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## Integrating Health Systems: A Conceptual Review of One Health Framework for Human, Animal, Ecosystem and Reproductive Health

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### Abstract



*The 'One Health' concept promotes peaceful coexistence between humans, animals, and environmental health. The paper employs a conceptual review to explore the 'One Health' concept, focusing on the ecological perspectives of human, animal, and ecosystem health connections. The One Health concept was discussed in-depth arguing that the environmental perspective of the connections between human health, animal health, and ecosystem health is multifaceted which could also affect the reproductive health of the human species, hence, no one person, organisation, or sector alone can adequately address health issues within the ecosystem since health issues encompass animal-human-environment interfaces. It is concluded that by challenging the utilitarian perspective that prioritises individual happiness, asserting that true well-being cannot be achieved in isolation. Rather, it is only through*

*fostering harmony and peaceful coexistence among humans, animals, and the environment that sustainable health outcomes can be realised for all.*

**Keywords:** animal health, ecosystem health, human health, one health, reproductive health

## 1. Introduction

Health is a fundamental right for everyone, regardless of race, religion, political belief, economic or social condition (Svalastog, Donev, Kristoffersen, & Gajović, 2017). In 1948, the World Health Organization (WHO) propounded a comprehensive definition of Health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’ (WHO, 1948). This definition promoted for the first time that, in addition to physical and mental health, social welfare is an integral component of overall health, because health is closely linked to the social environment and living and working conditions. Indeed, the concept of health, as defined by WHO (1948), suggests a state of equilibrium between a person and their environment, the union of the spirit and body, and the idea that sickness has a natural genesis. Based on this definition of health came three distinct dimensions of health which invariably defines the scope of health in humans. By extension, Reproductive Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes.

The interdependence between humans, animals and the environment has become increasingly apparent in recent years, especially as global health challenges continue to emerge at the intersection of these three domains. The ‘One Health’ concept, thus, emphasises the need for a holistic, integrated approach to health that recognises the complex relationships between human health, animal health, and the health of the ecosystems (Evans & Leighton, 2014; Zinsstag et al., 2011). Despite the growing recognition of the nexus between human, animal, and environmental health, current approaches to addressing health issues often remain fragmented, with sectors operating in isolation (Ferri et al., 2017). As Myers

and Patz (2009) intimate, this lack of an integrated approach neglects the multifaceted relationships within ecosystems that influence the health of all living beings and their reproduction to continue their race. The absence of a comprehensive strategy poses significant risks, including compromised human reproductive health, environmental degradation, and increased vulnerability to zoonotic diseases. Additionally, the dominant utilitarian view, which often prioritises population happiness over ecological harmony, fails to recognise that long-term health and wellbeing depend on balanced and peaceful coexistence between humans, animals, and the environment. In this regard, the ‘One Health’ approach seeks to foster sustainable health solutions that does not only improve the wellbeing of individuals and populations but also promote environmental stewardship.

This paper adopts a conceptual review approach to investigate the ecological dimensions of the ‘One Health’ concept, with particular attention to how environmental health impacts human and animal health. It further argues that the multifaceted connections within the ecosystem extend beyond individual perspectives, requiring collaborative efforts across various sectors to ensure the harmonious coexistence of humans, animals, and the environment. In this regard, the paper seeks to explore the ecological dimensions of the ‘One Health’ concept, while advocating for an integrated, collaborative approach to addressing health issues at the human-animal-environment interface.

## **2. A Conceptual Review**

### **2.1 Origins and Evolution of the ‘One Health’ Concept**

The “One Health,” concept according to Evans and Leighton (2014) dates back to Aristotle and Zoobiquity, who emphasised the interaction of humans, animals, and ecosystems. This concept has over the years been imaginative due to its complexity. The goal of 21st-century One Health concepts is thus to rethink health care in light of environmental shifts and the world’s population expansion as there have been some recognitions about how the interaction between humans, animals, and the environment has changed over time to impact on human health and reproduction.

Kahn et al. (2009) observed over the past decade that, humans have become more vulnerable to fatal zoonotic diseases like haemorrhagic fever, influenza, rabies, and ebola, among others. Following the 2003 SARS

outbreak, which presented the first significant threat to both human health and the world economy, the concept of One Health gained more traction as scientist recommended that these occurrences require that future research should focus on solutions at the interface between animals and humans which require involving microbiology, veterinary medicine, human medicine, ecology, public health, and epidemiology. The development of safe and effective human and veterinary vaccines therefore became a priority across the globe for public health interventions. Consequently, the idea of “One Health” which integrates environmental, animal, and human health seems to have been effective in identifying and preventing illnesses in recent time, yet, its future needs more defined parameters (Atlas, 2012). From historical perspective, Pasteur (1885) and Schwabe (1964) who are well recognised for the history of bridging the gap between human and animal health focused on improving infectious disease control in underdeveloped nations and proposed interdisciplinary collaboration in advancing the One health concept due to the convergence of human and animal diseases as a common approach to biosecurity. Although they straddled the line between human and animal health, Prata et al. (2022) provided a solution by advocating that the success of the One Health concept requires a transdisciplinary strategy of monitoring, prevention, and mitigation that seeks to maintain the health of people, animals, and the environment in order to achieve sustainability and optimal health.

## **2.2 Human-Animal-Environment Interface**

The existing literature on the interconnectedness of human, animal, and environmental health are diverse yet compounded by emerging zoonotic diseases (e.g., Ebola, COVID-19) of public health importance, biodiversity loss, anthropogenic climate change, and their impacts on public health. Mackenzie et al. (2013) noticed that the rise and reemergence of infectious diseases that are prone to epidemics, are already having devastating effects on national and worldwide economies, thereby make global health security a serious concern. The Institute of Medicine’s 1992 report, titled ‘Emerging Infections: Microbial Threats to Health in the United States’, provided documentation of the idea of disease emergence where more than 70% of newly discovered viral diseases are zoonotic many of which can spread from domestic animals to wildlife and people. ‘One Health’ is thus recognised as a comprehensive approach that involves coordinated, collaborative, interdisciplinary, and cross-sectoral efforts to better understand and address zoonotic illnesses.

Dixon et al. (2014) discussed current threats of zoonotic illnesses and how a better understanding of underlying risk factors could spur a paradigm shift from treatment to prevention of zoonotic infectious diseases in promoting the One Health concept since both human and animal populations are seriously threatened by infectious illnesses. However, Jones (2023) argues that, the human-animal-environment (HAE) interface is crucial in understanding the interactions between these triads in modern times since the COVID-19 pandemic has provided public health practitioners more insight into this approach of preventive care.

Evidences in advancing One human–animal–environment Health for global health security have demonstrated that the One Health approach enhances global health security across a range of health threats (Zinsstag et al., 2023). In domains like cooperative health services, surveillance systems, food safety, environmental risks, water and sanitation, zoonotic disease control, and antibiotic resistance surveillance, it has demonstrated gradual advantages. However, further operationalisation and fortifying multisectoral coordination systems at the national, regional, and international levels are required to optimise the advantages of the one health concept in public health interventions to prevent future pandemics

### **2.3 Ecological Health and Ecosystem Services**

There are successful models and frameworks that demonstrate integrated approaches to Ecosystem Health Management where human, animal, and environmental health are managed cohesively (Han et al., 2024). For instance, the relevance of optimal ecological health and how healthy ecosystems contribute to human and animal wellbeing cannot be over emphasized since clean water, air quality, food security can be negatively affected by environmental degradation. Jackson et al. (2013) linked ecosystem services and human health and found a direct correlation between Eco-Health Relationships. Wang et al. (2023) observed that Eco-fragile regions may suffer increased ecological risks as a result of changes in land-use patterns if attention is not paid to ecological restoration and management of Eco-Fragile zones. These according to Han et al. (2024) has implications on the determinants of ecosystem health.

### **2.4 Reproductive Health and Environmental Health Connections**

The impact of environmental health on human reproductive health can be attributed to anthropogenic climate change resulting to ecosystem

imbalances that affects both humans and animals' reproductive health outcomes (WHO, 2022). Again, Gray et al. (2017) also discuss the connection between breast cancer and the environment and provided an increasing evidence from epidemiological studies, for a better understanding of mechanisms linking toxicants with development of breast cancer. The Social determinants of health and their relationships to reproductive outcomes have also been documented by Brown (2013) and Smith (2023) as the medical community is focusing on social determinants of health (SDOH) to understand their impact on health and wellness for mainstream and disadvantaged communities as well as attempts to integrate medical and environmental sociology with environmental health outcomes through advocacy to enhance reproductive health.

### **3. Methodology**

The study adopted a conceptual review methodology, which systematically explores, synthesises, and integrates various theories, frameworks, and ideas related to the One Health framework (Iwelunmor et al., 2015). The review sought to unravel the interconnectedness of human health, animal health, ecosystem health, and reproductive health within the One Health framework. This involved a comprehensive and systematic search for relevant literature on the One Health framework. It identified the definitions, theoretical foundations, concepts, and perspectives that highlight the nexus between human, animal, ecosystem, and reproductive health. Academic databases such as Google Scholar, PubMed, JSTOR, Scopus, Web of Science, and Science Direct were searched to locate peer-reviewed articles, books, and reports that touch on the One health discourse. The relevant literature was identified, key information was extracted and organised for analysis. Each piece of literature was analysed to extract the main concepts related to the integration of health systems. These concepts were mapped to identify how they connect human, animal, ecosystem, and reproductive health. The literature was then synthesised to present a coherent conceptual model that explains the integration of human, animal, ecosystem, and reproductive health. Commonalities and differences in how the One Health framework was conceptualised across disciplines were identified while contextual conclusions were drawn.

### **4. Discussion of Findings from the Literature**

The literature revealed that the One Health concept recognises the connection between humans, animals, plants, and the environment

in which these organisms coexist and reproduce as intimated by Atlas (2012). Globally, human populations are expanding through improved reproductive health, leading to increased contact with animals, which can lead to diseases (Baker et al., 2022). The drastic changes in climate and land use (i.e., deforestation and intensive farming practices, disruptions in environmental conditions and habitats) can provide new opportunities for disease transmission from humans to animals and vice versa (Goudie, 2018). Again, De Garine-Wichatitsky et al. (2021) highlighted the interconnectedness between human health, biodiversity, ecosystem services, and agriculture using the COVID-19 pandemic. Their analysis of event that unfolded during the COVID-19 pandemic, call for “One Health integrated approaches” to prevent and respond to emerging zoonotic diseases. However, challenges remain in framing resilience in health contexts. The method used in this current paper posits that the dimensions of health in humans have been centered on the following three thematic areas:

i. *Physical well-being, (absence of disease or infirmity)*

Physical wellbeing is the ability to maintain a healthy quality of life that allows us to get the most out of our daily activities without undue fatigue.

ii. *Mental well-being (Intellectual capabilities and Emotional stability)*

Mental wellbeing can be described as a combination of how we feel (our emotions and life satisfaction) and how we function (relationships with others, personal control, purpose in life and independence).

iii. *Social well-being (Environmental and Spiritual health).*

Ability of the people to be free from want of basic needs and to coexist peacefully in communities with opportunities for advancement.

The concept of animal health on the other hand is the absence of disease or normal functioning which encompasses animal diseases, human health, the environment, and food safety (Bahari, 2013). Central to human and animal health is the concept of Ecosystem Health which integrates environmental conditions which impact human health and provide information for sustainable resource use (Lu et al., 2015). A commonly cited broad definition of Ecosystem Health states that a healthy ecosystem

has three attributes: 'Productivity', 'Resilience' and 'Organization' Including Biodiversity (Romanelli et al., 2015). Also, productivity is a 'measure of economic performance that compares the number of goods and services produced (output) with the number of inputs used to produce those goods and services' (Dantsis, et.al, 2010). Resilience is the 'process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional, and behavioral flexibility and adjustment to external and internal demands despite risk and adversity (Masten, 2012).

Regarding Organisations in this sense focuses on the condition prevailing in the ecosystem and the manner in which they are being organized. This brings to bare the concept of Biodiversity, which constitutes all the different kinds of life that exist in the ecosystem and encompasses a variety of animals, plants, fungi, and even microorganisms like bacteria that make up our natural world (Kay et al., 1999; Habitat, 2013). The complex interrelationships within the ecosystem makes each of these species and organisms reproduce rapidly hence have to work together within the ecosystems, like an intricate web, to maintain equilibrium and support life.

There has been empirical evidence that international travel and trade have increased the spread of diseases across the globe (Huynen et al., 2020). These changes have caused endemic and newly developing zoonotic illnesses to spread among populations all over the world (Karesh et al., 2012).

In view of the spread of zoonotic illnesses at pandemic levels, there have been some required approaches to public health interventions to mitigate the effects of these diseases on human and animal lives (Grange, et.al, 2021). The 'One Health' approach has therefore become a promising public health intervention that involves multiple stakeholders to address animal-human-environment issues.

The Centre for Disease Control (CDC) uses a 'One Health' approach by involving experts in human, animal, environmental health, and other relevant disciplines and sectors in monitoring and controlling public health threats, particularly in Sub-Saharan African countries (Fasina et al., 2021). This has shown that cooperation between partners in the fields of environmental health, animal health, and human health is necessary for effective public health initiatives. Professionals in the fields of human health (doctors, nurses, epidemiologists, public health practitioners), animal health



(veterinarians, paraprofessionals, agricultural workers), and environment (ecologists, wildlife experts), as well as other areas of expertise need to coordinate their efforts in unison to achieve the desired results. The One Health approach for public health interventions also requires cooperation/partnerships with policymakers, law enforcement agencies, agriculture experts, communities, and pet owners among other key stakeholders. The law and policymakers will formulate appropriate laws and policies towards the prevention of communicable diseases resulting from interaction with humans and animals in the environment, the law informant agencies will enforce the laws and policies for compliance experts in Agriculture will provide technical guidance on best farming practices that will not destroy the environment to destabilize the ecosystem thereby breeding diseases that will affect human and animal lives.

Unknown to many, the negative effects of poor crop and animal farming practices, which have a negative impact on the environment and negatively affect the flora and fauna within the ecosystem, are the root cause of how agrochemicals affect soil microbiota and management. For example, pesticides, fertilizers, and other harmful agricultural chemicals used indiscriminately in farming have the potential to contaminate fresh water, marine habitats, air, and soil. They may also linger in the environment for a long time (Meena et al., 2020). Also, Numerous pesticides are suspected of interfering with both human and wildlife hormonal systems. Coral reefs and streams are impacted by fertilizer runoff. Animals moving away from their natural habitats to other locations which are sometimes closer to human settlements pose health risks to both human and animal life. Adverse circumstances like drought, floods, and disease outbreaks are unfavorable for livestock farmers in underdeveloped nations like Ghana. Researchers have linked these occurrences to climate change since they included rising tides (Hope, 2009; Urama & Ozor, 2010).

The environment's impacts on animal life might also have an impact on human life, making it easier to fully comprehend how many species currently in existence have an impact on human well-being (Crowl et al., 2008). A typical example is the simultaneous outbreaks of Ebola virus disease (EVD) in Sudan (now South Sudan) and the Democratic Republic of the Congo (DRC), which was discovered in 1976 (Muyembe-Tamfum et al., 2012). The disease subsequently got into a pandemic state (Mendoza, et.al, 2016), spreading to Guinea, Liberia, and Sierra Leone in 2014 (Bell, 2016).

The Ebola virus disease (EVD) was noted to have originated from primates which caused the severe sickness known as Ebola that affects humans and other primates (Bell, 2016). Clearly, this pandemic had a tremendous influence on the world between 2013 and 2016, but notably on West Africa. A total of 11,310 fatalities and 28,616 EVD cases overall were recorded in Guinea, Liberia, and Sierra Leone. When the outbreak extended outside of these three nations, there were an additional 36 cases and 15 fatalities (Bell, 2016; Kamorudeen et al. (2020). It is worth contending that these many lives were lost during the Ebola crisis because the initial alternative approaches to contain the disease at the initial stages didn't incorporate the foundational ideas of 'One Health'.

According to Salyer et al., (2017), most countries worldwide prefer to focus their limited resources on endemic diseases and afflictions that they can effectively cure rather than control zoonoses. In the case of Ebola however, the primary goal of containing this zoonotic disease centered on prevention, control, and eradication by "breaking the chain of transmission at its epidemiologically weakest link" by regulating the reservoirs (animals), eradicating the channels of transmission, and immunizing humans against illnesses. This approach however did not yield much result until the spread of the disease was eventually stopped through incorporating behavioral change intervention that included distancing oneself from suspected wild animals that were noted to spread the diseases that lead the Ebola outbreak to be declared over, making Liberia the first country in West Africa to be declared Ebola-free in May 2015. This successful containment of Ebola was also due to the involvement of local leaders in prevention programs and messaging as well as careful policy implementation at the national and international levels that focused on the concept of "One Health" (Dube, 2020). It is worthy of note that Rabinowitz and Conti (2013) observed the growing populations and fast changes in the environment, making the connection between human, animal, and environmental health clearer. Salyer et al., (2017), further argued that in order to reduce the consequences of infections, toxicant releases, changes in the built environment, and climate change, it is necessary to retool global public health resources and capacities for a variety of species. Advancing the ecological perspective on the connections between human health, animal health, and ecosystem health ('One Health') has some ethical implications for environmental health (Rabinowitz et al., 2018).

From the literature, it was clear that there are 6 key ethical principles that guide environmental health decision-making as it relates to 'One Health' (van Herten et al., 2020). These ethical principles which include: Sustainability, Beneficence, Non-Maleficence, Justice, Community involvement, and Precautionary Substitution cannot be ignored if the aim is to have a successful 'One Health' initiative (Marais et al., 2021) for that matter a sustained reproductive health to ensure procreation of species for the continuity of life. Many times, however, the ethical implications of human acts on the environment are not fully considered until the disastrous repercussions force individuals to reassess their choices which are oftentimes too late (Des Jardins, 2012). Planning for future good health, therefore, necessitates a long-term approach to sustainability including critically looking at the impact of the one health concept on the reproductive health on humans within the ecosystem as well as the other components of health. Similarly, there is the need for sustainability in this sense is a social goal about the ability of people to co-exist with other species on earth over a long time as generations come and go through procreation and death. Specific definitions of this term are difficult to agree on, as they have varied with literature, context, and time. Experts often describe sustainability as having three dimensions (Cornell et al., 2013). In 1987, the United Nations Brundtland Commission defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". This definition actually refers to four distinct areas: human, social, economic and environmental which are also known as the four pillars of sustainability (Borowy, 2013).

The second ethical principle (Beneficence) is as an act of charity, mercy, and kindness with a strong connotation of doing good to others including moral human obligation to protect the environment and natural resources (Sandu & Caras, 2013). What this means is that, for mutual coexistence of humans and animals for a sustainable environment, humans have a moral obligation to protect the natural resources to conserve the environment. This therefore brings to the fore the ethical principle of non-maleficence which holds that there is an obligation not to inflict harm on others within the ecosystem (Traxler, 2002). If humans have an obligation not to inflict harm on others within the ecosystem, then there will be Justice which is the ethical, philosophical idea that people should be treated equally, fairly, properly, and reasonably by the law and by those who administer it, that laws should be designed to prevent harm to others, and that, when harm

is alleged, both the accuser and the accused should receive redress. In this regard, one could figure out four different types of justice as follows: distributive (determining who gets what), procedural (determining how fairly people are treated), retributive (based on punishment for wrong-doing) and restorative (which tries to restore relationships to rightness) (Ripstein, 2001). In all these ethical issues towards achieving one health, community involvement in formulation and implementation of all initiatives is key. The community in this context is a social group whose members share a similar characteristic, such as a common geography, culture, or heritage. In modern times communities are no longer restricted by geography as it used to be in the past (Muniz & O'guinn, 2001). If critical attention is not paid to embraces the 'one health' concept for sustainable development there will be crises for people and the environment throughout the world as a result of these consequences as their frequency and intensity increase and, in many cases, they already have. If left uncontrolled, these effects would intensify and spread, resulting in a loss of biodiversity and further animal extinctions, water shortages, and displaced communities.

In my opinion, what this means is that the concept of one health transcends beyond geographical locations to encompass the ideology of the comprehensive nature of health without borders most especially when human and animal migration has been associated with epidemics from time immemorial and heightened in recent times (Boff, 2008; Teo, 2023). This opinion was noted by Roberts and Scheper-Hughes (2011) as they observed that many people travel across borders to perform various activities of living thereby carrying diseases including diseases that are sexually transmitted along as they travel. In relation to this the precautionary substitution is a key ethical principle towards achieving the goals of one health. The precautionary principle enables decision-makers to adopt preventive measures when scientific evidence about an environmental or human health hazard is uncertain and the stakes are high. (Harremoes et al., 2013). Arguably, human reproduction for that matter optimal reproductive health is hampered if the one health concept is jeopardized since pregnancies thrive best in healthy and stable environments free of diseases and conflicts (WHO, 2022).

## 5. Conclusion

The One Health framework presents a comprehensive and integrative approach to addressing the complex interconnections between human, animal, ecosystem, and reproductive health. This review has highlighted the multidimensional nature of health challenges that transcend individual species and environments. It lays emphasis on the fact that health issues cannot be effectively tackled in isolation. The integrated perspective proposed by the One Health framework underlines the importance of collaboration across disciplines, sectors, and geographic boundaries to promote holistic solutions that benefit not only humans but also animals and ecosystems. The review reveals that the interdependence of these health domains necessitates a broader understanding of how factors such as zoonotic diseases, environmental degradation, biodiversity loss, and reproductive health are interconnected. The One Health approach offers a vital framework for addressing global health challenges, particularly as emerging health threats are increasingly linked to ecosystem imbalances and human activities that impact both animal and environmental health.

The ecological perspective on the connections between human health, animal health, and ecosystem health is multifaceted. In this regard, no one person, organisation, or sector alone can adequately address health issues within the ecosystem since health issues encompass animal-human-environment interfaces. 'One Health' promotes peaceful coexistence between human, animal, and environmental health. It, therefore, suggests an integrated approach to health in the ecosystem to counter the notion that utilitarians favor happier populations since no population will be happy if there is no harmony and peaceful coexistence between the animal-human-environment interfaces.

Indeed, this conceptual analysis has unraveled the need for coordinated efforts among policymakers, researchers, public health practitioners, and environmentalists to create sustainable solutions that foster harmony between humans, animals, and the environment. As the world continues to grapple with health crises that cross species and ecosystems, adopting and enhancing the One Health approach will be critical for safeguarding global health and ensuring a healthy future for all.

In conclusion, the One Health framework is an essential tool for addressing the growing complexities of global health, reinforcing the idea that a

healthy ecosystem is foundational to human and animal health, including reproductive health. Therefore, an integrated and interdisciplinary approach is necessary to ensure the well-being of all living organisms within the shared environment.

## Reference

- Atlas, R. M. (2012). One Health: its origins and future. *One Health: the human-animal-environment interfaces in emerging infectious diseases: The concept and examples of a One Health approach*, 1-13.
- Bahari, M. M. (2013). The importance of integrating animal welfare, environmental health and veterinary legislation in improving food security and contributing to agricultural gross domestic product in Africa. *governance*, 2(20), 22-23.
- Baker, R. E., Mahmud, A. S., Miller, I. F., Rajeev, M., Rasambainarivo, F., Rice, B. L., ... & Metcalf, C. J. E. (2022). Infectious disease in an era of global change. *Nature Reviews Microbiology*, 20(4), 193-205.
- Bell, B. P. (2016). Overview, control strategies, and lessons learned in the CDC response to the 2014–2016 Ebola epidemic. *MMWR supplements*, 65, 4-11.
- Boff, L. (2008). *Essential care: An ethics of human nature*. Baylor University Press.
- Borowy, I. (2013). *Defining sustainable development for our common future: A history of the World Commission on Environment and Development (Brundtland Commission)*. Routledge.
- Brown, P. (2013). Integrating medical and environmental sociology with environmental health: crossing boundaries and building connections through advocacy. *Journal of Health and Social Behavior*, 54(2), 145-164.
- Cornell, S., Berkhout, F., Tuinstra, W., Tàbara, J. D., Jäger, J., Chabay, I., ... & van Kerkhoff, L. (2013). Opening up knowledge systems for better responses to global environmental change. *Environmental Science & Policy*, 28, 60-70.
- Crowl, T. A., Crist, T. O., Parmenter, R. R., Belovsky, G., & Lugo, A. E. (2008). The spread of invasive species and infectious disease as drivers of ecosystem change. *Frontiers in Ecology and the Environment*, 6(5), 238-246.

- Dantsis, T., Douma, C., Giourga, C., Loumou, A., & Polychronaki, E. A. (2010). A methodological approach to assess and compare the sustainability level of agricultural plant production systems. *Ecological Indicators*, *10*(2), 256-263.
- De Garine-Wichatitsky, M., Binot, A., Ward, J., Caron, A., Perrotton, A., Ross, H., ... & Echaubard, P. (2021). “Health in” and “Health of” social-ecological systems: A practical framework for the management of healthy and resilient agricultural and natural ecosystems. *Frontiers in Public Health*, *8*, 616328.
- Des Jardins, J. R. (2012). *Environmental ethics*. Cengage Learning.
- Dixon, M. A., Dar, O. A., & Heymann, D. L. (2014). Emerging infectious diseases: opportunities at the human animal environment interface. *Veterinary Record*, *174*(22), 546-551.
- Dube, F. (2020). *Public health at the border of Zimbabwe and Mozambique, 1890–1940: African experiences in a contested space*. Springer.
- Errett, N. A., Sauer, L. M., & Rutkow, L. (2020). An integrative review of the limited evidence on international travel bans as an emerging infectious disease disaster control measure. *J Emerg Manag*, *18*(1), 7-14.
- Evans, B. R., & Leighton, F. A. (2014). A history of One Health. *Rev Sci Tech*, *33*(2), 413-420.
- Fasina, F. O., Fasanmi, O. G., Makonnen, Y. J., Bebay, C., Bett, B., & Roesel, K. (2021). The one health landscape in Sub-Saharan African countries. *One Health*, *13*, 100325.
- Ferri, M., Ranucci, E., Romagnoli, P., & Giaccone, V. (2017). Antimicrobial resistance: A global emerging threat to public health systems. *Critical Reviews in Food Science and Nutrition*, *57*(13), 2857-2876.
- Frieden, T. R. (2010). A framework for public health action: the health impact pyramid. *American Journal of Public Health*, *100*(4), 590-595.
- Goudie, A. S. (2018). *Human impact on the natural environment*. John Wiley & Sons.
- Grange, Z. L., Goldstein, T., Johnson, C. K., Anthony, S., Gilardi, K., Daszak, P., ... & Smith, B. (2021). Ranking the risk of animal-to-human spillover for newly discovered viruses. *Proceedings of the National Academy of Sciences*, *118*(15), e2002324118.

- Gray, J. M., Rasanayagam, S., Engel, C., & Rizzo, J. (2017). State of the evidence 2017: an update on the connection between breast cancer and the environment. *Environmental Health*, 16, 1-61.
- Habitat, U. N. (2013). *State of the world's cities 2012/2013: Prosperity of cities*. Routledge.
- Han, P., Hu, H., Zhou, J., Wang, M., & Zhou, Z. (2024). Integrating key ecosystem services to study the spatio-temporal dynamics and determinants of ecosystem health in Wuhan's central urban area. *Ecological Indicators*, 166, 112352.
- Harremoes, P., Gee, D., MacGarvin, M., Stirling, A., Keys, J., Wynne, B., & Vaz, S. G. (Eds.). (2013). *The precautionary principle in the 20th century: Late lessons from early warnings*. Routledge.
- Hope Sr, K. R. (2009). Climate change and poverty in Africa. *International Journal of Sustainable Development & World Ecology*, 16(6), 451-461.
- Huynen, M. M., Martens, P., & Hilderink, H. (2005). The health impacts of globalization: a conceptual framework. *Globalization and health*, 1(1), 1-12.
- Iwelunmor, J., Blackstone, S., Veira, D., Nwaozuru, U., Airhihenbuwa, C., Munodawafa, D., ... & Ogedegbe, G. (2015). Toward the sustainability of health interventions implemented in sub-Saharan Africa: a systematic review and conceptual framework. *Implementation Science*, 11, 1-27.
- Jackson, L. E., Daniel, J., McCorkle, B., Sears, A., & Bush, K. F. (2013). Linking ecosystem services and human health: the Eco-Health Relationship Browser. *International Journal of Public Health*, 58, 747-755.
- Jones, R. (2023). The Human–Animal–Environment Interface. In R. Jones & A. Jeffery (Eds.), *One Health for Veterinary Nurses and Technicians: An Introduction* (pp. 6-27). CABI.
- Kahn, R. E., Clouser, D. F., & Richt, J. A. (2009). Emerging infections: a tribute to the one medicine, one health concept. *Zoonoses and Public Health*, 56(6-7), 407-428.
- Kamorudeen, R. T., Adedokun, K. A., & Olarinmoye, A. O. (2020). Ebola outbreak in West Africa, 2014–2016: Epidemic timeline, differential diagnoses, determining factors, and lessons for future response. *Journal of Infection and Public Health*, 13(7), 956-962.



- Karesh, W. B., Dobson, A., Lloyd-Smith, J. O., Lubroth, J., Dixon, M. A., Bennett, M.,... & Heymann, D. L. (2012). Ecology of zoonoses: natural and unnatural histories. *The Lancet*, 380(9857), 1936-1945.
- Kay, J. J., Regier, H. A., Boyle, M., & Francis, G. (1999). An ecosystem approach for sustainability: addressing the challenge of complexity. *Futures*, 31(7), 721-742.
- Kickbusch, I., Brindley, C., & World Health Organization. (2013). *Health in the post-2015 development agenda: an analysis of the UN-led thematic consultations, High-Level Panel report and sustainable development debate in the context of health*. World Health Organization.
- Lu, Y., Wang, R., Zhang, Y., Su, H., Wang, P., Jenkins, A., ... & Squire, G. (2015). Ecosystem health towards sustainability. *Ecosystem Health and Sustainability*, 1(1), 1-15.
- Mackenzie, J. S., Jeggo, M., Daszak, P., & Richt, J. A. (Eds.). (2013). *One Health: The human-animal-environment interfaces in emerging infectious diseases* (Vol. 366). Berlin: Springer.
- Marais, B. J., Preisz, A., & Isaacs, D. (2021). Under-explored 'third dimension' of medical ethics. *Journal of Paediatrics and Child Health*, 57(11), 1792-1794.
- Masten, A. S. (2012). Resilience in individual development: Successful adaptation despite risk and adversity. In M. Wang & E. Gordon (Eds.), *Educational resilience in inner-city America* (pp. 3-25). Routledge.
- Meena, R. S., Kumar, S., Datta, R., Lal, R., Vijayakumar, V., Brtnicky, M., ... & Marfo, T. D. (2020). Impact of agrochemicals on soil microbiota and management: A review. *Land*, 9(2), 34.
- Mendoza, E. J., Qiu, X., & Kobinger, G. P. (2016). Progression of Ebola therapeutics during the 2014–2015 outbreak. *Trends in Molecular Medicine*, 22(2), 164-173.
- Muniz Jr, A. M., & O'guinn, T. C. (2001). Brand community. *Journal of Consumer Research*, 27(4), 412-432.
- Muyembe-Tamfum, J. J., Mulangu, S., Masumu, J., Kayembe, J. M., Kemp, A., & Paweska, J. T. (2012). Ebola virus outbreaks in Africa: past and present. *Onderstepoort Journal of Veterinary Research*, 79(2), 6-13.

- Myers, S. S., & Patz, J. A. (2009). Emerging threats to human health from global environmental change. *Annual review of environment and Resources*, 34(1), 223-252.
- Pasteur L (1885) Methode pour prevenir la rage apres morsure. *Compt Rend Acad Sci* 101:765–773
- Prata, J. C., Ribeiro, A. I., & Rocha-Santos, T. (2022). An introduction to the concept of One Health. In J. C. Prata, A. I. Ribeiro, T. Rocha-Santos (Eds.), *One Health* (pp. 1-31). Academic Press.
- Rabinowitz, P. M., Pappaioanou, M., Bardosh, K. L., & Conti, L. (2018). A planetary vision for one health. *BMJ Global Health*, 3(5), e001137.
- Rabinowitz, P., & Conti, L. (2013). Links among human health, animal health, and ecosystem health. *Annual Review of Public Health*, 34, 189-204.
- Romanelli, C., Cooper, D., Campbell-Lendrum, D., Maiero, M., Karesh, W. B., Hunter, D., & Golden, C. D. (2015). Connecting global priorities: biodiversity and human health: a state of knowledge review. World Health Organisation/Secretariat of the UN Convention on Biological Diversity.
- Salyer, S. J., Silver, R., Simone, K., & Behravesh, C. B. (2017). Prioritizing zoonoses for global health capacity building—themes from One Health zoonotic disease workshops in 7 countries, 2014–2016. *Emerging Infectious Diseases*, 23(Suppl 1), S55.
- Sandu, A., & Caras, A. (2013). Deconstruction of charity. Postmodern ethical approaches. *Journal for the Study of Religions and Ideologies*, 12(36), 72-99.
- Schwabe C (1964) *Veterinary medicine and human health*. Williams and Wilkins, Baltimore.
- Smith, P. B. (2023). Social determinants of health and their relationships to reproductive outcomes. *Bulletin of the Menninger Clinic*, 87(2), 189-208.
- Svalastog, A. L., Donev, D., Kristoffersen, N. J., & Gajović, S. (2017). Concepts and definitions of health and health-related values in the knowledge landscapes of the digital society. *Croatian Medical Journal*, 58(6), 431.
- Teo, V. (Ed.). (2023). *Human-animal Interactions in Anthropocene Asia*. Taylor & Francis.

- Traxler, M. (2002). Fair chore division for climate change. *Social Theory and Practice*, 28(1), 101-134.
- Urama, K. C., & Ozor, N. (2010). Impacts of climate change on water resources in Africa: the role of adaptation. *African Technology Policy Studies Network*, 29(1), 1-29.
- van Herten, J., Buikstra, S., Bovenkerk, B., & Stassen, E. (2020). Ethical Decision-Making in Zoonotic Disease Control: How Do One Health Strategies Function in the Netherlands? *Journal of Agricultural and Environmental Ethics*, 33, 239-259.
- Wang, Y., Yang, Z., Yu, M., Lin, R., Zhu, L., & Bai, F. (2023). Integrating ecosystem health and services for assessing ecological risk and its response to typical land-use patterns in the eco-fragile region, North China. *Environmental Management*, 71(4), 867-884.
- World Health Organization. (1946, June). Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. In *International Health Conference, New York* (pp. 19-22). WHO.
- World Health Organization. (2022). *A health perspective on the role of the environment in One Health* (No. WHO/EURO: 2022-5290-45054-64214). World Health Organization. Regional Office for Europe.
- World Health Organization. About World Health Organization. Constitution. Available at: <http://www.who.int/governance/eb/constitution/en/>. Accessed: May 13, 2023.
- Zinsstag, J., Kaiser-Grolimund, A., Heitz-Tokpa, K., Sreedharan, R., Lubroth, J., Caya, F., ... & De la Rocque, S. (2023). Advancing One human–animal–environment Health for global health security: what does the evidence say? *The Lancet*, 401(10376), 591-604.
- Zinsstag, J., Schelling, E., Waltner-Toews, D., & Tanner, M. (2011). From “one medicine” to “one health” and systemic approaches to health and well-being. *Preventive Veterinary Medicine*, 101(3-4), 148-156.

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