

PREDICT: Halting the Next Pandemic

In order to predict, respond to, and prevent the spillover of animal viruses into human populations. The [PREDICT](#) project, led by Dr. Jonna A.K. Mazet, DVM, MVPM, PhD of the UC Davis School of Veterinary Medicine recognizes that explosive human population growth and environmental changes have resulted in increased numbers of people living in close contact with animals. Unfortunately the resulting increase in contact, together with changes in land use, has altered the inherent ecological balance between pathogens and their human and animal hosts.

Since 2009, PREDICT, a \$75 Million project funded by the USAID's Emerging Pandemic Threats Program, has been building global surveillance capacity to predict, prepare for, and detect spillover of pathogens of pandemic potential that can move between animals, especially wildlife, and people (zoonotic diseases). PREDICT has developed a SMART surveillance method (Strategic, Measurable, Adaptive, Responsive, and Targeted) that accounts for the fact that zoonotic pathogens, such as influenza and SARS, are responsible for the majority of emerging infectious diseases in people, and that more than three quarters of these emerging zoonoses are of wildlife origin. The SMART surveillance approach is designed to detect novel diseases with pandemic potential early, giving health professionals the best opportunity to prevent emergence and spread. It also targets sentinel animal species at active human interfaces in hotspot regions to improve surveillance efficiency.

The PREDICT team builds on a broad coalition of partners to develop the global capacity to monitor diseases at the animal-human interface and develop a risk-based approach to concentrate these efforts in surveillance, prevention, and response at the most critical points for pathogen emergence from wildlife. The groundbreaking efforts of PREDICT have been cited by the World Bank and in the medical journal *The Lancet* as a model for a new, globally coordinated pandemic prevention strategy.

Information technology, molecular diagnostics, and risk modeling tools have dramatically and rapidly improved our ability to identify high-risk interfaces for disease transmission and to detect novel pathogens before widespread spillover occurs. PREDICT leads with recent technological advances, allowing for rapid detection and diagnosis of high-risk viral families in all resource settings.

Expanding the One Health Workforce

- Trained 1,600 people in surveillance, diagnostics, and safe outbreak response
- Coordinated with 59 ministries in 20 countries
- Partnered with US and foreign agencies to establish regional laboratories

Optimizing surveillance and response

- Standardized animal sampling protocols to ensure safe wildlife handling
- Improved cold chain access in remote areas
- Established scientifically justifiable and practical sampling goals to identify new viruses and evaluate diversity in regions and hosts

- Responded to deadly outbreaks incorporating animal and environmental best practices
- Identified an efficient diagnostic paradigm for mystery diseases

Providing proof of concept

- Sampled 40,000 animals
- Discovered more than 200 novel viruses in genera or families known to cause epidemics
- Built capacity for diagnostic testing in 22 laboratories
- Published 26-plus scientific publications in the first 3.5 years of the Project
- Characterized risk interfaces and human contact potential for transmission in different social and ecological contexts
- Incorporated new viral data into risk assessment and response
- Worked toward sustainable improvements in 33 laboratories
- Initiated the Deep Forest Project to assess drivers of infectious disease emergence

Partnering in a powerful coalition

- Partner EcoHealth Alliance is the first group to identify bats as the reservoir of SARS-like coronaviruses and to define hotspots of disease
- Metabiota, Inc. (formerly Global Viral Forecasting, Inc) has made seminal discoveries on the role of hunting of nonhuman primates and food handling in moving animal pathogens to humans
- The Smithsonian Institution and the National Zoo are among the founders of the field of conservation biology
- The Wildlife Conservation Society provides the Global Animal Information System, the first database designed to manage wildlife health and disease information on a global scale
- Other partners include Columbia University; Harvard University (ProMED, HealthMap); University of California, San Francisco; University of Edinburgh; Yale University

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