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# Opportunities for improving the management of zoonotic diseases in Vietnam: an EcoHealth approach

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Leptospirosis is one of the most common zoonotic diseases globally. More than half a million severe cases are diagnosed each year. Even so, awareness of leptospirosis across Vietnam among agricultural workers, medical officers and veterinary officers is low. The prevalence in humans and animals remains largely unknown in Vietnam mainly because there is no system in place that facilitates animal and human health authorities to work easily together and share information. This brief presents results from a collaborative study on leptospirosis conducted by three institutions – the Department of Animal Health, Nong Lam University and the Institute Pasteur of Ho Chi Minh City – and recommendations on how to strengthen links between animal and human health systems to improve disease control.

## Leptospirosis in Vietnam

The term neglected zoonoses describes diseases that are not prioritized by national or international health systems, and therefore tend to be under-diagnosed in humans and animals. After a review of animal and human health data in Vietnam, our research team found there were very little data on leptospirosis and decided to focus the research study on this disease in humans and pigs. The most common way the leptospira bacteria are spread between animals and humans is through contact with urine from infected animals. Animals that commonly develop and spread leptospirosis are rodents, dogs and livestock. Agricultural workers who work with animals or in flooded fields, like in rice production, are particularly vulnerable to infection. Living in areas with open sewers, flooding and poor hygiene also puts people at risk. In humans, symptoms of leptospirosis are similar to other common illnesses like the flu or malaria, making it difficult to diagnose and treat appropriately. Infection in animals often occurs without any signs.

- Public awareness of leptospirosis is low in Vietnam. The Ministry of Health and the Ministry of Agriculture and Rural Development should collaborate to increase awareness of risks and preventive measures.
- Zoonotic diseases are not the responsibility of a single sector. A steering committee that links human and animal health disease reporting systems will make joint surveillance part of normal practice. This should be utilized from the central to the local level to improve coordination across the two sectors.
- Investment in further research is urgently needed to improve understanding of zoonoses and the degree of impact they have on livelihoods and public health in Vietnam.

Zoonoses are a major constraint where animal production is a dominant agricultural activity. Leptospirosis can cause stunted growth and abortions in pigs, resulting in economic losses to individual pig owners and the pork industry. Affected household members will suffer economic losses due to decreased productivity, missed work and

costs associated with seeking medical treatment. There is no national monitoring system in Vietnam that tells us how many animals and humans are affected by leptospirosis or how this has changed with economic growth or changes in animal production systems. Very little is known about how many pigs and people are affected by leptospirosis, although previous research has classified it as a disease of importance in southern Vietnam.

## Use of an innovative approach to understand a neglected zoonotic disease

Understanding zoonotic diseases and planning ways to manage them require cooperation between multiple sectors. Our project brought together experts from the Department of Animal Health, the Institute Pasteur of Ho Chi Minh City and Nong Lam University to investigate leptospirosis in two provinces, Tien Giang and Binh Phuoc. Our research was guided by EcoHealth principles, a new approach being used in Southeast Asia to understand and manage diseases (see Definitions box). We started with a retrospective study looking at public health data for a number of zoonotic diseases. There was no prevalence data on leptospirosis in animals or humans. We used new approaches that helped us understand the community's knowledge of leptospirosis. In order to understand what risk factors might be linked to leptospirosis in humans or pigs, we conducted a household survey and collected biological samples from pigs and household members.

## Leptospirosis is common, but awareness is low

We tested more than 880 pigs and 360 humans in Tien Giang and Binh Phuoc provinces and found that leptospirosis was common in both. In Tien Giang, the results showed that 29% of pigs and 10% of humans in our sample tested positive for leptospirosis. In Binh Phuoc, 22% of pigs and 20% of humans in our sample tested positive. Testing positive indicated the person or animal had past contact with the pathogen. In our discussions with communities, we found that no one had heard of leptospirosis. We learned that human and animal health workers had not given as much attention to this disease compared to high-profile diseases like porcine reproductive and respiratory syndrome, foot and mouth disease and H5N1 (also known as "bird flu").

## What factors may increase the risk of leptospirosis?

Results from these two provinces suggest some conditions that may increase the risk of exposure to leptospirosis.

- **Pig production practices.** The number and type of pigs being kept together per unit area was found to increase the risk of infection. One way to mitigate this risk is to adopt management practices such as housing that minimize close contact between pigs and the surrounding environment. It is also advisable to keep new pigs separate from other pigs as they are introduced into the herd.
- **Source of water.** Water from wells was found to increase the risk of infection. In humans, the risk likely comes from using contaminated well water for cleaning and washing vegetables. Using contaminated well water to clean pigs and their pens is likely to have increased the risk of exposure. Awareness campaigns should focus on educating households on the importance of protecting well water from contamination and making sure well water is safe for human use.
- **Location.** Rural households were found to be more likely to have pigs and humans infected with leptospirosis than urban households. We suspect this is likely due to farming and hygiene practices that increase risk of contamination. Improving hygiene practices, including proper management of waste from pigs and humans, is one way to reduce risk at the household level.

## Opportunities for further research

Here are three areas of opportunity for further research to address gaps in what is known about leptospirosis in Vietnam and plan effective interventions. These research gaps may be similar for other important zoonoses, as well.

- There are a number of different serovars, or types, of the leptospirosis-causing bacteria found in animals and humans. Research to identify the specific serovars is urgently needed in order to improve the diagnosis of leptospirosis so decision-makers can understand the extent of the disease in Vietnam.
- Based on our knowledge, no analysis of the economic burden of leptospirosis has been done in Vietnam. Estimates of the economic losses from the burden to human health and to livestock health are needed so authorities can make informed decisions about disease control.
- Longitudinal studies on leptospirosis that collect data over much longer periods of time from the same populations are essential for understanding disease patterns. The disease itself and its prevalence in animals and humans may differ during different seasons and with changes in production systems.

**Policy implication**

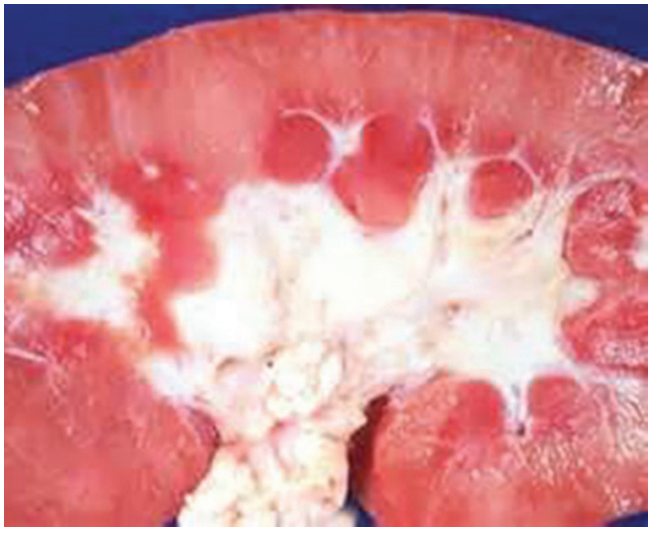
- Efforts need to be made to increase awareness of leptospirosis across Vietnam. Campaigns that address how the disease can be prevented, its symptoms and treatment options should be implemented under the leadership of the Ministry of Health, Department of Preventive Medicine in collaboration with the Department of Animal Health, and Ministry of Agriculture and Rural Development.
- Management and control of zoonotic diseases is not the responsibility of a single sector. A mechanism needs to be in place to enhance the links of disease reporting systems between animal health and human health. A steering committee could link the two sectors and be a practical way to make joint surveillance part of normal practice. We recommend this be utilized from the central to the local level to improve coordination across animal health and human health.
- Our study has added some information to the leptospirosis situation in two provinces in Vietnam. Investment in further research is needed to improve understanding of the disease and the degree of impact it is having on livelihoods and public health. The province of Binh Phuoc, one of our study sites, has recently submitted an investment plan to implement further studies on leptospirosis and we recommend more of this type of investment in zoonotic disease research across Vietnam.

**Definitions**

**Neglected zoonotic diseases** are zoonoses that are not prioritized by health systems at national and international levels.

**Serovars** describe the different variations of a species of bacteria or virus.

**EcoHealth** is an approach that recognizes there are links between humans and their biophysical, social and economic environments that are reflected in an individual's health. EcoHealth brings together physicians, veterinarians, ecologists, economists, social scientists, planners and others to understand how ecosystem changes are negatively impacting human health and to provide practical solutions to reduce the negative health impacts of ecosystem change.



**How do people get infected with leptospires?**

- Exposure to urine from infected animals
- Contact with contaminated water
- Ingestion of contaminated food and water
- Handling infected animal tissues
- The bacteria can enter the body through cuts and scratches on the skin or through the nose, mouth or eyes.

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