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Editorial Article

## One Health and Its Challenges: Pillars of Integration

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### Introduction

In the intricate web of life, where animals, humans, and the environment are interwoven, the health of one is inseparable from the health of others. In this context, the One Health approach emerges as a guiding beacon, acknowledging the profound interdependence that defines our planet. As we stand at the intersection of human-animal-environment, the consequences of our actions ripple through the entire tapestry of existence. Picture the threads of health, representing different components, intricately interwoven – a delicate balance that defines our complex dance of life.

The One Health approach is not merely a scientific framework; it is a philosophy rooted in the understanding that the health of one component – be it a species, an ecosystem, or a community – is intrinsically linked to the health of others. This holistic perspective seeks to dissolve the artificial barriers that have traditionally separated medical, veterinary, and environmental disciplines. Moreover, it calls for a unified response to the myriad health challenges that transcend these boundaries, recognizing that a comprehensive understanding of health must encompass the entirety of the interconnected system.

### The Interconnected Triad - Humans, Animals, and the Environment:

At the core of this dynamic relationship lies a crucial truth: the health of one element significantly impacts the others. It's not a simple connection but a complex interweaving of influences. Diseases effortlessly cross species boundaries, a phenomenon called zoonosis. Picture a virus from wildlife jumping to humans due to habitat encroachment, swiftly spreading within human populations. Diseases in domestic animals can also affect human health through direct contact or consumption of contaminated products, emphasizing shared vulnerabilities.

This interconnectedness extends beyond diseases. Human-induced environmental changes disrupt habitats, affecting migration patterns and resource availability. Deforestation, for example, not only threatens wildlife but also contributes to the spread of diseases affecting both humans and animals.

Recognizing this delicate balance is crucial for effective strategies in preventing, monitoring, and controlling diseases at the intersection of human-animal-environment interaction. Human health relies on the well-being of animals and environmental stability, making a comprehensive approach imperative.

### Zoonotic Diseases: A Shared Battlefield:

Zoonotic diseases, crossing effortlessly between

animals and humans, demand a collaborative approach. Instances like COVID-19, Ebola, Nipah, and influenza emphasize the urgency of understanding and addressing these threats. These diseases often originate in wildlife or domestic animals, adapting to infect humans and causing profound global impacts on health, economies, and ecosystems. The COVID-19 pandemic, believed to have originated in bats, highlights the need for a proactive approach to prevent, detect, and respond to emerging zoonotic threats. Ebola outbreaks in Central Africa underscore the importance of understanding ecological and socio-economic factors contributing to disease emergence.

Continuous surveillance and collaboration between veterinary and public health professionals are vital for monitoring and responding to potential pandemics, as seen with influenza. The interconnectedness of these instances stresses the importance of a collaborative and cross-disciplinary approach. Veterinarians, medical professionals, ecologists, and epidemiologists working together can unravel the complex factors influencing disease emergence. Policymakers should join this effort, fostering a global commitment to enact measures prioritizing both human and animal health.

### Environmental Health: A Pillar of One Health:

Human-driven activities such as deforestation, urbanization, and agricultural expansion contribute to habitat

destruction, disrupting the delicate balance of diverse ecosystems. This disruption leads to increased competition for resources among species, resulting in stress, disease transmission, and population declines. The repercussions extend beyond wildlife, affecting human populations reliant on ecosystem services and biodiversity for sustenance and health.

Pollutants, pervasive in air, water, and soil, not only harm the environment but also impact the health of humans and animals. The One Health approach recognizes that pollution knows no boundaries, requiring collaborative efforts to mitigate its impact on all fronts.

Climate change, a consequence of human activities, brings rising temperatures, extreme weather events, and shifts in ecosystems. These changes directly threaten health by influencing disease patterns, food security, and water availability. For example, the spread of vector-borne diseases, influenced by changing climatic conditions, poses risks to both animal and human populations.

### Surveillance and Early Warning Systems:

Surveillance is the proactive monitoring and data collection on the health status of populations, extending beyond humans to include animals and the environment in the One Health paradigm. This broad approach acts as a sentinel, detecting subtle shifts in health patterns that may indicate potential threats. Monitoring wildlife, domestic animals, and livestock offers a comprehensive understanding of the overall health landscape, especially considering the potential for zoonotic diseases that can jump from animals to humans.

Given that diseases recognize no borders, global collaboration in surveillance efforts is essential. Technological advancements, including remote sensing, data analytics, and genomic sequencing, enhance the precision and efficiency of surveillance systems. Information-sharing between countries and regions is imperative for swift responses to emerging health threats, facilitated by organizations like the World Health Organization (WHO), World Organization for Animal Health (OIE), and Food and Agriculture Organization (FAO), ensuring a unified response to potential pandemics.

### Challenges and Barriers to Implementation:

- a. Communication Gaps:** One of the primary hurdles in implementing One Health is bridging communication gaps across diverse disciplines. Medical professionals, veterinarians, ecologists, and policymakers often operate within silos, utilizing different languages and prioritizing varied objectives.
- b. Funding Constraints:** Allocating resources for collaborative research, surveillance systems, and interdisciplinary training necessitates a fundamental shift in funding structures.
- c. Fragmented Governance:** Achieving a harmonized and

coordinated approach requires overcoming bureaucratic barriers, fostering interdisciplinary collaboration at both national and international levels.

- d. Resistance to Change:** Breaking Inertia: Overcoming entrenched mindsets and practices demands advocacy, education, and a shared understanding of the benefits that One Health can bring to societies, economies, and ecosystems.
- e. Lack of Standardized Protocols:** The absence of standardized protocols for data collection, analysis, and response hampers the harmonization of efforts within the One Health framework.
- f. Global Cooperation:** Many health challenges, particularly zoonotic diseases and environmental issues, transcend national borders. International organizations, governments, and research institutions must unite to create a cohesive global strategy that acknowledges the interconnected nature of health.
- g. Educational Gaps:** Addressing educational gaps and cultivating a new generation of professionals with a holistic understanding of health challenges is essential for the sustained implementation of the One Health approach.

### Conclusion:

In the tapestry of global health, the One Health approach transcends strategy, emerging as a profound philosophy envisioning a future where human, animal, and environmental well-being converge harmoniously. It prompts a paradigm shift, emphasizing the inseparable health of all constituents. Navigating One Health reveals the vital role of early detection through surveillance in guarding against unseen threats. Challenges are viewed as opportunities for global cooperation, education, and transformative change. Embracing One Health propels us toward a healthier, more sustainable future - a future free from fertile grounds for zoonotic diseases, with restored environments, and interconnected well-being for all life forms.

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