

Bridging the Divide:

Advancing ‘One Health’ for a Better World

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Human health is interconnected with the ecosystem that consists of animals, plants, and the environment. As such, any health intervention should be integrative of these connecting factors. ‘One Health’ (OH) is a holistic approach that considers all the determinants of health, designed for disease prevention and control. It is a transdisciplinary approach that allows multisectoral collaboration and deals with antimicrobial resistance and the prevention and control of zoonoses and vector-, food- and water-borne diseases.

Since 2022, the Quadripartite collaboration between the World Health Organization, Food and Agriculture Organization, United Nations Environment Programme, and World Organisation for Animal Health has been responsible for OH operations, guiding countries in planning and adapting strategies for addressing global health challenges. Implementing OH will enhance pandemic prevention, preparedness, and response, and will also enable the strengthening of domestic health systems, including in India.

Deconstructing 'One Health'

The World Health Organization (WHO) defines 'One Health' (OH) as “an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems.”¹ In addition to an individual's characteristics and behavioural patterns, social, economic and physical environments are important determinants of health, and include a variety of factors such as water, air, animals, plants, housing, and jobs. Animal trade, agriculture, livestock farming, urbanisation, extractive industries, climate change, habitat fragmentation, and encroachment into wild areas are some of the factors that can impact human health. It is essential to consider the possible interactions of these factors with an individual's health to achieve optimal health outcomes. Therefore, no health intervention can be designed and implemented with the consideration of the health sector alone. There should be multisectoral inclusivity in addressing any health-related issues. For example, antimicrobial resistance (AMR) cannot be addressed only through medical intervention and also requires the checking of antibacterial content in food and water.

The OH concept encourages a collaborative, multisectoral, and transdisciplinary approach at the local, regional, national, and global levels. It recognises the interconnection between people, animals, plants, and their shared environment to achieve optimal health outcomes, and it encourages experts from multiple sectors to work together. Under the OH concept, policy, advocacy, financing, organisational development, data, evidence, and knowledge are focused on providing sustainable and long-lasting results at all levels.

The OH concept identifies a range of priority health issues that need the world's urgent attention:

Antimicrobial Resistance (AMR)

AMR is one of the greatest threats to human health, food security, and development. WHO has declared AMR as one of the top 10 global public health threats that need coordinated and concerted global action.² By 2050, there could be nearly 10 million deaths due to AMR each year, and it could cost the global economy between US\$11–444 million.³

Medicines become ineffective when pathogens undergo structural changes as a result of increased drug exposure. Misuse or overuse of antimicrobials, multiplication of pathogens due to unhygienic water and poor sanitation processes, and inadequate infection prevention and control measures in hospitals and healthcare settings are some of the other factors that cause AMR. It also arises due to the use of antibiotics in the farming, livestock, and fisheries sectors, which enables pathogens infecting these animals to develop resistance. Close contact with these animals and the contamination of soil and water with these microbes exposes humans to these bugs.

AMR makes treating infections difficult, leaving patients with limited treatment options, if at all. In such cases, managing serious infections in children and adults alongside any surgical intervention becomes a challenge. Indeed, the global health system is already exposed to drug-resistant Tuberculosis, HIV infections, and specific AMRs such as artemisinin-based combination therapy-resistance in malaria treatment, and antileprotic drug resistance.

Zoonotic diseases

Over the past three decades, around 30 pathogens have been detected, with 75 percent of them originating from animals, causing zoonotic diseases and contributing to about 60 percent of emerging infectious diseases globally.⁴ These diseases can be spread directly through the saliva, blood, urine, mucous, faeces, or body fluids of infected animals, or indirectly through contact with areas where animals live and roam as well as through contaminated objects or surfaces.

Urbanisation and the destruction of the natural habitats of animals, illegal trade in wildlife, and wet markets increase the chances of interaction between animals, animal products and humans, thereby increasing the risk of zoonotic disease and contributing to zoonotic spillover. Recent disease outbreaks such as SARS, MERS, Ebola, Nipah, and avian influenza are examples of zoonotic infections being established in humans. It is important to ensure the hygienic and appropriate care of animals in the agriculture sector, and the safe handling of meat, eggs, dairy, and vegetables to avoid contamination to prevent outbreaks of food-borne zoonotic diseases.

Addressing zoonotic infectious diseases through an OH approach includes multiple actions:

- Raising awareness at all levels of society on prevention and risk-reduction strategies.
- Investing in interdisciplinary approaches including OH perspectives.
- Initiating research to explore the complex social, economic, and ecological dimensions of diseases; to assess risks and effective interventions; and to conduct cost-benefit analyses.
- Regularly monitoring food systems, from farm to fork, and improving sanitary measures.
- Implementing biosecurity and zoonoses-control measures for both industrial and disadvantaged smallholder farmers and herders.
- Supporting agricultural and wildlife habitats by managing landscapes and seascapes collectively.
- Promoting agro-ecological methods of food production, mitigating waste and pollution, reducing further destruction of wildlife and habitat loss, and maintaining ecological connectivity.
- Being mindful of biodiversity during government and private-sector planning, decision-making, and capacity building.⁵

WHO, the Food and Agriculture Organization (FAO), and the World Organisation for Animal Health (WOAH) have already established the Global Early Warning and Response System for Major Animal Diseases to combat zoonoses to coordinate risk assessment and assist in early warning, prevention, and control of disease threats.⁶

Vector-borne diseases

The determining demographic, environmental, and social factors of the distribution of vector-borne diseases are often complex, such as global travel, trade, and unplanned urbanisation. WHO's Global Vector Control Response (GVCR) 2017–2030 provides strategic guidance to countries for strengthening vector-control programmes.⁷

Water-borne diseases

Drinking or coming in contact with contaminated water causes water-borne diseases. Faecal-contaminated water is consumed by two billion people globally, which causes diseases such as cholera, dysentery, typhoid and polio. These diseases are responsible for around 485,000 deaths every year.⁸

Food-borne diseases

Over 200 diseases, ranging from diarrhoea to cancers, are caused by eating or drinking food contaminated with animal or human faecal matter, chemical substances such as unpasteurised (raw) milk, undercooked meat or eggs, and raw fruits and vegetables. Globally, 600 million people are affected by food-borne diseases, in which 420,000 die each year, resulting in 33 million healthy life years lost. Access to adequate safe and nutritious food is key to sustaining life and promoting good health.⁹

Operationalising ‘One Health’

In April 2022, WHO, FAO, United Nations Environment Programme (UNEP), and WOAHA signed a memorandum of understanding for joint work on OH, forming the ‘Quadripartite Collaboration for One Health’. The Quadripartite is a strategic coordination mechanism that aims to work towards “*a world capable of preventing, detecting, containing, eliminating, and responding to animal and public health risks attributable to zoonoses and animal diseases with an impact on food security through multi-sectoral cooperation and strong partnerships*”.¹⁰ The One Health High-Level Expert Panel comprising 26 key international experts serves as the advisory group to the Quadripartite. In late 2022, the group launched the first One Health Joint Plan of Action (2022–2026) to combat health risks at the human–animal–environment interface.¹¹

The Quadripartite has urged all countries to translate the OH approach into policy actions by promoting and increasing investment in intersectoral health governance. Countries are encouraged to adopt national OH policies, and create and exchange research on OH. Research institutions can be encouraged to work on improved genomic surveillance and data-sharing practices. Academic courses on OH can help train and equip a workforce.

Since the OH approach is similar to pandemic prevention and preparedness, resources allocated for the latter can also be utilised for operationalising OH. For instance, the World Bank's US\$10-billion fund for pandemic prevention can be used to implement the OH approach. Additionally, the UN's high-level meeting on pandemic prevention, preparedness, and response (scheduled for September 2023) is an opportunity to integrate the OH agenda into the pandemic action plan.

According to the World Bank, between US\$10.3–11.5 billion is needed annually to implement OH at a global scale.¹² But the lack of centralised OH funding is a challenge, leaving relevant ministries in each country to assume the responsibility for implementing necessary actions and activities. This hinders the development of effective global OH strategies.

WHO has identified several other existing gaps in the implementation of the OH approach.¹³ These gaps are evident in the following areas:

- Databases and knowledge-sharing resources for effective information exchange.
- Showcasing best practice examples to encourage successful OH initiatives.
- Mapping and generating an OH workforce to strengthen capacity.
- Developing a model for an integrated OH surveillance system.
- Establishing routine and emergency coordination mechanisms with stakeholders.
- Creating a standardised framework for addressing zoonotic spillover risks related to animal trade, agriculture, and livestock farming.
- Addressing issues related to urbanisation and habitat fragmentation.
- Identifying spillover risks and disease spread in ways that minimise trade-offs and maximise co-benefits.

'One Health' in the G20 countries¹⁴

The G20 countries can play a key role in improving global health, for various reasons—the member countries are among the world's largest economies, they are home to roughly two-thirds of the global population

(including the majority of the ageing population), they house 78 percent of the world's pharmaceutical companies, see a high prevalence of non-communicable diseases (and account for nearly 70 percent of proportional mortality from such diseases), and contribute 72 percent of all CO₂ emissions.¹⁵ The G20 countries agreed to adopt OH at the 2022 Summit.¹⁶ India has already made headway on this front.

One Health approach in India¹⁷

The Indian government initiated the OH approach under the office of the Principal Scientific Adviser (PSA) with the aim to increase pandemic preparedness and integrated disease control against priority diseases in both human and animal sectors. A supplementary goal includes establishing an early warning system built on an integrated surveillance system and response-readiness for endemic and emerging epidemic or pandemic threats. The country has also sought to implement integrated disease surveillance, build environmental surveillance systems, and develop robust outbreak investigation mechanisms. The OH mission will also focus on:

- **Targeted R&D** to develop critical tools such as vaccines, diagnostics, therapeutics, and other prevention tools, and to invest in developing novel disease surveillance and control methodologies.
- **Data and database integration** for better information sharing across different departments, and investing in analytics for better tracking of national-level progress and implementation at the local level.
- **Streamlining regulatory and approval processes** for enabling OH research and for rapid decision-making.
- **Building a governance model** for integrating OH into existing programmes for system strengthening, sustainability and resource allocation for maximising outcomes.

India has also established a One Health Centre at the National Institute of Animal Biotechnology, Hyderabad, for intersectoral collaboration among veterinary, medical, agriculture, environmental, forestry, meteorological and

other areas to detect, prevent and control zoonoses and transboundary animal diseases.¹⁸

In 2008, an attempt to operationalise the OH approach for zoonotic disease control and prevention identified the barriers preventing effective cross-sectoral collaboration on disease control.¹⁹ These included a lack of supportive policies, conflicting departmental priorities and limited institutional capacities. A review of zoonotic policy documents revealed there is a lack of specific mechanisms or strategies to safeguard livestock health, and a lack of guidelines for promoting cross-sectoral action. It also revealed a lack of clarity and inadequate information regarding engagement in the animal and forest sectors. This study found that implementing the OH approach in India requires contextual adaptation based on the underlying sociopolitical, institutional, and cultural contexts.²⁰

Given India's diverse context, the way forward involves developing strategies that focus on fostering existing informal interpersonal relationships and collaborations between different sectors to successfully adopt the OH approach. It also requires intersectoral coordination at all levels, including the veterinary workforce, academic institutions, and the local or grassroots population. For instance, to conduct the SARS-CoV2 vaccine trial, the Tamil Nadu Veterinary and Animal Sciences University signed a pact with the Tamil Nadu Dr MGR Medical University for conducting joint academic and research activities. Similarly, during an outbreak investigation in Punjab, community health workers, non-government organisations, auxiliary nursing midwives, accredited social health activists (or ASHAs) and village leaders actively participated in efforts to address vaccine hesitancy.²¹

Conclusion

Implementing the OH approach will enhance pandemic prevention, preparedness, and response. It will also strengthen systems and cross-sectoral capacities, allowing for the co-design and implementation of inclusive and equitable multi-level workplans and strategies in line with OH principles. It is essential to develop, disseminate, and utilise improved and harmonised OH tools, technologies, and practices that integrate data and knowledge to prevention of future pandemics, reduce the spread

of infectious diseases through better surveillance systems, and boost collaboration between different organisations.

India's G20 theme of 'One Earth, One Family, One Future' highlights that global collaboration and solidarity is needed to live harmoniously with nature and to ensure health and well-being for all people, everywhere.

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