

One Health, One Future: Synergy in Strengthening India's National Public Health Systems

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Abstract

WHO defines the One Health approach as a concept that promotes a trans disciplinary, cross-sectoral, and collaborative framework for linking and coordinating human health, animal health, and the environment. In this respect, this approach is quite relevant in India due to the increased prevalence of zoonotic diseases caused by India's vast geographical area, more variable types of wildlife, a large number of cattle and other livestock, and a high human density. The outline of the National One Health Mission in India is to maintain health agendas coherent via intersectoral coordination, to reinforce current One Health initiatives, as well as to identify deficiencies. This research paper aims to understand the implication of the National One Health Mission in improving the sustainability of the public health system and containing the risks of diseases in India. Based on the literature review and the data obtained from 12 articles, the paper aims at discussing the context, as well as the accomplishments and barriers of the mission. Altogether, the mission has disease surveillance, environmental monitoring, and outbreak investigation, and the study shows that these factors are of huge value in the sustainability of public health. Nevertheless, difficulties like scarcity of funding, poor management, and integration amongst sectors remain an issue to this day. The findings thus argued that there is a need to implement the above-identified challenges, based on policy reforms; resource development; and multisectoral collaborations for the achievement of the mission. The study offers useful information on the effects and the difficulties observed during the formulation and implementation of the National One Health Mission and thus helps in stressing the need to improve on fares, policy guidance, and practice to obtain the desired aimed public health gains and disease prevention results.

INTRODUCTION

An Integrated Approach: One Health

The One Health approach has been defined by the World Health Organization WHO as a concept that seeks to approach, interconnect, and coordinate the information relating to public health, animals, and the environment systematically. This approach is essential in the prevention, early identification, early warning, and combating of major health risks that are global like COVID-19 (WHO, 2022). One Health in its essence tries to involve various sectors, fields, and communities of society in solving issues in question and applying new and futurological concepts in their prevention. One Health incorporates the health of animals, especially pets, and the environment of the people inhabiting it. It is useful, especially for food and water safety and quality, nutritional and caloric content, disease sources such as flu, rabies,

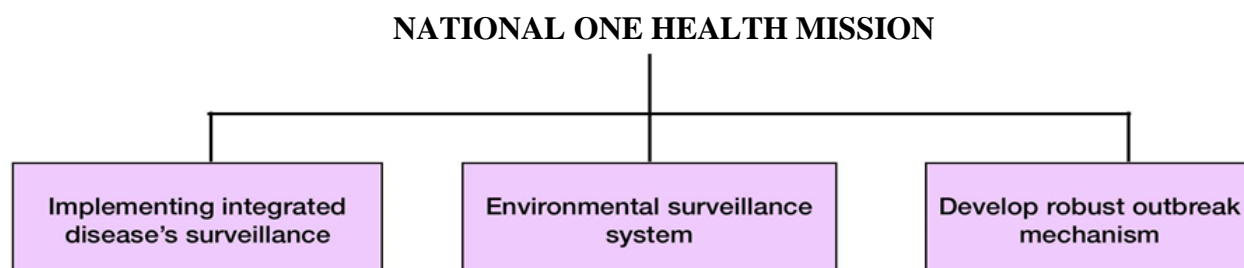
and Rift Valley fever, pollution, and antimicrobial resistance. Thus, it supports the development of a strengthened interconnection that is vital for managing multifaceted public health issues.

One Health in India

In India, One Health is a crucial concept given the country's diverse wildlife, large livestock population, and high human population density, all of which heighten the risk of inter-compartmental disease spread (One Health Mission: Unifying Health Strategies for India's Well-being, n.d.) Thus, the time has come for all stakeholders to come under the banner of united health strategies for wellbeing of India. Hence, these factors and the complexity of the Indian ecosystem put the country's effort in a perspective that requires strong and coherent integration of sectoral strengths to address public health threats adequately. Outbreaks like the current COVID-19, Lumpy Skin disease in cattle, and Avian Influenza and Monkey Pox among other diseases show that the solution to human, livestock, and wildlife disease control must go hand in hand. The National One Health Mission in India seeks to harmonize health-related agendas through inter-ministerial coordination and support, aiming to align, strengthen, and coordinate existing One Health activities and address any gaps. (One Health Mission: Unifying Health Strategies for India's Well-being, n.d.)

National One Health Mission

The National One Health Mission in India focuses on several key areas:



1. Integrated Disease Surveillance: This includes developing detection mechanisms, incorporating clinical/epidemiological details, and employing surveillance data from other programs for early and accurate diagnosis of diseases (One Health Mission: Unifying Health Strategies for India's Well-being, n. d.).
2. Environmental Surveillance System: Setting up surveillance systems of diseases that are used by identifying the pathogens and diseases in humans, animals, and wildlife. This system includes monitoring sewage, vectors, milk, animal markets, water sources, abattoir discharge, and airports (One Health Mission: The Strategies for Effectively Strengthening and Converging Health Outcomes for India's Health and Well-being, n. d.).
3. Outbreak Investigation Mechanism: Improving the well-coordinated structures for proper and quick detection and further tackling of diseases affecting humans, animals, and wildlife. This includes national and state-level outbreak response teams This is effectively underlined by the fact that 'some of the identified strategies are still quite new, hence the need to continue reviewing and strengthening them with a unifying health strategy view on India well-being n. d.).

Critical enabling activities of the One Health Mission

As for enabling interventions for the one health mission, significant outcomes will be achieved as follows: Of these initiatives, many are ongoing and will be reinforced under the mission with several new activities that will enable achievement of the mission objectives. (One Health Mission: Unifying Health Strategies for India's Well-being, n.d.)

The National One Health Mission in India is focused on the integration and alignment of various health-related agendas in multiple sectors. Key aspects of the mission include:

1. State Pilots: These are state-level interventions aimed at readiness for One Health Mission by integrating the mission into the states' activities.
2. Disease Gap Prioritization Exercise: This exercise is aimed at checking the level of disease control and prevention in connection with One Health priorities such as zoonotic and transboundary diseases as well as potential epidemics. It is used to find deficiencies so that new and improved vaccines, therapies, and tests can be developed in the future.
3. Mapping of Existing Surveillance Programs: This entails conducting a review of disease surveillance at the state/ provincial/ national levels to determine common areas and possibilities of collaboration.
4. Mapping Laboratory Capabilities: Potential laboratories along with the existing ones are assessed based on their capacity, BSL-2, BSL-3, and BSL-4 level to further establish a network of disease control centers and pandemics in the country.
5. Mapping Institutional Capabilities: In this exercise, the different institutions starting from the government to the non-government organizations are supposed to evaluate how they have been supporting the One Health system.

The mission focuses on bringing together human health, animal health, and environmental health to ensure the improvement and development of a more efficient system of health in India.

Data Collection System

The National One Health's implementation calls for a strong data collection system. Key initiatives include:

1. Integrated Data Platform: A mechanism to facilitate the information exchange on the disease dissemination process in sectors and contribute to advancements in research, development, training, and response (One Health Mission: Unifying Health Strategies for India's Well-being, n. d.).
2. Federated Model: In sync with distributed data, the information is disseminated across stakeholder departments and enforced with Data APIs and other techniques (One Health Mission: Unifying Health Strategies for India's Well-being, n. d.).
3. Data Content: Such involvement includes surveillance activities that are correlated with care, disease status concerning the departments, cost for research and development, and preparedness (One Health Mission: Unifying Health Strategies for India's Well-being, n. d.).

Centre for One Health (CoH)

The CoH is collaborating closely with all stakeholders to enhance health and quality of life by implementing measures for the prevention and control of zoonotic diseases, guided by the "One Health" approach. This approach recognizes the interconnectedness of humans, animals, plants, and the larger ecosystems, all of which coexist in a complex and interdependent relationship.

The Centre for One Health implements national health programs such as

1. National Rabies Control Program (NRCP), Ministry of Health and Family Welfare, Government of India.
 2. National Programme for Prevention and Control of Zoonoses (Panzootics Control Zones)
 3. The National Programme for Prevention and Control of Snakebite Envenoming, abbreviated as NPSE.
- Apart from this, it is involved in investigations of outbreaks, teaching for EIS, and research and training in conjunction with other divisions of the National Centre for Disease Control (Centre for One Health - National Centre for Disease Control [NCDC], 2024). Building the synergy between sectors such as human, animal, and environmental health, One Health in India is also directing its response towards more effective solutions and prevention of disease.

OBJECTIVE

The main objective of the study is to assess the effectiveness of One Health concept as reflected by National One Health Mission of India for enhancing the public health systems' sustainability and reducing the disease risks and the challenges faced by India's National One Health Mission in implementing sustainable public health systems to manage diseases

METHODS AND MATERIALS

Evaluation of one health is the main objective of this study, as adopted by India's National One Health Mission, to alleviate the public health system's sustainability and contain disease threats. To achieve this objective, first, a literature review was carried out focusing on 12 articles that shed light on different dimensions of the implementation of the National One Health Mission as well as emerging issues related to it. To respond to the objective leading the study, a context analysis study was conducted.

A search was performed using Research Gate, Google Scholar, PubMed, and the official website of the Ministry of Health with publications from January 2011 to January 2024. Thus, the limitations of the study include the following: The possibility of publication bias and the ability to generalize results due to the varying nature of the populations studied in research articles. However, it is hoped that the work can contribute to an understanding of the effects of the program and of the issues that occur in introducing efficient and long-term approaches to disease control in India.

FINDINGS

The findings elucidated from an extensive synthesis of the available literature align with the beneficial roles of India's National One Health Mission in enhancing the sustainability of the country's public health systems. Based on the analysis of available literature, including Yasobant (2023) as well as Paliwal's policy (2023), it can be noted that the complex mission's approach, which includes education, governance, and communication about the risks of zoonotic diseases, implies the organization's readiness to address complex logics of the connection between human, animal, and environmental health. Thus, it can be concluded that by leveraging these strategies India would certainly be able to prevent future devastations like pandemics and manage disease outbreaks for the improved public health sustainability that aims at the overall improvement of human health and longevity. This mission aims to:

1. **Coordinate Disease Surveillance:** Adopt sound ways or epidemiological systems that would enable the human, animal, and environmental health sectors to detect possible outbreaks early (Yasobant et al., 2023; Impri, 2023; Raut et al., 2023).
2. **Strengthen Outbreak Response:** Develop functional outbreak investigation messages that include cr-

cross-sectional participation from human, animal, and ecological health to address diseases effectively (Impri, 2023).

3. Enhance Preparedness: Increase preparedness by combining laboratory facilities and personnel, procuring stocks, and enhancing awareness among the people (Impri, 2023; Chatterjee et al., 2016).

The National One Health Mission aims at dismantling sectoral approaches to humans, animals, and the environment through cross-cutting approaches. The rationale of this approach is to build capacity for sustainable development of existing health systems to face new health threats. The mission of Disease Surveillance and Control in these interconnected comprehensive spheres is formed by creating a system of coordinated data gathering that allows for the early identification and management of health threats. The mission fills the existing gaps with the help of cooperation based on the best assets of each sector. Supervision plays a major function in the first notice of diseases, incidence reporting, and control to enable a fast response to threats to health. Also, in the strategic vision, particular attention is paid to the creation of methods for monitoring the environment and the use of sentinels to assess the change in pathogen strains in environmental reservoirs. The outbreak response teams include national and regional units with adept abilities and equipment that efficiently coordinate with the local governments and people in managing the diseases.

Several initiatives in India demonstrate the potential of the One Health approach: Several initiatives in India demonstrate the potential of the One Health approach:

- 1. State Pilots:** Selected pilot interventions in different states establish the effectiveness in terms of sustainability and scalability, as the basis for scaling up the One Health interventions across the country (Impri, 2023).
- 2. Disease Gap Prioritization:** Screening and more A pointer to research in zoonotic and other priority diseases inform the undertakings towards eradication (Impri, 2023).
- 3. Mapping Existing Programs:** Familiarizing oneself with disease surveillance programs present at the current times across sectors contributing to it assists in synchronizing similar endeavors (Impri, 2023).
- 4. Building Data Infrastructure:** Thus, the development of an electronic data warehouse based on integrated data for different sectors of the disease (Impri, 2023).

Despite these efforts, the One Health approach in India faces significant challenges: Despite these efforts, the One Health approach in India faces significant challenges:

- 1. Policy Disconnect:** There is uncertainty regarding some sectors' relation with other current plans that exist, so the proper formation of policies that include human, animal, and environmental health (Impri, 2023; One Medicine vs One Health: Policy disconnect in India, n. d.; Chatterjee et al., 2016).
- 2. Cross-Sectoral Collaboration:** Essentially, it is challenging to establish and maintain strategic partnerships/intersectoral collaborations where the partners themselves have different organizational emphases (Mor, 2023; Asaaga et al., 2021).
- 3. Capacity Building:** HRD needs to be a continuing process with interdisciplinary competencies (Yasobant et al., 2023).
- 4. Resource Limitations:** These are areas where funding and resources that are sustainable for infrastructural development, particularly training for those doing disease diagnosis and surveillance are critical.

To overcome these challenges, several strategies are essential: To overcome these challenges, several strategies are essential:

1. **Strengthening Policy Coherence:** Revise and use One Health as the foundation for sectoral policies and involve respective ministries in the multi-sectoral approaches (Impri, 2023; One Medicine vs. One Health: Policy Disconnect in India | CABI One Health, n.d.).
2. **Promoting Inter-Sectoral Communication and Collaboration:** Foster sectorial communication and meet-ups to ensure alignment of strategies and to be sure of each other (Asaaga et al., 2021; Mor, 2023).
3. **Investing in Workforce Development:** Introduce oriented training programs to create One Health competent professionals and foster interdisciplinary interactions.
4. **Community Engagement:** Support the population to understand why One Health is crucial and prevent behaviours that promote the likelihood of getting diseases.

It is in this regard the One Health Mission in India has made progress pointing to the country's determination to create sound and integrated health systems to confront current and future health threats. The mission enhances intersectoral and interdisciplinary work toward the enhancement of the health of the nation. The opportunities highlighted point to the fact that India possesses the latent to considerably augment its disease prevention, control, and preparedness capacity and readiness by merely employing discipline, fusion of efforts, and ideas. India has an opportunity to strengthen the One Health approaches and promote the path toward the successful future of public health interests.

DISCUSSIONS

The concept of India's National One Health Mission could offer good hope for strengthening the country's Public Health Systems. From the mission, education, the governance agenda as well as communication are evident thus making them fit the broad strategic theme of human, animal, and environmental health as a system. Looking at it from my camp as a public health enthusiast, one could argue that this is a noble cause of trying to prevent the occurrence of another major outbreak in the future and being proactive if one were to consider disease control and prevention as a cycle. This assertion correlates with a study by Yasobant et al. This study also highlights patients' and caregivers' perspectives towards the development of a sustainable framework to reinforce the One Health approach in India to enhance the public health system. Similarly, Paliwal's policy update (2023) also revealed the necessity of cooperation among the sectors and changes in the Indian policies to build a stronger defense against future pandemics. Still, as has been revealed by the literature on the subject, the effectiveness of the National One Health Mission in India beckons by several rather serious obstacles that affect the project profoundly. Studies by Young et al. (2021) and Chatterjee et al (2016) identify how evolving challenges of resource scarcities, governance structures, and; institutional path dependencies. The same observation is made by Daniele Yopa et al. (2023) who carried out a study on the challenges and opportunities of the One Health approach in developing countries focusing on cross-sectoral interventions and communication. Moving forward, preventive strategies based on scientific and communal information and cooperation would be let alone significant in dealing with these hurdles and optimizing the utilization of India's National One Health Mission. The Failure of Policies The above-discussed challenges are not easy to overcome, but by ensuring policy change, adequate resource mobilization, and integrating the multi-stakeholder system, the stakeholders may enhance an ideal strategic framework for shaping up the future public health sector in India. This sentiment is the same in the article by Raut et al., (2023) where the call for a synergy of efforts

and coordination of partnerships for tackling the multiple connections among humans, animals as well as ecosystems is made.

CONCLUSION

Overall, this research paper highlights the importance of India's National One Health Mission in boosting the sustainability of the public health systems of the country. By evaluating the mission from various perspectives presented in the literature, it can be concluded that due to the four-fold model that comprises education, governance, and communication, this mission may respond to the interconnection between the different aspects of human, animal, and environmental health. However, the literature also does not shy away from identifying the numerous and significant barriers that the mission faces such as resource issues, governance issues, and institutional considerations. Nevertheless, the results indicate that timely actions based on scientific data and stakeholders' participation are critically important for addressing these issues and enhancing the mission's effectiveness. Thus, through policy advocacy and policy change, resource mobilization, and multisectoral partnerships, stakeholders may overcome these barriers and build a better sustainable, and equitable public health system in India. Finally, it is crucial to address these challenges in enhancing the policy direction and implementation of India's National One Health Mission for achieving targeted public health improvement and effective disease prevention.

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