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Traditional Medicine**FITM POLICY BRIEF**

India's One Health Framework: Harnessing Indian Systems of Medicine

Introduction

The COVID-19 pandemic highlights the power zoonoses have to disrupt global public health, economies and food systems. COVID-19 however, is not the first pandemic. The last two decades has witnessed the emergence of several new pathogens, each occurring with a severity stronger than the last. The zoonotic origin of most emerging pathogens, the connected complexity of drivers involved in the associated increases in bacterial and fungal infections creating anti-microbial resistance (AMR) to available drugs has brought out the imperativeness of a holistic approach. Consequently, as compared to the narrow focus on veterinary epidemiology, the One Health approach, which unites human health, animal health and environmental or ecosystem health through a multi-sectoral, collaborative transdisciplinary framework, is being adopted globally. At the national level, it calls for coordination and collaboration between several agencies that are administered by different ministries, across both Central and State governments.

As India's policy response to One Health takes shape, it is to be seen if it draws from the knowledge reserves of Indian Systems of Medicine. With India's extensive network of traditional medical practises and knowledge systems on zoonoses and livestock that emphasises on the interconnectedness of environmental, human, and animal health and sustainable holistic curative and preventive responses, this Policy Brief aims to explore how India's One Health policy stands to gain with the inclusion of knowledge and practice of Indian health traditions.

One Health Conceptual and Operational Framework

The conceptual framework has evolved since 2004 when the symposium on 'Building Interdisciplinary Bridges to Healthina Globalized World' organised by the Wildlife Conservation Society (WCS) brought out the Manhattan Principles and coined 'One World One Health' now generally adopted as One Health¹. World Bank (2020) describes One Health as 'a framework for enhanced collaboration in areas of common interests (intersections),

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with initial concentration on zoonotic diseases that will reduce risk, improve public health globally and support poverty alleviation and economic growth in developing countries'. The One Health High- Level Expert Panel (OHHLEP) defines it as an 'integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent. The approach mobilizes multiple sectors, disciplines and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development'².

The operational framework definition of One Health, as provided by World Bank (2018) is 'collaborative approach for strengthening systems to prevent, prepare, detect, respond to, and recover from primarily infectious diseases and related issues such as AMR that threatens human health, animal health, and environmental health collectively, using tools such as surveillance and reporting with an endpoint of improving global health security and achieving gains in development. While using infectious disease/AMR as a starting point, this definition and approach is expandable for wider scope (e.g.,

water and soil pollution that have animal and environment connections)'.

Rationale for Action

The urgency of a One Health Framework is based on the demonstrated threats to both health and economic security. Six major outbreaks of zoonoses between 1997 and 2009 caused economic losses of \$80 billion, and if these events could be prevented, a saving of \$7 billion per year would have resulted (World Bank, 2012). In the last decade too, the increasing severity of pandemics demonstrates the continued potential to impact human development (Table 1)

The devastating impact of AMR is no less threatening. A wide range of infections, with decreasing treatment options, is leading to increased morbidity and mortality. At least 700,000 people die each year due to drug-resistant diseases. This includes the increasing resistance to current antibiotics, antivirals, antifungals, and antiparasitics in treatment of zoonoses. As seen in Table 2, the lack of emphatic action in mitigation may have substantial impact on health and economy.

India's Policy Framework on One Health

Clearly, India stands to be impacted by an effective One Health strategy. India has the highest livestock population in the world,³ along

Table 1 : Estimated Loss from Pandemics (2000-2022)

Pathogen causing pandemic	Year	Cases	Deaths	Estimated loss (USD)
SARS CoV-1 (OIE, 2020)	2002-03	8429	813	41.5 billion (Bhatia, 2021)
Influenza H5N1 (OIE, 2020)	2004-2006	486	282	20 billion(FAO,2008)
Influenza H1N1 (WHO, 2010)	2009		18500	50 billion (Bhatia, 2021)
MERS CoV (WHO, 2020)	2011	2562	881	2.6 billion (in Republic of Korea)
SARS CoV-2 (till 18th November, 2022) (WHO 2022)	2020	633,601,048	6,596,542	\$12.5 trillion through 2024 (Reuters)

Source: Author's compilation based on various sources

with a very high burden of AMR in humans and livestock⁴. The COVID-19 pandemic demonstrated the susceptibility to zoonoses and India's response following the global call for initiatives in One Health in the aftermath of COVID-19, has been swift. The Union Budget of 2021 specifically allocated for 'One Health'⁵. The One Health consortium consisting of 27 organisations led by DBT-National Institute of Animal Biotechnology, Hyderabad, soon followed. However India's efforts at controlling zoonoses have been ongoing for a longer period. India had established a National Standing Committee on Zoonoses way back in the year 1980. In 2008 the Ministry of Health and Family Welfare, the Ministry of Agriculture and the Wildlife Institute of India, has launched 'The Roadmap to Combat Zoonoses in India (RCZI)⁶ initiative. The Department of Biotechnology's National Institute of Animal Biotechnology (NIAB), also launched the Centre for One Health on November 3, 2020, with the manifesto "Animal Health for Human Welfare"⁷. These initiatives are either research collaborations or action-based collaborations wherein institutions like ICMR or ICAR have collaborated for joint research programmes on zoonotic research.

Table 2: Global losses from impact of AMR by 2050

Impact on GDP	1.1 - 3.5 % reduction in GDP
Impact on global poverty:	28 million
Impact on world trade	To shrink between 1.1-3.8 %
Impact on healthcare costs	Global increase of \$300 bn- \$1 tn
Impact on livestock output	Decline of 2.6% - 7.5% per year

Source: World Bank, 2017, *Drug-Resistant Infections: A Threat to Our Economic Future*

India's key sectoral policies affecting zoonoses and AMR management include the following:

- National Health Policy (2017)
- Draft National Pharmaceutical Policy (2017)

- National Policy on Treatment of Rare Diseases (2018)
- National Vaccine Policy (2011)
- National Livestock Policy (2013)
- National Wildlife Action Plan

The fundamental aspect of the One Health framework, both at the national and the international level, has been surveillance, monitoring and control of zoonoses and AMR. However, even as such policies and programmes in the past and the present have been framed, there has been little visible effort in India at drawing from knowledge and practice of tackling zoonoses or AMR drawn from traditional health practices for humans, animals, livestock and the environment. This becomes pertinent especially given that, unlike several countries, India has had a thriving health system that sustainably balances human and animal health through centuries.

Indian Systems of Medicine: Conceptual and Practical Relevance of Ayush for One Health

Reflections on the concept of 'One World One Health' can be identified strongly in the health practices of India. One of the principles enunciated by *Charaka Samhita* (one of the comprehensive texts of Indian Systems of Medicine), namely "*Loka Purusha Sama Siddhanta*", translates as - all that exists in the universe also exists in an individual. *Purusha* is the epitome of the *Loka*; ⁸. *Ayurveda*, the most well-known of the Indian Systems of Medicine itself is a study of the continuous association between the living and its surrounding environment to maintain a state of balance and health. The science of *Ayurveda* emphasizes on the broader goal of universal care and planetary health, harmony between the mind, body, and spirit as a theoretical framework and its operational framework includes universal health care and global wellness.⁹

Zoonotic diseases mitigation, long been part of veterinary and animal husbandry practices, were referred to in the Vedic and Puranic texts and extended beyond Epic

Box: AMR Mitigation with One Health Approach: Ayush for Livestock Management

The excessive use of antimicrobials in agriculture and livestock and the associated risks to humans and the environment has become a global concern. With the highest cattle population (305 million in 2021) in the world India will be deeply impacted by sustainable health management of its livestock. The use of phyto-pharmaceuticals is one such approach. In the backdrop of several studies, including Wynn and Fougere (2007), Sar et al (2018), (Walusansa et al, 2021) and Matua et al (2020), having demonstrated the impact of ethno-veterinary herbal medicine in combating AMR, the use of Ayurvedic Veterinary Medicine (AVM), could be a game changer. AVM, mostly drawn from poly-herbal formulations, reduces the use of drugs, especially antibiotics, thereby also reducing its residues, for example in milk produced by bovine, and will go a long way in coping with AMR. At the moment, the usage of Ayurveda for livestock is being promoted by National Dairy Development Board (NDDB), although data on the extent of usage for livestock health is minimal.

periods. The understanding of animal health with its associated risks is well demonstrated in veterinary health textbooks, which, for example, explain a variety of edible products with the indication of the different properties suitable for animals of a given temperament, compartment and health status, living in a particular climate and at a particular time of the day.¹⁰ This is particularly relevant in the face of large scale industrial livestock currently managed with unsustainable feed practices thereby transferring health risks to consumers.

Shalihotras Ashwashastra (1800 BC) itself is considered the first work on Veterinary science¹¹. Similarly, texts like *Charak Samhita's* chapter 'Janopadhodhwansa', dedicated to epidemics¹² lay down the interlinkage of air, water, country and diseases in animals and infectious diseases due to the ingestion of decayed and infected meat. A reference to infectious diseases is also found in *Ayurveda*. The cause for infectious diseases (Agantuk Roga) is described as microscopic organisms (bhutas), cutaneous contact, and polluted air. *Mrugayurveda* manuscripts mention various aspects of veterinary care in livestock health management¹³. Other texts like *Hastayurveda* (1000 BC) by Palakapya, the most ancient text

on Elephants, *Matsyapurana*, *Garudapurana*, *Agnipurana*, *Brahmanandapurana* and *Lingapurana* too have veterinary information. *Arthashastra* by Kautilya gives a detailed account of the welfare practices of livestock and regulations for the protection of wildlife. *Pashuvaidyamattuvagadam*, a Tamil book based on ancient Tamil palm leaves manuscript, discusses over 250 diseases in cattle and their management¹⁴.

The usage of traditional medicine systems by India's livestock industry is still prevalent today, although data on the same may be negligible.

Conclusion and Recommendation

One Health approach is particularly relevant in food safety, control of zoonotic diseases, neglected tropical diseases, environmental health and AMR. Implementing a 'One Health' Framework consists of multi-disciplinary systems collaboration. At present a National Expert Group on One Health, a National Institute of One Health at Nagpur, Maharashtra and Integrated Public Health Laboratories are the three contemporary policy initiatives responsible for popularising 'One Health' in India. It is not known if Ayush institutions are a part of either of the above-mentioned policy initiatives. Given Ayush system's relevance in the conceptual and

practical application for One Health, its potential for India's One Health programme may not have been capitalised on. As demonstrated earlier Ayush's role in biosecurity and biosafety, zoonoses management, and AMR mitigation can prove to be a significant highlight of India's unique and successful approach towards One Health. It is therefore recommended that:

India's Ayush research institutions be included in the current One Health consortium consisting of 27 medical and veterinary research institutions.

The National Expert group, which is a multi-sector transdisciplinary collaborative group engage Ayush institutions for a India's One Health Strategy

Documentation and research through clinical data at the state and district levels, with institutions including clinical medicine, veterinary and wildlife institutions, as well as environmental health and private (including corporate) stakeholders on the impact of traditional medicines in the mitigation of AMR be undertaken.

Greater usage of Ayush veterinary medicine in livestock management be promoted with institutional support.

While the Memorandum of Understanding (MoU) between the Department of Animal Husbandry and Dairying (DAHD), the Ministry of Fisheries, Animal Husbandry and Dairying and the Ministry of AYUSH¹⁵ is a step towards this direction, holistic integration of Ayush would serve India's One Health strategy. This could, in the long run, serve as an example of the practical relevance of Ayush for One Health.

Endnotes

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- ¹⁵ <https://pib.gov.in/PressReleasePage.aspx?PRID=1710389>

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