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Conference Abstract

Toward a "WildHealth" network: a transdisciplinary framework to address the threat of alien pathogens

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Abstract

The emergence of infectious diseases (EIDs) represents one of the most significant yet under-researched threats to global biodiversity and environmental security. While international assessments recognize invasive alien species (IAS) as primary drivers of ecosystem change, the specific role of "alien pathogens"—those introduced to new ranges or spread by invasive vectors—remains a critical blind spot in both science and policy. Current regulatory frameworks effectively address pathogens with direct economic impacts on livestock or agriculture, yet those affecting wildlife and native ecosystems frequently fall between the cracks of fragmented institutional mandates. To address this systemic gap, we propose the establishment of the WildHealth network, an innovative transdisciplinary framework designed to embed biological invasions robustly within the One Health approach.

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The core innovation of this proposal lies in the creation of a unified, multi-sectoral platform that does not currently exist. By bridging the divide between invasion biology and disease ecology, the WildHealth network aims to foster a community of expertise encompassing invasion biologists, plant pathologists, and ecologists alongside veterinarians, epidemiologists, and public health professionals. Critically, the network intends to integrate mathematical modellers, social scientists, and humanities experts to address the socioeconomic drivers of disease spread and improve the science-policy interface. This collaborative structure is designed to unite researchers with governmental agencies, NGOs, and stakeholders from the agriculture, forestry, and fisheries sectors.

To ensure scientific depth and provide actionable outcomes, the proposed network focuses on Forest and Island Ecosystems as primary case studies. Forests serve as "sentinels" for terrestrial health, where alien pathogens threaten carbon sequestration, timber resources, and complex biodiversity networks. Conversely, islands act as living laboratories; their high endemism and geographic isolation make them disproportionately vulnerable to EIDs, offering a controlled context to map host-pathogen dynamics and test the efficacy of novel biosecurity protocols. By grounding the network's efforts in these specific environments, the framework moves beyond theoretical goals to develop tangible management tools, such as early-detection toolkits for foresters and specialized biosecurity measures for island conservationists.

A primary function of the WildHealth network will be the mobilization and harmonization of baseline information. Currently, data on alien pathogens is scattered across disparate repositories and lacks standardized terminology. The network seeks to lead the transition toward FAIR (Findable, Accessible, Interoperable, and Reusable) data standards, creating a foundation for predictive models that assess host specificity and ecosystem susceptibility. By identifying specific introduction pathways and fostering a geographically balanced exchange of knowledge, this network provides the coordination necessary to safeguard global biodiversity and enhance the resilience of our most vulnerable natural heritage.

The complexity of pathogen invasions requires a response that no single discipline or nation can provide in isolation. As we move toward formalizing this initiative, there is a clear opportunity for the diverse expertise present at this conference to help shape the network's trajectory. We welcome a dialogue with researchers, policy-makers, and practitioners interested in contributing to this transdisciplinary vision. By aligning our collective efforts, we can ensure that the WildHealth network achieves the critical mass necessary to transform wildlife health surveillance and build a more resilient, integrated future for global environmental health.

Keywords

Alien pathogens, One Health, Invasive alien species, Transdisciplinary, Biosecurity, Disease ecology

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Conflicts of interest

The authors have declared that no competing interests exist.