

# Flu: alert or alarm?

Warren Page looks at the facts behind the threat of avian flu – and some of the international efforts to counter it

**H**ow real is the threat of a pandemic of avian influenza? Some media reports have suggested that it is only a matter of when, not if. References to the 'Spanish flu' outbreak of 1918 to 1919 have aimed to justify this threat, supported by the rapid geographic spread of avian influenza from Asia to Europe.

The current avian influenza is one of many strains known to exist. It is, however, far more virulent and pathogenic (harmful) than other known strains – referred to as Highly Pathogenic Avian Influenza or HPAI. Another term to describe it is the H5N1 strain (see What is bird flu?, right). Humans contracting this strain have often died, with the source of these infections attributed to an association with birds.

For a pandemic to occur, the virus would need to mutate to allow transmission from person to person, a possibility that increases the longer the virus circulates. Efforts are focusing on controlling outbreaks among bird populations, to limit the opportunity for mutation.

Avian influenza is not new, first being identified in the 1890s in Italy. What is different about this virulent strain is that it has only recently been recognised, leaving much about it unknown. These gaps in knowledge have fuelled speculation on the potential for a pandemic.

Balancing this speculation against improved controls needs more information, something the international research community and governments are focusing on providing. Developing and distributing this knowledge can reduce the impact of the H5N1 strain of HPAI, and other diseases transmitted from animals to humans.

The Australian Government has initiated a coordinated response, including involvement from AusAID, the Australian Department of Health, the Department of Agriculture, Fisheries and Forestry, the Australian Quarantine and Inspection Service and ACIAR.

Each is providing expertise to help develop a coordinated Australian and regional response, and to build capacity in Southeast Asia.

ACIAR's role is focused on this last aspect, including expanding the knowledge base regarding avian influenza.

Indonesia, Vietnam, Cambodia and Laos will all be involved in projects now being developed or under way. The first two countries have been hardest hit, both in terms of outbreaks and human and bird fatalities.

The projects are being developed as part of a

suite of ACIAR projects with three broad aims:

- ▶ building up knowledge of the virus;
- ▶ using this to increase the effectiveness of surveillance; and
- ▶ understanding the costs of the disease to inform control options.

The first emphasis is to build up knowledge of the virus and disease. Ducks are often kept in close proximity or farmed with chickens. Chickens are a known infection 'reservoir', but what is unclear is whether ducks, like chickens, can pass on the disease. Determining the existence and levels of virus antibodies (a sign of past infection) and current infection rates will help answer this. Ducks may act as hosts of the virus, allowing it to remain alive and also amplify or change; if so, this has implications for control strategies.

A related area of research under development is identifying how avian influenza is transmitted from poultry to humans. All human fatalities from the disease have been attributed to some form of direct association between birds and infected humans.

Chickens are an important income earner and contributor to food security in smallholder and village-based farming systems. Poultry are often left to scavenge food. Mortality rates are high, especially for maturing chicks. Disease plays a large part in this mortality.

Targeting controls against bird flu, Newcastle disease and other diseases, as well as control strategies and surveillance, relies on effective systems reaching villages. In Cambodia and Laos an ACIAR project, under way, is testing village-based disease control and surveillance systems.

A complementary project under development and targeting Indonesia is focusing on the role of agencies responsible for community-based systems operating in villages, the front line in monitoring and control. A proven 'toolbox' approach to surveillance, equipping local extension officers with the knowledge to assess disease losses, will be tested.

One key element of control is helping policy makers better understand the

## WHAT IS BIRD FLU?

There are three types of influenza virus – A, B and C. Bird flu is an A-type virus with multiple subtypes, these being defined by combinations of two proteins (HA and NA) which exist on the surface of the virus. The HA protein has 15 different subtypes, the NA nine subtypes. The combination formed by one HA and one NA protein is used to name the virus subtype. Bird flu is known as H5N1 virus, being a combination of HA5 and NA1 proteins. The Spanish flu of 1918–19 was attributed to the H1N1 strain and is believed to have originated from an avian strain of the disease. It is estimated that up to 50 million people died from this strain. Other strains known to cause fatalities are the Asian flu (H2N2) of 1957–58 and the Hong Kong flu (H3N2) of 1968–69, which still circulates today.

Avian influenza viruses are also classified by their level of pathogenicity (or the level of harm caused to the infected subject) and their virulence (the speed and ease of transmission). Highly pathogenic avian influenza (HPAI) has a high mortality rate in poultry, capable of killing between 90 and 100 per cent of infected chickens. Low pathogenic avian influenza (LPAI) causes less severe symptoms; in many cases no illness may occur in infected chickens. But LPAI viruses can evolve into HPAI viruses, requiring that both be monitored should outbreaks occur.

potential gains from a variety of control options. Current controls rely on mass cullings and limited vaccination of unknown effectiveness. As an example, the World Bank puts the direct cost to Vietnam for bird flu in a range between US\$30 million to US\$105 million. Indirect costs, such as lost jobs and reduced income trickling down to smallholders and throughout the economy, are up to eight times the direct costs.

In Indonesia, the estimated cost of eradicating avian influenza is a prohibitive US\$2.1 billion. An ACIAR project is in development to assess the real control costs for the poultry industry and wider economy. The analysis will examine options for control and their effects on national, provincial and local economies and weigh these against the potential gains, to support government and other agencies. ◀

