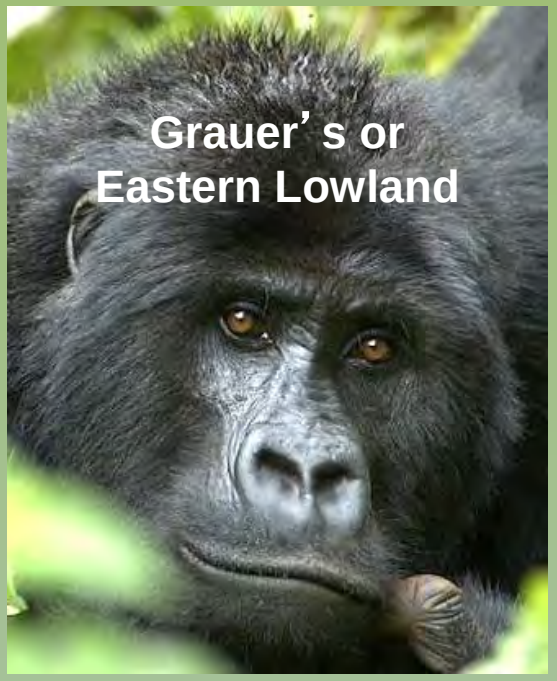
One Health:
Where gorilla conservation meets ecosystem sustainability and human wellbeing

GORILLA DOCTORS

MOUNTAIN GORILLA VETERINARY PROJECT

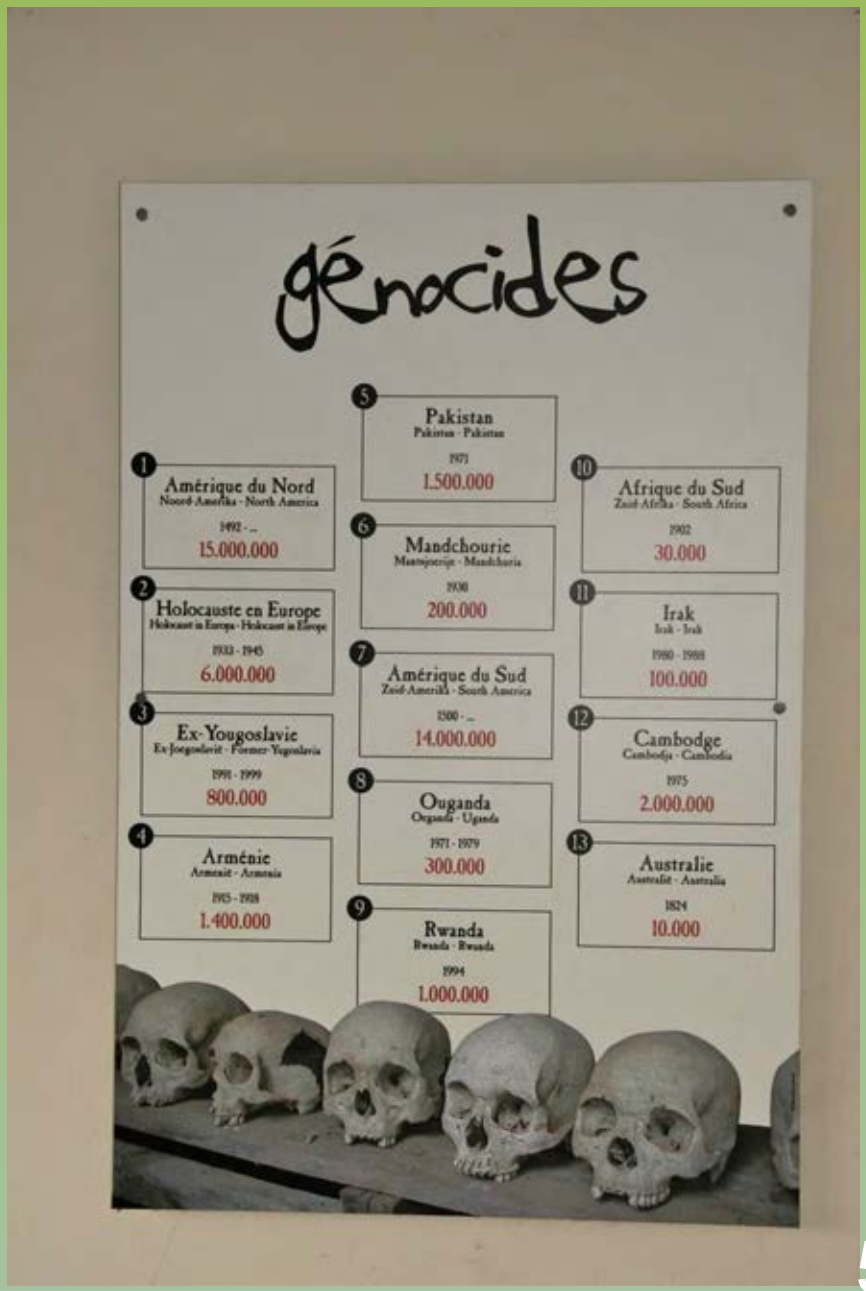
Gorilla gorilla

Gorilla beringei




DEMOCRATIC
REPULIC OF
CONGO
UGANDA
RWANDA
Bwindi
Impenetrable
N.P
Mgahinga N.P.
Virunga N.P.
Volcanoes N.P
Mountain Gorilla Habitat
Grauer's Gorilla Habitat
Lake
Kivu
Kahuzi-Beiga N.P.
GORILLA DOCTORS

Slide courtesy of A. Fritzberg



Slide courtesy of A. Fritzberg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1986 - Dr. James Foster, the first Gorilla Doctor

2014-
14 veterinarians in Rwanda, Uganda, the Democratic Republic of Congo and the United States.

- One Health “perfect storm”
  - Close proximity
  - Shared susceptibility to pathogens
  - Historical disease transmission events

“One Health”

- “One Medicine” Calvin Schwabe - 1960’s epidemiologist advocating a unified approach to veterinary and human medicine - Veterinary Medicine and Human Health, 1984

- Everyday fact of life in most developing countries that have limited access to medical care, depend intimately on animals for food, and have limited infrastructure

Activities of One Health

- Proactive health monitoring or disease surveillance
- Clinical treatments or interventions
- Post mortems or mortality monitoring

Activities Applied to Components

1. Target Species
2. Other Wildlife
3. Human Population
4. Livestock and Companion Animals
5. Habitat

The Habitat or Environment

Snare Injuries


05/10/2013 11:28

Mortality in Virunga Gorillas through 2010

Cause	Through 2005	2007 - 2009
Trauma (incl. infanticide)	40%	50%
Respiratory	24%	22%
Undetermined	17%	11%
Other	19%	17%

Biological Resource Center

- Store wide range of specimens
- Allows for studies to use the same technology in the same individual over time
- Allows storage till new technology is developed


MVE
CRYOMD0-VER

Gorilla Conservation Employee Health Program

- Sensitization, consent forms
- Logistics (site, transportation)
- Pre-exam questionnaire
- Physician examination
- Laboratory testing
  - CBC
  - TB intradermal test
  - HIV
  - Measles titer

Gorilla Conservation Employee Health Program

- +/- vaccination: DPT, polio, MMR, tetanus
- De-worming and health/hygiene education
  - Quarterly, including families
  - Mebendazole
- Follow-up

<u>2012/13</u>

1,850 individuals


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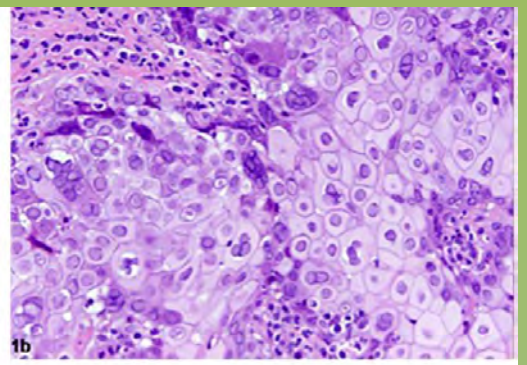
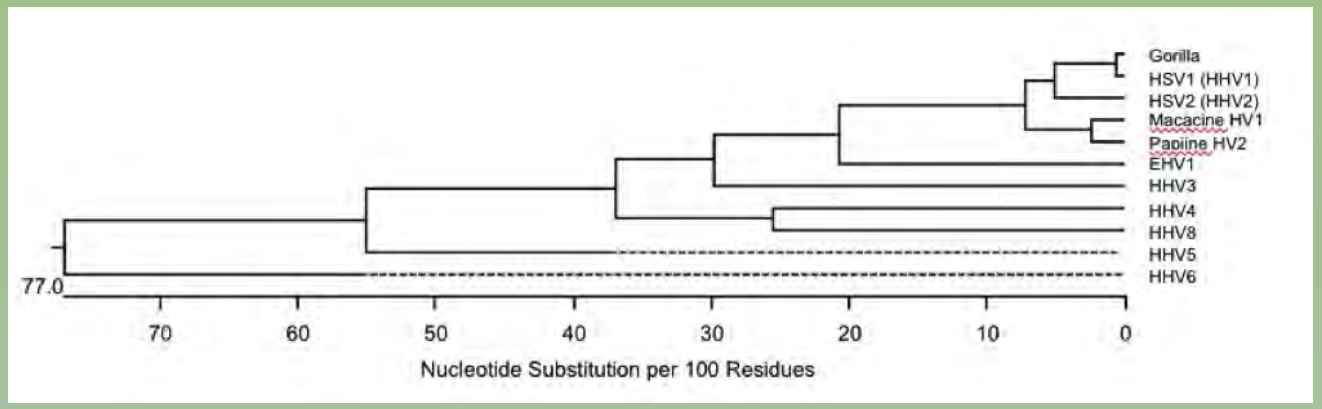
Human Herpes Simplex-1

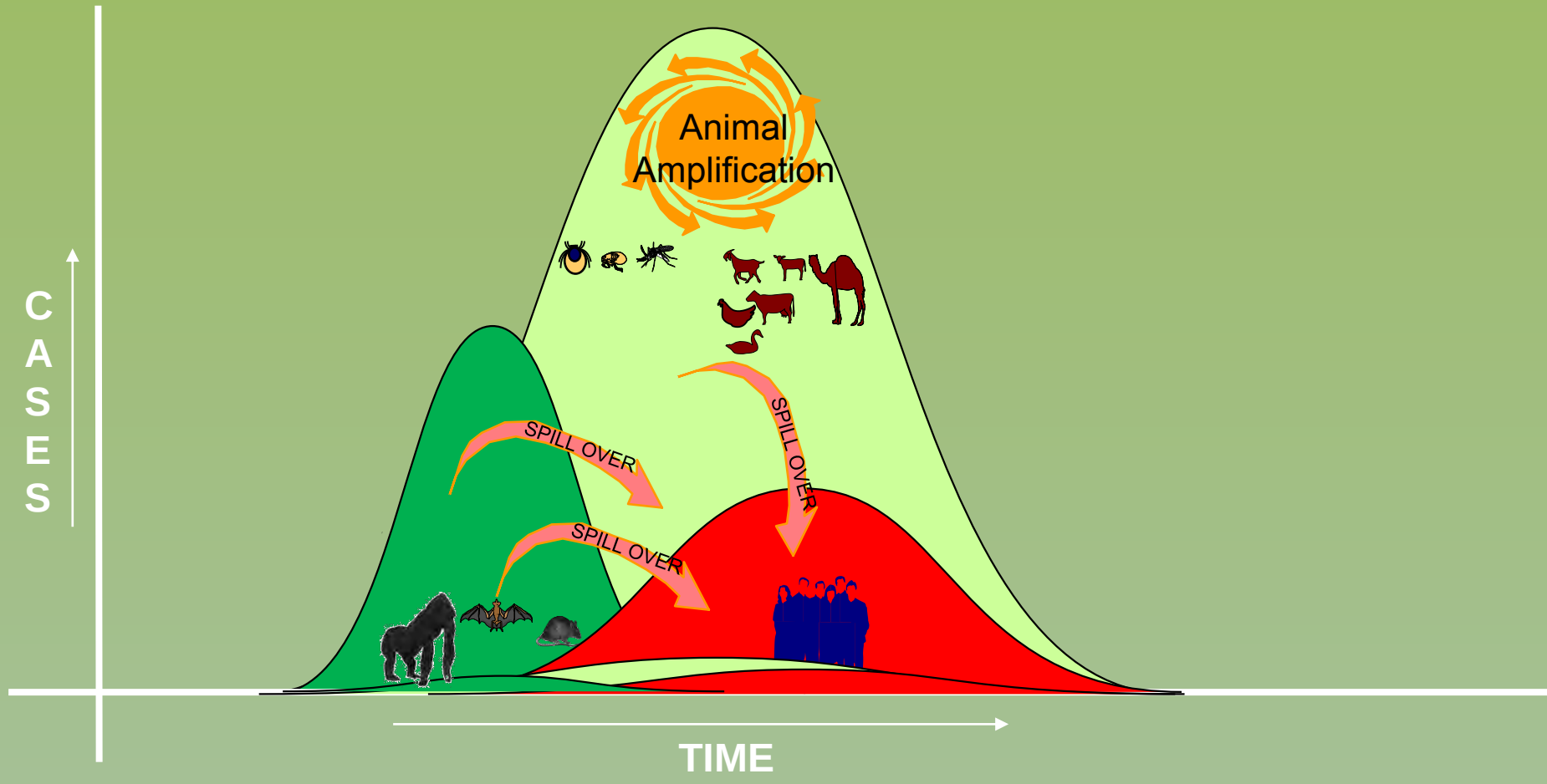


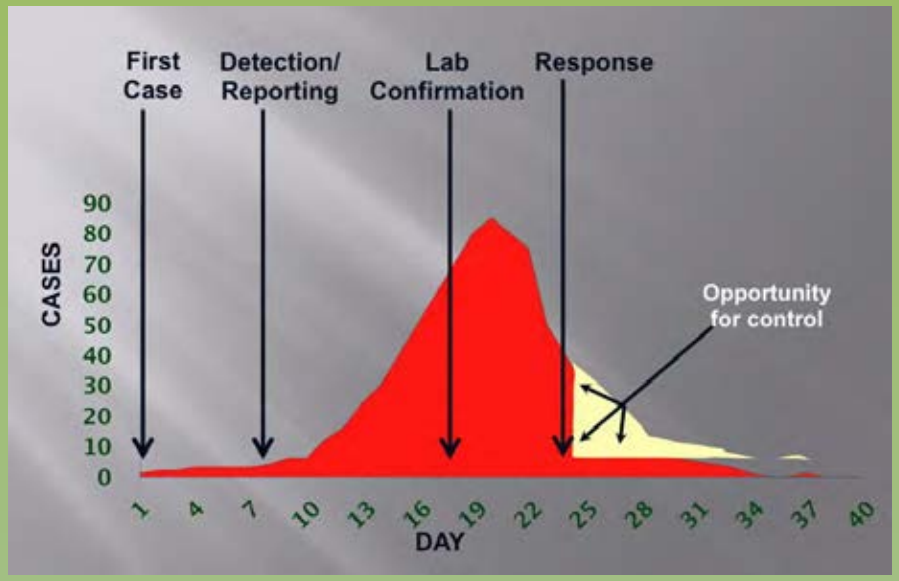


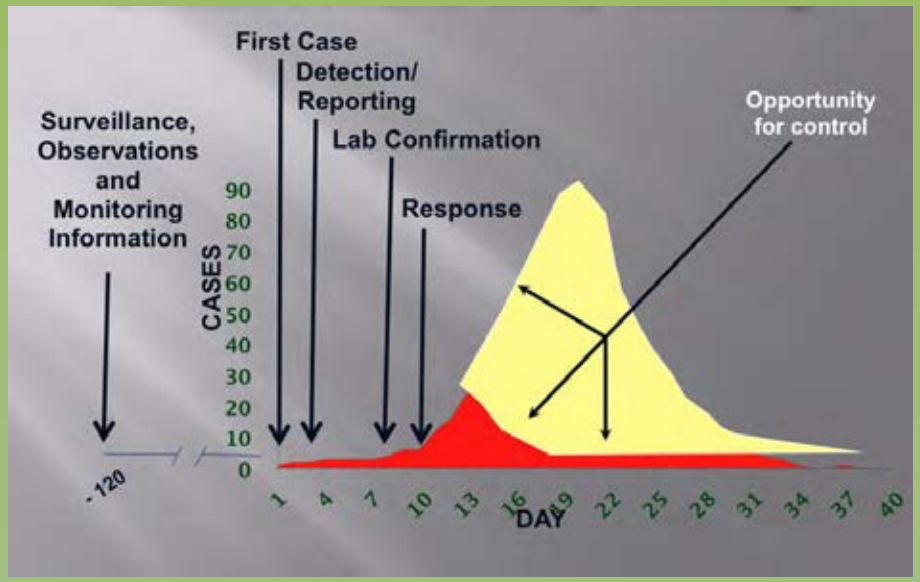
USAID Emerging Pandemic Threats PREDICT

- Identifying known and new zoonotic viruses in wildlife at high-risk human-wildlife interfaces

- Using a risk-based surveillance strategy
- Building capacity for zoonotic disease detection
- Operationalizing One Health


Animal
Amplification
SPILL OVER
SPILL OVER
SPILL OVER
CASES
TIME


First Case
Detection/ Reporting
Lab Confirmation
Response
Opportunity for control
CASES
90
80
70
60
50
40
30
20
10
0
1
4
7
10
13
16
19
22
25
28
31
34
37
40
DAY


Surveillance, Observations and Monitoring Information
First Case
Detection/ Reporting
Lab Confirmation
Response
Opportunity for control
CASES
90
80
70
60
50
40
30
20
10
0
-120
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4
7
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13
16
19
22
25
28
31
34
37
40
DAY

Risk-based Surveillance Strategy: High-risk Taxa

- **Primates**
- **Bats**
- **Rodents**
- Birds
- Suids
- Carnivores
- Ungulates

Shared Pathogens

- 1) Cryptosporidia (genotype II)
- 2) Microsporidea
- 3) Giardia

DOI: [illegible]

Journal of Wildlife Diseases, [illegible], pp. 21–[illegible]
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GIARDIA IN MOUNTAIN GORILLAS (*GORILLA BERINGEI BERINGEI*), FOREST BUFFALO (*SYNCERUS CAFFER*), AND DOMESTIC CATTLE IN VOLCANOES NATIONAL PARK, RWANDA

Jennifer N. Hogan,[1] Woutrina A. Miller,[1] Michael R. Cranfield,[2,6] Jan Ramer,[3,5] James Hassell,[4] Jean Bosco Noheri,[5] Patricia A. Conrad,[1] and Kirsten V. K. Gilardi[2,6]

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Human Metapneumovirus Infection in Wild Mountain Gorillas, Rwanda

Gustavo Palacios, Linda J. Lowenstine, Michael R. Cranfield, Kirsten V.K. Gilardi, Lucy Spelman, Magda Lukasik-Braum, Jean-Felix Kinani, Antoine Mudakikwa, Elisabeth Nyirakaragire, Ana Valeria Bussetti, Nazir Savji, Stephen Hutchison, Michael Egholm, and W. Ian Lipkin

The genetic relatedness of mountain gorillas and humans has led to concerns about interspecies transmission of infectious agents. Human-to-gorilla transmission may explain human metapneumovirus in 2 wild mountain gorillas that died during a respiratory disease outbreak in Rwanda in 2009. Surveillance is needed to ensure survival of these critically endangered animals.

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Extreme Conservation Leads to Recovery of the Virunga Mountain Gorillas

Martha M. Robbins[1]*, Markye Gray[2], Katie A. Fawcett[3], Felicia B. Nutter[4], Prosper Uwingeli[5], Innocent Mburanumwe[6], Edwin Kagoda[7], Augustin Basabose[2], Tara S. Stoinski[3,8], Mike R. Cranfield[4], James Byamukama[2], Lucy H. Spelman[4], Andrew M. Robbins[1]

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Mountain Gorilla Veterinary Project & UC Davis Wildlife Health Center