



STOP THE SPREAD



World Health
Organization

Western Pacific Region

OIE

World Organisation
for Animal Health



Food and Agriculture
Organization
of the United Nations

Measures To Stop the Spread of
Highly Pathogenic Bird Flu At Its Source

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Note: Photographs in this publication do not necessarily demonstrate best practice, they reflect current practice in various stages of the food chain in a number of countries. Appearance in this publication does not imply endorsement of the practice by FAO, OIE or WHO.

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"There is no doubt we are in a frightening situation, but I do not believe we are powerless. We still have a chance to make our mark on history by trying to stop this virus."

- Shigeru Omi, MD, Ph.D.

Regional Director for the Western Pacific
World Health Organization,
Addressing the FAO/OIE/WHO Consultation on Avian
Influenza and Human Health,
Kuala Lumpur, Malaysia, 4 July 2005

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Only by taking action at the local level can we prevent a disaster at the global level.

Avian influenza, commonly known as bird flu, is one of the most serious health threats today. The disease is an agricultural disaster that can wreck local economies. The 2004 epidemic that spread to several Asian countries caused record losses, running into billions of dollars. More than 100 million birds were killed in efforts to control the epidemic. The virus also, alarmingly, directly infected and killed humans.

The most ominous threat from bird flu might not have been seen yet. If the virus transforms so it can spread easily among humans, it could cause an influenza pandemic - a global problem of huge proportions. Tens of millions of people could die and billions could fall ill, creating massive economic and social disruption. A new study by the Asian Development Bank warns that such a pandemic could slash economic growth rates to virtually zero.

We must do all we can to prevent such a catastrophe. To reduce the risk of the virus evolving, we must stop it from circulating in poultry. The focus should be on the way poultry is bred and killed. This document outlines strategies to minimise the disease in the production, distribution, processing and marketing of poultry, thereby reducing the risk to human health from bird flu. It is aimed at leaders in the community - mayors, local officials, medical and animal health personnel, and nongovernmental organisations.

By preventing disease, local resources, jobs and livelihoods are protected, which strengthens local economies. It is critical for communities to act now on bird flu.



A Disease With Deadly Potential

Bird flu is an infectious disease of birds caused by the influenza virus. Domestic poultry are highly vulnerable. In its highly pathogenic form, the disease is extremely contagious and rapidly fatal. Mortality in poultry can approach 100% and they can die the same day symptoms appear. Some birds, such as waterfowl, are more resistant to disease.

Outbreaks are often difficult to control. The disease can spread quickly in a flock and from farm to farm through droppings and contaminated material. In January 2004 in Viet Nam, for example, more than 400 outbreaks were reported in just three weeks following the first outbreak. Outbreak control is also costly - generally, all fowl in the affected zone must be killed. In Hong Kong (China) the entire poultry population was destroyed in an outbreak in 1997. This is why prevention of bird flu is so important.

Never before has bird flu been known to be so widespread, so persistent and so threatening to humans.

A Growing Threat

Bird flu is not a new disease. It was identified more than 100 years ago. Until recently, however, the highly pathogenic form of the disease was relatively rare, with only 21 outbreaks reported in 40 years.

In 2004, the disease spread to several Asian countries in a few months - mostly through the live poultry trade but possibly associated with migratory birds, which excrete the virus in faeces. More than 100 million chickens were destroyed. Infections also were reported in wild birds and possibly pigs. Disturbingly, more than 100 people fell ill - and half of them died.

This raised considerable alarm. Never before in recorded history has highly pathogenic bird flu been so widespread and persistent. Never before have so many outbreaks occurred at the same time in several countries. Never before have so many people been infected directly and become ill.

Tell people of the hardship we are suffering...

*Dr Nguyen Viet Nga,
Animal Health Sub-Department Director,
Tien Giang, Viet Nam*



Le Thi Yen, from Ha Noi, lost her son after the family ate diseased chickens

Bird Flu Basics

Hosts

- Bird flu infects birds and, less commonly, pigs and some cats. Domestic poultry are especially at risk.
- Migratory waterfowl, notably ducks, are the natural reservoir of bird flu. They are also the most resistant to disease. They can carry the virus without symptoms and excrete it in faeces. Outbreaks have started after contact between waterfowl and domestic poultry - by, for example, using the same water source.

Symptoms

- The disease in chickens can cause mild illness or can be highly contagious and rapidly fatal. Highly Pathogenic Avian Influenza (HPAI) is characterised by sudden onset, severe illness, rapid death and high mortality.
- Symptoms in poultry include weakness, bowed heads, watery diarrhoea and laboured respiration. Mortality ranges from 50%–100%.

Transmission

- Infected birds excrete the virus in high concentration in faeces and in discharge from the nose and eyes.
- The droppings of infected wild birds can infect poultry.
- The virus can survive in manure for more than a month in cool temperatures. One gram of contaminated manure, in theory, can infect one million birds.
- Contaminated equipment, vehicles, feed, cages, clothing and shoes can spread the virus. The virus can spread by air if birds are kept closely together with poor ventilation.

H5N1

- Bird flu viruses have many strains. The strain that caused the 2004 outbreaks in Asia, known as H5N1, is particularly deadly and versatile.
- H5N1 has the rare ability to pass directly from birds to humans. This was first documented in Hong Kong (China) in 1997, when 18 people fell ill. From 2004 to the end of 2005, H5N1 is known to have infected more than 130 people in Asia.



Pandemic Potential

A strain of the avian influenza virus, known as H5N1, caused the 2004 outbreaks. Of all strains, H5N1 probably raises the most concerns, because it can infect humans directly - a rare phenomenon. It also causes severe disease and even death among those it infects.

H5N1 is mutating constantly. If it transforms so it can spread easily from person to person, an influenza pandemic could occur. Previous pandemics have produced catastrophic death tolls. The 1918 pandemic killed 40 - 50 million people globally. In today's mobile world, the virus would spread quickly and widely.

Reports of possible H5N1 infections in pigs are also worrisome. As pigs have receptors for avian and human influenza viruses, they can also serve as a "mixing vessel" for these viruses to swap genes, resulting in a new, possibly deadly, subtype of virus. Thus, pigs should never be exposed to infected poultry. However, this reassortment of genes might not be needed if the virus continues to spread in humans and poultry, which increases the chances of it mutating into a more dangerous form.

The Aftermath of the Asian Epidemic

Investments in the control of bird flu make good economic sense. The disease can devastate poor communities, as the recent epidemics in Asia demonstrated. More than 140 million birds were killed between January 2004 and May 2005. The estimated losses to the Asian poultry sector totalled more than \$10 billion. Local economies and households were hit hard and deep. Tens of thousands of farmers lost assets, cash flow, food security, even their livelihoods, increasing their overall vulnerability.

We lost 10 000 birds in the first wave and had to shut down for six months...

*- Farmer Boonchoo Sondej,
Thailand*



A 2004 study by the Food and Agriculture Organization (FAO) found that in badly affected areas of Indonesia, more than 20% of permanent workers on industrial farms lost their jobs. Estimates for Thailand indicate that the growth rate for the agricultural sector might have halved in 2004.

Poultry is a valuable asset in many rural areas, providing a key source of additional income, food security, dietary protein and an “insurance policy” for fast cash. Thus, the loss of half the stock of poultry in some localities was a severe blow. Some farmers were left indebted or impoverished. Others even abandoned poultry for pig farming. This had an impact on the region’s poultry trade, as well as on the mental and physical health of farmers and farming communities.

Given the contagious, fatal nature of the disease, and its potential to wreak massive damage, authorities usually take aggressive control measures as soon as an outbreak is detected. The costs of not doing so are evident.



Danger in the Community

The way animals are kept and slaughtered in Asia needs to be examined. Many practices in poultry production allow the virus to persist and spread. Authorities urgently need to address high-risk practices and raise awareness in communities.

High-risk Farming

The typical village or “backyard” farm common in Asia is problematic for bird flu control. Chickens roaming freely can spread infection. Close contact between birds and humans allows the virus opportunities to adapt genetically. Investigations show this was the cause of the first human H5N1 infections in Hong Kong (China) in 1997.

In countries where highly pathogenic bird flu is endemic, raising ducks and chickens together is risky. Ducks, a natural reservoir of bird flu viruses, can infect chickens. Like wild birds, they are often “silent carriers,” showing few symptoms while excreting the virus. Thus, the water in ponds used by ducks or wild birds can be infectious. Some farmers move ducks from harvested paddy fields over long distances, dangerously spreading infection.



PVinet

Rearing pigs and poultry together is also unsafe, as pigs can act as a “mixing vessel” for the virus to transform into a more lethal form for humans.

Poor hygiene and farm conditions are other major causes of the spread of bird flu. Cleanliness is critical, as poultry excrete the virus in high concentrations in faeces. Contaminated equipment, vehicles, cages or clothing are key modes of spreading the virus. Some farms even use chicken faeces as feed.

The buyer [poultry trader] sold infected live chickens at the market, people took them home... and [the disease] spread even further.

- Dr Isep Sulaiman,

Director, Disease Investigation Centre, Central Java, Indonesia

Infection in the Marketplace

The marketplace is often a centre of social and economic activity in communities across Asia. Unfortunately, it can also be a hub for the rapid spread of disease.

Many traditional practices - especially those involving slaughtering - are unsafe. Bringing together many birds of different species is risky in itself. This “mixing pot” can become a breeding ground for a changed, and possibly more dangerous, virus.



Markets were a source of infection in Hong Kong (China)'s 1997 epidemic. Roughly 20% of poultry in live bird markets were infected then. Infection in marketplaces also clearly helped expand and escalate the 2004 epidemics in Asia.

Trading of infected animals continued in some markets even when it was illegal, such as during bans on the movement of birds. In a recent study, roughly one in eight traders in Viet Nam admitted to selling infected poultry during the 2004 epidemic. In fact, selling diseased birds is not an uncommon practice. Another widespread, high-risk practice is to return unsold birds to the farm. This allows the virus to enter a farm and spread.

Markets selling live birds present other hazards. In much of Asia, people traditionally prefer "warm" - or freshly slaughtered - meat to killed and chilled meat. Animals are frequently slaughtered on the premises, often in open and unprotected areas. This can release virus particles from an infected bird's feathers, organs, faeces and blood.

Infection also can spread through unhygienic conditions and chicken faeces. Poultry is often transported, caged and stored in cramped, dirty and poorly ventilated conditions. Sometimes, chickens and ducks are kept in the same area. Such practices could have serious implications in terms of an influenza pandemic.

Roughly 1 in 8 poultry traders interviewed in a study in Viet Nam admitted to selling sick birds in markets during the 2004 epidemics.



To control bird flu - and avert a pandemic among humans - we must reduce the amount of virus in circulation. While wild birds play a role in spreading the virus, the most important target areas for control measures are farms and markets. During the FAO/OIE/WHO Consultation on Avian Influenza and Human Health in July 2005, a series of strategies were developed to prevent the spread of bird flu.

Strict controls are needed in poultry production and marketing. Good hygiene and protected environments for poultry are essential. Control strategies also should include surveillance and monitoring, and vaccination can be considered an efficient tool. To challenge age-old traditions, raising awareness and enforcing laws are necessary.

In the long run, these strategies will not just reduce the threat of a devastating agricultural disease and a human pandemic, but also will stabilise poultry production and enhance food safety by helping reduce contamination from other organisms.

Outbreaks must be detected quickly and halted. An early warning system and rapid response procedures are critical. Infected or exposed poultry must be destroyed - or culled - and properly disposed of. Without prompt control, epidemics can persist for years. A H5N2 epidemic in Mexico that began in 1992 as a mild disease took three years to control. By then, it had evolved into a highly fatal form.

In summary, a control strategy should cover these measures:

- I. Farm practices: biosecurity, exclusion of wild birds, "all-in, all-out".
- II. Markets: safe transport, hygiene and cleaning, zoning, disease detection.
- III. Vaccination: when to vaccinate, rules and strategies, preparing for vaccination, cautious use.
- IV. Raising Awareness: information needs, resistance to change, key messages for people in affected areas, cullers and others at risk, key messages on poultry and food safety.
- V. Information networks: information sharing, surveillance systems, disease notification.
- VI. Regulatory control: national laws, developing legislation, enforcement.

These measures, discussed in the following pages, should be weighed against the risks, costs and benefits. No one measure is a panacea. No one measure used in isolation is sufficient. The control strategy must be developed for the local situation, based on knowledge of how the virus spreads and persists, as well as the suitability of interventions such as vaccines.



Measuring the Costs of Control

Control measures are not cheap. Restructuring the poultry sector from farm to market has huge social and economic consequences. Then there are the costs of outbreak investigations, culling of birds, movement controls, vaccination and enforcement. The costs and benefits of any approach must be analysed to support informed choices. Mitigation measures should be foreseen and included in policy planning.

FARM PRACTICES

Control measures on the farm basically focus on stopping the entry of the virus. Anything entering a farm, from visitors to vehicles, can be contaminated. The situation has been described as having an “enemy at the gate”, so all potential “enemies” must be barred or screened.

Biosecurity Measures

Biosecurity refers to measures to keep the virus off farms. It can involve creating a barrier - even a simple fence - between the farm (or flock) and the environment. Biosecurity requires close control over the access of people, animals and goods to the farm or flock.

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To focus on situations where humans appear at greatest risk, countries must prioritise village or backyard farms, small commercial farms with limited biosecurity, and associated communities where humans live in proximity to the animals they (or other community members) are raising. Providing greater biosecurity in such circumstances is complex, because environments where poultry can wander freely simply are not designed for a high level of biosecurity.

Despite these difficulties, biosecurity often still can be enhanced. An enclosure, such as a truly “backyard” (rather than a front yard) pen, can be created. Given that most human H5N1 cases in 2004 occurred in backyard farms - the most common type of farm in the region - such action should not be underrated.



Keeping wild birds and ducks, which are natural reservoirs of the virus, away from domestic poultry also is important. These wild birds and ducks can excrete the virus for 30 days without symptoms. Placing netting over ponds to exclude waterfowl can help resolve this problem. Drinking water from suspect ponds should not be given to poultry, or at least should be treated. Feed should be stored out of reach of wild birds. And waste needs to be managed safely.

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Killed by Heat and Disinfectant

While the bird flu virus is contagious, it is not very hardy. Heat (poultry meat should be heated to at least 70° C when cooking) and common disinfectants can kill it. But in faeces and water, the virus can remain infectious for 4 days in warm temperature (between 22° C and 25° C), and more than a month in cooler climates.



Other simple steps to improve the biosecurity of these farms and communities could include:

- keeping poultry, ducks and pigs separately;
- improving the safety of feeding practices;
- ensuring communities work together to implement community cleaning and disinfection days/ programmes, monitor the health of their poultry, and close certain locations to poultry production for a period of time;
- instructing animal health workers to guard against spreading infection themselves from farm to farm in their visits;
- introducing efforts to exclude cats, dogs, rats and other vermin from areas with poultry;
- managing waste properly; and
- excluding poultry from the home.

Our gate is always locked now and no outsider can enter the coops.

*- Farmer Boonchoo Sondej,
Thailand*

All-In, All-Out

This refers to bringing in and taking out all birds in a flock at one time.

In the market refers to selling all birds on site. If unsold birds are returned to the farm, they might carry back the virus. Prior arrangements must be made for birds that are unsold.

On the farm refers to rearing chickens of the same age. Once birds are sent to the abattoir or market, workers can clean and disinfect the premises before the arrival of a new flock. Thus, the flock is protected against the entry of new, possibly diseased, birds.

Biosecurity measures also need to be reinforced on industrial and large commercial farms since the impact of infection can be considerable, due to their dense populations of poultry. However, putting such measures into practice can be surprisingly difficult even here, because of all the frequent movement on and off farms - of farm workers, feed, fertilizer, replacement flocks, veterinarians and vehicles.

For those addressing such farms, the methods and tools to be used to prevent and control avian influenza have been fully described in the FAO document prepared with OIE in September 2004: *Recommendations on the Prevention, Control and Eradication of HPAI in Asia* [see <http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/27septrecomm.pdf>]. That document recommends such farms develop their own biosecurity plan, which should cover secure designs of farms, restriction of traffic on and off the site, sourcing safe supplies, appropriate disinfection, and protective clothing.

Biosecurity is an extremely important safety measure. Indeed, the lack of biosecurity on many farms is a key factor behind the persistence of bird flu.



Markets selling live animals are a critical point to stop the spread of disease. As they so often are at the heart of a community, markets are also an apt place to raise awareness and enforce new regulations.

Provincial, municipal and local authorities, market leaders and market communities should develop a plan to combat the disease. This should cover hygiene, animal management and market design - such as having a separate area for slaughtering chickens - as well as education of traders. A system for early, rapid detection of disease also should be set up.

Safe Transport

Moving birds between farms and markets can spread the virus. Care should be taken to prevent faecal contamination in the materials to transport birds, the roads and offloading areas. Cages used to carry birds should be constructed with equipment that can be easily cleaned and disinfected. Plastic and metal are preferred to wood.



Some countries are already moving to centralised slaughtering and now restrict the sale of live birds at markets. This involves considerable upheaval, and might even introduce other hazards associated with centralised slaughtering facilities. Other measures can be introduced:

Hygiene and cleaning:

- Compulsory rest days. Emptying and disinfecting markets regularly improves hygiene and prevents the build-up of pathogens. Hong Kong (China) has two rest days a month. But this can be difficult to introduce as traders will lose income. In Viet Nam, some markets are emptied and cleaned at night.
- Hygienic cages. To prevent cross contamination with faeces, cages holding chickens should not be placed below cages with other birds. At a minimum, waste trays should be placed under the cages. Adequate ventilation and lower stocking rates also help to reduce infection.
- Cleaning facilities. A special room to clean and disinfect cages, with appropriate waste treatment, should be set up. Cages should be made of material that is easy to clean and disinfect. Hand washing basins should be provided where humans and birds come into contact.



- Manage waste safely. Faecal matter, feathers and waste materials from the slaughter of birds need to be disposed of properly.
- Personal protective equipment. Workers handling dead birds should wear protective gear. Shoes and hands can be covered with plastic bags.

Zoning:

- **Slaughtering zones.** A separate area strictly for poultry will improve biosecurity by reducing the likelihood that products or consumers in other areas get contaminated. The safe disposal of waste needs special attention.
- **Separating species.** Different bird species should not be kept together at any time, including during transportation to and from the market. In the market, this might mean having different storage areas, or at least separate cages.

Disease detection:

- **Monitoring.** Birds in the market should be assessed continually for sickness. Regular surveillance, sampling and analysis are needed for this.
- **Notification.** Diseased or dead birds must be reported immediately to health and veterinary authorities. Appropriate action should then be taken. If authorities consider bird flu a likely cause of the illnesses or deaths, all the animals in the market should be quarantined while testing determines the exact cause. Compensation might help encourage notification.
- **Traceability.** The source of sick birds should be traceable back along the production and marketing chain.

Taking action in marketplaces has far-reaching benefits, not just in terms of preventing disease and providing a safe, hygienic working environment. Animals are less likely to become sick and die, which thus protects the resources and income of farmers. This, in turn, helps businesses and local economies to prosper.



In some countries, or parts of countries, massive vaccination could be the only way to reduce the infection in poultry, which will lower the risk of human exposure and infection. In others, where stamping out without vaccination can be achieved, the authority of countries to prohibit the use of vaccination needs to be respected.

Vaccination can reduce the number of new outbreaks - and thus the “viral load” in the environment. It increases animals’ resistance to infection, thereby enhancing disease control and reducing the risk of bird and human infection. Some vaccines are available that provide poultry with excellent protection against disease. However, poultry should only be consumed 14 days after vaccination and uncooked chicken may still present some risks.

When to Vaccinate

The decision to vaccinate must be made carefully and with government approval. Costs also must be assessed beforehand. Authorities should consider providing financial support to backyard farmers who might not be able to afford vaccination.

Vaccination is valuable where the risk of infection is high and preventive measures are inapplicable or ineffective. “Ring vaccination” can be carried out in areas surrounding the outbreaks or where domestic waterfowl, wild birds or live bird markets are reservoirs of the virus and a threat to domestic poultry. It can be the only hope where biosecurity cannot be improved, such as on backyard farms.

To control outbreaks, culling is still an appropriate choice. However, blanket vaccinations might be the only choice when the disease is endemic, when outbreaks are numerous, and when other measures, such as stamping out, are not effective. Under such conditions, vaccination can reduce the number of outbreaks and allow a switch to a stamping out strategy alone or combined strategy (stamping out, biosecurity and targeted vaccination).

Vaccination Rules

Vaccination should be done only:

- on healthy birds;
- with surveillance;
- with appropriate products; and
- with government approval.

Preparing for Vaccination

In preparing for vaccination, a number of other issues must be considered:

- The types of poultry to be vaccinated must be determined and documented.
- Infected birds must not be vaccinated.
- Surveillance systems must be developed to monitor vaccinated birds and the response to vaccination, and to detect the presence of the field virus.
- Detailed records of vaccinations should be kept.
- Sufficient quantities of vaccines should be available for the whole programme.

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- Quality vaccines are critical. Vaccination, therefore, must be carried out with appropriate products, manufactured and quality-controlled to ensure compliance with international standards referred to in OIE's *Manual for Diagnostic Tests and Vaccines for Terrestrial Animals* [See: http://www.oie.int/eng/normes/mmanual/A_summry.htm].
- Logistical arrangements must be set up to deliver and administer the vaccine.
- Vaccinators should be trained in correct procedures, biosecurity measures and public health measures, (such as wearing personal protective equipment).
- A timeframe for a review of effectiveness of vaccination should be established.
- An exit strategy should be developed, even if the exit point is not likely to be reached for years.

A Case for Vaccination

Viet Nam suffered the worst bird flu epidemic in Asia in 2004. Despite culling some 45 million birds, the country struggled to control the disease. A key problem was that 94% of households keeping poultry (which accounted for 55% of poultry produced) were village or "backyard" farms with poor biosecurity. In August 2005, the Government began a programme to administer 20 million shots of vaccine. FAO, OIE and WHO all welcomed the move for Viet Nam as a high risk country.

Vaccination Strategies

Vaccination is appropriate in three situations:

In response to an outbreak. Healthy poultry at risk (such as village chickens) around an outbreak (usually within 8 kilometres) are targeted through ring vaccination. All birds in the infected area are culled. The aim is to control the outbreak as quickly as possible.

To prevent an outbreak. If surveillance provides an early warning of a potential outbreak (for example with the death of wild ducks), this can be a trigger for vaccination. The aim is to prevent any cases in domestic poultry.

To protect valued birds. If the risks of infection are high and the consequences serious, baseline vaccination might be used. It is done to protect valued genetic material, safely restock chickens after an outbreak, safeguard zoological animals or protect long-lived chickens, such as breeder flocks. Fighting cocks and other valued birds also can be vaccinated.

Cautious Use

Vaccination should not be considered a permanent measure. Incomplete vaccination coverage will not stop the circulation of the virus. In addition, a small percentage of vaccinated birds can excrete the virus, although in far lower quantities. Persistent excretion of the virus could generate new viral strains. This is why vaccination must be administered under government supervision with surveillance and monitoring, which can track the circulation of the virus and the efficacy of the programme.



RAISING AWARENESS

A strong, unfulfilled need for public awareness about bird flu is evident in Asian countries. Control strategies require public awareness for success. Often, however, the public know little of the risks and responses. While regulations can set parameters, they can be circumvented or flouted by a public that fails to understand their importance. No control strategy can succeed without some community support.

Resistance to Change

Given the costs of control strategies, not to mention the inconvenience and hardship, people tend to resist change of practice. This could be a major reason behind the persistence of the disease in Asia in 2004.

At the height of the first wave of these outbreaks, when government restrictions and stamping out activities peaked, studies show about one in 10 households in affected areas still continued to move poultry. In Cambodia, about 25% of traders interviewed in a study continued to conduct business during the ban. In Viet Nam, among farms that culled, 80% culled the entire flock, but 20% culled only part of it.

This shows the importance of public awareness to break the contamination chain. Knowledge of the issues helps people make informed choices and change behaviour.

Information Needs

Awareness and information is needed at all levels - from administrators and poultry owners to market traders and the public. An education strategy should be established.

Local communities should be informed about bird flu - the risks, how it is spread, and the preventive, control and sanitary measures. Farmers lack information in many areas. Communities should be

Key Messages for the Public in Affected Areas

- Avoid contact with chickens, ducks or other birds unless necessary.
- Keep children away from birds and their waste or feathers.
- Do not keep birds as pets.
- Do not prepare poultry from affected areas as food. Slaughtering such birds is dangerous.
- If you touch birds or bird faeces from affected areas, or walk on soil contaminated with faeces, wash hands with soap and water. Clean shoes outside the house. Seek medical help if you feel unwell.



We concentrate on education about disinfection and other measures... going on television, holding seminars, distributing cassettes and even going to...schools.

Dr Nguyen Viet Nga,

*Director of the Animal Health Sub Department in Tien Giang,
Viet Nam*

made aware that preventing disease protects local resources and livelihoods. Education campaigns should target backyard farms, live bird markets and organisations dealing with livestock.

Within a community, those most at risk should be prioritised:

- cullers, food handlers and people preparing food;
- owner of prized birds;
- low-income households where people live with animals;
- poor women and children;
- ethnic minorities from remote areas; and
- village-to-village traders.

Messages should be timely, concise and targeted at the local audience. They should take into account whether the area has been affected by bird flu, thus requiring a high alert.

Key Messages for Cullers

(And people handling diseased birds or decontaminating farms)

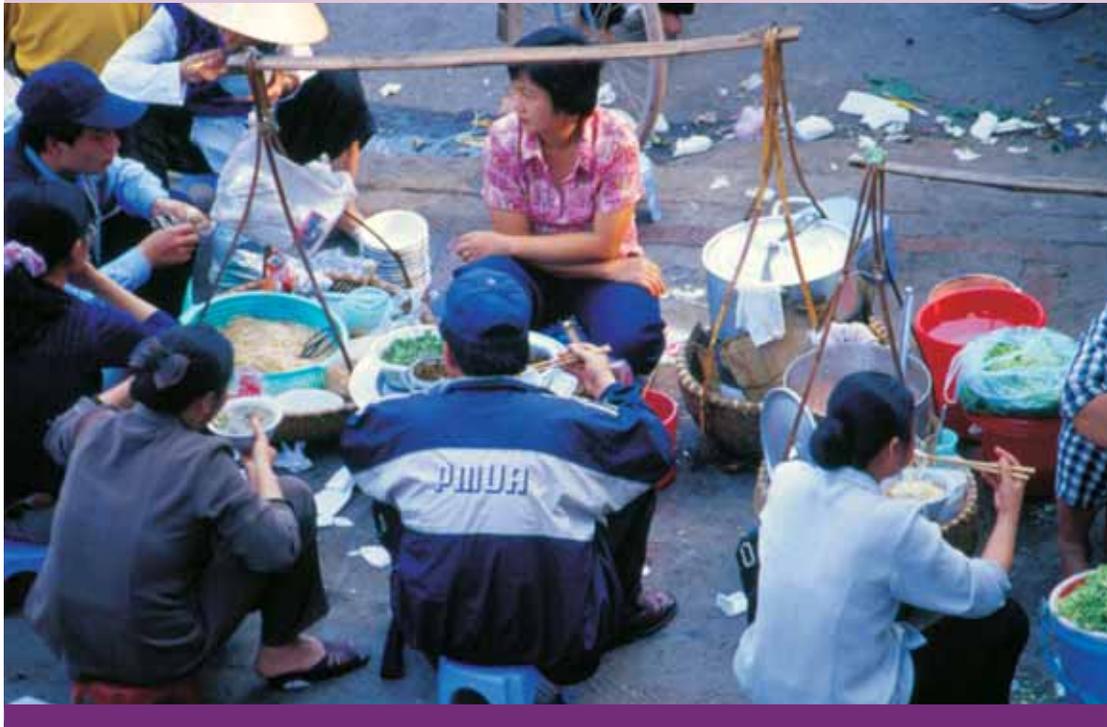
- Wear protective clothing (mask, goggles, gown, rubber boots and gloves). If such clothing is unavailable, cover mouth with a cloth and hands and shoes with plastic bags, tied with string. Wash or dispose of clothing.
- Dispose of diseased birds properly. Bury bird carcasses and faeces at least 1 metre deep. Avoid generating dust. Clean the area well with detergent.
- Exclude poultry from outdoor areas for at least 42 days to allow ultraviolet radiation to destroy remaining virus.

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Key Messages for the Public on Poultry and Food Safety

- No birds from diseased flocks – or products such as raw eggs or blood – should enter the food chain.
- Slaughtering sick chickens is not safe. Those preparing them for food are also at risk.
- Practise good hygiene during slaughtering. Do not contaminate the environment with blood, faeces or dust.
- Separate raw meat from cooked food to avoid contamination. Do not use the same utensils or chopping board for raw and cooked foods.
- Keep clean. Wash your hands – and utensils or surfaces – after any contact with raw poultry or eggs.
- Cook food well to inactivate the virus. Meat should be cooked to 70° C so that no meat is pink in any part. Eggs should be handled carefully and cooked well. They should not be consumed raw or partially cooked (i.e. runny yolk).
- By-products of slaughter, such as intestines, organs and bone meal, should not be fed to chickens.
- Duck blood pudding is potentially unsafe. Ducks can carry infection without symptoms, so knowing if they are infected is difficult. As the blood is uncooked, this food can be fatal and is best avoided.



Strategies to raise awareness include:

- activities with schools, teachers, religious leaders and mass media;
- outreach and training with the community;
- community participation with the engagement of community champions, village volunteer workers and village veterinary workers.

Teachers, local authorities, youth associations and women's groups also can help play a role. Whatever strategy is selected, the programme should have a component to measure its effectiveness in changing behaviour.

INFORMATION NETWORKS

The 2003 SARS (Severe Acute Respiratory Syndrome) epidemic demonstrated the danger of poor information networks. Failure to report new cases, or respond to them rapidly, can lead to disaster. For H5N1, which is more contagious among birds than SARS, it could even mean the difference between a small local outbreak and a catastrophic human pandemic. And even if an influenza pandemic does emerge, it still could be halted if detected early (within two weeks or so) and contained at the source, some experts believe.

Unfortunately, current disease information systems and veterinary capacity are far from adequate in many Asian countries. Surveillance, diagnostic services, disease notification and data analysis all need to be strengthened.

More knowledge about the virus - specifically, how it circulates and persists - is needed urgently. This is vital for the right response and control strategy. Incomplete information also impedes scientists' efforts to advance their understanding of the behaviour of the virus. Moreover, potentially dangerous changes in the virus might slip by unnoticed.

Information Sharing

Good disease intelligence depends on regular, consistent and transparent information sharing. Networks are needed at many levels - farms, laboratories, epidemiology units, economic institutions, and government offices at the local and federal level. Information should flow from the bottom up and top down in regulatory agencies.

Information should reach regional and international reporting networks. Human and animal viruses - as well as clinical specimens - should be shared with laboratory networks, as well as international organizations. Studies of human infections also need to be shared.

All H5N1 viruses are not the same - the genotypes in Viet Nam and Indonesia are different - and not enough is known about the impact this could have.

Investigations into outbreaks, especially the extent and nature of spread, should be more thorough to aid further understanding of the virus. Joint investigations by medical and veterinary personnel could help address this.



Surveillance Systems

Some countries lack effective surveillance systems to monitor the disease and provide early warnings of outbreaks or changes in the virus. The diagnostic capability to confirm disease is often weak due to inadequate local laboratory services. Typically, countries have critical shortages of trained staff and resources. Coordination between the public and private sectors, as well as between agencies, also might be lacking.

To derive the most value, surveillance should be targeted. It should focus on reservoirs of infection, such as markets and abattoirs.

Compensating Farmers

Bird flu severely affected many poor Asian farmers in 2004. Many village farms received little economic support. Farmers' reluctance to disclose cases, therefore, is not surprising. Compensation is important to counteract this. Some studies indicate timely credit might be even more useful. Veterinary support is also essential. In Cambodia, 80% of small-holder poultry owners have never exposed their poultry to a trained veterinarian or animal health worker.



To contain a fast-spreading virus, countries need to respond promptly, act with transparency, obtain reliable scientific data, and share information and experiences with one another.

- Thaksin Shinawatra,
Prime Minister of Thailand, at a regional ministerial meeting in Bangkok,
January 2004.

Disease Notification

Improvements in the reporting of cases to veterinary and health authorities, especially from backyard farms, are needed urgently. Fresh outbreaks and new human cases must be reported quickly for a prompt response. The lack of a timely response has led to outbreaks flaring up across countries.

Farmers and communities might be reluctant to notify authorities about cases, fearing the losses if flocks get culled. Farmers must be made aware of the issues. If possible, compensation or credit should be given to the farmers. Authorities also might be unwilling to declare cases when trade and tourism are at stake.

REGULATORY CONTROL

Laws need to be strengthened in the key areas of outbreak control. Many countries have gaps, although governments generally are adjusting quickly. A greater concern is regulatory enforcement. In many countries, the disparity between the law and the capacity to enforce it is significant. Limited human and financial resources, as well as inadequate infrastructure, hamper enforcement. Major efforts are required to address this problem.

National Laws

Laws vary widely between countries. Hong Kong (China) has the most comprehensive legal framework on the issue. All farms must be registered and installed with facilities to keep wild birds out. Imported chickens also require health certificates.

Viet Nam has issued new regulatory controls. However, provinces can set their own regulations, and poultry production systems are diverse. In rural areas, the community might be more important in establishing control measures. Thus, public awareness is vital.

Developing Legislation

Wherever possible, regulations should be based on the risks in the country, so they have the intended impact when implemented. Legislation should prioritise:

- outbreak management, including culling infected flocks;
- protection of farmers and workers;
- cleaning, disinfection and carcass disposal;
- movement control, as well as import control and quarantine;
- surveillance in high-risk populations; and
- registration and licensing of large farms.



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Enforcement

Regulatory controls can be enhanced through:

- disease awareness and communication at all levels, from policy makers to villagers;
- resource mobilisation to help enforce regulations;
- information systems and mapping of poultry distribution and movement flow;
- compensation to support notification and culling; and
- research related to legislation, including social impacts.

The active involvement of all groups of people affected will be necessary to formulate the regulations and enforce them.



The challenges in preventing bird flu are formidable. The virus has already evolved into a more resilient and versatile form. The scope, severity and rapid spread of the recent epidemics in Asia showed how countries - and their veterinary services - are ill-equipped to cope.

The virus is now entrenched firmly in the region. Farming systems in many areas are inherently risky, adding fuel to the viral fire. Chickens can be found in many backyards, while farmers commonly move ducks over long distances to feed on harvested rice fields.

Financial resources, disease information and regulatory control are also lacking, while control measures are often expensive and cumbersome, and require changes in behaviour.

Yet the consequences of not taking action are simply staggering: agricultural disaster, economic ruin, food shortages and a potential human health catastrophe. We have a duty to do all we can to avert such a scenario. The window of opportunity to change the course of global disease history is still open.

We need to act quickly and not waste the opportunity presented to us. The task ahead is difficult, but not impossible. It requires animal and public health authorities to work together with community leaders and farmers. It requires reducing the risks all the way along the food production chain, from farm to table.

Action in the community will be crucial in the battle against bird flu. Indeed, mobilising the masses might be what is needed to create the momentum for change. Community leaders in affected areas must respond to this challenge. In this way, they can build secure futures for their people.



FURTHER INFORMATION:

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