International Journal of Community Medicine and Public Health
*Singh S et al. Int J Community Med Public Health. 2023 Jul;10(7):2657-2660*
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20232069

**Commentary**

# One health: a long road ahead

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**Received:** 27 April 2023
**Accepted:** 19 June 2023

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## ABSTRACT

One health (OH) is a collaborative, multisectoral, coordinated and transdisciplinary approach-working at the local, regional, national, and global levels – with the goal of achieving optimal health outcomes by recognizing the interconnection between people, animals, plants, and their shared environment. OH framework was officially recommended as an approach to deal with zoonotic infectious diseases by the world health organization in 2008 of which the core components of the framework are food safety, zoonoses and antibiotic resistance. India has taken some steps towards the OH concept by promoting collaboration among various sectors and allocating the required resources. However, still a lot needs to be done to overcome the challenges. Implementing systematic zoonotic surveillance; regulated antibiotic use among humans and animals; development of a zoonotic registry in the country; constitution of a wide network of academic, research, pharmaceutical and various implementation stakeholders from different sectors is the need of the hour to effectively use OH. Implementing a ' OH ' system consists of emphasizing the intersections of humans, domestic and wild animal populations as well as plants and ecosystems. By promoting collaboration across all sectors, a OH approach can achieve the best health outcomes for people, animals, and plants in a shared environment.

**Keywords:** OH, Collaboration, Zoonosis, Environment

## INTRODUCTION

One health (OH) is a collaborative, multisectoral, coordinated and transdisciplinary approach-working at the local, regional, national, and global levels-with the goal of achieving optimal health outcomes by recognizing the interconnection between people, animals, plants, and their shared environment.[1] OH could also be regarded as a multidisciplinary approach working at the intersection of human health, animal health and environmental health to attain optimal health for all living organisms while ensuring their sustainability in the ecosystems. OH concept is an important strategy in addressing the complex global health issues because it recognizes the interrelationship between human health and problems like zoonotic diseases, antimicrobial resistance, foodborne illnesses, food security and climate change.[2] The idea of the OH concept is, in essence, to appreciate the wealth of opportunity that lies in the three interfaces, namely, human, animal, and environment, which could be capitalized on, to protect the health of our planet as a whole.[3] From 1940 to 2018, more than 340 pathogens emerged, with 60% being zoonotic origin. Out of these, 70% zoonotic pathogens are from wildlife. It is projected that future pathogens will emerge mostly from wildlife sources.[4]

The concept of OH can be traced as far back as to the Greek physician Hippocrates in his book titled "On Airs, Waters, and Places."[5] Several scientists and public health experts have emphasized the role of environment in totality to build a healthy population thus laying the stepping stones for the concept of OH. The term 'OH' was first used in 2003-2004, and was associated with emergence of severe acute respiratory disease (SARS) in early 2003, subsequently by spread of highly pathogenic

avian influenza H5N1 and later by series of strategic goals known as the 'Manhattan Principles' derived at a meeting of the wildlife conservation society in 2004. [6] OH framework was officially recommended as an approach to deal with zoonotic infectious diseases by the WHO in 2008. India's programme on OH was approved by the prime minister's science, technology, and innovation advisory council under the national mission on biodiversity and human well-being in November 2018. [7]

## OH AROUND THE WORLD

OH is an interdisciplinary solution-bolstered by government infrastructure, adequate healthcare financing and administration of the healthcare system. The food and agriculture organization, world organization for animal health, and WHO came together with the United Nations children's fund, United Nations system influenza coordination, and the world bank to develop a strategic framework for reducing risks of infectious diseases at the animal-human-ecosystems interface in 2008, reiterating recommendations for a OH approach to global health. Each year around the world, it is estimated that zoonoses cause 2.5 billion cases of sickness and 2.7 million deaths.[1] Countries around the world have to prepare and implement holistic approaches that conserve biodiversity and reduce disease. Several countries, including Laos People's Democratic Republic, Mongolia, Philippines and Malaysia, have surveillance systems to manage infectious disease through OH. Bangladesh in 2006 formed a multidisciplinary team with experts from the field of epidemiology, disease control and research to track and investigate Nipah virus cases in the country. In Nepal, inter-governmental agencies work in partnership with the donor-funded projects for implementing OH activities to address emerging public health threats.[8] In the southwestern U.S. and Mexico, long-lasting tick collars on dogs, regular pesticide applications around homes, community education, and free spay and neuter clinics were used for controlling Rocky Mountain spotted fever in people and dogs. After only four months, 99% of dogs were tick-free in the community and the number of people who had Rocky mountain spotted fever went down. November 3 has been designated as OH day is celebrated through educational and awareness events held around the world where students are especially encouraged to envision and implement OH projects, and to enter them into an annual competition for the best student-led initiatives in each of global regions.

## OH INITIATIVES IN INDIA

In a joint endeavor by the ministry of health and family welfare, ministry of agriculture and wildlife institute of India, established the Roadmap to combat zoonoses in India in June 2008. The framework highlights the need to measure the morbidity, mortality, and economic burden of zoonotic diseases and emphasizes the rationale for adopting OH framework. The Union Budget of 2021 specifically allocated a portion for OH. Laboratory capacity is being increased throughout the country, expanding from the block level, to enable district level surveillance of microbial infections using the OH methodology.[9] The establishment of 'national institute of OH ' at Nagpur, Maharashtra is the tipping point for the initiative to elucidate the human health perspective into the manifesto of economically focused, socially adept and ecologically sustainable development.[10]

## CHALLENGES TOWARDS IMPLEMENTATION OF OH

As the most-populous in the world, India faces certain challenges related to adopting OH approach. A large number of people are in contact with pet and farming animals, making the country a hotspot for emerging zoonotic diseases. In order to accommodate the needs of the constantly growing population, various human activities like deforestation, industrialization, mining, agriculture etc. end up in making humans more in contact with wildlife. This could possibly be the reason for the transmission and spread of emerging infectious diseases or re-emergence and existence of mutated viruses, where humans or livestock end up as accidental or incidental hosts.[11] Novel infectious agents could be capable of jumping the species barrier and spreading rapidly around the globe due to increased travel, food habits and trade across borders. Further, India shares border with seven countries and is heavily forested with a total forest cover of 708,273 $km^2$, which is 21.54% of the total area of the country.[12] Thus, the health-care sector is coming under increasing pressure calling for urgent OH attention.

While there is an increased focus on awareness, prevention and prediction of diseases in human health, the animal health sector lacks proper surveillance and reporting of animal diseases and laboratory diagnosis. Wild zoonosis is a domain which lacks proper attention. Another major challenge is that the collaboration and coordination among the stakeholders is not sufficient to adopt a standard OH protocol which may be attributed to the absence of a legal framework to implement OH, lack of proper surveillance of animal diseases, poor data sharing mechanism across sectors and limited budget. Climate change is also likely to impact food security, poverty, and other socioeconomic factors that affect individuals' and societies' vulnerability to disease outbreaks.

## COVID-19 AND OH

As the world navigates through the COVID-19 pandemic, it has been proved that SARS-CoV-2 is a zoonotic virus, which means it can spread between people and animals.[13] More than 400 animals from 29 countries have been reported infected of which most of these animals became infected after contact with people who had COVID-19.[14] As more animals are reported infected with the COVID-19 virus, it becomes increasingly clear that OH approach is crucial to address new disease threats that affect both

people and animals. The Coronavirus pandemic has taught the world to adopt a holistic approach towards health because human health can never be in isolation from environmental health or any organism residing within.[15] The ongoing pandemic enables the possible framing of OH as a human health imperative.

## OPPORTUNITIES AND WAY FORWARD

India requires a strong and resilient public health system to address the threats that exist at the human-animal-environment interface and OH approach has proven to counter such threats.[16] Implementing systematic zoonotic surveillance; regulated antibiotic use among humans and animals; development of a zoonotic registry in the country; constitution of a wide network of academic, research, pharmaceutical and various implementation stakeholders from different sectors is needed to effectively use OH in order to combat increasing zoonotic diseases. For the potential of the OH paradigm to be realized, it needs to be visualized beyond the scope of zoonoses. Good interdisciplinary research, adoption of inclusive and innovative conservation frameworks, feeding the results into policies and plans will have a significant positive impact on human well-being and health. There is a need of instituting the social determinants of health approach in OH. Enhanced and integrated surveillance infrastructure and monitoring mechanisms should be implemented to detect new microorganisms sharing similar genotypes across species that have the potential to infect humans. Adequate sustainable laboratory capacity supported by external quality assurance systems is needed. Policies and programs should address the high risk of disease transmission among the vulnerable and marginalized populations including healthcare workers. Strengthening information and communications technologies, risk communication and community engagement processes would have positive impact towards OH. Improving in-service programmes for researchers and practitioners trained in uni-disciplinary contexts and promoting inter-professional collaboration may go a long way in the production of trained professional human resource for the implementation of OH.

## CONCLUSION

Implementing a ' OH ' system consists of emphasizing the intersections of humans, domestic and wild animal populations as well as plants and ecosystems. The OH programme, by bringing together experts from public health, virology, genomics, ecology, social science and animal science, could help prevent an outbreak from turning into an epidemic. The COVID-19 pandemic has provided new evidences that a longstanding and sustainable OH collaboration is needed. By promoting coordination across all sectors, OH approach can achieve the best health outcomes for people, animals and plants in a shared environment. Thus, there is the need to promote the doctrine of ‘oneness’ to achieve ‘health for all’.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: Not required*

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**Cite this article as:** Singh S, Jha SK. One health: a long road ahead. Int J Community Med Public Health 2023;10:2657-2660.