



Perspective

One Health Bulletin

One Health: Status, opportunities and challenges in Bangladesh

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1. Introduction

One Health is a comprehensive strategy aims at enhancing the wellbeing of humans, animals, and the environment by recognizing and addressing the interconnectedness of their health. One Health initiatives could significantly impact Bangladesh by mitigating complex issues effecting human, animal, and ecosystem health, as the country's heavily reliance on agriculture, livestock, aquatic resources, and shared ecosystems. Although Bangladesh formulated an One Health strategy document in 2012, the implementation faces several challenges, including inadequate governance, insufficient institutional capacity, and a lack of funding and infrastructure. To achieve better coordination and collaboration across various sectors and effectively tackle infectious and non-infectious diseases at the human-animal-environment interface, we recommend that the Government of Bangladesh incorporate and enforce One Health initiatives at all administrative levels, including Division, District, and Upazila levels in Bangladesh.

The growing recognition of the interconnectedness between human, animal, and environmental health reflects the complexity of 21st-century challenges and underscores the importance of the One Health approach. One Health is a feasible, affordable, and sustainable strategy for achieving the best possible health for humans, animals, and their shared environment[1]. World Bank estimates that a ten-year zoonotic disease outbreak may cost USD 20 billion in direct expenditures and cause indirect economic losses of over USD 200 billion globally[2]. One Health offers significant advantages such as enhanced human and animal health, improved disease control, social and cultural advancements, environmental protection, economic benefits, and better data quality and quantity. Moreover, the One Health approach can address a variety of health-related issues that affect humans, animals, and the environment, such as re-emerging, endemic, and emerging zoonotic diseases, vector-borne illnesses, neglected tropical diseases, food security and safety, antimicrobial

resistance, environmental contamination, and climate change, including non-communicable diseases and facilitates the exchange of information and resources across diverse scientific disciplines, thus benefiting all fields. One Health strategy has been implemented for regulating zoonotic diseases such as rabies and tuberculosis for a few decades. To solve issues under the One Health concept, the Food and Agriculture Organization (FAO), the World Health Organization (WHO), and the World Organisation for Animal Health have collaborated since the beginning of 2000[1]. Hence, holistic and interdisciplinary methods are necessary for solving complex health issues, especially in nations with inadequate resources.

Bangladesh is a densely populated South Asian nation with a nearly 171.74 million population and an average density of 1 163 persons per square kilometer[3]. Although public health has significantly improved over the last several decades, Bangladesh is considered a significant global hotspot for zoonotic disease transmission. The Government of Bangladesh identified six diseases as priority zoonotic diseases during an One Health workshop, including rabies, anthrax, brucellosis, Nipah virus, zoonotic tuberculosis, and zoonotic influenza[4]. However, limited studies were conducted on the One Health approach despite the communities' vulnerabilities to zoonotic diseases, AMR, detrimental environmental impacts, and food insecurity. This article examines the current state, prospects, and obstacles of One Health in Bangladesh and offers suggestions for advancing One Health in practice within the nation.

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2. One Health status in Bangladesh

Bangladesh was the first nation in the South Asian Association for Regional Cooperation and Association of Southeast Asian Nations regions to develop a strategy document for One Health in 2012[5]. One Health Bangladesh was founded as a small professional organisation under the guidance of the Institute of Epidemiology, Disease Control and Research, the Ministry of Health & Family Welfare, the Ministry of Fisheries and Livestock, Chittagong Veterinary and Animal Sciences University, and International Centre for Diarrheal Disease Research, Bangladesh. One Health Bangladesh received funding for the action plan and strategic framework from the World Bank, United Nations Children's Fund, WHO, FAO, and the UN System for Influenza Coordination in 2012[6]. The strategic framework sets the course for preventing, predicting, and managing emerging, re-emerging, and high-impact infectious diseases at the interface of humans, animals, and ecosystems in Bangladesh. The framework has identified a total of nine components for the execution of diverse activities that involve pertinent stakeholders[6]. After assessing the accomplishments, capabilities, deficiencies, and obstacles related to One Health initiatives in Bangladesh, a revised framework incorporating seven key components was introduced, which include: 1) Institutional governance and program management; 2) Coordinated surveillance; 3) Coordinated outbreak investigation and response; 4) Transdisciplinary research; 5) Networking and partnerships; 6) Strategic communication and advocacy; 7) Capacity building[7].

Subsequently, developing these strategies, several initiatives have been made, with an Inter-Ministerial Steering Committee and a One Health Secretariat establishment in 2016. These initiatives include live bird market surveillance for avian influenza, human anthrax surveillance data sharing publicly through the Institute of Epidemiology, Disease Control and Research website, disease-specific (Influenza) outbreak control and prevention strategy, and multi-hazard public health emergency contingency plans have been developed[7]. Furthermore, several multidisciplinary collaborative research projects have been conducted at the human-animal and ecosystem interface, as well as several training programs were introduced for capacity building, such as field epidemiology training program (Bangladesh), Wildlife Investigation in Livestock Disease and Public Health training in collaboration with Centers For Disease Control and Prevention and FAO, respectively[6].

Yet, there is a lack of sufficient trained One Health staff, applied epidemiology training opportunities, priority research areas identification, non-coordination, and translation of research outcomes into policy and practices. Furthermore, there exists a deficiency in the formal framework of the integrated monitoring system, encompassing epidemiology and laboratory proficiency across various domains (human, animal, and forestry)[7]. Also, the

strategies exclude matters extending beyond infectious diseases, such as antimicrobial resistance (AMR), foodborne illnesses, and non-communicable diseases within the One Health agenda[6]. Additionally, there are insufficient contingency plans and Standard Operating Procedures for the investigation and response to priority zoonotic disease outbreaks and insufficient inter-departmental coordination for joint outbreak investigation and response in Bangladesh[7].

3. One Health opportunities in Bangladesh

Approximately 43.6% of the nation's labour force works in agriculture and 25% of the population is directly involved in livestock keeping, interacting daily with millions of calves, sheep, poultry, goats, and other animals[6]. In the past several decades, there has been an increase in the closeness of domestic animals, wildlife, and human populations because of human population growth and intrusion into forested regions. Additionally, there is a lack of public knowledge regarding zoonotic diseases, insufficient resources[8] and inadequate sanitation and hygiene conditions, increasing individual exposure to zoonotic diseases. It is also usual to sell and slaughter sick animals in Bangladesh. Farmers, farm labourers, butchers, and employees in live animal markets are particularly vulnerable to regular animal contact. In Bangladesh, highly pathogenic avian influenza viruses have caused periodic epidemics in chickens, and over 550 outbreaks have been documented since 2007[8]. Over 300 human cases of the Nipah virus have been reported since 2001[9], and human anthrax cases are discovered annually[10]. The prevalence of zoonotic diseases is not adequately known due to limited resources, little research and monitoring. There is also lacking of understanding of the total risk of zoonotic diseases on public health disease emerging causes. To identify the knowledge gap and support the development of solutions, a deeper comprehension of the effects of zoonotic diseases and related variables on public health is required.

Bangladesh is also highly vulnerable to AMR, increasing the global risk of death and economic impact. Antimicrobials are readily accessible as over-the-counter medications in many nations, and Bangladesh is no exception. The existence of a pluralistic healthcare system, which includes unqualified providers in the informal sector, creates complications[11]. Effective interventions to stop the emergence and spread of AMR depend on laws and policies that encourage the reasonable and proper use of antibiotics. In compliance with the WHO Global Action Plan standards, Bangladesh has recently established a National Action Plan to limit AMR. Comprehensive data on Bangladesh's present AMR condition in humans, animals, and the environment are required for NAP to organise and coordinate efforts across the sectors[11].

Furthermore, contaminated food is a significant public health

concern in Bangladesh, and foodborne diseases affect more than 30 million people annually[12]. The environment, human health, and animal health are associated with food and water security and safety, and the multidisciplinary framework of One Health can handle these issues effectively.

4. One Health challenges in Bangladesh

Both human and animal health professionals have achieved some awareness of health concerns, yet there are several implementation-related obstacles to overcome in Bangladesh. Inadequate coordination of stakeholders and the required legislation for inter-sectoral collaboration are among the most significant barriers. The lack of routine sharing of surveillance data among specific sectors led to a strategic communication gap[4]. Even while research has advanced significantly, there are still inadequate resources to conduct long-term studies (FAO, 2024). Other challenges include inadequate collaboration among various stakeholders, insufficient resources and logistical support for research and surveillance work, a lack of synchronised and sustainable funding from national and international sources, and a lack of emphasis on evidence generation, leading to insufficient proof[6]. Hence, inadequate funding limits the scope of programs and keeps them from reaching their full potential.

The failure of stakeholders to acknowledge and grasp the concept of One Health hinders the integration of multiple industries and diminishes the efficacy of One Health strategies. Finally, professionals in disciplines must pursue ongoing education and training to develop the skills necessary to implement the ‘One Health’ idea. The training to address this issue is either insufficient or not given high priority, although it is currently a priority in every part of the world and restricts the potential results for One Health[6].

5. Way forward

The successful identification, prevention, and response to health hazards necessitate coordination, cooperation, communication, involvement of local communities, capacity building, and collaborative research across multiple sectors. The policymakers and professionals in the health and environmental sectors should collaborate to integrate the One Health concept in Bangladesh. This collaboration should aim to institutionalise One Health within government and educational systems and engage the communities actively. Governments should address health challenges decisively, making biodiversity and ecosystem health, alongside human and animal health, a priority in their development agendas. By incorporating One Health principles into budgeting and sectoral benefit distribution, they can more effectively tackle these issues.

Achieving the Sustainable Development Goals necessitates adopting One Health as an overarching framework.

6. Conclusions

Bangladesh has been cited as an example of initialising One Health in South Asia. However, there is a notable deficiency in cooperation and coordination across various sectors, including the environment, wildlife, agriculture, and health. The environmental, veterinary, and health departments usually work independently from one another, which prevents cooperation and results in disorganised efforts. Therefore, it is critical to encourage active participation within current institutional frameworks to advance inclusion across all sectors.

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The authors contributed to this article in their personal capacity. The views expressed are their own and do not necessarily represent the view of the institutions they are affiliated with.

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The authors declare that there is no conflict of interest.

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The data supporting the findings of this study are available from the corresponding author upon request.

Authors’ contributions

Ishra R conceptualized and designed the study. Ishra R and Md Haque A wrote the initial draft of the manuscript, then critically reviewed the manuscript and refined it. All authors have read and agreed to the published version of the manuscript.

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