# WILDLIFE CONSERVATION AND ONE HEALTH: IMPACTS OF BIODIVERSITY LOSS ON THE EMERGENCE OF ZOONOTIC DISEASES

# CONSERVAÇÃO DA VIDA SELVAGEM E SAÚDE ÚNICA: IMPACTOS DA PERDA DE BIODIVERSIDADE NO SURGIMENTO DE DOENÇAS ZOONÓTICAS

# CONSERVACIÓN DE LA VIDA SILVESTRE Y UNA SOLA SALUD: IMPACTOS DE LA PÉRDIDA DE BIODIVERSIDAD EN LA APARICIÓN DE ENFERMEDADES ZOONÓTICAS

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## ABSTRACT

This study analyzes the relationship between wildlife conservation, biodiversity loss, and the emergence of zoonotic diseases, based on the One Health framework. It consists of a literature review of national and international publications from the past ten years, selected from recognized scientific databases. The reviewed studies indicate that biodiversity loss alters ecological relationships, favoring pathogen reservoirs and increasing the risk of spillover events. The One Health approach highlights the importance of integrating human, animal, and environmental health. It is concluded that integrated conservation strategies, surveillance systems, and public policies are essential to mitigate health risks and prevent future public health emergencies.

**Keywords:** Biodiversity. One Health. Zoonoses.

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**RESUMO**
Este estudo analisa a relação entre a conservação da vida selvagem, a perda de biodiversidade e o surgimento de doenças zoonóticas, com base na abordagem de Saúde Única. Consiste em uma revisão da literatura de publicações nacionais e internacionais dos últimos dez anos, selecionadas a partir de bases de dados científicas reconhecidas. Os estudos revisados indicam que a perda de biodiversidade altera as relações ecológicas, favorecendo reservatórios de patógenos e aumentando o risco de eventos de transbordamento. A abordagem de Saúde Única destaca a importância da integração da saúde humana, animal e ambiental. Conclui-se que estratégias integradas de conservação, sistemas de vigilância e políticas públicas são essenciais para mitigar os riscos à saúde e prevenir futuras emergências de saúde pública.

**Palavras-chave:** Biodiversidade. Saúde Única. Zoonoses.

**RESUMEN**
Este estudio analiza la relación entre la conservación de la vida silvestre, la pérdida de biodiversidad y la aparición de enfermedades zoonóticas, con base en el enfoque Una Salud. Consiste en una revisión bibliográfica de publicaciones nacionales e internacionales de los últimos diez años, seleccionadas de bases de datos científicas reconocidas. Los estudios revisados indican que la pérdida de biodiversidad altera las relaciones ecológicas, favoreciendo los reservorios de patógenos y aumentando el riesgo de contagio. El enfoque Una Salud destaca la importancia de integrar la salud humana, animal y ambiental. Se concluye que las estrategias integradas de conservación, los sistemas de vigilancia y las políticas públicas son esenciales para mitigar los riesgos para la salud y prevenir futuras emergencias de salud pública.

**Palabras clave:** Biodiversidad. Una Salud. Zoonosis.

## 1 INTRODUCTION

Wildlife constitutes a critical component of global biodiversity, providing ecosystem services that support environmental stability and human health. However, increasing anthropogenic pressures such as deforestation, improper land use, urban expansion, and wildlife trade have accelerated biodiversity loss at multiple scales, altering species communities and their natural interactions (Barrio, 2022).

The One Health concept emerges as an integrative paradigm that recognizes the interdependence between human health, animal health, and ecosystem integrity (Alimi; Wabacha, 2023). One Health approaches emphasize the need for collaboration across sectors, including human medicine, veterinary science, ecology, and environmental policy, particularly in regions with high species richness and intense human intervention, such as the Amazon and other tropical areas (Salvarani *et al.,* 2025).

Despite growing recognition of these connections, significant gaps remain in the implementation of effective conservation policies that also mitigate health risks (Alimi; Wabacha, 2023).

In this context, the present study aims to analyze, through a literature review, how wildlife conservation contributes to reducing the risk of zoonotic disease emergence, discussing its implications for public policies and integrated One Health strategies.

## 2 METHODOLOGY

This study is based on a literature review of national and international publications from the last ten years. The analysis focused on studies addressing the relationship between biodiversity loss and zoonotic diseases, the role of wildlife conservation in mitigating health risks, and the application of the One Health concept in preventive strategies.

The literature search was conducted in the PubMed, ScienceDirect, MDPI, Google Scholar, and Cambridge Core databases, as well as in specialized journals in ecology and public health. Original articles and review studies published in English or Portuguese were included if they presented empirical evidence on pathogen spillover, impacts of reduced ecological diversity on hosts and vectors, and integrated surveillance initiatives involving human, animal, and environmental health. Studies that did not meet these criteria or exceeded the established time frame were excluded.

## 3 DEVELOPMENT

### 3.1 BIODIVERSITY AND ZOONOTIC DISEASE RISK

Biodiversity loss alters ecological relationships and maintains a higher proportion of species that act as pathogen reservoirs. In highly biodiverse natural environments, the presence of multiple non-host species can dilute the transmission of potentially zoonotic, agents known as the dilution, effect thereby reducing the likelihood of transmission to humans and domestic animals (Keesing; Ostfeld, 2021).

The simplification of biological communities due to human activities favors generalist species that thrive in anthropized environments and frequently serve as reservoirs for pathogens with greater spillover potential (Barrio, 2022). This phenomenon is observed, for example, in urban areas where synanthropic species such as rodents and bats proliferate at the expense of predators sensitive to disturbance.

The impact of biodiversity loss on zoonoses extends beyond remaining natural areas. Environmental degradation and habitat fragmentation expose humans and domestic animals to new contacts with wildlife carrying infectious agents, creating favorable conditions for the emergence and reemergence of infectious diseases (Tonelli *et al.,* 2021).

### 3.2 ONE HEALTH AND WILDLIFE CONSERVATION

The One Health approach emphasizes the need for cross-sector integration to effectively prevent, detect, and respond to zoonotic diseases. Its effectiveness depends on strengthening surveillance systems that incorporate ecological, epidemiological, and socioeconomic data (Alimi; Wabacha, 2023).

In highly biodiverse biomes such as the Amazon, interdisciplinary interventions contribute to improving knowledge of parasitic and infectious diseases in wildlife while simultaneously generating relevant insights for public health (Salvarani et al., 2025).

Furthermore, conservation initiatives including the protection of natural areas, sustainable habitat management, and control of anthropogenic activities have direct effects on preventing pathogen spillover by reducing human exposure to wildlife disease reservoirs (Tonelli *et al.,* 2021).

### 3.3 IMPLICATIONS FOR PUBLIC POLICIES AND SOCIETY

The integration of wildlife conservation into public health planning still faces institutional and operational challenges. There is a lack of coordination between environmental agencies and health sectors, as well as insufficient funding and infrastructure

for monitoring emerging diseases at the human–animal–environment interface (Alimi; Wabacha, 2023).

Effective policies should consider actions such as regulating wildlife trade, promoting sustainable forest habitat management, strengthening environmental education, and enhancing collaborative surveillance networks that include local communities, veterinary sectors, and public health professionals (Barrio, 2022; Tonelli *et al.,* 2021).

## 4 CONCLUSION

Wildlife conservation plays a central role in maintaining biodiversity and mitigating the risk of emerging zoonotic diseases, as the reduction of ecological diversity favors the transmission of pathogens from wild animals to humans, posing a significant threat to public health.

The One Health concept emerges as an indispensable approach to addressing these challenges by integrating human, animal, and environmental health. Coordinated strategies involving conservation, surveillance, and public policies are essential to prevent future health emergencies and reduce the impacts associated with biodiversity loss.

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