

HEALTH PROFESSIONALS WEBINAR SERIES

The Animal-Human Health Link

TUESDAY, 28 JULY 2020

7:00PM QLD/NSW/ACT/VIC, 6:30PM SA/NT, 5:00PM WA





Presented by

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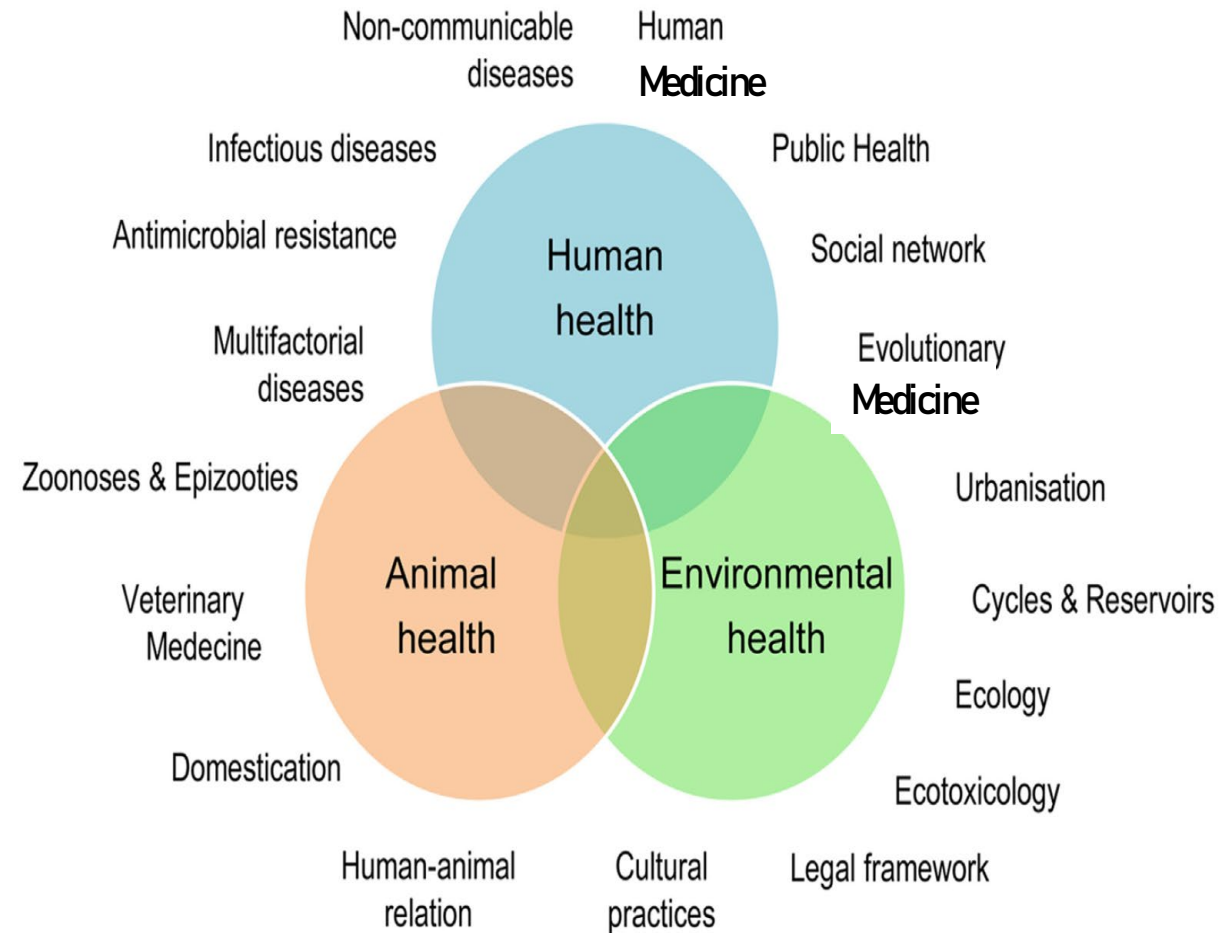


What is One Health?

It is a holistic collaborative effort of multiple professionals, disciplines, communities and other stakeholders working across their disciplines (transdisciplinarity), locally, nationally and globally – to attain optimal health for people, domestic and production animals, wildlife, plants and our environment.

Adapted from:

https://www.onehealthcommission.org/en/why_one_health/





Why do we need this approach?

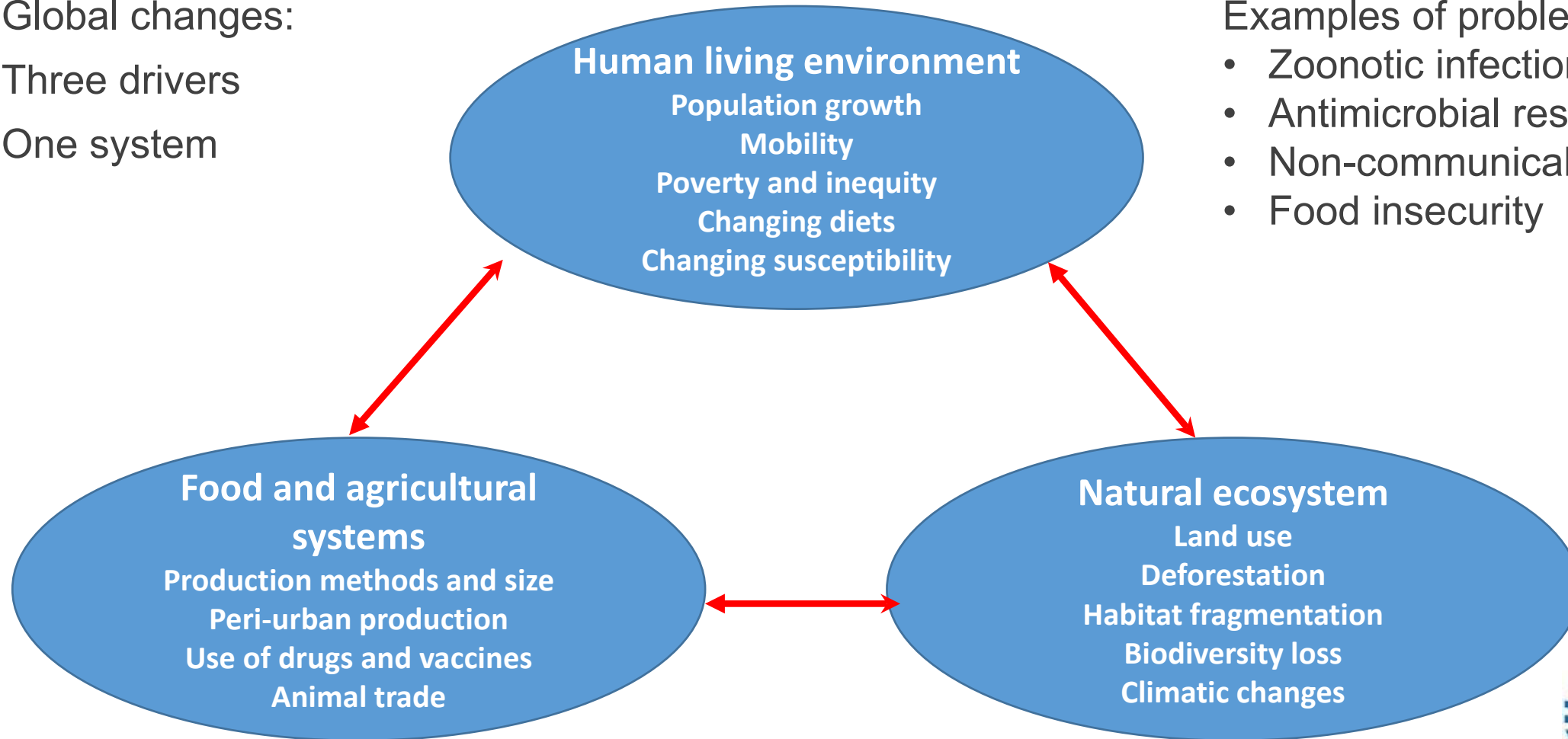
Global changes:

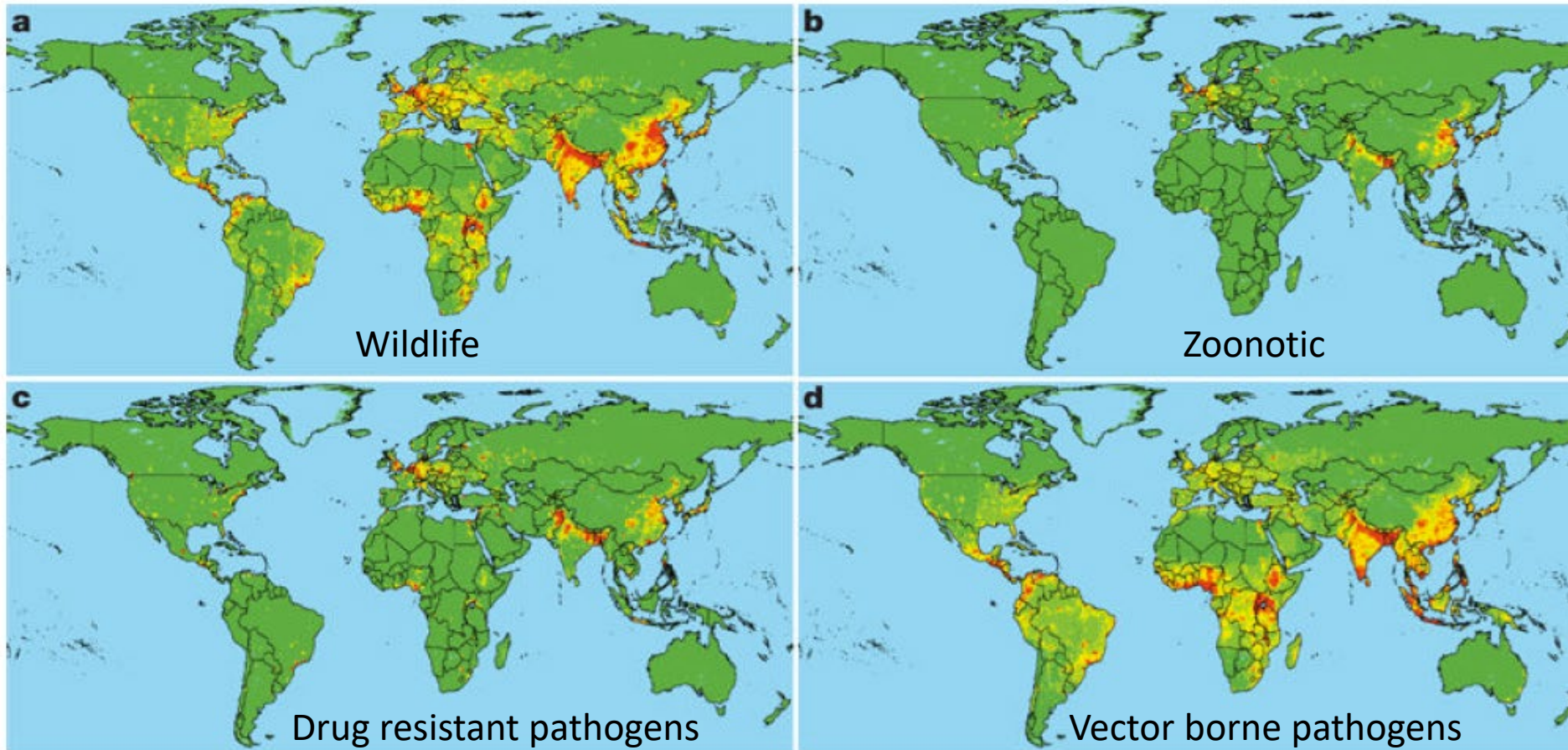
Three drivers

One system

Examples of problems resulting:

- Zoonotic infections
- Antimicrobial resistance
- Non-communicable diseases
- Food insecurity





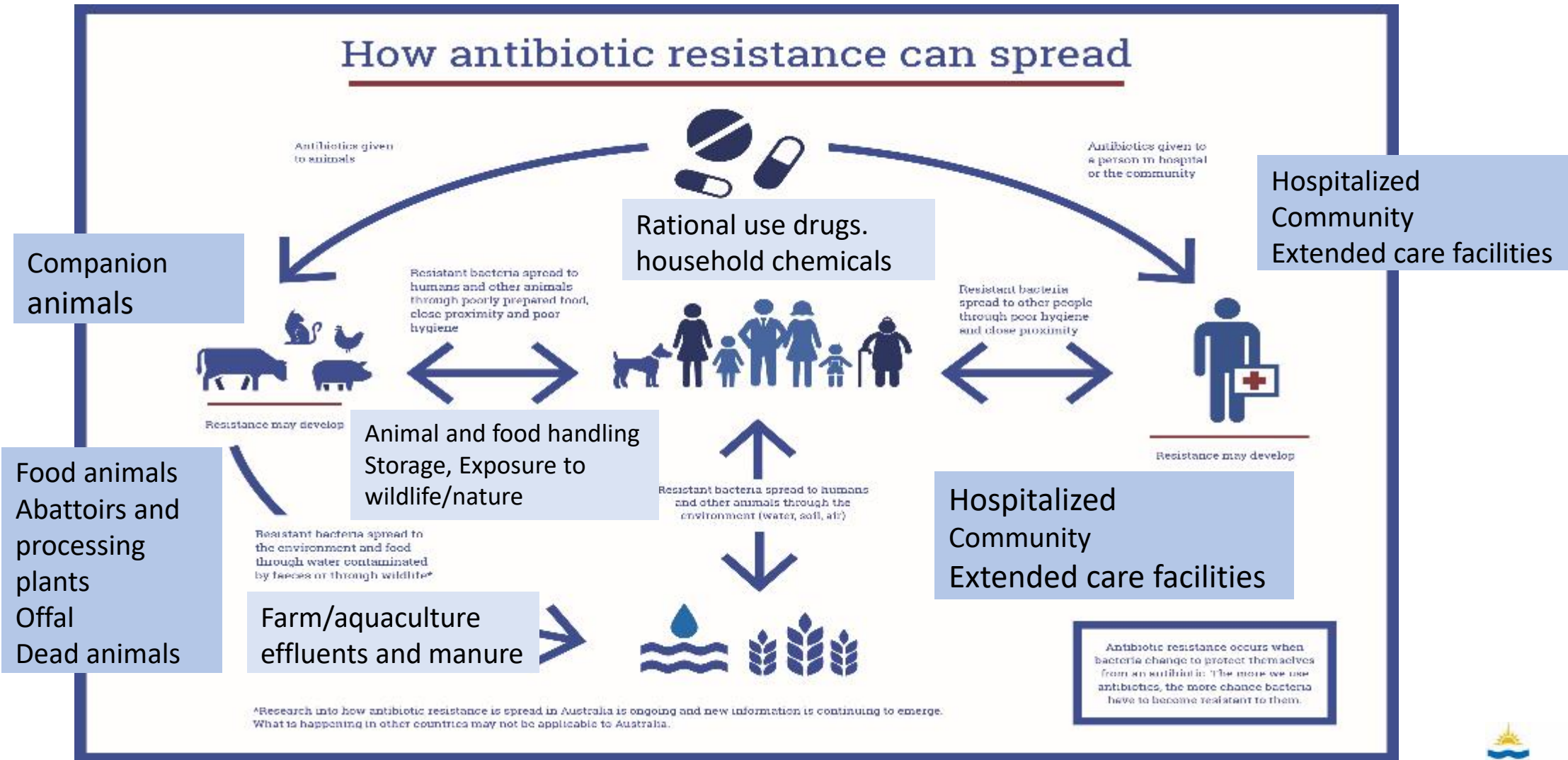
Jones, K., Patel, N., Levy, M. *et al.* Global trends in emerging infectious diseases. *Nature* **451**, 90–993 (2008).
<https://doi.org/10.1038/nature06536>

Figure 3. Global distribution of relative risk of an EID event

Maps are derived for EID events caused by **a**, zoonotic pathogens from wildlife, **b**, zoonotic pathogens from non-wildlife, **c**, drug-resistant pathogens and **d**, vector-borne pathogens. The



How antibiotic resistance can spread



*Research into how antibiotic resistance is spread in Australia is ongoing and new information is continuing to emerge. What is happening in other countries may not be applicable to Australia.

<https://www.amr.gov.au/resources/infographic-how-antibiotic-resistance-can-spread>

- 3 GOOD HEALTH
- 6 CLEAN WATER AND SANITATION
- 12 RESPONSIBLE CONSUMPTION
- 14 LIFE BELOW WATER
- 15 LIFE ON LAND

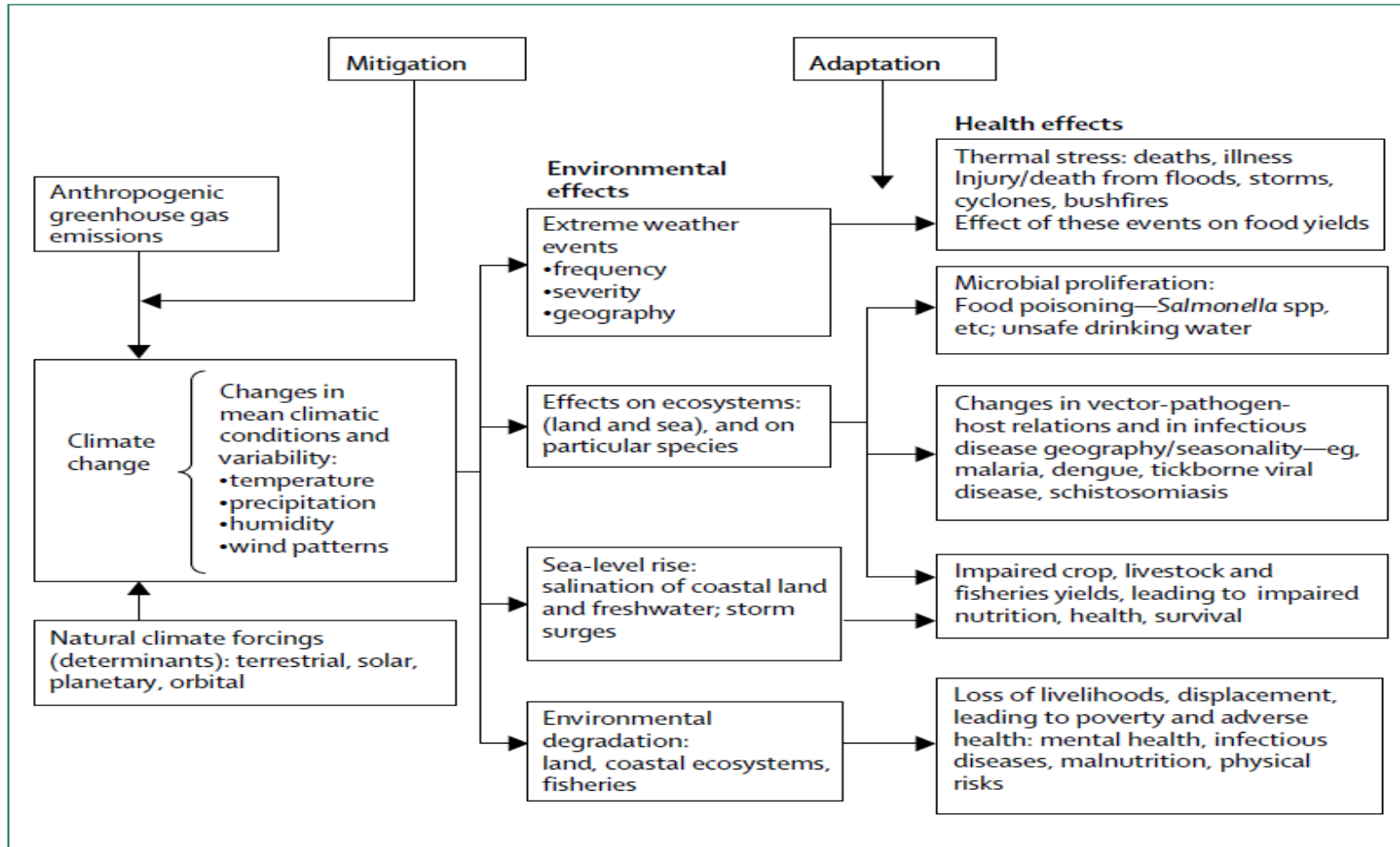


"The human-animal bond is a mutually beneficial and dynamic relationship between people and animals that is influenced by behaviours that are essential to the health and well-being of both. This includes, but is not limited to, emotional, psychological, and physical interactions of people, animals, and the environment."



AVMA Definition Human Animal Bond

<https://www.avma.org/one-health/human-animal-bond#:~:text=Human%2Danimal%20bond-,Human%2Danimal%20bond,health%20and%20wellbeing%20of%20both.&text=The%20American%20Veterinary%20Medical%20Association%20has%20adopted%20a%20range%20of,to%20the%20human%2Danimal%20bond.>



McMichael, A. J., Woodruff, R. E., & Hales, S. (2006). Climate change and human health: Present and future risks. *The Lancet*, 367(9513), 859-69.



Figure 1: Schematic summary of main pathways by which climate change affects population health
Mitigation refers to true primary prevention (reducing greenhouse gas emissions). Adaptation (a form of late primary prevention) entails interventions to lessen adverse health effects.



Key interfaces for zoonotic disease emergence

- The interface between human, animal and wildlife interaction is seen as 'key' to zoonotic disease emergence
 - growth in human and livestock populations
 - rapid urbanization
 - rapidly changing farming systems
 - closer integration between livestock and wildlife
 - forest encroachment
 - globalization in human and animal movements
- PREVENTION AND CONTROL REQUIRES A COLLABORATIVE APPROACH BETWEEN HUMAN, LIVESTOCK AND WILDLIFE HEALTH SECTORS





<https://www.newschannel10.com/story/32181609/cattle-improvement-series-to-answer-questions-in-changing-industry/>



Live animal markets



<https://psmag.com/environment/guinea-pig-its-whats-for-dinner-54828>



<https://www.newsweek.com/2014/08/29/smuggled-bushmeat-ebolas-back-door-america-265668.html#slideshow/265303>



Wildlife markets

Live bird markets



<http://www.onehealthsea.org/lacanet/>



<http://www.wildportraits.com/?p=328>





Live animal markets and viral emergence

- What makes live animal markets an ideal setting for viral emergence, persistence and transmission?
 - Opportunities of intense viral amplification and circulation
 - Many animals in close contact
 - Often animals of many species
 - Daily introduction of immunologically naïve animals
 - High stress (potentially immunocompromised)
 - Poor biosafety/biosecurity







Aerosol exposure to avian influenza viruses in live bird markets

- Collection occurred during known periods of high avian influenza circulation
- Air samplers worn by market workers (30 mins/day) with flow rate adjusted to simulate human breathing
- AIV RNA was detected from 100% of the air samplers using molecular methods
- Viable AIV (A/H5N1 and/or A/H9N2) was isolated from 50% of air samplers





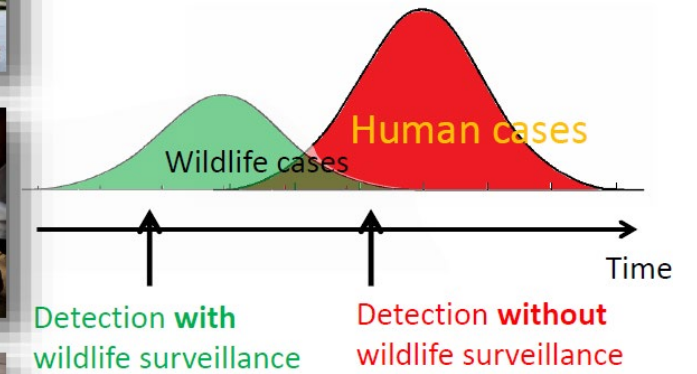
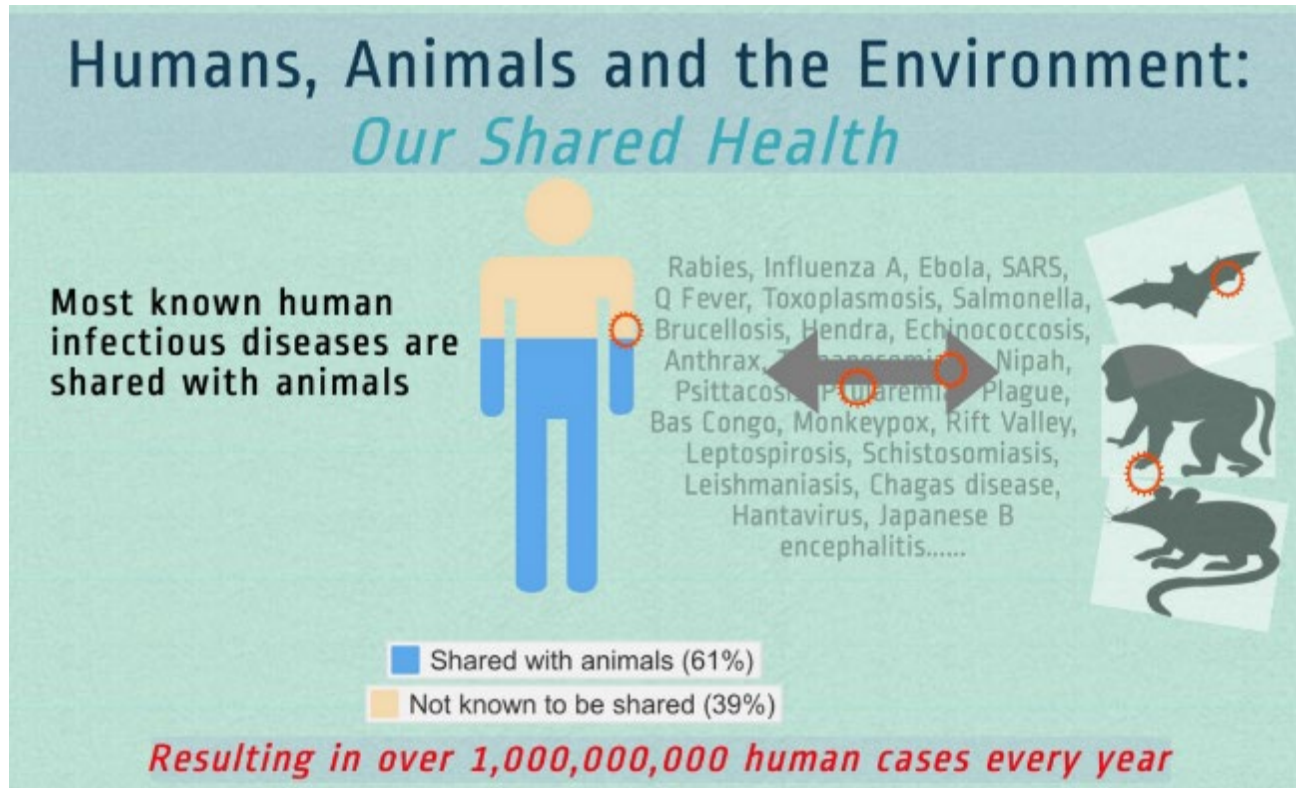
Why live animals?

- People want to see that the animal is ‘healthy’
- Perception that fresh meat is healthier – ‘natural’ product
- No access to refrigeration (food safety implications)
- Preference for the taste and texture of freshly slaughtered meat
- No association between wildlife consumption patterns and the socio-economic indicators - preference and not necessity
 - Pruvot et al. Science of the Total Environment. 2019; 676: 732-745.





Integrated surveillance of people, animals and the environment

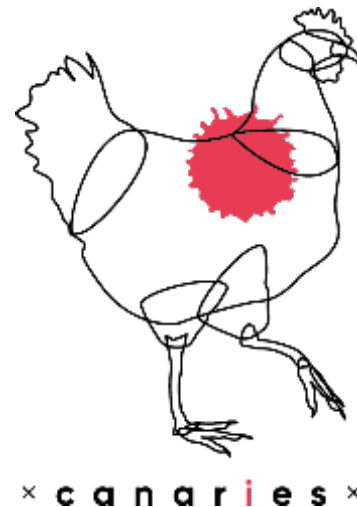


https://www.huffpost.com/entry/ebola-is-just-one-of-many_b_5688094



The Consortium of Animal Market Networks to Assess Risk of Emerging Infectious Diseases Through Enhanced Surveillance (CANARIES)

- Inaugural meeting 12-14th June 2019, Phnom Penh, Cambodia
- Representatives from Cambodia, Egypt, Israel, Chile, UK, Australia and the USA
- Develop One-Health networks between countries conducting avian influenza surveillance in live animal markets





Thank you

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1970 - 2020