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PREDICT

Building a global surveillance system to detect and prevent spillover of pathogens of pandemic potential that can move between wildlife and people.

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

Opportunity: Current **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.

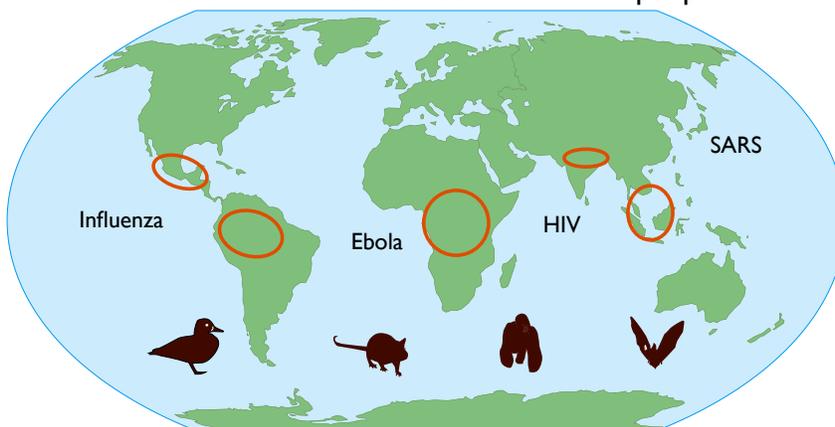
PREDICT has built a broad coalition of partners to **discover, detect, and monitor** diseases at the wildlife-human interface using a risk-based approach. Our efforts integrate digital sensing and on-the-ground surveillance at critical points for disease emergence. PREDICT is at the cutting-edge of recent technological advances allowing for **rapid diagnosis of high-risk viral families**.

Emerging infectious diseases pose a significant burden on human 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 global trade and travel have made a shift toward a proactive, predictive approach paramount. The PREDICT project aims to prevent and rapidly respond to the spillover of novel infectious pathogens from wildlife to humans. We now know that more than half of all infectious diseases are shared between humans and animals. Further, three-fourths of these originated in wildlife. Nowhere in the world are the risks of emerging infectious diseases greater than in developing countries, where people and animals are most connected and livelihoods are highly dependent upon natural resources. These countries have little to no capacity for detecting disease emergence in wildlife and domestic animals prior to spread 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 and security community still have three critically important needs:

1. A broader and deeper knowledge of pathogens with potential to emerge from animals;
2. Targeted surveillance to maximize available resources; and
3. Sophisticated tools to characterize whether or not an organism is a pathogen of significance.

PREDICT: Building a global early warning system for emerging diseases that move between wildlife and people



Programmatic Focus

PREDICT uses a risk-based approach focused in areas where zoonotic diseases are most likely to emerge and where host species are likely to have significant interaction with domestic animals and high density human populations:

- Amazon Region and Mexico
- Congo Basin
- Gangetic Plain
- Southeast Asia





Pathogens

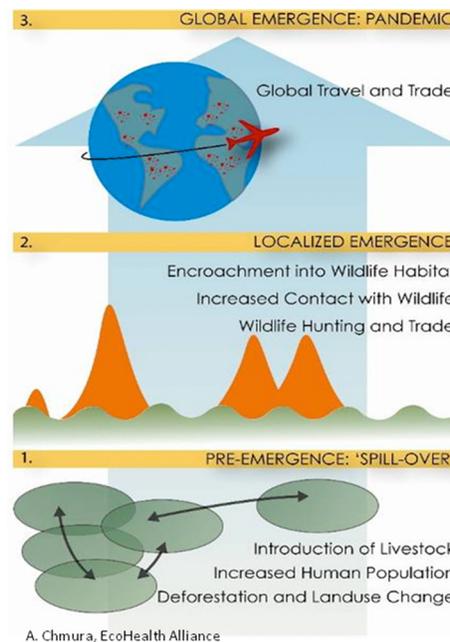
PREDICT focuses on pathogens most likely to have a significant public health impact, such as:

- Alphaviruses
- Arenaviruses
- Bunyaviruses
- Coronaviruses
- Filoviruses
- Flaviviruses
- Henipaviruses
- Orthomyxoviruses
- Paramyxoviruses
- Reoviruses
- Retroviruses
- Rhabdoviruses
- Emerging pathogens

Objectives

PREDICT is creatively and efficiently expanding on lessons learned in order to:

- Assess local wildlife surveillance capacity
- Increase the value of infectious disease modeling
- Implement targeted and adaptive wildlife disease surveillance systems
- Develop and deliver new technologies to improve efforts close to the source
- Use cutting-edge information management and communication tools to bring the world closer to realizing an integrated, global approach to emerging zoonotic diseases



Lead Institutions

- UC Davis' world class School of Veterinary Medicine, with demonstrated leadership in program development and management, education, research, and service in zoonotic disease, wildlife epidemiology, pathogen pollution, and ecosystem health.
- Global Viral Forecasting, Inc., which has made seminal discoveries on the role of hunting of nonhuman primates and food handling in moving animal pathogens to humans.
- Wildlife Conservation Society, with ongoing programs to monitor wildlife diseases worldwide and the GAINS database designed to identify the movements of wild avian species for influenza and other viruses.
- Ecohealth Alliance (formerly known as Wildlife Trust), the first group to identify bats as the reservoir of SARS-like coronaviruses and to define hotspots of disease.
- Smithsonian Institution and the National Zoo, among the founders of the field of conservation biology.

The authors' views expressed in this publication do not necessarily reflect the views of the U.S. Agency for International Development or the United States Government.

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