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EMERGING PANDEMIC THREATS PROGRAM

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The Global Challenge

Pre-empt or combat the first stages of the emergence of zoonotic diseases that pose a significant threat to public health, before they enter into humans.

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In order to predict the emergence of novel infectious diseases in humans, pathogens must be identified at their source.

Targeted, informed surveillance

→Pathogen identification

→Response and Prevention

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- **Majority of emerging infectious diseases (EIDs) in people are of animal origin (zoonotic)**

- **75% of emerging zoonoses have wildlife origins**

- **Examples: HIV, SARS, Avian Influenza, Nipah virus, Ebola**

Importance of Early Detection

- Key to Control
- Reduction of Post-transfer Host Adaptation
- Potentially Lower Transmissibility
- Allows Sequencing to Improve Quality & Speed of Diagnostics and Preventive care

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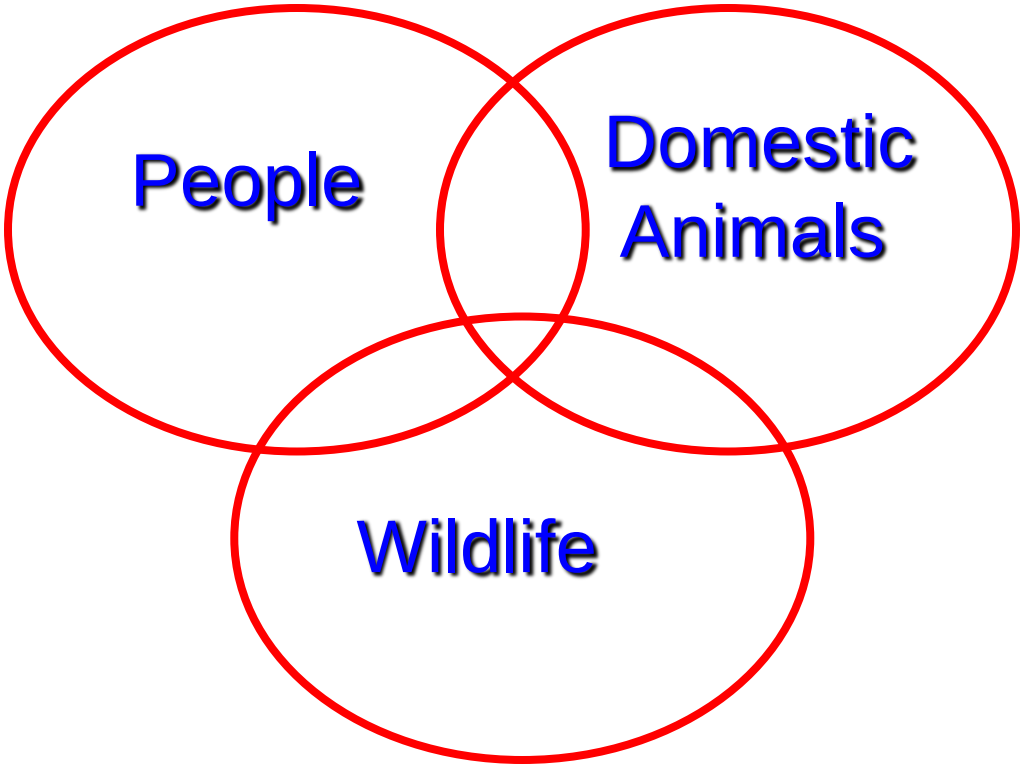
Wild animal/ Human/ livestock/ interfaces: high risk areas for disease transmission between species



Developing a Targeted Surveillance Strategy

along high risk disease transmission interfaces

Initial Surveillance Targeting

- Geospatial Risk Modeling
- High Risk Transmission Interfaces
- Species of Special Concern
- Digital Surveillance & Information Network
- Undiagnosed Human or Animal Event

- Hunting
- Markets/trade
- Wildlife/livestock conflict
- Wildlife farms
- Extraction
- Land use change
- Water availability
- Global transportation

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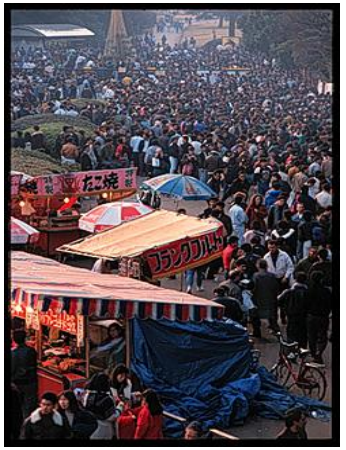
Increasing interfaces, especially in developing countries

Increasing human and livestock population densities



Wild habitat reduction and land use changes

AIMS

- **Assess & Improve wildlife pathogen surveillance**
- **Increase value of infectious disease modeling**
- **Deliver new technologies**
- **Employ cutting-edge information management & public health communication tools**

Building Wildlife Surveillance Capacity for Lao PDR

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Training Topics

- Overview of zoonotic diseases and surveillance methods
- Health and safety during sample collection
- Health and safety during wildlife sample analysis
- Identification of different wildlife species
- Ethical and safe handling and sampling methods for a wide range of wildlife species
- Appropriate cold storage and sample storage and shipment for specific zoonotic disease analysis
- Diagnostic methodologies
- Relevant wildlife data collection for risk analysis
- Novel Information management techniques

Key animal groups

- Bats
- Carnivores
- Rodents
- Primates
- Birds
- Ungulates

Initial planned collaboration with NAHC

- **Bats**:

Rabies (Lyssavirus family)

Henipaviruses

Coronaviridae

- **Civets**: Coronaviridae (e.g. SARS CoV)

Lyssavirus

Expand to other species and pathogens

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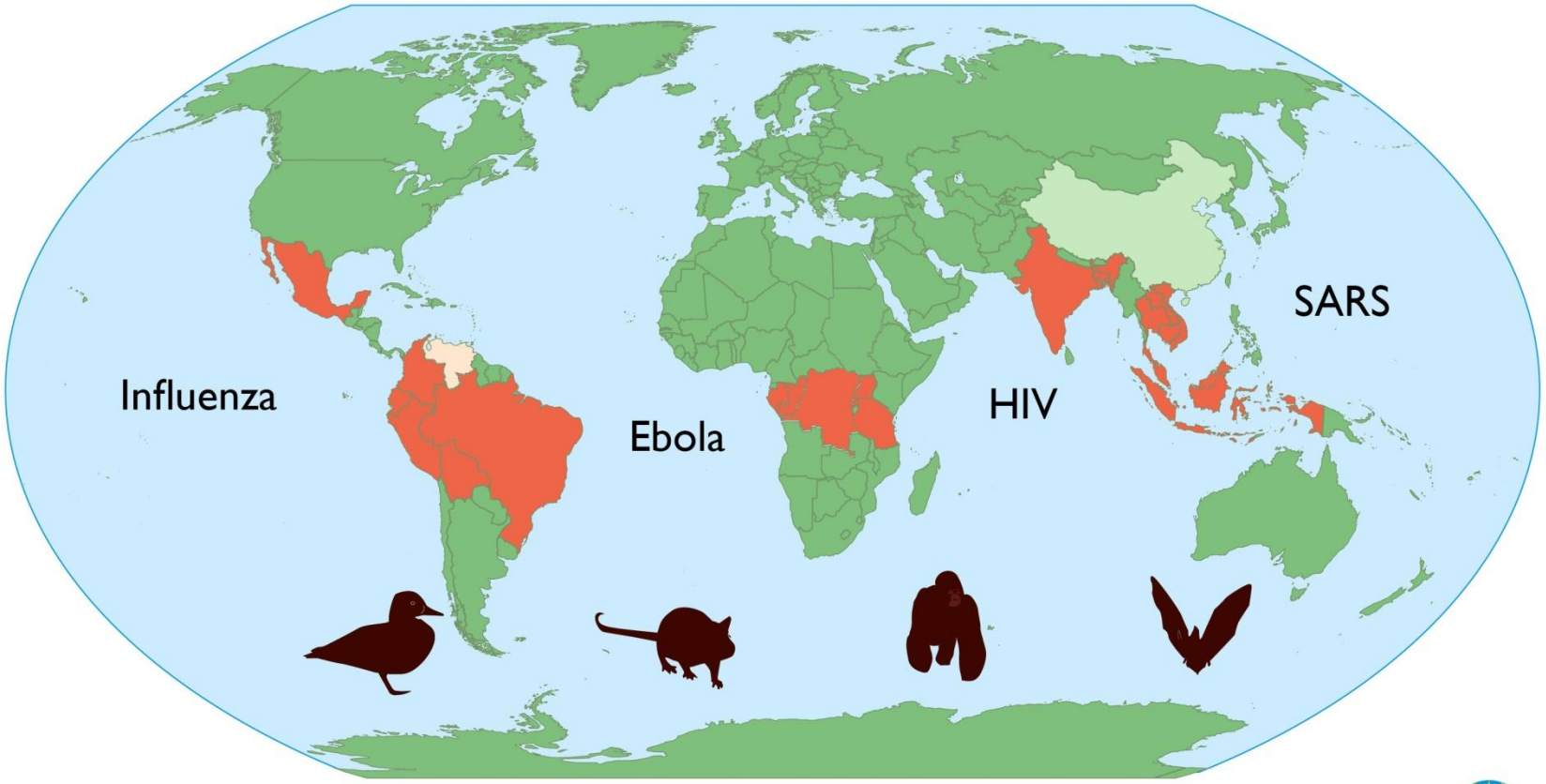
PREDICT: Building a global early warning system for emerging diseases that move between wildlife and people



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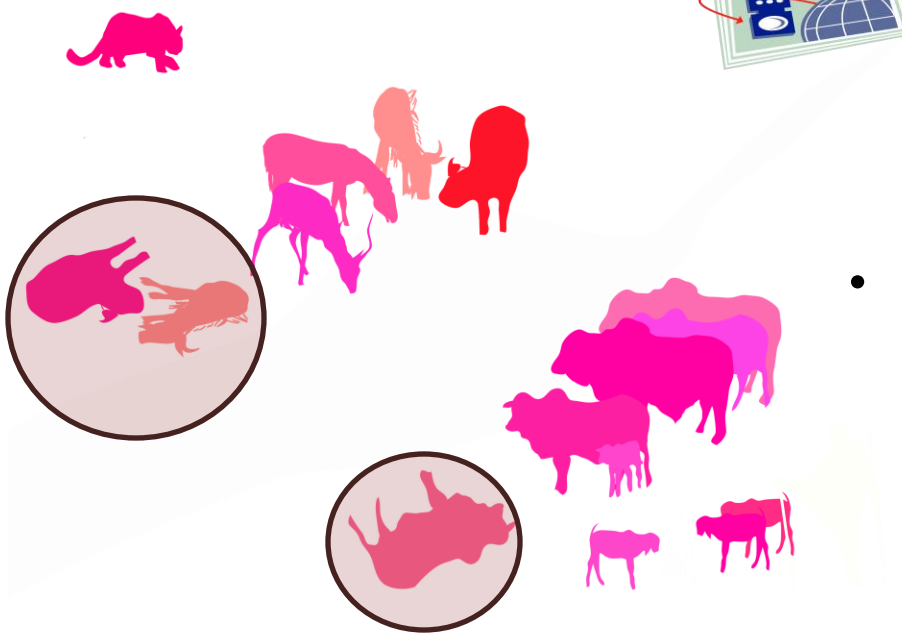
- Identify high risk species, locations and activities
- Work with IDENTIFY to rule out common pathogens and identify key emerging pathogens

  -Communication through NEIDCO-

- Target locations for PREVENT to focus
- Work with RESPOND for surveillance and outbreak response training

Developing a Targeted Surveillance Strategy

responsive to potential pathogen emergence



- Surveillance of sick or dead wild animals
  - **Using mobile phone technology to rapidly detect symptomatic animals & evaluate spillover**

- Monitor for human & livestock outbreaks of zoonotic disease
  - **Sample wildlife in proximity to affected communities to determine source**

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Collaboration and Communication among medical doctors, veterinarians, rangers, village animal and human health workers, laboratory technicians, teachers, and biologists

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