Health professionals on the front lines play a key role in responding to zoonotic disease threats, a role increasingly important as environmental and global changes reshape zoonotic disease risk.

Zoonotic disease threats affect human, animal, and environmental health, highlighting the interconnectedness of health challenges at the human-animal-environment interface.

Zoonoses

Zoonotic Infectious Diseases (ZIDs)

Diseases that spread between animals and humans, with causal agents being pathogenic microorganisms such as viruses, bacteria, fungi, or parasites.

Zoonoses

Interplay Human Animal Environment Health

Zoonoses, diseases that spread between animals and humans, with causal agents being pathogenic microorganisms such as viruses, bacteria, fungi, or parasites.

Zoonoses are commonly spread at the human-animal-environment interface, where people and animals including livestock, wildlife and domestic animals, coexist in shared environments, allowing transmission through direct and/or indirect contact. [2]

The transmission of pathogens between species, including from animals into human populations, reflects our relationship with animals and the environment, and impacts pathogen ecology and evolution, where microbes exploit new niches and adapt to new hosts. Yet, in most cases, the underlying drivers that open access to these new niches are often mediated by human activity.[3]

The **human-animal-environment interface** refers to the complex and interconnected relationships among humans, both domestic and wild animals, and their shared environments.[4]

Human behaviours such as hunting/ trapping or harvesting, domestication, agriculture, colonization, war, travel, urbanization, and industrialization have shaped, and continue to shape, patterns of human-animal-environment contact. [5]

Today, environmental and anthropogenic changes continue to alter this interface. Although cross-species transmission is a natural and ongoing process, the accelerating pace of these changes increases the likelihood of pathogen exchange between humans and animals.[6]

The emergence and re-emergence of zoonoses, in recent decades, have been associated with environmental and ecosystem disruptions caused by anthropogenic activities. [iv 7] The drivers of zoonotic disease emergence are embedded in socio-ecological systems and include shifts in farming and livestock systems, land-use change, unsustainable resource extraction, wildlife exploitation, global travel, and climate change, increasing the frequency of pathogenic microbes spreading from animals to people. [8 9 10]

Integrated health approaches such as One Health, Eco Health, and Planetary Health recognize the interconnectedness of human, animal, and environmental health and promote collaboration across sectors and disciplines at the human–animal–environment interface, contributing to more comprehensive responses to complex health challenges. These frameworks support multidisciplinary collaboration to strengthen global health security across diverse hazards and enhance overall well-being. [11]

Managing and reducing the health risks posed by zoonoses requires looking beyond human–animal interactions to consider the complex interconnections between environmental change, biodiversity, and human society. [12 13]

*Consult the **Key Terms** section for definitions used throughout the materials.*

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