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 objective of the PREDICT project in Gabon was to strengthen emerging pandemic threat surveillance by investigating potential transmission of high-risk viruses from animals to humans. PREDICT-Gabon was a collaborative effort between the International Center of Medical Research of Franceville (CIRMF) and Metabiota (San Francisco, California).

**Background**

Gabon is a hotspot for zoonotic diseases, including dengue, yellow fever, Ebola, Marburg, and Rift Valley fever. Population growth and anthropogenic activities in Gabon, such as land conversion for agriculture, natural resource extraction, and hunting, lead to greater wildlife-human interactions and a high risk of spillover of infectious diseases from animals into people.

**Disease Surveillance**

PREDICT-Gabon focused on surveillance of known and unknown viruses in wildlife and people in regions of Gabon where wild animals are most likely to have significant interactions with people.

Samples were collected from bats, rodents, nonhuman primates, and ungulates at high-risk disease transmission interfaces between wildlife and people.

**Disease Outbreak Response**

PREDICT-Gabon has facilitated operational logistics for disease outbreak response in cooperation with the High Gabonese Authorities.

The high security biosafety level 4 laboratory (BSL-4) at the PREDICT partner facility serves as a regional diagnostic and reference center for disease outbreak response in Central Africa.
Partnerships for Sustainability

- Ministry of Health (MoH)
- Ministry of Water and Forest (MoWF)
- National Agency for National Parks (ANPN)
- National Laboratory of Public Health (LNSP)
- University of Libreville (UOB)
- University of Masuku (USTM)
- Regional Doctoral School of Central Africa (EDR)

Capacity Building

- Developed and implemented advanced molecular laboratory diagnostics to detect and characterize known and novel viruses.

- Trained local scientists and graduate students in safe collection, transport, processing, and testing of wildlife specimens.

- Conducted thorough investigations of potential zoonotic disease spillover events from animals to people in association with the High Gabonese Authorities.

Making a Difference for Global Health

Expanding Disease Detection

- Strengthened Central African disease detection capacity via implementation of standardized, inexpensive protocols and new technologies that accelerate detection, identification, and characterization of emerging viruses.

- Collected over 12,000 specimens from over 3,000 animals (bats, rodents, nonhuman primates, and ungulates) throughout the country.

- Conducted over 17,000 diagnostic tests on wildlife samples to detect known and unknown viruses.

Actively Addressing Disease Threats

- Participated in the response to numerous suspected viral hemorrhagic fever outbreaks within the Central African region.

- Discovered a novel rhabdovirus associated with acute hemorrhagic fever in Central Africa.

- Characterized divergent Zaire Ebola Virus strains in Democratic Republic of the Congo.

- Documented the re-emergence of Crimean-Congo Hemorrhagic Fever Virus in Central Africa.

Contact:

Mélanie Caron
Centre International de Recherches Médicales de Franceville (CIRMF)
BP 769 Franceville - Gabon
Tel: 00 241 01 67 70 92 / 00 241 01 67 70 96
Fax: 00 241 01 67 72 95
Email: melaniecaron.cirmf@gmail.com
Local website: [http://www.cirmf.org](http://www.cirmf.org)