

Veterinary Services



Emerging Risks to Animal Health

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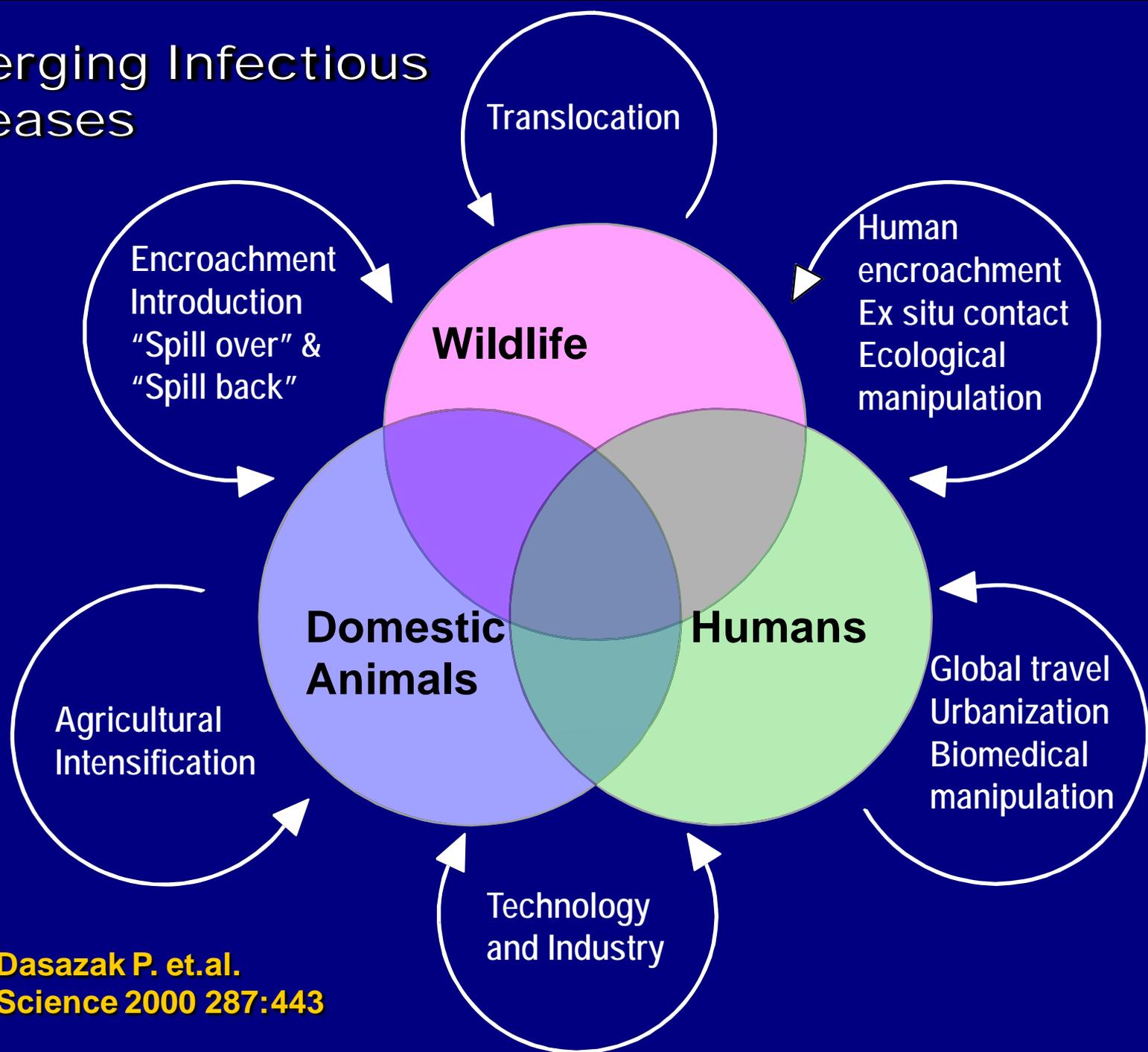


Why do we care?

- Global issue
- Zoonotic implications
- Uncertain consequences of a new disease
- Unknown pathways for disease transmission
 - Vectors
 - Movement
 - Wildlife-livestock interface



Emerging Infectious Diseases



Daszak P. et.al.
Science 2000 287:443

What do we want?



- To provide timely information to stakeholders.
- Global awareness, assessment and preparedness
 - Emerging risk events detected, identified and characterized
 - Emerging risk findings communicated
 - Quick response undertaken to minimize the impact of emerging risk events

How Are We Doing?

“While it has been possible to eradicate certain infectious diseases (smallpox and veterinary disease rinderpest), and to significantly control many others..., it seems unlikely that we will eliminate most emerging infectious diseases in the foreseeable future.”

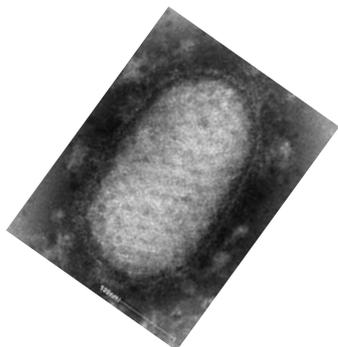
- Morens and Fauci, PLOS Pathogens, 2013

“Indeed, our war on emerging pathogens may never end. War on emerging pathogens is intensifying in 2013.”

- Wu and Gao, Nature, 2013

Emerging Disease - Globally

- Middle East Respiratory Syndrome Corona virus (MERS-CoV)
- Orthopoxvirus (Georgia)
- Teschen Disease (Haiti)
- *New avian influenzas:*
 - H7N9 (low pathogenic (China))
 - H5N8 Highly pathogenic (South Korea)
- Hendra Virus (Australia)
- Re-emergence of Ebola
 - Largest known outbreak in humans (west Africa)
- Antimicrobial resistance
 - Multi-resistant staphylococcus aureus
- Nipah virus (Bangladesh)
- Severe fever with thrombocytopenia syndrome
- Schmallenberg virus – affecting cattle, sheep and goats₆



SECD



Emerging Disease - Domestically

- Chikungunya
- Dengue
- H1N1
- Swine Enteric Coronavirus Diseases (nSECD)



How can we address the issue?

- Detection Methods and Information Sources
 - Passive Surveillance
 - Active Surveillance
 - Information Sources
 - Internet
 - Databases
 - Direct Collaboration with Stakeholders
 - Collaboration with Partners



Products

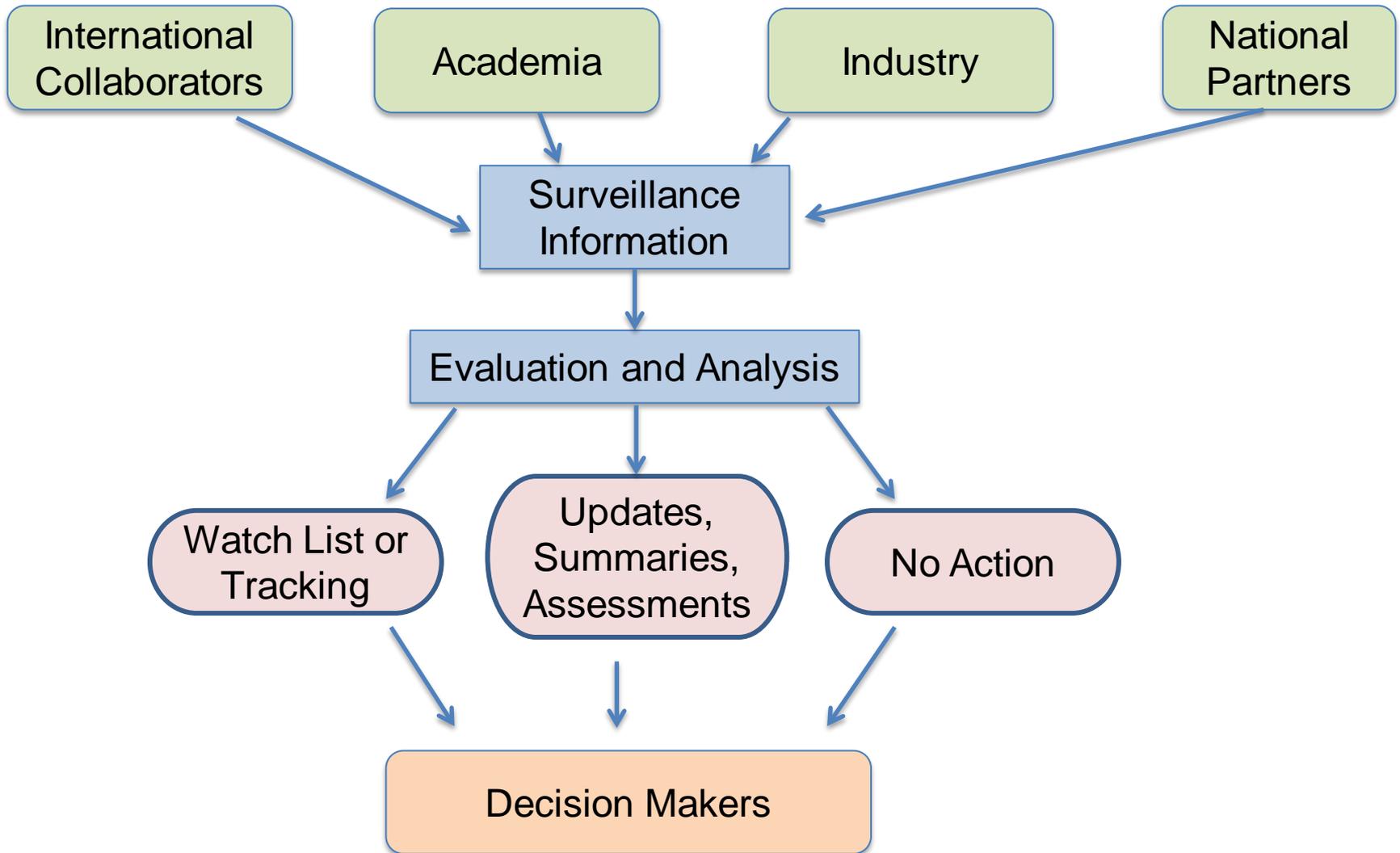
- Watch List
- Informational Notices
- Assessments
- Pathway Analysis
- Economic Assessments
- Risk Analysis
- Etc.

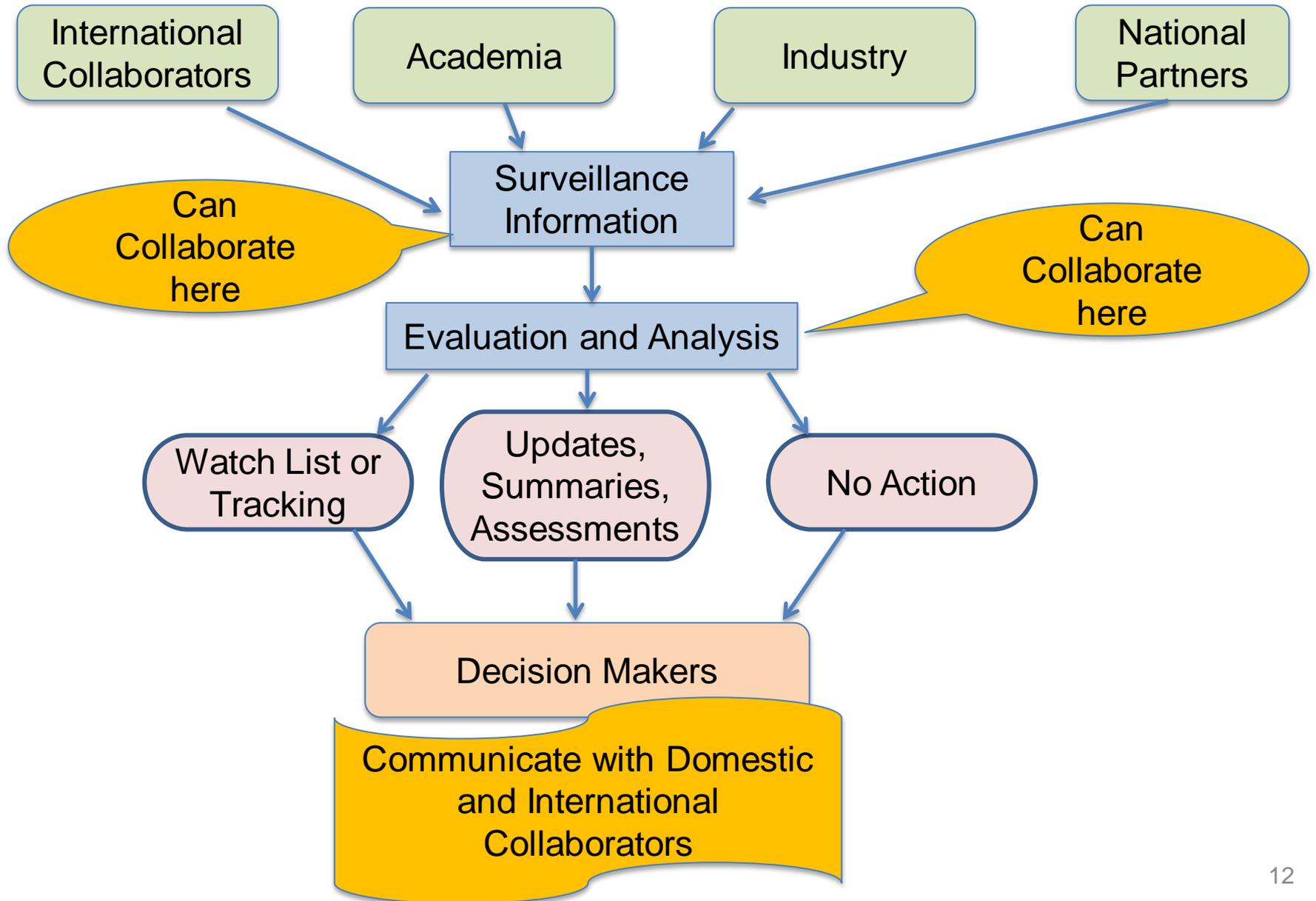


Resources

- Staff
- Expertise
- Telephone contact
- Travel
- Cooperative agreements
- Partnerships
- Development of information systems
- + others







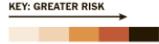
Measurable Outcomes

- Timely recognition and reporting
- Cooperative assessments
- Sharing of information



Hot Spots for Emerging Diseases

Map shows an analysis of the future likelihood of infectious diseases originating in wildlife that have the potential to infect humans.



Factors in the analysis included population density, proximity to and variety of wildlife, and climate.



West Nile virus A mosquito-borne illness that causes symptoms in about a fifth of those exposed. One in 150 becomes severely ill with encephalitis.

ANIMAL RESERVOIR Various birds, especially robins in the U.S.

FIRST HUMAN CASE West Nile district of Uganda, 1937; first U.S. case was in Queens in 1999.

WHY IT EMERGED International air travel.

SUSCEPTIBLE HOSTS Humans; birds, especially crows; horses.



SARS A severe viral respiratory infection that quickly spread from China to more than two dozen countries. The outbreak was contained, and since 2004 no new cases have been reported.

ANIMAL RESERVOIR Horseshoe bats.

FIRST HUMAN CASE Guangdong Province, China, 2003.

WHY Wildlife markets and trade; global travel.

SUSCEPTIBLE Humans, civets (inset, left).



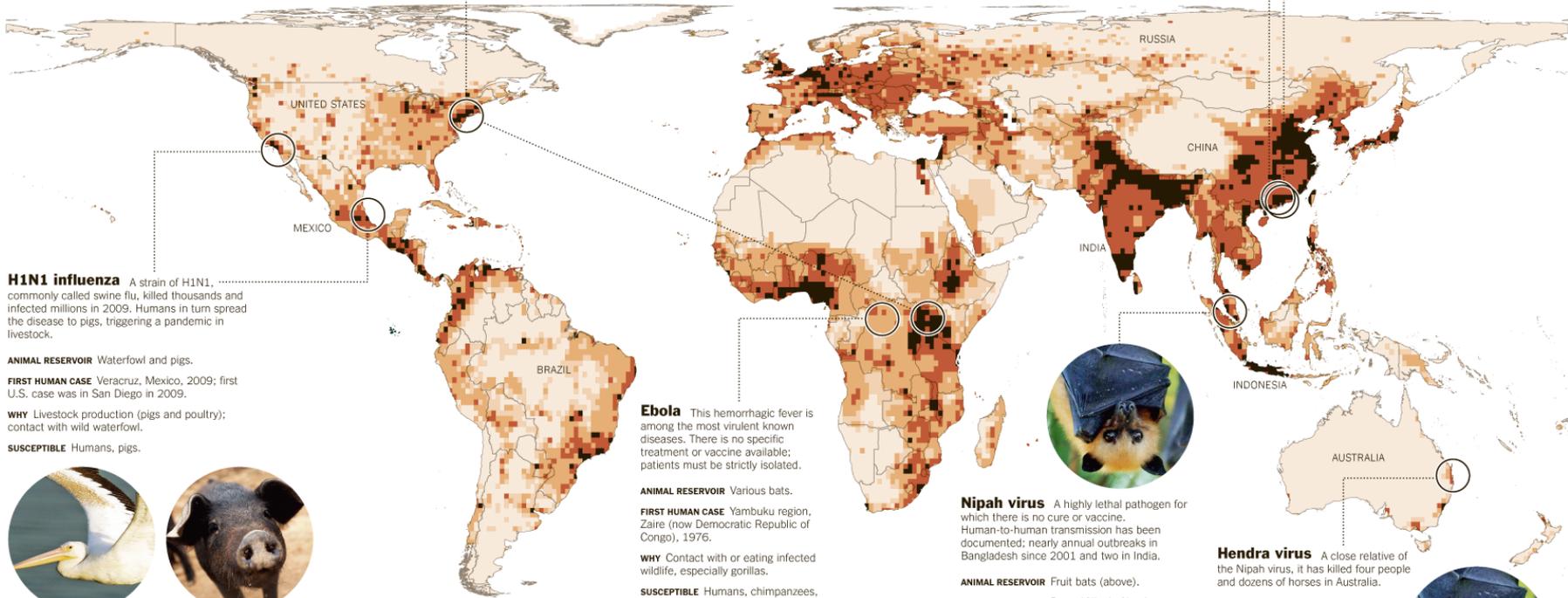
Bird flu A deadly strain of the avian influenza virus called H5N1 has spread to humans via contact with live or dead poultry.

ANIMAL RESERVOIR Wild waterfowl.

FIRST HUMAN CASE Hong Kong, 1997. It re-emerged widely in 2003 and 2004.

WHY Global expansion of intensive poultry farming; contact with infected birds.

SUSCEPTIBLE Humans, poultry, cats.



H1N1 influenza A strain of H1N1, commonly called swine flu, killed thousands and infected millions in 2009. Humans in turn spread the disease to pigs, triggering a pandemic in livestock.

ANIMAL RESERVOIR Waterfowl and pigs.

FIRST HUMAN CASE Veracruz, Mexico, 2009; first U.S. case was in San Diego in 2009.

WHY Livestock production (pigs and poultry); contact with wild waterfowl.

SUSCEPTIBLE Humans, pigs.



Ebola This hemorrhagic fever is among the most virulent known diseases. There is no specific treatment or vaccine available; patients must be strictly isolated.

ANIMAL RESERVOIR Various bats.

FIRST HUMAN CASE Yambuku region, Zaire (now Democratic Republic of Congo), 1976.

WHY Contact with or eating infected wildlife, especially gorillas.

SUSCEPTIBLE Humans, chimpanzees, gorillas, duikers (small African antelopes, below right).



Nipah virus A highly lethal pathogen for which there is no cure or vaccine. Human-to-human transmission has been documented; nearly annual outbreaks in Bangladesh since 2001, and two in India.

ANIMAL RESERVOIR Fruit bats (above).

FIRST HUMAN CASE Sungai Nipah, Negri Sembilan, Malaysia, 1998.

WHY Large-scale livestock production; presence of orchards on pig farms; date palm sap harvest (eating contaminated sap is a significant cause of infection).

SUSCEPTIBLE Humans, pigs, horses, dogs, cats.

Hendra virus A close relative of the Nipah virus, it has killed four people and dozens of horses in Australia.

ANIMAL RESERVOIR Fruit bats.

FIRST HUMAN CASE Hendra, a suburb of Brisbane, Australia, 1994.

WHY Urban encroachment of wild habitats.

SUSCEPTIBLE Humans, horses, dogs.



“No one person, no one alliance, no one nation, no one of us is as smart as all of us thinking together.”

- James Stavridis

“The secret is to gang up on the problem, rather than each other.”

- Thomas Stallkamp





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Questions?



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