

# Stopping diseases at the border

Understanding the movement of livestock through Cambodia and Laos is vital to controlling the spread of devastating diseases such as foot-and-mouth and classical swine fever

**D**iseases show no respect for national borders. Recent outbreaks of H1N1 influenza, beginning in Mexico and spreading to Australia, Asia, the US and Europe, demonstrate how easily and rapidly viruses can spread between countries and affect new areas. The World Bank estimated that the earlier avian influenza (H5N1) outbreak in 2004 cost more than US\$10 billion in affected Asian countries.

In Cambodia and Laos livestock movement is a potential source of disease outbreak. Both countries are at the centre of commercial networks and animal trails through China, Vietnam, Malaysia, Burma and Thailand. The long, shared borders allow easy passage for animals, making control a regional issue.

Two trans-boundary diseases in particular are of concern in the region: foot-and-mouth disease (FMD) and classical swine fever. Both have the potential to cause significant losses and can be spread quickly via the movement of infected animals.

Stopping the spread of disease begins with understanding movement patterns. Two types of disease outbreaks occur in the region: localised outbreaks in an area where disease is known to be a problem, and new outbreaks in previously disease-free areas, caused by the movement of infected animals and animal products. The Southeast Asian Foot and Mouth Disease program estimates that 55% of new FMD outbreaks are the result of animal movement.

Commercial sales of animals are the most important factor in livestock movement, both across borders and within countries. Other factors, such as searching for fodder, wood collection, breeding, using animals for ploughing fields and using animals while travelling to sell other produce, such as pottery, contribute to animal movements in localised areas.

Cambodia and Laos keep some movement records for the main animals farmed in the broader Mekong region—an estimated 85 million cattle, buffaloes and pigs (UN Food and Agriculture Organization (FAO), 2005). Collecting available data formed the initial activity in an ACIAR-funded project to understand livestock

movements and the risks they pose in the spread of trans-boundary animal diseases.

However, these data were not enough to develop the levels of understanding needed to expose the influence of livestock patterns on disease spread. To properly predict the risk of disease outbreaks more information was needed.

“The reasons that animals are moved are complex, so the project team designed data-collection activities to identify patterns of livestock movement. These include tracking tagged animals, examining livestock population dynamics and surveying livestock industry participants,” explains ACIAR’s research program manager for animal health Dr Doug Gray.

“Success in the project really depends on changing the way data are captured and used. We are working with our project partners to not only influence what data are recorded, but to introduce and use web-based and mobile phone reporting of data. It is a significant change that is reaping real rewards as we gain a far more developed picture of livestock movement patterns,” Dr Gray says.

Since mid-2008 project staff in Laos and Cambodia have been using a project website and SMS reporting systems to enter data on livestock movement and market prices. This is based, in part, on an animal-tracking study initiated in the same year to record the movements of tagged cattle and buffaloes through road and border checkpoints in Laos. A pilot study is also underway to determine the feasibility of collecting data on animals that do not pass through such checkpoints. This is focused on collecting data on tagged animals from a slaughterhouse.

A number of industry participants have been interviewed in surveys designed to broaden the understanding of trading networks and the reasons behind farmers transporting animals. Almost all cross-border animal movements are driven by commercial imperatives. What characterises these movements is the rapid changes in patterns. These are the result of traders having very short turnaround times, during which they seek to sell animals before they lose condition.

An example would be if a disease outbreak

occurred in one country in the region. This would likely result in cross-border restrictions on animal movements. A country that exported animals across a now-closed border would see movement patterns reversing. As cross-border trade stopped, traders who had exported animals would respond to the dip in supply by sending animals to larger centres within their own country, including provincial capitals.

## Market stimulus sought for biosecurity

**In a country where the poultry industry employs more than 10 million people and 13,000 poultry markets are held daily, finding a way to involve farmers and the industry in farm biosecurity is a daunting task.**

**Yet this is the challenge Dr Ian Patrick faced earlier this year when he began an ACIAR-funded project in Indonesia. Dr Patrick, an agricultural economist from the University of New England in NSW, has set out to introduce cost-effective biosecurity to Indonesia’s small commercial farms; those with anything from 500 to 100,000 birds.**

**The farms are often contracted to produce broilers, which are picked up by trucks on a farm-to-farm circuit before being delivered to market. If an outbreak of disease occurs—such as the highly pathogenic avian influenza—there is no way to trace where diseased birds have come from. As trucks move from farm to farm, disease can spread quickly.**

**Dr Patrick says that for many farmers concerned about rising input costs and fluctuating poultry prices, biosecurity has often been a low priority. Some also believe it is a waste of time, given the rest of the market chain must also act if on-farm measures are to be successful.**

**“We realised we needed industry buy-in because any change in biosecurity will require a change in attitude from contractors, companies, the transport industry and from farmers,” he says. “We also realised farmers needed an economic incentive.”**

The hope would be to make enough profit to be able to replace stock once cross-border trade reopened, once again seeing a reversal in movements from exporting animals to importing stock to replace that sold. Under such a scenario the potential for disease to spread could rise as movement patterns shift to meet demand. These shifts can also be rapid as traders respond to market forces.

Data collection on the project has revealed that traders respond rapidly to meet supply and demand, but have very small profit margins. This finding, along with others, will be the subject of analysis once data collection concludes at the end of this year, after which the project's emphasis will change to analysis of the relationships between the main drivers of livestock movement and how these illustrate the risks of disease spreading.

**But where to start? Through a colleague, Dr Patrick was introduced to Don Utoyo, the director of the Indonesian Poultry Raisers Forum (FMPI). An umbrella organisation, the FMPI represents Indonesia's drug and vaccine suppliers, farmers, feed millers, breeders and market information suppliers. It is also one of the most effective means for industry to consult with government, since Mr Utoyo is a retired government official.**

Working with Mr Utoyo, Dr Patrick has established a subcommittee of the FMPI called the Biosecurity Consultative Group (BCG). "The FMPI had identified biosecurity as a major issue and was keen to work with us, so the BCG was established. It allows us to talk to the industry and for industry to talk to us," he says.

The group has seven members and meets quarterly to discuss national-level issues. Provincial-level issues and project plans are discussed through provincial steering committees, which include similar industry, farmer and government representatives to the BCG.

Mr Utoyo says the BCG is proving a useful means of coordinating biosecurity measures and aid agency support. "We can all talk together and if possible get the same biosecurity messages to politicians."

Poultry production is an important way of life for Indonesians, he says. Although the country has made inroads into improving poultry biosecurity, work by ACIAR to improve biosecurity and develop markets for biosecure products is important for improving animal health and poultry farmers' livelihoods.

But, he echoes Dr Patrick's point, money matters, and conflicting economic factors often

A computer model to predict livestock movements is being developed to collate the data gathered. This will overlay existing knowledge on livestock movement patterns with market prices and the results of the animal-tracking studies conducted during the project. Movement reports, animal-movement maps and market-price maps can be generated by month and species. These should enable the prediction of risk, based on changes in the main drivers of animal movements.

For example, combining surveillance data indicating high disease levels with changes in market prices should indicate where animals are likely to be moved, and from this the risk of disease spreading and subsequent outbreaks can be identified.

The results will be made available through partnerships with the World Organisation for

Animal Health (OIE), the FAO and regional organisations such as the Southeast Asian Foot and Mouth Disease program. The Australian Department of Agriculture, Fisheries and Forestry will also be involved in the dissemination of research outcomes.

Information on disease-control options—including the definition of risk in particular zones, pre-emptive control activities and appropriate interventions in identified livestock movement patterns—will be passed to researchers and policymakers at a regional technical workshop. The potential to hold country-specific workshops in China, Malaysia, Burma, Thailand and Vietnam is being investigated. These activities may also strengthen the implementation of bilateral agreements between Cambodia, Laos and their neighbouring countries in relation to livestock movements. ■

**reduce on-farm biosecurity measures.**

This is why Dr Patrick is exploring ways for farmers to be paid a premium for audited disease-free birds. He says avian influenza is "the straw that is breaking the camel's back" and he is encouraging farmers to improve biosecurity and alleviate consumer concern. With industry support now established through the BCG, his team is concentrating its efforts on improving biosecurity and developing biosecure product markets in Bali and West Java. These areas were chosen because of their proximity to big cities and tourism, which may provide the market impetus for audited, biosecure products.

One farmer who has already had success with producing a more biosecure product is the leader of GOPAN, the National Association of Poultry Farmer Organizations. "Tri Hadiyanto now has a stall at his house where he sells chicken products from his farm for a premium price," he says. Tri's work to better his on-farm

biosecurity by  
improving  
fences, and

**developing strict rules about who and what can enter the farm and when, is an example, Dr Patrick says, of how farmers can be financially rewarded for improving biosecurity.**

He says defining biosecurity is difficult. "For the purposes of our project, we say farm biosecurity includes any management activity undertaken to keep diseases out of the flock."

An auditing process is being developed through the Poultry Biosecurity Centre (PBUI). Started by the ACIAR project team, the centre works under the auspices of the BCG and will provide a national-level repository and resource for poultry biosecurity advice, information and training. It is also training farmers, advisers and auditors on biosecurity measures. "With the support of the local government agencies it will provide the 'stamp' to say that a farm is biosecure," Dr Patrick says.

PBUI's Dr Dewa Dharma says by the project's end, in 2012, the centre will have a master biosecurity trainer in Bali and West Java, about 200 trained farm advisers, 200 trained farmers, and a market for products from avian-influenza-free farming systems. He expects to see 600 farms adopt minimum biosecurity measures, a move that will help them control avian influenza and other diseases, and with that improve income.

For others in the community, improved biosecurity measures will reduce the likelihood of avian influenza outbreaks and pandemic possibilities.

– REBECCA THYER

