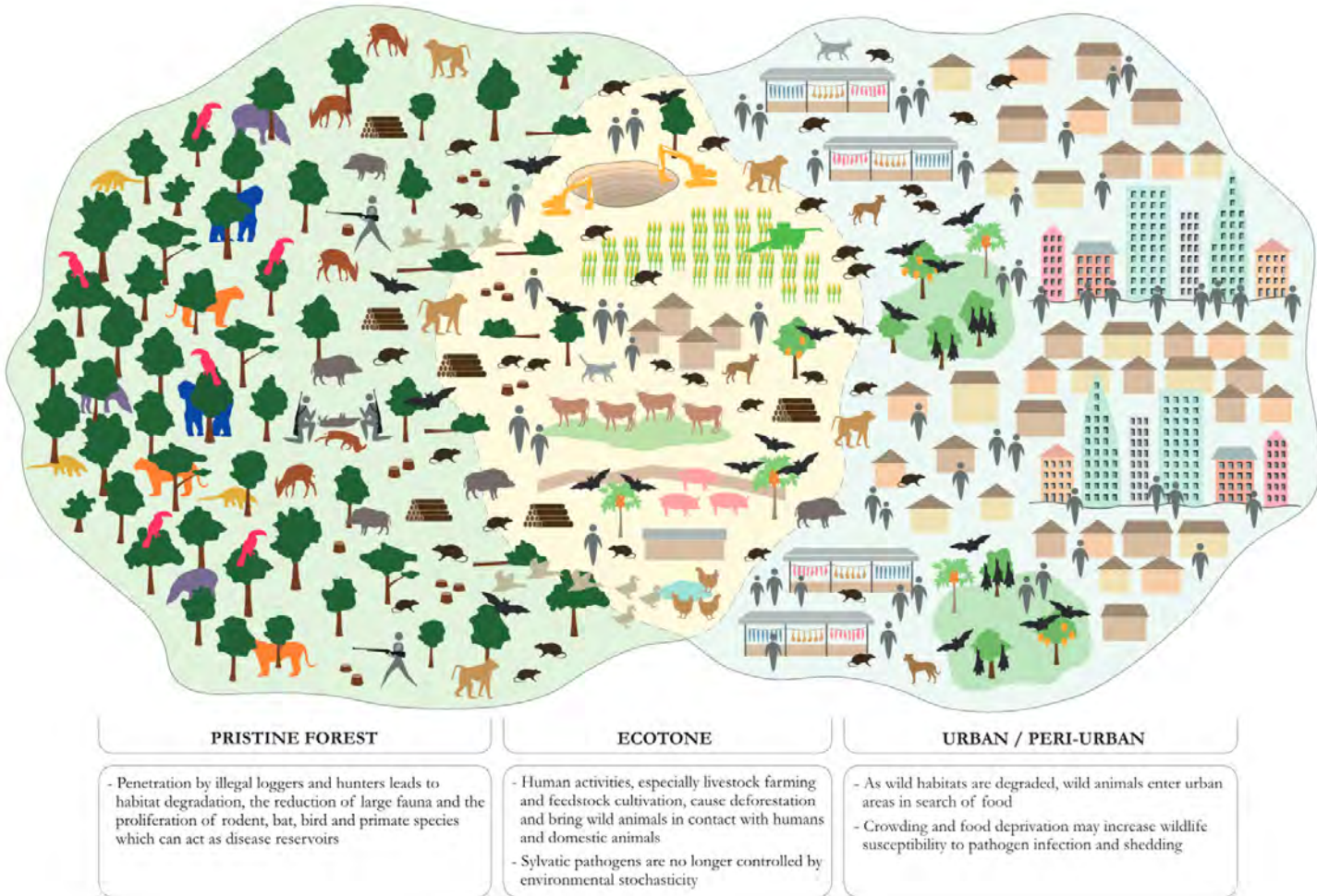


# Environments and Health Research Summit

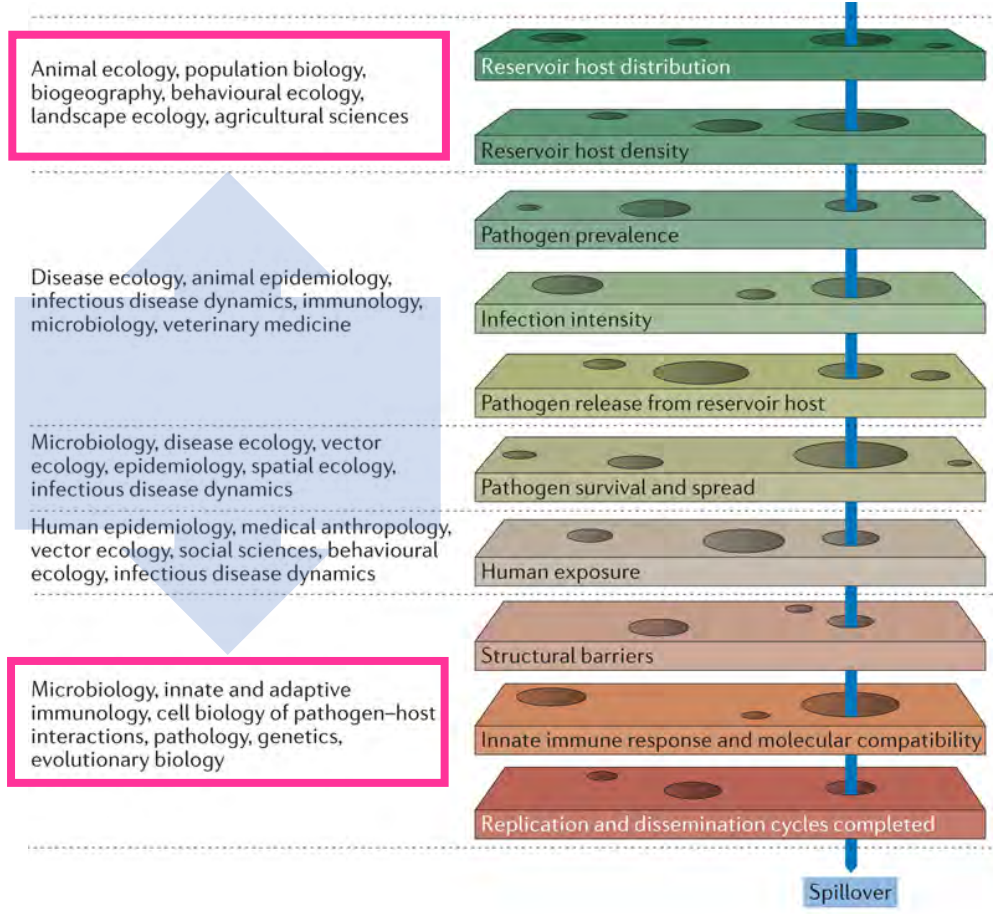
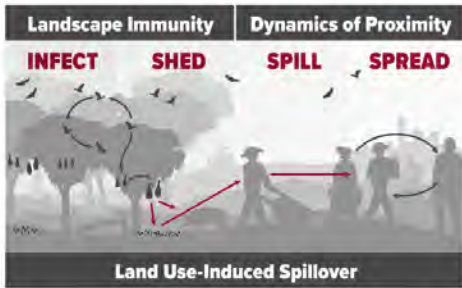
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# Socio-ecological drivers of inter-species pathogen transmission



# Maintaining health through immunity, from human and other animal cells to ecosystems



## Land Use-Induced Spillover

**Healthy Ecosystem**

- Intact structure and function
- Wildlife stress within normal limits

**Landscape Immunity**

"Dominos" are secure

Pathogen dynamics within wildlife stable in space and time.

**Unhealthy Ecosystem**

- Disrupted structure and function
- Wildlife adversely stressed

**Spillover**

"Dominos" fall

Pathogens proceed through the infect-shed-spill-spread cascade. This is facilitated by infected animals and humans being in close proximity.

## Fostering Landscape Immunity

**Scenario 1**

Foster landscape immunity to secure "dominos" in place.

e.g., establish protected and conservation areas; restore human-altered landscapes.

**Scenario 2**

Use ecological countermeasures to manage the dynamics of proximity by separating "dominos" across space and/or time. May involve "domino" removal.

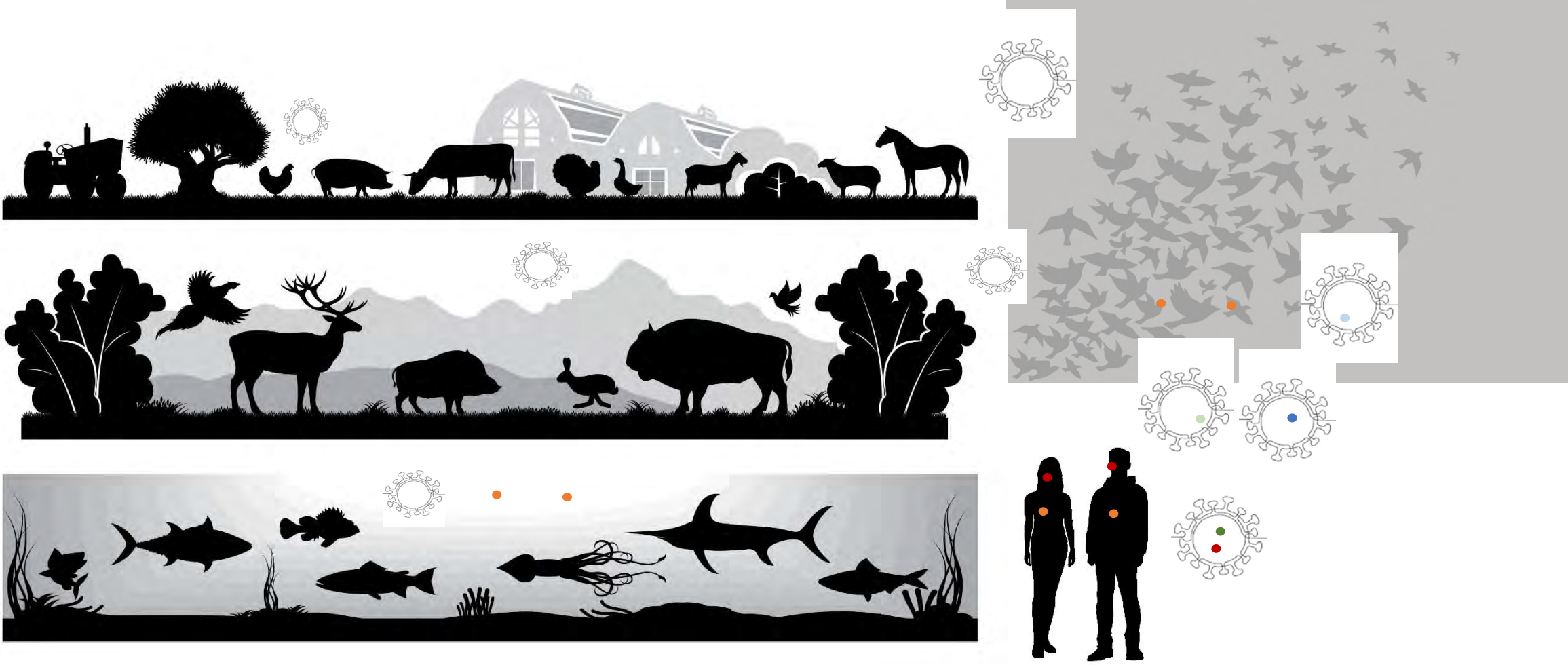
e.g., separate wildlife food resources from domestic animal and human environments; eradicate invasive species that facilitate spillover.

**Scenario 3**

Establish ecological countermeasures (barriers) to stop "dominos" from falling at a certain point.

e.g., keep wildlife from leaving their habitats and/or domestic animals and people from entering wildlife habitats.

# Highly pathogenic avian influenza virus; a leading candidate for the next pandemic



# Action track 2: Reducing the risks from emerging and re-emerging zoonotic epidemics and pandemics



- 2.1.1 Research and risk assessments on the drivers, processes and pathways for zoonotic diseases; characterize intact resilient eco- and health systems and their effect on disease prevention
- 2.1.3 Identify drivers and indicators to monitor their impacts on zoonotic diseases including those that can lead to increased interfaces or disruptions of natural host-pathogen dynamics
- 2.1.4 Develop a One Health indicator framework to monitor the health of humans, wildlife, domestic animals, vectors and the environment, including in intact, resilient eco- and health systems
- 2.2.2 Incorporate land-use planning in health and biodiversity risks assessment, and vice versa
- 2.2.3 Establish standards for the management of ecosystem processes to support resilience, including mainstreaming habitat degradation prevention and biodiversity protection
- 2.2.4 Engage with local communities, including Indigenous Peoples, to identify sustainable solutions, nature-based where applicable, to increase community preparedness and resilience

**Action 2.1.** Understand the drivers of emergence, spillover and spread of zoonotic pathogens  
**Action 2.2.** Identify and prioritize interventions to prevent zoonotic emergence, spillover and spread

**FIGURE 1. PREVENTION OF ZOOBOTIC SPILLOVER TO HUMANS**

