A Project of USAID’s Emerging Pandemic Threats Program

Emerging infectious diseases pose a significant burden on human and animal health and global economies. Conventional approaches to epidemic control have most often been reactive. However, explosive human population growth, dramatic changes in land use, and increased global trade and travel require a shift toward a proactive, predictive approach. The PREDICT project aims to prevent, detect, and rapidly respond to the spillover of novel infectious pathogens from wildlife to humans.

While the linkage of human, animal, and environmental health is at the heart of our One Health approach – an increasingly important and recognized lens through which governments, NGOs, and practitioners view public health – the global health community still has three critically important needs:

1) Broader and deeper knowledge of pathogens with the potential to emerge from animals;
2) Targeted surveillance to maximize available resources;
3) Tools to characterize organisms that could be pathogens of significance and to predict where and how they might spillover to susceptible hosts.

**Challenge:** Develop a strategic framework to identify pathogens of pandemic potential that have not yet emerged.

**Opportunity:** Current infrastructure improvements and technological advances have dramatically and rapidly improved our ability to identify high-risk interfaces for disease transmission and to detect novel pathogens before widespread spillover occurs. These advances include improvements in information technology, molecular diagnostics, and risk modeling.

PREDICT has built a broad coalition of partners to discover, detect, and monitor pathogens at the wildlife-human interface using a risk-based approach. Our efforts integrate digital sensing and on-the-ground surveillance at critical points for disease emergence. PREDICT is at the cutting-edge of recent technological advances allowing rapid detection and diagnosis of high-risk viral families, even in settings where resources are limited.
The goal of the PREDICT project in Thailand was to strengthen surveillance and diagnostics to protect human and animal health. PREDICT-Thailand was a collaborative effort between Chulalongkorn University; Kasetsart University; EcoHealth Alliance; and the Department of National Parks, Wildlife and Plant Conservation (DNP).

**Background**

- One Health recognizes that activities and conditions of humans, animals, and the environment affect each other. More than half of all infectious diseases are shared between humans and animals. Further, three-fourths of these originate in wildlife.

- In Thailand, land conversion for agriculture, wildlife trade, and floods have led to greater interactions between wildlife, domestic animals, and humans as a result of increased sharing of resources. This human-wildlife-domestic animal interface may lead to spillover of infectious diseases from animals to people.

**Disease Surveillance**

- PREDICT prioritized wildlife disease surveillance in eastern part of Thailand and on the Myanmar border where wildlife host species are likely to have significant interactions with domestic animals and humans.

- Samples were collected from **a total of 785 animals** (bats, rodents, and macaques were sampled at high-risk interfaces where interactions with people and domestic animals frequently occur).

Department of National Parks, Wildlife and Plant Conservation staff were trained in the field and classroom for sample collection and biosafety. Photo by EcoHealth Alliance & the PREDICT Thailand team.

PREDICT safely captured and sampled primates and fruit bats throughout Thailand to learn more about infectious pathogens that they carry that may pose a threat to human and domestic animal health. Photo by the PREDICT Thailand team.
Partnerships for Sustainability

- Faculty of Forestry, Kasetsart University
- Department of National Parks, Wildlife and Plant Conservation (DNP)
- Ministry of Public Health
- Department of Livestock and Development
- AFRIMS: Armed Forces Research Institute of Medical Sciences

Making a Difference for Global Health

Expanded and Strengthened Network

- Strengthened collaboration with DNP.
- Established network with government to strengthen the wildlife surveillance system.
- Supported the government for pathogen detection in humans and animals using PREDICT protocols.
- Expanded to human pathogen surveillance and identification.

Preparedness for Emerging Pandemic Threats

- Strengthened laboratory capacity to cope with emerging infectious diseases.
- Applied PREDICT novel diagnostic approach utilizing consensus (genus/family level) polymerase chain reaction (PCR) for human diagnostics in hospital settings.

Developed Complete Surveillance Program

- Standardized animal sampling protocols to ensure safe wildlife handling.
- Sampled over 600 bats and 75 macaques at high risk interfaces for human-wildlife contact in collaboration with DNP.
- All priority pathogen testing in bat, nonhuman primate and rodent populations were performed completely in Thailand.

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PREDICT characterized zoonotic disease risks at critical animal-human interfaces in Thailand.
Selected PREDICT Publications 2012-2014


