995. Older legislation (especially technical regulations and rules) may also not reflect the latest scientific knowledge or concepts relating to disease transmission or animal welfare issues.

- *Is there legislation governing the veterinary profession?*

Is there a Veterinary Professions Act, a Veterinary Services Act or an Act creating a Veterinary Council? Generally, countries have laws requiring that veterinarians have received a certain education and passed certain requirements in order to work with animals. The legislation may also list certain activities that must be performed by veterinarians rather than para-veterinarians or village animal health workers, although this is worth taking a closer look since it can be problematic where there are disease outbreaks. In an animal health emergency, all experienced health workers must be mobilized regardless of their status; in fact, local animal health workers may be better suited to ensure cooperation within rural villages if strangers are not trusted. Village animal health workers can also be employed to do outreach where not enough qualified veterinarians are available. Countries can use the OIE Tool for the Evaluation of Performance of Veterinary Services (OIE-PVS Tool) to identify gaps and weaknesses in their veterinary infrastructure, including with respect to the veterinary profession.

- *Is there a disaster relief act and does it make the contingency plan for animal diseases legally binding?*

Is there an Act that creates a national disaster organization? Is the national disaster organization empowered to legally adopt a contingency plan?

- *Are there local regulations or rules that govern animal husbandry?*

Some relevant rules may already be in place in local ordinances, such as restrictions on where poultry breeding farms may be situated and any sanitary measures they must follow. Any such local requirements should be collected, listed and analysed before the national contingency plan is formulated. As noted earlier, to ensure consistency and to prevent gaps in the imposition of emergency measures, the central government should retain primary authority in the case of an outbreak even where local authorities are empowered under local rules to carry out certain tasks.

- *Is there other legislation not directly related to HPAI that may be useful in controlling an outbreak of animal disease?*

Besides the main animal health act, there may be other laws or regulations which should be considered when surveying existing legislation. For example, are poultry keepers and farms required to be registered and if so, what size farms are covered? A list of poultry producers in an area can be an invaluable tool to effectively monitor and control HPAI, yet the existing legislation may only require registration of the larger farms. Policy-makers will have to assess the risks posed by small producers and balance those against the difficulty and expense of registering flocks with less than a minimum number of birds. The local context will be key.

There may also be legislation on animal movement and legislation regarding animal transport and animal welfare. Legislation may also cover the registration and operation of diagnostic laboratories. Expert legal advice can assist the government in identifying the constellation of legal provisions that is or will be relevant to the control of HPAI outbreaks in the country.

B. Necessary Elements of National Legislation

A legislative framework that will enable a quick and effective response in the event of an outbreak of H5N1 HPAI should contain many or most of the elements in the bullets to follow. The discussion following each bullet outlines the justification for the element to be included in animal disease legislation, and where possible includes illustrative examples from existing national laws and regulations.

The question of whether new legislation should be parliamentary-level or subsidiary (i.e. issued as a regulation or ministerial decree) will depend on a number of factors, including the structure of the legal system and the legislative tradition. In general, parliamentary-level legislation is kept as basic as possible, whilst the details and specific requirements are defined in subsidiary legislation, such as regulations. This structure serves a number of functions. First, keeping the parliamentary-level legislation very general makes it easier to pass into law, because there are fewer details for different interest groups to find objectionable. Second, allowing for the details to be defined in regulations means that any changes based on recent scientific advancements or altered political circumstances can be effected without having to go through the lengthy and time-consuming parliamentary process.

The subsidiary legislation should use the parliamentary-level legislation as a framework on which to build. At the same time, every

effort should be made to ensure that the subsidiary regulation completely fills out the framework and creates a comprehensive whole in its own right. This is to ensure that if the main act is repealed on some future date, the system developed through the subsidiary legislation remains intact. The repealing legislation can provide that all subsidiary regulations issued under the repealed act remain valid as if made under the new act, unless and until they are specifically repealed – but this is only effective if the system created by the subsidiary instruments is well-designed and effective without the principal act.

Subsidiary legislation is limited, however, in that it should only serve the purposes and objectives of the main act. Because subsidiary legislation is interpreted by reference to the main legislation, it may be subject to challenge if it exceeds that scope of authority. Grants of official powers, for example, should always occur in the main legislation and never in the subsidiary legislation. See Box 2, below, for an example of the legislative structure.

Box 2: Tanzania's Animal Diseases Act of 2003

Tanzania's parliamentary-level legislation, the Animal Disease Act of 2003, provides various government agents with general authorities and then relies on the Minister to prescribe subsidiary legislation to complete the details. For example, the Act grants the Director for Veterinary Services the power to institute quarantine measures. The specifics, however, such as the technical steps taken to define the quarantine area, are included in the subsidiary legislation (regulations). Similarly, the Act requires that compensation be paid to owners of culled animals but relies on regulations to determine the amount of compensation and to set out the specific claims procedures. The Act maintains the same general structure – creating broad legislative duties and calling for regulations to determine the specifics – for animal registration, for lists of notifiable diseases, for establishing and operating hatcheries, for compulsory disease control measures and for rules governing movement of animals, amongst other things.

Although this section provides some recommendations of what should be included at the parliamentary level and what at the subsidiary level, the decision will ultimately rest with the government designing the system. The same holds true for whether the legislation will be drafted so as to specifically target HPAI or will more broadly address all animal diseases. As noted earlier, many countries are viewing the current need to address potential H5N1 HPAI outbreaks as an opportunity to review their animal health policies and veterinary legislative frameworks more broadly. Circumstances will differ by country and by region, depending on priorities and needs.

1. List of Notifiable Diseases

A priority list of notifiable diseases is an essential part of a national (or sub-national) veterinary legal framework, as it contains all the diseases to which the legislation applies. Many countries base their lists on the OIE list (~100 animal diseases). The priority list can be an annex or schedule to the parliamentary-level Animal Diseases Act so that diseases may be added or changed as needed. For example, the Malaysia Animal Act takes this approach and includes the list of diseases as an appendix to the Act. Other legislation, such as the Animal Diseases Act of the State of

New South Wales in Australia, includes a list of diseases within the Act itself and then grants authority to the Minister or to the relevant regulatory body to declare additional diseases, based on risk assessment. The legislation will also usually impose a duty on the Minister or relevant regulatory body to periodically update the list and publish any changes.

2. Powers of Delegation

The Minister must be able to delegate certain powers to the head of veterinary services (usually the Chief Veterinary Officer (“CVO”)) or to other officials. During an emergency, when there may not be enough staff to cover all necessary tasks, the Minister must also be able to press into service other ministry personnel and in some circumstances, private veterinarians. For example, the Estonia Infectious Animal Disease Control Act grants the Veterinary and Food Board – the body tasked with creating the contingency plan and with implementing many of the response measures – the right to require supervisory officials and authorised veterinarians to carry out disease control activities outside their area of work.

To the greatest extent possible, these considerations should be debated and agreed prior to any outbreak. For example, the government could create pre-existing contractual relationships with private veterinary organizations, universities or other research institutes to provide essential services during an animal health emergency. Such agreements could also be signed before with the national veterinary association to cover issues such as the terms of hiring and remuneration for private sector veterinarians if they are needed to help with vaccinations or other activities.

Although the legislation will usually assign primary responsibility to the Minister, the actual implementation will likely be carried out by the CVO or some other individual or group to whom the Minister has delegated authority. International norms and practical experience suggest that emergency diseases like HPAI are best controlled where the CVO has primary implementing authority. To avoid confusion, the remainder of this paper will refer to the responsible or implementing party as the “competent authority”.

3. Power to Impose and Lift Quarantine

The competent authority must have the power to declare affected areas under quarantine, meaning that it may restrict ingress and egress from the area as well as the sale of animals and animal products (or poultry and poultry products) within that area. The order should clearly identify the objects and animals/birds to which it applies. It should also clearly identify the areas that are under quarantine and the conditions that need to be met in order for the competent authority to lift the quarantine order. If the country is a member of the WTO then, as noted earlier, the SPS Agreement requires quarantine restrictions and restrictions on imports to have a scientific basis and to be based on risk assessment. The *OIE Terrestrial Animal Health Code* (OIE Code) standards satisfy the risk assessment requirements.

Mexico, for example, includes many of these components in its National Law on Animal Health. The legislation assigns the Secretary of Agriculture, Livestock, Rural Development, Fish and Food, in coordination with the Secretary of Health, the role of establishing animal health campaigns – including imposing quarantines. For quarantines, the Secretary must specify the disease leading to the quarantine, the objective and type of quarantine, the geographic limits, the affected objects and animals and the requirements for the lifting of the quarantine order.

4. Assistance from Forces of Public Order

The competent authority must have the ability to request the assistance of law enforcement services in carrying out control measures associated with quarantine and prevention of disease spread. Control measures could include searching markets, farms, private homes and villages; stopping individuals from trying to cross from quarantined to unquarantined areas; and seizing or destroying infected poultry or products. The Australia Animal Diseases Act, for example, specifically grants the Director of Veterinary Hygiene the authority to direct police officers to take actions necessary to control the spread of diseases, including searching, seizing and restricting movement. Similarly, the Tanzania Animal Diseases Act specifically grants police officers the authority to search, seize and arrest in furtherance of the Act. The Act also grants authority to inspectors to demand police assistance in ensuring compliance with the Act.

5. *Import controls*

Governments must exercise control over the importation of animals and animal products to prevent the introduction or spread of notifiable diseases such as H5N1 HPAI. In most legislation this will be achieved by requiring import permits. Although the specific requirements for the issuance of an import permit are often left for regulations, in order to satisfy the SPS Agreement they should be based on risk assessment, they should be published in advance of promulgation so that importing parties have a chance to adapt to the requirements, and they should be continually reviewed and updated.

Import control legislation may prove more effective if it allows for some flexibility. Import permit exceptions can help facilitate importation of animals for scientific research or other purposes. One example is the Bahamas Animal Contagious Disease (Import Control) Regulations, which prohibit importation of animals without import permits but allow the Director of Agriculture to authorise importation without a permit where the Director considers that the importation is justified given the circumstances and that the animal is not diseased.

Allowing for import flexibility can also provide trade benefits. If the disease is present in the exporting country, the two countries may be able to minimize trade disruptions by working to agree on established areas or sectors with animal or poultry populations that are considered free of the disease (through zoning or compartmentalization) and allowing importation of animals or birds from those areas. The OIE Code provides further guidelines for import controls that will minimize trade disruptions.

6. *Power to Declare Emergency/Access to Funds*

The competent authority must have the authority to declare an animal disease emergency, which triggers the release of funds to take measures against the disease. The money should come from a fund specifically created for the purpose of addressing the emergency. For example, draft legislation in Timor-Leste (2009) establishes an Animal Disease Emergency Fund to be supplied with all necessary resources to enable the national veterinary authority to respond to an outbreak in the country. The resources are to be made available to the authority immediately upon the

Minister's declaration of an animal disease emergency within the meaning of the legislation. The legislation may also establish some restrictions on when the fund can be accessed and for what purposes. The Animal Diseases Act of New South Wales in Australia, for example, specifically limits use of the Emergency Animal Diseases Compensation and Eradication Fund for diseases that fall within the Act. The fund is to be used for expenses directly connected with controlling, eradicating or preventing the spread of applicable diseases, with an exception for wages of public servants who are or would be employed regardless of whether an outbreak occurs.

7. *Surveillance*

For early detection of animal diseases, the competent authority should be responsible for maintaining a disease surveillance programme. At the very least, the competent authority should perform regular inspections and sampling. For HPAI concerns, these inspections should cover some or all of the following locations: farms and poultry keeping areas (including villages and homes where poultry are allowed to roam free); wild bird areas or wetlands, borders, ports and airports; markets and slaughterhouses; poultry and poultry products (such as eggs and feathers); veterinary medicines and facilities; and animal feeds. The OIE Code offers specific guidance for surveillance methods.

In some countries, for historical reasons or because of understaffing, the health ministry conducts meat inspections. Expert consensus, as reflected in the OIE Code, establishes that meat inspection is a core responsibility of the veterinary services. The veterinary service should develop relevant inspection programmes for animals and animal products and should retain the final responsibility for satisfactory performance of any delegated activities. China's Animal Epidemic Prevention Law, for example, creates Animal Health Supervision Institutions, staffed with officially registered veterinarians, to perform inspections. The Law provides the institutions with a mandate to supervise the breeding, slaughter, trade, isolation and transport of animals. The institutions are also charged with supervising the production, trade, processing, storage and transportation of animal products. The Law specifically grants the institutions authority to sample and detain animals and animal products, enter relevant sites to

investigate and take evidence, make spot inspections and check quarantine certificates.

8. Reporting Requirements

The legislation must impose a duty on government officials (veterinary workers and health officials, field staff, police and border guards) and private citizens (farmers and poultry keepers, private veterinarians and physicians) to report their suspicions of the appearance of notifiable diseases such as HPAI. Timely reporting is a critical aspect of any surveillance system and may help identify changes in virus activity with sufficient time to prevent disease spread or to control an outbreak. Malaysia's Animals Act, for example, imposes a duty to report animals reasonably suspected to be infected from or to have died of a disease listed in the Act. The reports must be made to a veterinarian or to the nearest police station. If the police station receives the report, the Act imposes a duty on the officer in charge to forward the report to the nearest veterinary authority. The Act also imposes a duty on an owner to confine and isolate, until a veterinary authority arrives, infected animals as well as any animals that have been in contact with the infected animal(s).

As noted earlier, because parliamentary-level acts are generally kept as basic as possible, the specific information that the report must contain will likely be defined in a regulation but should include at least the following: the suspected disease, the exact geographic location of the potential outbreak, the locations of affected farms, the species affected, the approximate number of sick or dead animals or birds, the approximate number of at-risk animals on the premises, a description of the clinical signs and lesions observed, the dates of observation and reporting and the initial disease control actions taken and vaccination status if vaccines are part of the official control programme. There should also be a system to communicate throughout the country the disease situation, control measures and other activities being undertaken.

Because farmers and private veterinarians are perhaps the most likely persons to detect the presence of a disease, ensuring cooperation between the private and public sectors is important for the reporting system to function well. One way to facilitate cooperation is to ensure that private veterinarians and farmers are involved in the contingency planning process, as mentioned above. Another strategy is to officially involve private

veterinarians in some public veterinary tasks, depending on their level of knowledge and experience and assuming that this is permissible under the existing legislative framework.

The legislation can also specifically set out a chain of reporting and command, as has been done in the draft legislation in Timor-Leste. There, the draft includes a specific provision setting out the chain of command from local actors to the central government and from the central government to the field.

There should also be an established system for reporting confirmed cases to international organizations and the international community, in accordance with OIE guidelines.

9. Animal and Farm Registration/Identification Scheme

In order to develop an action plan, the competent authority must have reliable information on where animals are kept in the country, the production systems, how many animals there are and of what species. This information can help achieve more effective and targeted responses, such as surveillance procedures, preventive or control measures and compensation schemes (discussed below) designed and implemented based on accurate data. The legislation should create a registration scheme and identify which animals are required to be registered within the system.

To control HPAI, the legislation should require registration of all poultry producers and their birds, although successful registration programmes will always depend to some extent on industry cooperation. One way to provide incentives for poultry producers to register their flocks is to limit compensation for unregistered flocks to a pre-determined flock size. All producers with flocks above the selected size would make sure to register in order to protect themselves in case their birds are culled. The selected flock size could vary depending on the structure of the poultry industry and the resources available to the competent authority to monitor the registration programme and maintain surveillance of registered flocks.

Although full and detailed registration is the ultimate goal, this will probably never be economically or administratively feasible, especially in countries with many smaller, backyard producers. Nonetheless, small-scale poultry producers and backyard production

systems should be included in the registration system, because proper epidemiological analysis and efficient compensation programmes require data on all poultry flocks. One way to gather data on small-scale poultry producers is to perform a regular poultry census. Another method is to create mechanisms to register smaller flocks in the aggregate, perhaps for all the poultry kept in one village or in one specified region. These entities could be treated the same as larger flocks in order to ease the administrative costs but would still be able to provide valuable data in the fight against the disease, especially because village flocks often intermingle and can be treated as a single epidemiological unit.

For the quickest response and reaction, animal and farm identification systems should be in place long before any disease outbreak occurs. As an example, in reacting to its 2004 outbreaks, Thailand noticed that the majority of cases were from free-range duck farms and farms with limited biosecurity measures. Without comprehensive identification data, however, Thailand had no way to immediately target all such farms to improve biosecurity measures, and was forced to design and implement a registration requirement in the midst of the crisis.

10. Collect, Manage and Analyse Epidemiological Data

There should be a unit responsible for regularly collecting and analysing epidemiological data. An expert body that has access to all of the national infection reports and that is familiar with the epidemiology of H5N1 HPAI (reservoirs of infection and disseminating factors) can evaluate the nation's disease situation and provide timely advice on the most effective prevention and control strategies. Honduras, for example, assigns this role to its National Service of Agricultural Health (SENASA) through legislation (the Regulation on Epidemiological Surveillance of Animal Health). SENASA is mandated to collect, evaluate and interpret epidemiological data from around the country and then distribute information and provide recommendations for disease response.

Countries that lack the expertise or specially equipped laboratories needed to run necessary tests for confirming disease diagnosis can look to a number of sources for assistance. OIE and FAO recently established a worldwide network of influenza expertise, OFFLU, which can offer technical advice in the

diagnosis and analysis of influenza viruses including H5N1 HPAI. Additionally, OIE supports reference laboratories around the world which can help provide necessary laboratory materials and reagents and also independently test samples and confirm national test results.

Effectively managing the large amounts of data needed for a proper analysis of the status of H5N1 requires a well-designed database system, especially once an outbreak has occurred and the data needs to be accessed and analysed efficiently. Many systems have already been created and are available for use, such as the FAO-designed and supported system, TADinfo. TADinfo is a data management system that includes modules for field observations, abattoir observations, active disease surveillance and livestock census and vaccination. It has been deployed to more than 35 countries around the world. Countries with database programmes already in place may wish to supplement them with a simple, purpose-designed spreadsheet or relational database system.

11. Vaccination

The competent authority should have the authority to implement vaccination programmes and to create vaccine banks to secure an adequate supply of quality vaccines. Although culling affected populations is still the preferred means of controlling an outbreak of H5N1 HPAI (Thailand, for example, avoided vaccinations altogether and focused on culling), vaccination can provide effective protection against the virus. However, vaccination should always be applied alongside other preventive measures such as surveillance, culling, biosecurity and movement restrictions. Even if the measures taken fail to completely eliminate HPAI, vaccination reduces susceptibility to the virus and decreases viral shedding, reducing the viral load in the environment.

Vaccination programmes should have an exit strategy and should not be considered a permanent measure. Every vaccination programme should be paired with epidemiological studies and careful surveillance activities to evaluate its coverage and response so that the competent authority can determine if the programme is still needed and so that vaccinations can be more precisely applied. Colombia, for example, in Law No. 1255 of 28 November 2008, assigns responsibility for authorizing and controlling

vaccinations with the Colombian Agricultural Institute and requires the Institute to perform subsequent review of the vaccination programme. Proper design and application of vaccination strategies can also provide benefits beyond making the programme more effective, because satisfying OIE vaccination recommendations helps minimize barriers to trade.

12. Culling

Once an outbreak has occurred, the competent authority must have the authority to cull animals affected by the disease. For HPAI, culling sick and susceptible birds in the vicinity of outbreaks is the preferred method for disease control. The Singapore Animals and Birds Act, for example, grants wide authority to the Director-General of Agri-Food and Veterinary Services to require the destruction of animals known to be infected, animals reasonably believed to be infected or exposed to the disease and animals the Director-General believes are able to perpetuate the disease.

Although the parliamentary-level legislation will grant the authority to cull, the subsidiary legislation will generally contain the details such as who should carry out the culling, how culling should occur, how to properly dispose of the poultry carcasses, how the pens, culling areas and burial areas should be decontaminated and when restocking should occur. There should also be a clear mandate to create accurate and detailed records of the number, age, species and use of culled birds, which is critical to maintain community trust and to limit compensation disputes.³

Generally, culling is performed by rapid response teams (made up of veterinarians, animal handlers, animal killing personnel and carcass disposal personnel) that can quickly mobilize if an outbreak occurs. Animal welfare is a significant concern, and for that reason many countries will have legislation addressing the issue. Tanzania's Animal Welfare Act, for example, requires that killing for disease control purposes take into account the welfare of the animal and employ the most humane method available according to the circumstances. The OIE Code offers suggestions on how to efficiently and humanely cull flocks: the general principles require that the procedures used result in

immediate death or loss of consciousness leading to death, and that they be regularly monitored to ensure that they are consistent with regard to animal welfare, operator safety and biosecurity.

The driving concern behind selecting a method of disposal is to limit the risk of exposure to the infected carcasses. The FAO Manual *Preparing for Highly Pathogenic Avian Influenza* (FAO Manual) recommends burial as the preferred option because it can be performed quickly and with minimal transportation of infected material. However, burial may not be appropriate where the required space or equipment is not available or where there is a risk of groundwater contamination. In such cases, composting, burning or rendering are all possible alternatives, depending on the available resources.

HPAI can be inactivated by soapy water and detergents, which can be very effective in decontaminating areas once birds have been culled. The FAO Manual provides decontamination recommendations for a variety of items and materials, and also contains information on how and when to restock poultry to minimize the risk of further outbreaks.

13. Compensation

The competent authority must have the authority to compensate owners of culled animals. Compensation has many justifications and can be viewed as a form of social welfare, as rehabilitation or as an example of fairness after government taking of private property. The strongest reason for compensation, however, is to directly combat an outbreak by encouraging reporting of sick birds. To incorporate compensation, the legislation should identify a specific authority with the ability to quickly access and mobilize funds. This authority must work closely with the group responsible for culling, because compensation is integrally tied to the culling process.

The legislation itself need not contain the particulars of the compensation scheme, but it should define what types of procedures and structures need to be included and identify the details that must be decided. The scheme should contain at a minimum a method of determining who receives compensation, the type of compensation, the way that the amount of compensation will be determined, how the claim and payment process works, a timeline

³ Compensation is discussed in the next subsection.

for payment processing and information on how to appeal the compensation amount. Compensation is most often limited to direct losses suffered by owners of birds that have been culled through the government programme (with direct losses including at times not only birds but also eggs and feed), although compensation schemes can also incorporate indirect costs, losses from birds that have died from the disease and losses by individuals involved in the poultry sector who do not own birds, such as processors or marketers. Compensation can be provided in kind or with cash payments. In-kind payments are uncommon because they often take a long time to provide; it is difficult to quickly find healthy replacement birds; and regulations usually prevent immediate restocking for biosecurity reasons. Poultry owners may also wish to change the species they are raising. Cash payments raise difficulties, too, because in addition to being more easily diverted for corruption they must reflect a careful balance between the incentives provided to producers and the economic realities of the country.

Poorly designed compensation schemes can provide incentives to poultry producers that increase the risk of further infections. For example, offering different amounts of compensation in different regions may provide an incentive for producers to sneak birds into those regions where they will receive greater compensation, with the consequence of further disease spread between regions. Low compensation amounts may provide an incentive for producers to hide or sell birds, whilst compensation that is too high may provide an incentive for producers to expose their birds to the virus. One way to avoid creating adverse incentives – mentioned above but worth repeating – is to involve the poultry producers as much as possible in the design of the compensation system. Where outbreaks occur close to and across national borders, cross-border discussions may also be useful to harmonize compensation payments to prevent illegal poultry movements to benefit from the better compensation scheme.

Some compensation schemes provide positive incentives for poultry producers to report possible outbreaks quickly. For example, compensating more for healthy birds than for sick birds often leads to producers reporting outbreaks as soon as they are suspected. Well-developed pricing schemes based on a percentage of a baseline price that includes relevant factors such as the species, the bird category (breeder, broiler, layer, etc.) and the

production sector type (industrial, commercial or village level) can also improve reporting levels. Defining compensation by bird category should also take account of high value species in some regions such as cocks for cock fighting, as these species play an important role in the spread of avian influenza viruses and other diseases such as Newcastle disease.

To determine the baseline price, many countries use the average market price for the month before the outbreak. Others use the price on the day of culling to try to provide more incentives to report quickly, because poultry prices tend to drop dramatically during the initial stages of an outbreak. The Bahamas Animal Contagious Diseases Act, for example, bases compensation on the market value the animal would have had immediately before slaughter. On the other hand, in areas where market prices are very volatile, it may be possible to use production costs as a basis for calculating compensation. The percentage reimbursed generally varies between 50-100 percent, depending on available funds and the amount that poultry producers are willing to accept.

A final consideration is to ensure that the government is capable of rapidly processing compensation claims and disbursing timely payments. When producers know that they can reliably expect to be compensated shortly after culling, they will be much more likely to report sick birds.

14. Offences and Penalties

Offences and corresponding penalties must be outlined in the legislation. In most legal systems the detailed list of offences and penalties will be included in the parliamentary-level Animal Diseases Act, although the Act may just provide a range of penalties and leave the specifics to be included in the regulations. Other legal systems may set out all penalties in a penal code or administrative code.

There are two types of offences, those that are committed by the public and those that are committed by officials carrying out their duties. The former group should have prohibitions against the following types of activities: digging up buried animals; disobeying orders given by a person in authority such as an inspector; violating market restrictions or other quarantine measures; carrying out unauthorized culling;

and committing fraud in connection with the compensation scheme.

The second group must have prohibitions against improper financial rewards while on duty (i.e. bribery or corruption), revealing business secrets acquired in the course of duty or otherwise abusing the power entrusted to them in the performance of their responsibilities. Again, some jurisdictions cover these types of offences by government officials in an umbrella law, obviating the need to address these offences in the Animal Disease Act. In some societies, a highly publicized prosecution at the beginning of an outbreak can deter other would-be lawbreakers.

Each country must consider its particular situation in determining the level of punishment for infractions, but in general the penalties must be serious enough to deter violations whilst not being overly strict or unenforceable. Penalties may be linked to the nature and magnitude of the offence, and a second or subsequent infraction may be penalized more harshly. For example, the Indonesia Law Concerning Animal, Fish and Plant Quarantine considers wilful infringement of quarantine restrictions a crime and negligent infringement an offence, with different maximum punishments for both. Penalties can consist of fines and imprisonment as well as forfeiture of poultry flocks or other property.

* * *

To effectively respond to an animal health emergency, legislation covering at least some of the preceding subject matters should be enacted prior to any outbreak. Some provisions will be included in the principal parliamentary-level Animal Diseases Act, whereas others will be included in the various regulations, orders and other subsidiary instruments associated with the Act.

In addition to having some legislation in place ahead of time, it will be essential to have already-prepared decrees or draft regulations ready for the Minister, Prime Minister or President to issue. This is because in the face of a full-fledged emergency, there will not be enough time to prepare new legislation or to consult widely with potential stakeholders whose collaboration is essential. When the outbreak occurs, the competent authority should be able to immediately initiate the response mechanisms and mobilize the relevant organizations identified in the contingency plan.

IV. FUNDING

A. Costs

Fighting an outbreak of HPAI involves a number of costs. Governments will have to consider whether and how well they can meet the necessary expenses that will arise during an outbreak and in the course of normal monitoring and prevention of the spread of the disease. One of the most direct and significant costs is compensation for culled poultry. Many governments, especially in some countries where HPAI is prevalent, do not believe that they can afford to provide poultry producers with a replacement for their lost birds, whether in kind or with cash. However, this point of view can create much greater costs than compensation. Without an adequate and fair compensation scheme, the increased consequent costs can include: producers suffering poultry losses; consumers experiencing increased prices as a result of increased demand for other sources of protein; governments seeing reductions in exports of poultry and other products and a corresponding loss of confidence in the country's food commodities; and governments absorbing higher costs of fighting a possible endemic infection as well as costs related to the declining food security of the population.

In addition to the compensation costs, governments may need to expend funds to strengthen public health and veterinary services, increase surveillance activities, provide nationwide educational campaigns or increase research expenditures. Some costs are already part of the government's budget for veterinary, police and general laboratory services. But all of these individuals and services must be sufficiently remunerated so that they will perform honestly and efficiently, and they must also have proper equipment. All of these elements must be operating reliably before an outbreak occurs.

An outbreak may also require new expenses such as payments to new veterinarians or additional workers needed to properly cull poultry or dispose of poultry carcasses. Other new expenses could arise from the purchase of laboratory reagents, or from the costs of closing, cleaning or relocating markets. Additionally, the government may decide to institute a vaccination programme near the sites of outbreaks or at other high-risk areas to prevent the further spread of the disease. All these costs must be considered and budgeted for.

The costs of inaction, however, far outweigh the costs of implementing preventive measures for animal diseases. An OIE-funded study from 2007, *Prevention and Control of Animal Diseases Worldwide*, concluded that an investment of €14.6 million in preventive measures in Africa could save more than double that amount from animal deaths. This direct cost does not even take into account additional benefits such as improved trade and market access and a decreased risk of transfer to human populations.

B. Availability and Sources of Funds

Governments can look to the following sources of funding to prepare for and respond to an outbreak of HPAI:

- *Local authorities.* Different government subdivisions (federal, state and local) may be able to share the costs. If most poultry farming takes place in one area which is enriched by that poultry trade (through direct payments, the creation of jobs or the collection of tax income in the region), the government may expect that area to shoulder more of the cost burden than other regions. If the trade is spread evenly throughout the country, all levels of government from the central ministries to the local assemblies may be able to allocate part of their emergency budgets to fight HPAI.
- *Special funds.* General trust funds, or trust funds on particular issues, may be available for government use during an animal disease emergency. If HPAI is present in more than one country in a region, a regional or international organization may donate funds. If one population group is affected disproportionately more than others, funds may be available from a specific source (e.g. money from a Women's Development Fund if women as poultry keepers are disproportionately affected). As noted earlier, government should have established an animal disease emergency fund in the legislation whose use is triggered by the competent authority's declaration of an animal disease emergency according to criteria set out in the law.
- *NGOs and civil society groups.* NGOs that work in food security or in animal husbandry may have access to funds, and other governmental and non-governmental organizations may be able to obtain funding from other sources. Does the national civil protection organization have funds? NGOs may also be able to provide expertise, materials and staffing for vaccination, culling or other control measures.
- *Industry.* Farmers and poultry keepers working on a large scale may be able to subsidize preliminary measures to combat HPAI before it strikes their flocks – either through payments once an outbreak begins or smaller, regular payments prior to any outbreak. Small-scale farmers usually do not have the means to provide such contributions but they may be able to help in some ways such as by assuming responsibility for carefully monitoring flocks for signs of the disease.
- *Insurance.* It may be possible for some poultry producers to sign up for insurance policies, which can lighten the burden on the compensation scheme. Most insurers, however, are hesitant to provide coverage in developing countries – especially rural areas – largely because they do not have access to sufficient data to calculate their risks and because their losses are highly dependent on the effectiveness of the country's veterinary services and disease response mechanisms. They may also be reticent since they need a pool of insurers in order to cover their risk, but in some countries the poultry sector may not provide a big enough pool. Improving farm registration schemes and enhancing the capacities of veterinary services can make regions more attractive for insurers. In cases where premiums are still too high for poultry producers, it may be more cost-efficient for the government to subsidize insurance fees than to maintain a larger compensation scheme. That way, in addition to sharing the cost of the risk with producers, the government can spread over time one of the largest expenses of reacting to an HPAI outbreak.

Box 3 below illustrates some of the possible ways to combine support from different sources to be able to fund preparations for and a response to an HPAI outbreak.

Box 3: Funding Vietnam's Integrated Operational Program for Avian and Human Influenza (OPI)

The Vietnamese Government expects to jointly finance half of its Operational Program for Avian and Human Influenza with provincial governments. The remaining funds will come from 13 donor countries which will provide both monetary and in-kind support and from UN organizations which will provide technical assistance and resources for equipment and vaccination campaigns. The Avian and Human Influenza Trust Fund, administered by the World Bank, has funds available for developing countries and will be able to support the Government of Vietnam in its efforts. Both the World Bank and the Asian Development Bank will directly support Vietnam with credit and grants, and there is also potential support from the Association of Southeast Asian Nations (ASEAN), which is a ten-nation organization devoted to promoting regional stability and cultural development, and the Asia-Pacific Economic Cooperation (APEC), which was established to facilitate economic growth, cooperation, trade and investment in the Asia-Pacific region.

In order for the contingency plan and all of its constituent elements to function properly, funds must be immediately available upon notice of an outbreak. Similarly, the preliminary work must have already been completed in order for a timely and efficient disease response to be carried out quickly. The longer it takes to get needed funds and to begin implementing measures against the disease, the worse the outbreak will be and, as noted above, the more expensive. The outbreak may even become endemic and create a constant and in the long run more debilitating budget drain.

V. AWARENESS

A public education and awareness programme is critical to the success of any efforts to combat HPAI and should be present from the initial planning stages of the contingency plan through any response to an outbreak. In addition to widespread public awareness, specific training and education activities should be designed and implemented for anyone working in the government system who may have responsibilities for controlling the spread of the disease: field agents, veterinary personnel, police and health service workers.

One common approach is to plan two separate campaigns – one to disseminate information prior to an outbreak and another to provide information once an outbreak has occurred. The pre-outbreak campaign should outline the dangers of the disease, its clinical signs, the necessity or legal obligation to properly report any suspicions immediately, the importance of participating in poultry registration programmes and the amount of government support in the

event of an outbreak. Educational programmes should also include specific information about the strategies chosen to address a potential outbreak. For example, if vaccination is a part of the eradication campaign, the public should be informed of the beneficial effects of vaccination, food safety issues (e.g. the fact that vaccinated poultry are safe to eat), the risks raised even by birds that carry the virus without signs or symptoms, any expected trade impacts and the technical and scientific basis for vaccination.

If an outbreak does occur, the campaign should inform citizens of the elements of the contingency plan that will affect them, their rights and duties, the quarantine and its scope, the culling programme and corresponding compensation scheme, the sanitary measures to be undertaken and any other information relevant to the crisis.

A successful public awareness campaign requires consistent, clear messages that take cultural and social factors into account, and therefore requires research into the national situation. Cambodia, for example, designed the educational campaign for its National Comprehensive Avian and Human Influenza Plan around a pair of studies analysing the population's knowledge about the HPAI threat. The studies showed that the majority of Cambodians learned about HPAI from radio and television, but this knowledge was having very little effect on their behaviour. Therefore, the government altered its campaign to include personal discussions with local leaders and poultry producers on matters that required changing well-established practices. Another objective of the government was to create opportunities for local people to discuss the issues and develop their own solutions for

improved poultry handling and human hygiene so that they would be more invested in the plan. A variety of broadcast methods and messages specifically addressing target populations can be very useful. For example, many at-risk populations are rural and may not have high literacy levels. The materials designed for these populations should contain elements that even uneducated individuals can understand. Also, in countries where cock fighting is popular, it will be important to successfully target the owners of fighting cocks with information on techniques that can minimize their risks of exposure when training or working with the birds. Because cross-border areas are high-risk areas, coordination

between affected national governments can prove especially effective.

Education programmes can come from a variety of sources, although coordination between the sources and their messages should be carefully organized. The veterinary services, field agents, schools and meeting places, medical and veterinary clinics, the media and the national disaster organization can engage in outreach and awareness-raising programmes. Box 4 below highlights one approach used in public awareness campaigns for foot and mouth disease in the Philippines.

Box 4: Successful Public Awareness Campaign in the Philippines

Much of the Philippines' success in reacting to foot and mouth disease has been credited to its serious, well-run public awareness campaign. The campaign included the character "Super Pig", which was conceived as a method to grab the public's attention after the government realized that its messages were not getting across. At first Super Pig appeared as a simple drawing on leaflets and billboards while subsequently the government created a costume and Super Pig became the mascot of the campaign. Super Pig would make regular visits to livestock establishments and bus and railway terminals. The mascot would also make appearances to raise awareness of the disease during public holidays, festivals and other gatherings with large audiences. Other countries have expressed interest in developing similar mascots as part of their own public awareness campaigns, whether for foot and mouth disease, avian influenza or other animal diseases.

VI. INTERNATIONAL AND REGIONAL COORDINATION

Because of the global presence of HPAI and the ease with which it has crossed national borders, coordinating response procedures with global and regional bodies has become a significant part of combating the disease. As a result, many organizations have begun to facilitate such coordination. For example, in addressing the outbreaks in Asia, FAO helped develop minimum, standardized requirements for diagnosis and surveillance of HPAI. Although control and response strategies should still be tailored to specific epidemiological, biological, economic and socio-political factors in each country, national rules are expected to satisfy the regionally agreed-upon minimum standards. These common standards among trade partners can also minimize any potential negative effects on trade.

Some regional bodies, such as ASEAN, have been working on more advanced frameworks for HPAI prevention and control. Establishing contingency plans within these regional frameworks can reduce duplication of effort and expenses at national level. Information sharing can also lead to more complete epidemiological studies and more successful early detection programmes in a particular region. WHO, FAO and OIE help facilitate epidemiological information sharing with the Global Early Warning and Response System (GLEWS), which combines the alert and response mechanisms of the three organizations, eliminating the redundancies of multiple reporting and improving international preparedness for animal epidemics.

VII. CONCLUSION

Developing a preparedness and contingency plan to combat HPAI which has the necessary legislative elements in place and which has been sufficiently tailored to the specific needs of the country is not easy. It requires research, careful thought and planning, regular communication with stakeholders and lots of time. It also requires substantial investments and efforts to find sources of funding. Still, avian influenza's potential for economic and social upheaval is so great that any country that does not already have an established plan

must make it a priority, whilst countries that do have a plan should continually look for ways to improve preventive measures and response mechanisms.

Countries developing or updating contingency plans should coordinate with international actors and use available international resources. Only through sustained commitment and coordination, from small backyard producers to national and international stakeholders, can the threat of avian influenza be controlled.

VIII. SOURCES OF INFORMATION

A. General

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