

## Emerging Health Threats Forum

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### Wash hands to cut zoonosis risk

Human behaviour drives pathogen spread between people and animals in Uganda



Kibale Forest, Uganda.

Image credit: Flickr/Tom Vogler

Research into the spread of zoonoses has reached a "pivotal point", with human attitudes and behaviours emerging as a key piece of knowledge missing from efforts to prevent the transmission of infectious diseases between people and animals, said environmental epidemiologists at the EcoHealth 2010 conference that concludes today in London, UK.

Tony Goldberg, Professor of Epidemiology at the University of Wisconsin-Madison, USA, told EHTF News that although studies are documenting links between changes in land use, human behaviour and disease transmission, designing interventions to protect the public's health requires evidence of a different kind. "The only way to get an idea of how to intervene is to understand how people are thinking," he says.

Goldberg works in Uganda's Kibale National Park, where a fragmented forest and high population density bring local communities in frequent contact with primates and domestic livestock. **With research published in 2008**, his team described a greater genetic similarity between *Escherichia coli* bacteria circulating between people and animals on fragmented land compared with those circulating in nearby undisturbed forest — suggesting that disturbing forests can enhance spread of these pathogens.

Speaking at the conference this week, Goldberg presented new evidence showing high rates of antibiotic resistance in bacteria isolated from people living in Kibale and animals in their community. The resistance patterns matched, he said, and suggest that the bacteria were transmitted from people to animals.

Disease spread can also occur in the opposite direction, with animals as the source of pathogens that may take hold in human populations. Some experts have suggested that the rise of zoonotic diseases in people amounts to a **new epidemiological transition**.

In the Ugandan forest, the researchers used a statistical model to look for reasons behind the symptoms of gastrointestinal illness driving the use of antibiotics in the community. They found two significant risk factors: not washing hands before eating, and use of cheap antimicrobial drugs.

The team concluded that human behaviour is driving cross-species transmission of pathogens. But changing behaviours "is the most difficult thing in the world", says Goldberg. "You can't increase people's handwashing frequency. **Hygiene interventions are notoriously difficult** even in the best of circumstances."

What might work, suggests Goldberg, is educating people about how they should interact with wildlife or about the consequences of not washing their hands. But without first understanding their motivations and how they perceive the problem, "any intervention you design is very likely to fail, because people won't buy into it, won't understand it".

For this, 'classical' epidemiology is of little help, so the team has begun to use qualitative methods. Sarah Paige interviewed people living in the forest to probe their beliefs and attitudes towards zoonotic disease risk. She presented preliminary data at the conference which suggest that local people have a good understanding that animals can be a source of disease.

"The qualitative aspects of zoonotic diseases... are really unexplored," says Goldberg. "Everybody's focusing on diagnostics, massive quantitative epidemiology on a global scale, but... we haven't even gotten one step on the road to understanding why people are actually doing what they're doing on the ground."

A review of evidence on zoonotic disease emergence **published earlier this year** concluded that public health officials should target behaviour change in zoonosis 'hotspots' in order to prevent new infectious disease epidemics.

"We can discover all the new pathogens we want, but until we understand what the contexts are for contact and infection and sickness and spread, then it doesn't really matter," said Paige.

#### Reference and link

1. **Ecohealth Conference**: Global Ecohealth Challenges; Multiple Perspectives. London School of Hygiene and Tropical Medicine, 18-20 August 2010.

**World Health Organization information** on zoonoses and veterinary public health

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