

One Health Approach: The Only Escape Hatch

One health, according to the WHO, is a comprehensive, unified strategy to balance and improve the health of people, animals, and ecosystems. It develops innovative techniques for disease prevention and surveillance by leveraging the intimate, interconnected connections between various domains. The world of plants, animals, and the environment are all closely related to humans, which benefits us greatly but also serves as a major source of zoonotic diseases. According to recent WHO statistics, domestic and wild animals are responsible for 60% of newly discovered infectious diseases reported worldwide. In the past three decades, more than 30 novel human infections have been identified, with 75% having animal origins. The phrase "One Health" was first used in 2003–2004, it was linked to the outbreak of highly pathogenic avian influenza H5N1 and the early 2003 onset of severe acute respiratory sickness (SARS). The Wildlife Conservation Society's 2004 meeting produced a set of strategic objectives known as the "Manhattan Principles," which made it abundantly evident how illnesses endanger economies and food supplies and how human and animal health are intertwined¹. In particular, the inclusion of wildlife health as a crucial element of worldwide disease prevention, surveillance, control, and mitigation was made possible by these principles, which were a crucial step in acknowledging the vital importance of collaborative, cross-disciplinary approaches for responding to emerging and re-surging diseases.

Four international organizations—the World Health Organization (WHO), the World Organization for Animal Health (WOAH—formerly OIE), the UN Food and Agriculture Organization (FAO), and the UN Environment Programme (UNEP)—have now decided to establish the

One Health Quadripartite in recognition of the value of cross-disciplinary, multi-national collaboration. They have decided to concentrate on six areas², which are; Services for laboratories, Zoonotic disease control, Tropical diseases that are overlooked, Resistance to antibiotics, Safety of food and Health of the environment.

One Health Approach to Laboratory Services:

Diagnosis of infectious diseases relies heavily on laboratory testing. This is because their symptoms—such as diarrhoea, pyrexia, and jaundice—can frequently be non-specific, and figuring out the causative organism is crucial to choosing a course of treatment. Infectious disease surveillance heavily relies on laboratory services. The majority of nations regularly gather and compile information on human diseases. Since certain of these infections are "notifiable," cases are required by law to be reported to a central authority. Diseases are classified as notifiable if they are part of a vaccination campaign, are highly contagious and linked to outbreaks, or are likely to be harmful even if they may be rare. Both domestic and wild animals are simultaneously monitored by the same laboratory. The secret to early disease detection is combining human and animal disease surveillance.

One Health Approach to Controlling Zoonotic Diseases

Humans can contract zoonotic infections through direct or indirect contact (for example, through an invertebrate vector) with domestic or wild animals that are carriers of diseases. Therefore, control necessitates understanding how those interactions take place as well as the elements that keep those animals infected. The Mpox is the quintessential illustration of this. Although it makes sense from a human standpoint to implement education and treatment or prophylactic programs to decrease interaction with possible animal reservoirs or invertebrate vectors of

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infection, their impact has frequently been minimal. It only works when concurrent programs are implemented to reduce these diseases in animal reservoirs. Given the interconnection of people worldwide and the factors that contribute to zoonotic transmission from animal reservoirs of infection, a One Health strategy is therefore crucial for the effective control of diseases.

One Health to Controlling Neglected Tropical Diseases

Twenty neglected tropical diseases (NTDs) are recognized by the WHO³. Numerous viruses, bacteria, fungi, and parasites can cause these illnesses. They are thought to significantly impact women and children, and are primarily spread among lower-income populations. Mycetoma and podoconiosis, which are brought on by exposure to infectious agents or irritants in soil, lymphatic filariasis, which is spread to humans by mosquito vectors, rabies and echinococcosis, which are zoonoses in which humans become inadvertently infected, and dracunculiasis and schistosomiasis, which are caused by parasites with complex life cycles that involve intermediate invertebrate hosts. Some factors affect people's living conditions, housing, food, and drinking water quality. To better understand the epidemiology and identify the strategies for better disease control, the One Health approach is crucial.

One Health Approach to Combating Antimicrobial Resistance

In his acceptance speech, Nobel laureate Alexander Fleming made the foresighted prediction that bacteria would become resistant to penicillin if the medication was not used more prudently. He was quickly proven correct, and as a result, we are currently experiencing a worldwide pandemic of antimicrobial resistance. Antimicrobials and their metabolic products are excreted in large quantities and end up in the sewage system as a result of overprescription and improper use. Furthermore, a lot of prescribed antibiotics that are left unused are eventually rinsed down the sink or flushed down the toilet. The antimicrobials in the sewage system interact with a variety of microorganisms and spread throughout the environment. The widespread abuse of the same (or closely related) medicines in agriculture has exacerbated the misuse of antibiotics in human medicine. The majority of antibiotic use in many nations, up to 80% at times, occurs in agriculture⁴. To address the issue, a One Health strategy, including

interdisciplinary methods and the collaboration of many national and international entities, will be required.

One Health Approach to Ensuring Food Safety

For both people and animals, food security and safety are crucial. It's not always obvious when materials meant for human consumption contain poisons, pollutants, or infectious agents. This emphasizes how crucial it is to have systems in place for routine food testing to make sure that products fulfil requirements and are stored and transported properly. Many nations have laws governing the consumption of game animals, bushmeat, and other foods that are contaminated with a variety of parasites, viruses, and other pathogens. Scientists working in diagnostic laboratories must be aware of any potentially dangerous substances present in such products.

One Health Approach for Ensuring Environmental Health

There are many ways that climate change might affect the spread of infectious illnesses, and the One Health concept helps to understand the connections between these issues. Land temperature increase has an impact on vertebrates, including humans, by rendering certain habitats uninhabitable. This causes migration, which may result in closer contact between humans and animals than in the past. It also presents a chance for the spread of anthroponoses and zoonosis. The other significant impact of climate change, which may be more important for controlling infectious diseases, is the rise in the frequency and volume of extremely heavy rainfall that causes flooding.

The Indian scenario: At its 21st meeting, the Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC) approved the creation of a National One Health Mission, a cross-ministerial endeavour that will serve to integrate, support, and coordinate all of the nation's One Health initiatives while filling in any gaps where necessary. The following specific efforts will be undertaken in the National One Health Mission⁵:

1. Implementing integrated disease surveillance within and across human, animal, and environmental sectors to address communicable diseases of zoonotic, transboundary animal diseases and diseases of epidemic/pandemic potential
2. Environmental surveillance system

3. Develop robust outbreak investigation mechanisms.

CONCLUSIONS

It takes the contributions of a variety of medical specialists, veterinarians, social workers, and ecologists to solve the intricate, multifaceted problems of infectious diseases. Promoting a cross-sectoral approach and developing recommendations and policy guidelines for governments, healthcare planners, and pertinent national and international organizations are among the One Health Quadripartite initiative's declared goals. Encouragement to "think global, act local" is one strategy for health.

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