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 that have 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 for identifying 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 Peru was to enhance wildlife disease surveillance to improve detection and prevention of zoonotic diseases of wildlife origin. PREDICT-Peru was a collaborative effort between the Wildlife Conservation Society, the Peruvian Institute of Health (INS), and the Peruvian Animal Health Service (SENASA).

**Background**

Major transformations of the Amazon rainforest are occurring as a result of human disturbance. In Peru, economic and population growth is leading to deforestation for agriculture and extractive industries, and an increase in illegal activities, such as wildlife trade. These activities result in increased interactions between wildlife, vectors of disease, and people and consequently a higher risk of zoonotic disease emergence.

The majority of all infectious diseases are zoonotic and most have a wildlife origin. PREDICT’s strategy for improved detection and prevention of zoonotic diseases takes a One Health approach, recognizing that activities and the health of humans, animals, and the environment are linked.

**Disease Surveillance**

PREDICT conducted surveillance for zoonotic pathogens in bats, nonhuman primates, and rodents at five animal-human interfaces: subsistence hunting (indigenous territories), wildlife trade, captive settings (sanctuaries, rehabilitation centers, and zoos), disease outbreaks, and peri-domestic settings (near villages or urban areas). Field teams sampled over 2,500 animals.
GLOBAL IMPACT

Strengthening the National Task Force for Zoonoses Surveillance:

- Enhanced surveillance network through coordination with key government agencies, scientific institutions, and people at risk (market vendors and subsistence hunters).
- Trained 340 government officers, veterinarians, lab technicians, and other health professionals in wildlife sampling, diagnostic methods, and biosafety protocols.
- Trained park rangers and wildlife specialists to detect and report wildlife health problems.
- Formalized agreements between partners to sustain the PREDICT One Health approach for wildlife disease surveillance and research.

Enhancing Disease Surveillance and Response:

- Facilitated standardization of field protocols for disease surveillance in wildlife.
- Engaged stakeholders in the national wildlife disease surveillance system (VEAS) managed by SENASA.
- Established diagnostic techniques for 12 viral families at INS laboratory, using synthetic DNA plasmids and broadly reactive consensus PCR assays to detect and classify zoonotic viruses.
- Supported INS and regional authorities to sample wildlife for zoonotic disease surveillance and control.

Partnerships for Sustainability

- School of Veterinary Medicine, Universidad Nacional Mayor de San Marcos
- US Naval Medical Research Unit Six (NAMRU-6)
- General Directorate of Epidemiology, Ministry of Health
- General Directorate of Forestry and Wildlife, Ministry of Agriculture
- Regional governments of Loreto and Ucayali
- Universidad Nacional de Tumbes
- Zoo Parque Natural de Pucallpa, Ucayali
- Varillal Temporary Custody Center, Loreto
- Ikama Peru Rescue and Rehabilitation center, Amazonas
- Tariaya Rescue Center, Madre de Dios
- Amazon Shelter Rehabilitation and Rescue Center, Madre de Dios

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