

**GORILLA DOCTORS**  
MOUNTAIN GORILLA VETERINARY PROJECT



**USAID | PREDICT**  
FROM THE AMERICAN PEOPLE

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# **Emerging Diseases and Treatment of Wild?? Great Apes**

**Another challenge to Conservation  
and Protected Area Management**

# Wild apes monitoring - Methods

- Practical limitations to obtaining a definitive diagnosis of health problems in wild apes
  - Limited access to biological samples
  - Limited availability of local laboratories
  - Lack of validated diagnostic tests for the species

## 1. Non invasive sampling and laboratory testing



# Wild apes monitoring - Methods

## 2. Visual assessment of clinical parameters and signs



# Wild apes monitoring - Methods

## 3. Opportunistic invasive sample collection during interventions

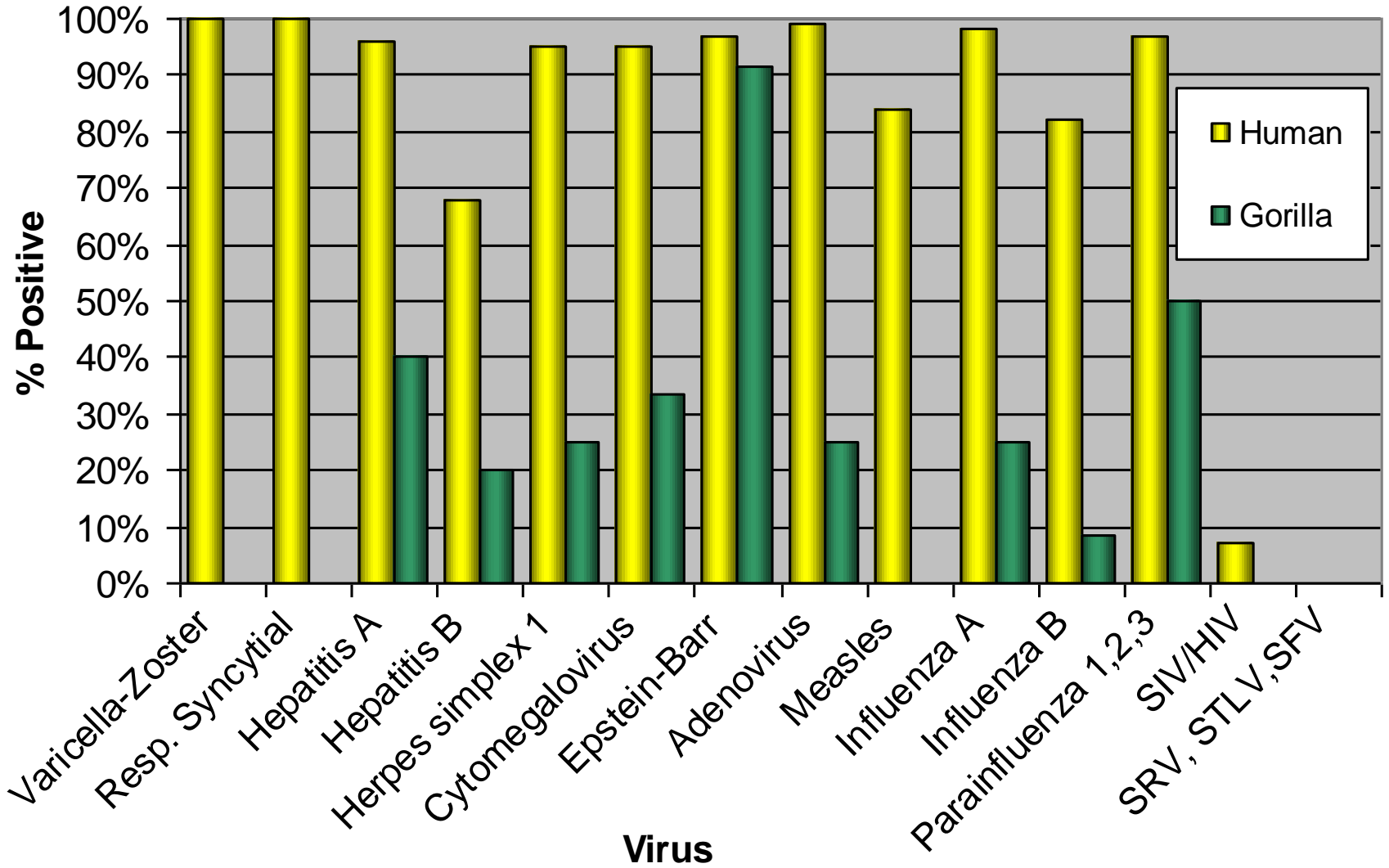


# Wild apes monitoring - Methods

## 4. Opportunistic sample collection during post mortem examinations



# Viral Serology



# Definition: Treatment or Intervention

## Populations Versus Individual

### - Captive situation

- Ethics
- Animal welfare

### - Wild situation

- Conservation
- Sustainability of population
- - Genetic importance of individuals
- Knowledge
- Carrying Capacity
- Ethics?????



# Clinical Interventions



- Life threatening and / or human induced conditions
- Demographic information
- Consensus of protected area authorities

Risk / Benefit

**Human and animal safety**

# Treat or not to treat?



# Intervene or not to intervene?

– How far should we go?



- A growing family of gorilla orphans
  - Then, now, and the future????



# USAID EPT Program

## Animals

Wildlife  
Domestic

Animal  
+  
Human

## Human

### PREDICT

- Prevention
- Surveillance
- Control

### RESPOND

- Prevention
- Surveillance
- Control

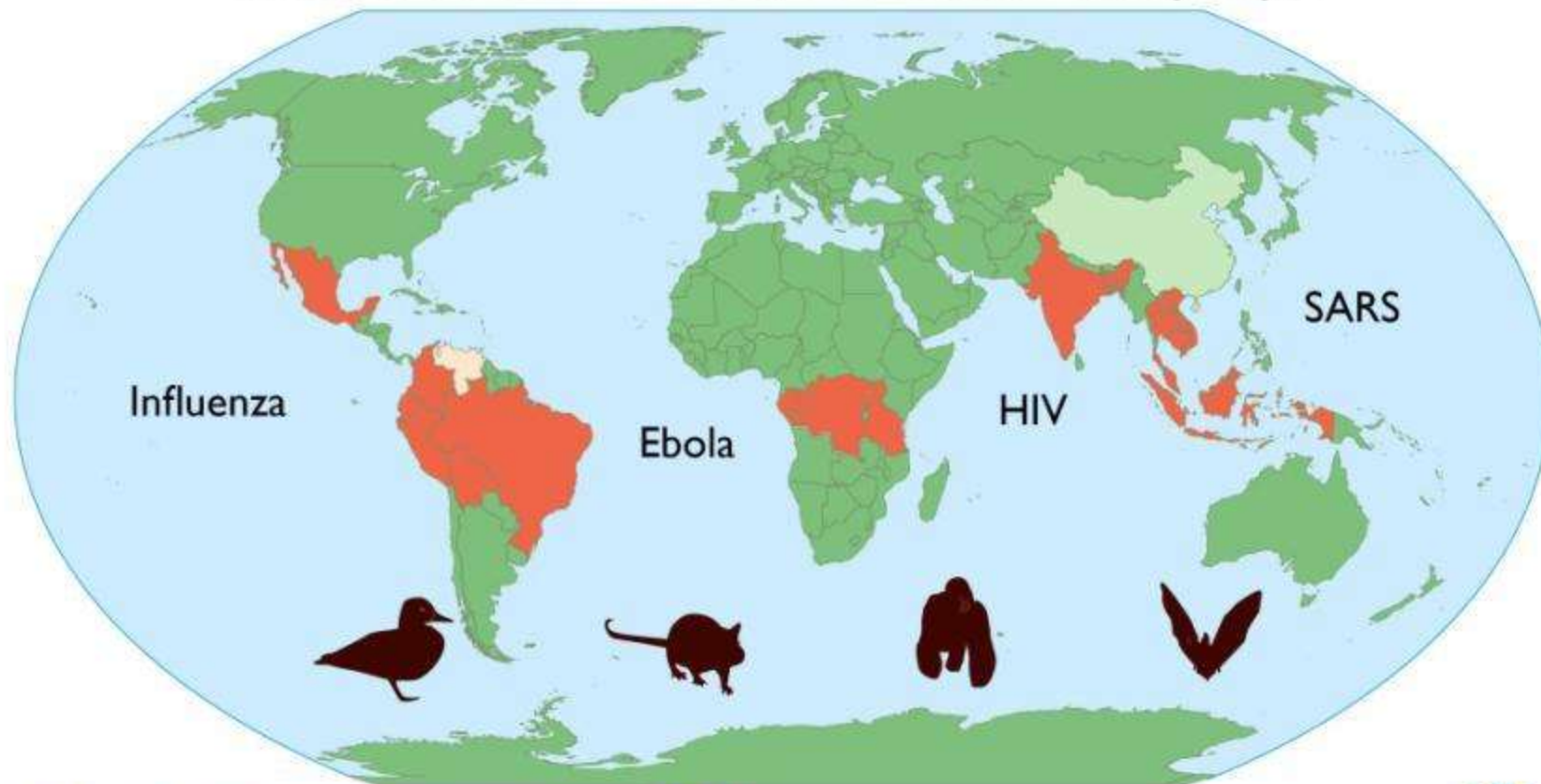
### IDENTIFY

- Prevention (isolation)
- Surveillance
- Control

**PREVENT**



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



EcoHealth Alliance

GVFI

Global Viral Forecasting Initiative



Smithsonian Institution

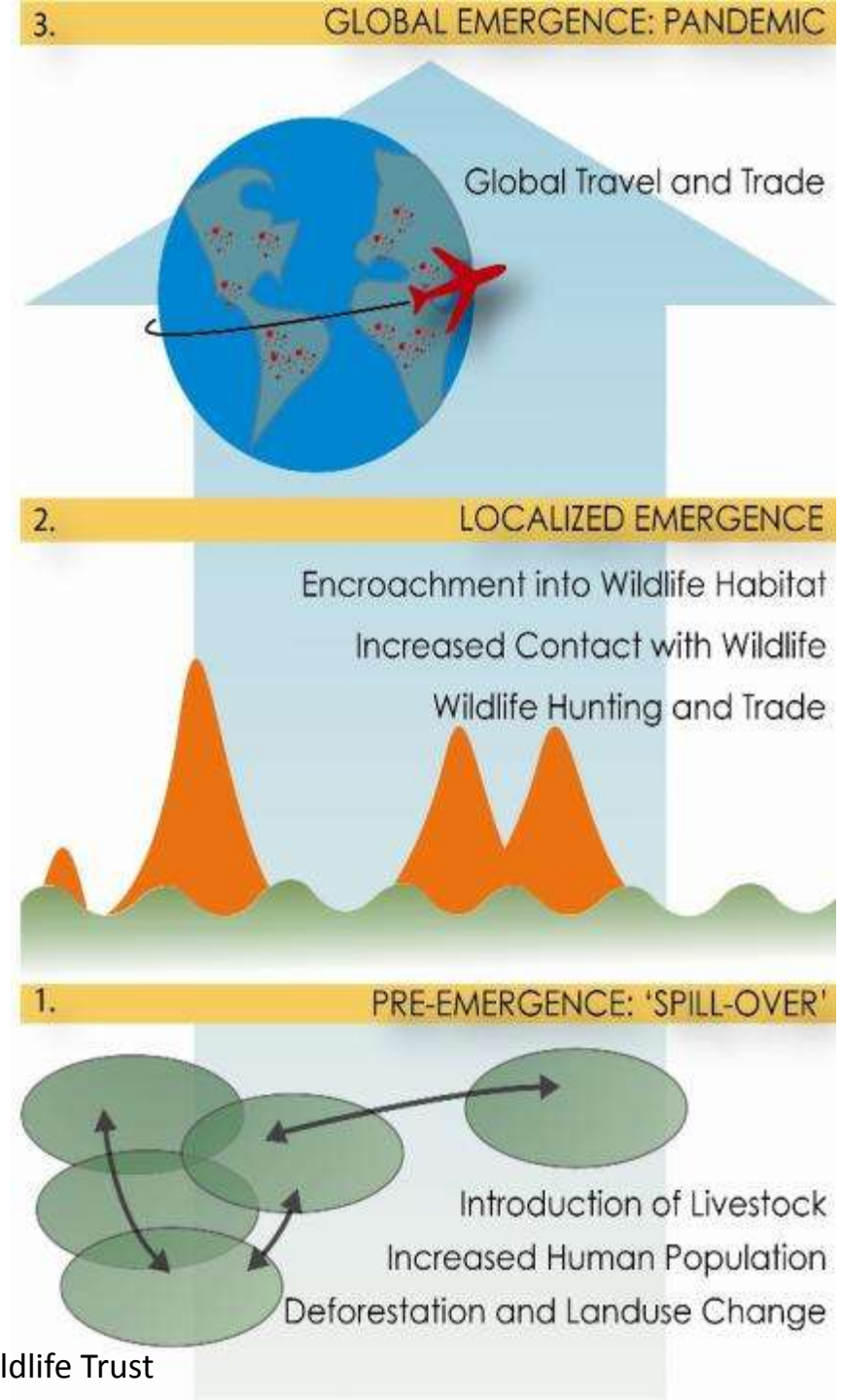


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# Pathogens

- Influenza
- HIV/AIDS
- SARS
- West Nile virus
  
- Nipah virus
- Ebola virus
- Undiagnosed outbreaks
- New human infections
  
- Wildlife die-offs
- Silent human infections
- Unknown pathogens



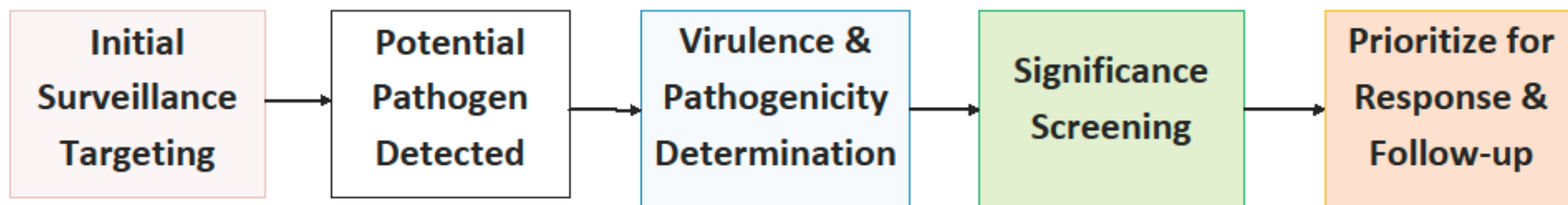




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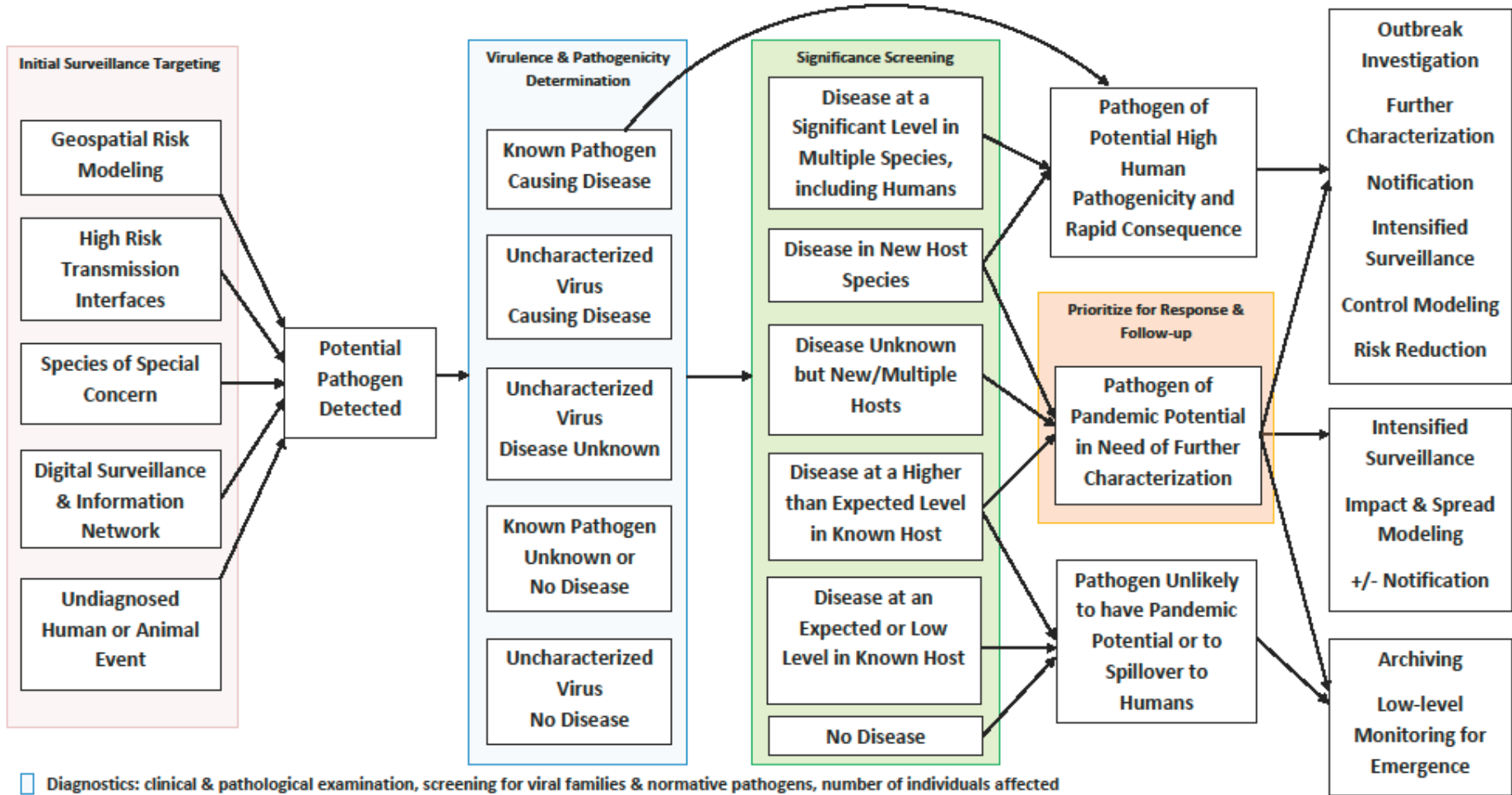
## Wildlife SMART Surveillance



- Targeting Surveillance:** risk modeling, identifying interfaces, species considerations, remote sensing, situational analysis
- Diagnostics:** clinical & pathological examination, screening for viral families & normative pathogens, number of individuals affected
- Rapid Epidemiologic Analysis & Modeling:** incidence, host & number of species affected, demographics, location & spread
- Molecular Characterization & Modeling:** relatedness to human pathogens, transmissibility factors, opportunity for spillover & spread, pathogenic potential in new hosts & ability to counteract host



## Wildlife SMART Surveillance



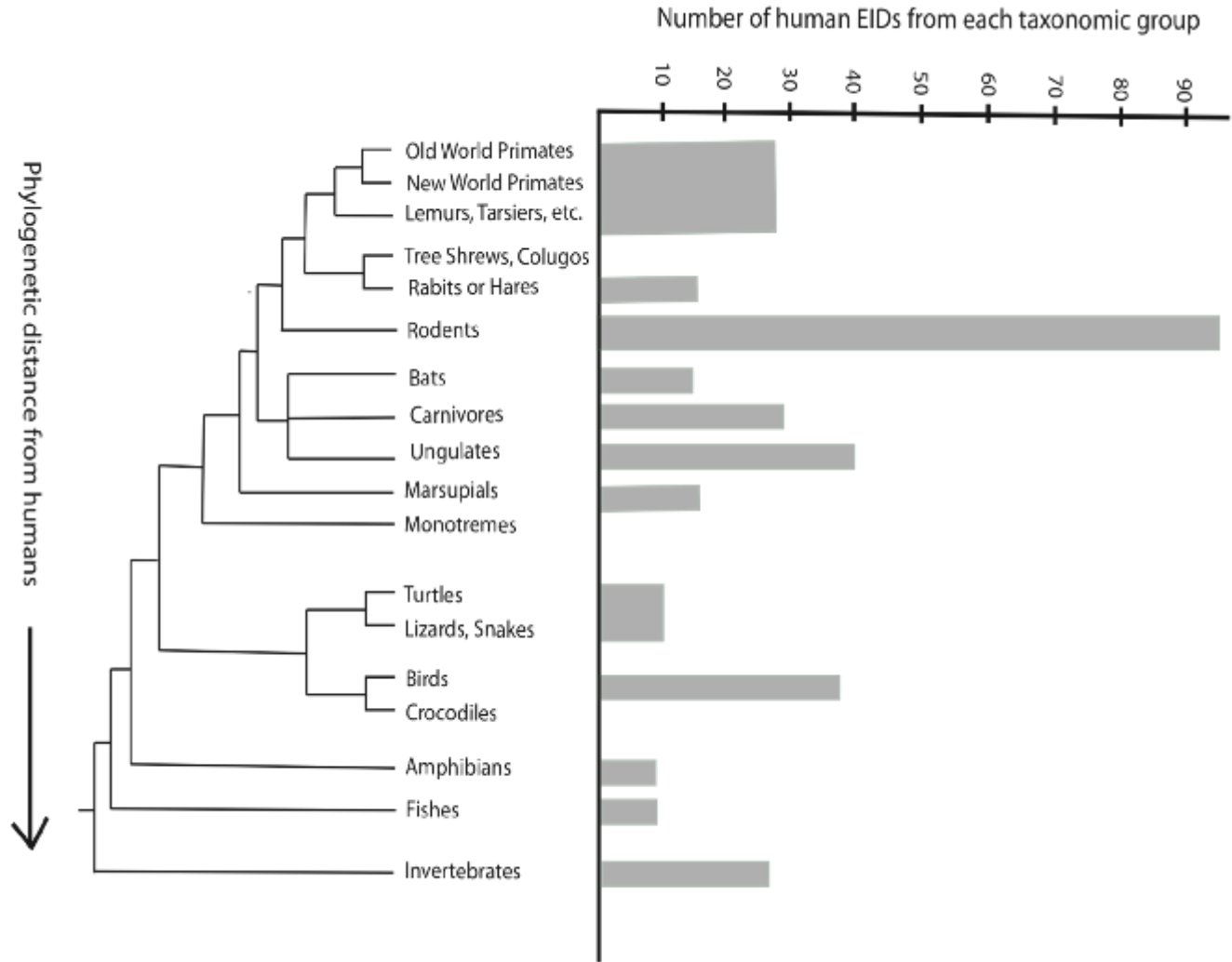
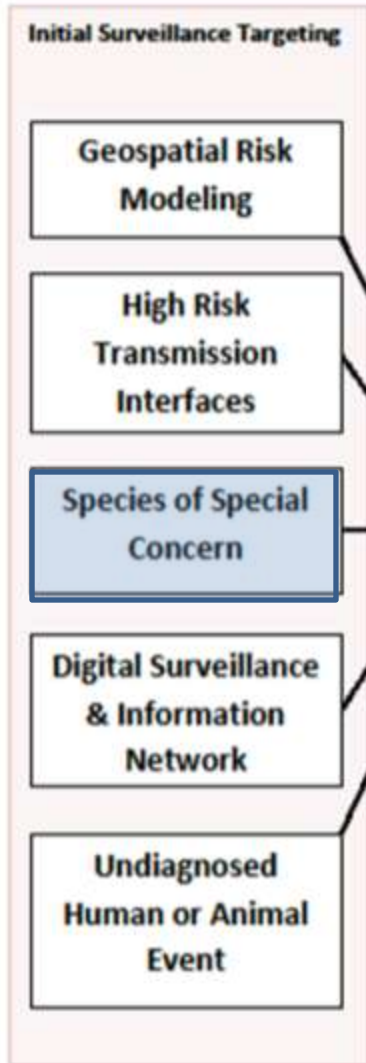
■ Diagnostics: clinical & pathological examination, screening for viral families & normative pathogens, number of individuals affected

■ Rapid Epidemiologic Analysis & Modeling: incidence, host & number of species affected, demographics, location & spread

■ Molecular Characterization & Modeling: relatedness to human pathogens, transmissibility factors, opportunity for spillover & spread, pathogenic potential in new hosts & ability to counteract host defenses, emergence & evolutionary history

# Developing a Targeted Surveillance Strategy

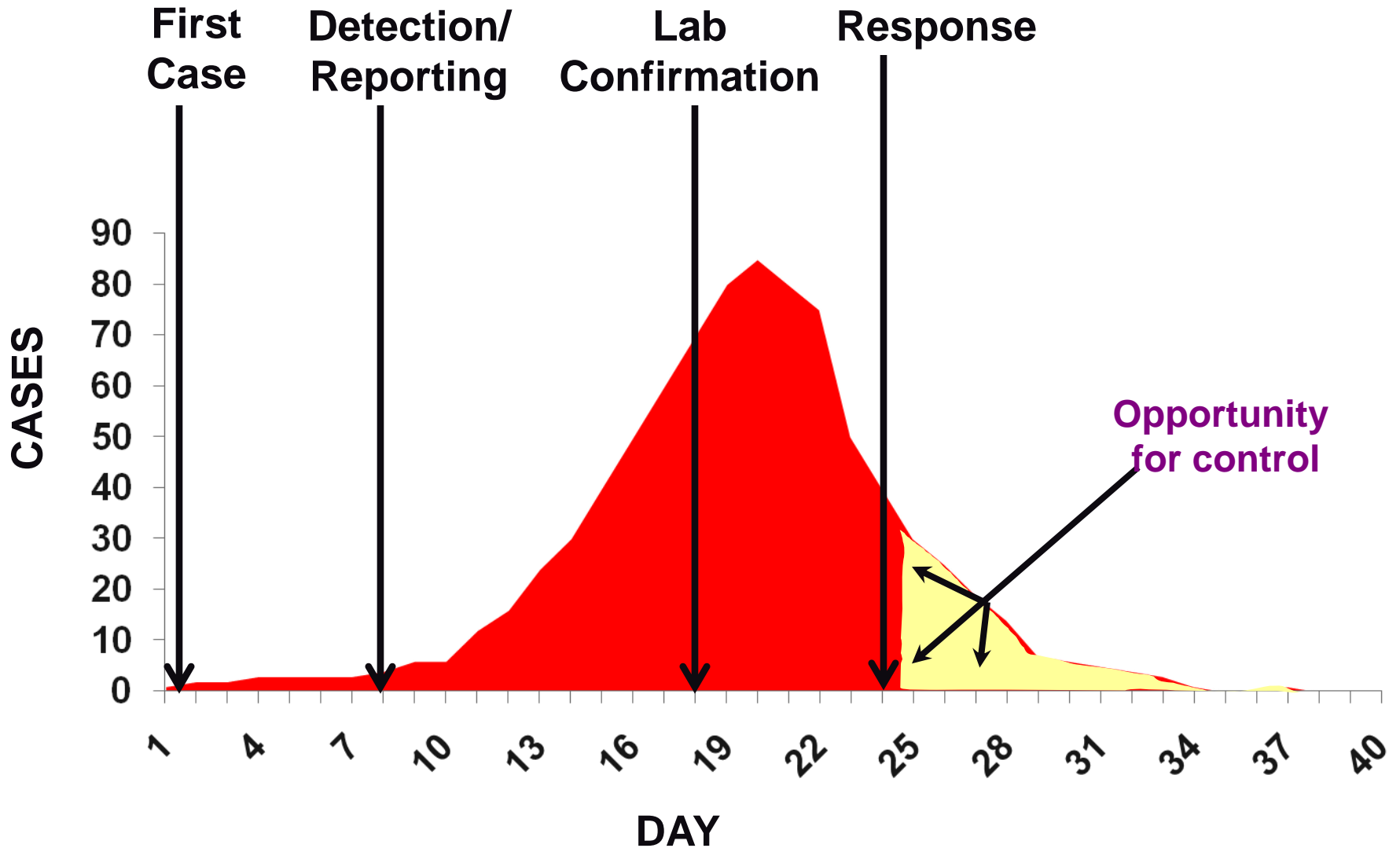
*for wildlife species of highest risk*



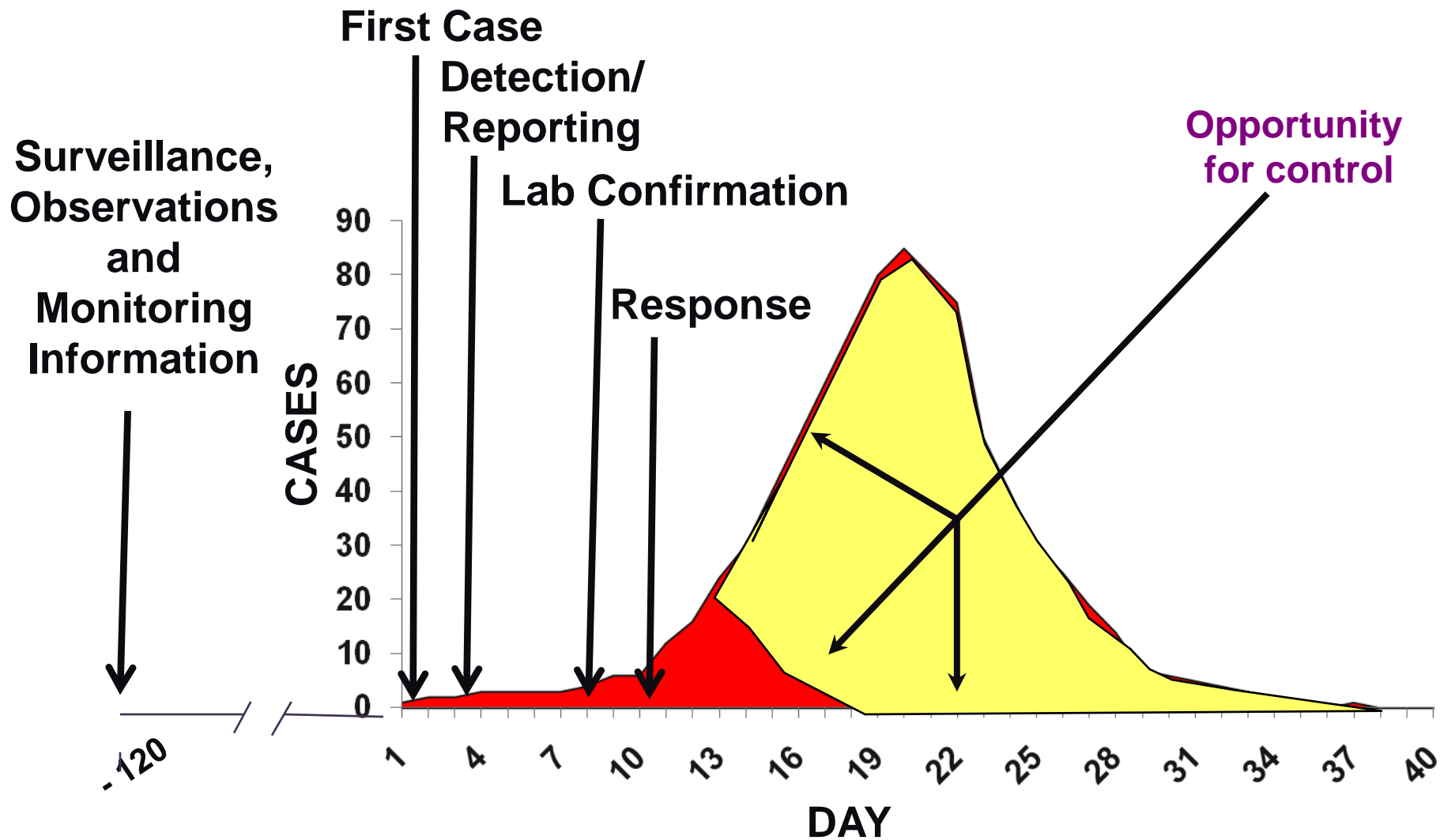
# Hosts and Priority Pathogens

Animal Host	Priority Pathogens
<b>i. High Priority Species</b>	
Rodents	Arena, Hanta, Pox, Alpha, Reo, <i>Brucella</i> , <i>Leptospira</i>
Bats	Flavi, Corona, Henipa, Hendra, Rhabdo, Arena, Filo, Reo
Non-human Primates	Retro, Filo, Flavi, Orthomyxo, Paramyxo, Pox, Herpes B, Corona, Arena, <i>Brucella</i> , TB, Malaria
Birds	Orthomyxo, Paramyxo, Flavi, Malaria
<b>ii. Lower Priority Species</b>	
Vectors (mosquitos, ticks, flies)	Alpha, Bunya, Flavi, Reo
Carnivores	Flavi, Corona, Paramyxo, Filo, Arena, Parvo, Rhabdo
Ungulates	Flavi, Rhabdo, Corona, Paramyxo, Reo
Artiodactyls	Flavi, Corona, Paramyxo, Filo, Arena, Orthomyxo, Bunya, Parvo

# Current Outbreak Detection and Response



# Effective Health Early Warning





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*Wildlife Health Center*

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