THE ROLE OF CONSERVATION IN PUBLIC HEALTH

Erin Jobman | MPH Candidate 2017 | Field Experience Report
CONSERVET PROGRAM

- Conservation medicine course
- Costa Rica
  - Soltis Center
  - Monteverde
- Goals of Program
  - Interface between human, animal, and environmental health
  - Biodiversity
  - Conservation strategies
  - Infectious disease prevalence
COSTA RICA

- 5% of the world’s biodiversity

- Geography
  - Two coasts
  - Mountainous system
  - Volcanoes

- Eco-zones
  - Cloud Forests
  - Rain Forests

CONSERVET 2015
SPECIES COLLECTION

- Avian
- Bat
- Insects
- Livestock
DISEASES OF INTEREST

- Avian Influenza
- West Nile Virus
- Dengue
- Chikungunya
- Viral Encephalitis
- Chagas Disease
ZOONOTIC DISEASES

- 60% of infectious diseases
  - 75% of emerging diseases
- Marked increase in emerging diseases
  - Land-use alterations
    - Urbanization
    - Agriculture
  - Trade and travel
  - Habitat encroachment
  - Increased awareness
ENVIROMENTAL HEALTH

• Climate Envelopes
  • Temperature
  • Precipitation
  • Elevation

• Disease systems
  • Complex host-vector relationships

• Abiotic factors
  • Behavior
  • Social structure
  • Dispersal
• Changes alter pathogen transmission

• Requirements:
  • Necessary host and vector species
  • Conditions for pathogen survival

• Altered interactions increase risk of transmission
  • Climate change
  • Habitat destruction
  • Disappearance of species
EMERGENCE OF INFECTIOUS DISEASE

• Driving Factors:
  • Climate change
  • Habitat Destruction
  • Loss of biodiversity
CLIMATE CHANGE

• Result of increased carbon dioxide levels in the atmosphere

• Life cycles and transmission routes of infectious agents are affected by climate
  • Temperatures
  • Precipitation patterns

• Arboviruses
  • Replication kinetics

• Altered environments
  • Changing density and distribution of animal and insect reservoirs
    • Emergence into new territories
      • Naïve populations
CLIMATE CHANGE

- Declines in amphibian populations during warm years
  - Golden toad
  - Harlequin frog

- Warm temperatures
  - Reduced humidity
  - Favorable conditions for pathogens

http://www.bagheera.com/inthewild/van_animal_gldtoad.htm
HABITAT DESTRUCTION

• Land-clearing
  • Increased interactions with wildlife
  • Naïve exposure

• Examples
  • Nipah Virus
  • Marburg Virus
  • Severe Acute Respiratory Syndrome
  • Ebola
LOSS OF BIODIVERSITY

- Bats
  - Insect predators
  - Seed dispersers
  - Pollinators
- White-Nose Syndrome
  - 80% decline in North American species
- $50 billion per year
- Highly specialized species
DISEASE EMERGENCE

- Driving Factors:
  - Climate change
  - Habitat Destruction
  - Loss of biodiversity

- Role of conservation
CONSERVATION STRATEGIES

- Government organizations
- Policy changes
- Biological corridors
- Sustainable agriculture
CONSERVATION STRATEGIES

• Preservation of Biodiversity
  • Bats

• Habitat Conservation
  • Biological Corridors
  • Sustainability
  • Carbon sinks
THANK YOU!
REFERENCES


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QUESTIONS?