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Popular Article

One Health Approach: Merging Human and Animal Well-being through Veterinary Microbiology

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Abstract

One Health is indeed an emerging global concept that recognizes the interconnectedness of human, animal, and environmental health, emphasizing the need for collaborative efforts to address health challenges at the interface of these domains. There are various definitions of One Health, according to Zinsstag and Meisser, "One Health is something that contributes value to the health of animals and humans, or economic savings, that wouldn't be achieved without the cooperation of the two medicines." It should merely become common for doctors and veterinarians to collaborate as closely as feasible. One Health believes that the health of humans, animals, and ecosystems are intrinsically connected. Many of humanity's most serious health hazards, such as novel infectious diseases, antibiotic resistance, and food borne disorders, stem from interactions between humans, animals, and the environment. Implementing a One Health approach, policymakers, researchers, and clinicians aim to address these concerns more effectively by addressing their interconnected nature and implementing coordinated measures that boost the health of all stakeholders.

Introduction

Hippocrates and Galen were the first to chronicle the connection between early knowledge of human and animal health in the Greek and Roman civilizations. Giovanni Lancisi, an Italian physician, was tasked by Pope Clement in 1713 to investigate and document an outbreak of the "cattle plague," or rinderpest, in Rome. Lancisi was among the first to propose its contagious nature, attributing it to "exceedingly fine and harmful particles that transmit from one body to another through contact." He also pioneered public health measures by implementing restrictions on the transportation of livestock from areas with a high prevalence of sick animals (4). This policy ultimately contributed to the eradication of rinderpest, the precursor to the measles virus, from the world in 2010 (2). Inspired by



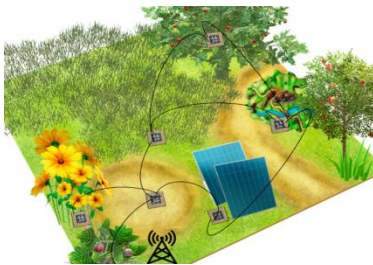
Lancisi's approach, William Foege and others adopted similar tactics, including vaccinating communities surrounding infected areas, leading to the global eradication of smallpox in 1980. This was achieved by employing the vaccination emerging from the one health-one medication awareness that existed in the 18th century, when the English physician, Edward Jenner—with help from John Hunter—adapted the cowpox virus as a live vaccine for humans.

The significance of the One Health concept is evident to microbiologists who face the regular introduction of zoonotic illnesses as well as environmental factors that cause changes in the distribution and activity of microbes around the world. Microbes easily span ecological boundaries; they have evolved to overcome environmental obstacles, including those that distinguish humans from other animal species (3).

Though it is old concept: renowned microbiologists Louis Pasteur and Robert Koch carried out studies on both animal and human disease and recognized the close relationship between animal and human health (1). The medical and veterinary sciences share a shared body of knowledge in anatomy, physiology, pathology, and the causes of diseases in all species". Although the veterinary community has made a significant contribution to One Health, its importance extends far beyond collaboration between veterinarians and physicians. Importantly, "over the last decade, the concept of One Health has expanded beyond an examination of the human-animal health interface to encompass the health and sustainability of the world's ecosystems." Considering its apparent upsides, executing a full One Health model presents significant obstacles. Education, study findings, diagnosis, monitoring, and financing for human medicine, veterinary medicine, and environmental health sometimes reside in different divisions with limited exchange. Medical students are frequently trained solely in human diseases. Similarly, veterinarians focus on non-human animals. The environment is typically overlooked in introductory microbiology courses. These barriers must be addressed before the benefits of One Health may be achieved.

Furthermore, dealing with these issues will necessitate the development of new instruments for rapid detection and response. A variety of new tools, such as environmental metagenomics, geospatial modeling, and mobile communication technologies, have enabled the rapid detection of many diseases in the environment, providing a window of opportunity to develop upstream barriers to transmission before the diseases pose a serious threat to health. This alters our approach to infectious disease, shifting from treating patients during an outbreak to recognizing and intervening in the process above.



Existing pattern**Disease surveillance****Investigation****Treatment****One Health Pattern:****Environmental surveillance****Prediction****Prevention**

With an emphasis on surveillance and upstream interventions that are anticipated to yield evident and quick advantages for the health of human populations, One Health initiatives are likely to have a significant impact on public health. Because of this, veterinary associations, agricultural departments, and public health organizations like the World Health Organization and the CDC are working together to promote the One Health agenda.

In conclusion, the One Health approach emphasizes the interconnectedness of human and animal well-being, highlighting the critical role of veterinary microbiology in safeguarding both populations. By recognizing the shared environment and health risks between humans and animals, this integrated approach underscores the importance of collaborative efforts between human health, veterinary, and agricultural sectors. Through a unified approach, we can address emerging infectious diseases, antimicrobial resistance, and other global health challenges more effectively, ultimately promoting the health and welfare of both humans and animals.

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