

# Preventing Anti-Microbial Resistance (AMR)

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# Actionable Area

Adopt One Health (OH) Approach to prevent the spread of antimicrobial resistance and unregulated use of antibiotics.

## Issue

- India is currently facing many health threats such as antimicrobial resistance, environmental health hazards, food safety risks, and most importantly, zoonotic diseases such as Nipah, Avian Influenza, Scrub Typhus, Congo fever, Kyasanur forest disease, COVID-19, and Leptospirosis that grossly impact country's economy. The recent pandemics have exposed the gaps in public health policy, and the government is prepared to commit to the One Health Approach and invest more in public health infrastructure. Further, as challenges have increased in recent years, the experts advocated the One Health Approach not only to cope with the pandemic but also to manage the infodemic by promoting the timely dissemination of accurate information. Thus, the healthcare sector is coming under increasing pressure calling for urgent attention.
- Scientists have observed that more than 1.7 million viruses are circulating in wildlife, and many of them are likely to be zoonotic. This implies that unless there is timely detection, India risks facing more pandemics in times to come. "Anthropozoonotic" infections get transferred from humans to animals. The transboundary impact of viral outbreaks in recent years such as the Nipah virus, Ebola, Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), and Avian Influenza has further reinforced the need for us to consistently document the linkages between the environment, animals, and human health.



**Zoonotic diseases are responsible for an estimated 2.5 billion cases of illness and 2.7 million deaths worldwide each year.**



Source: UNDP

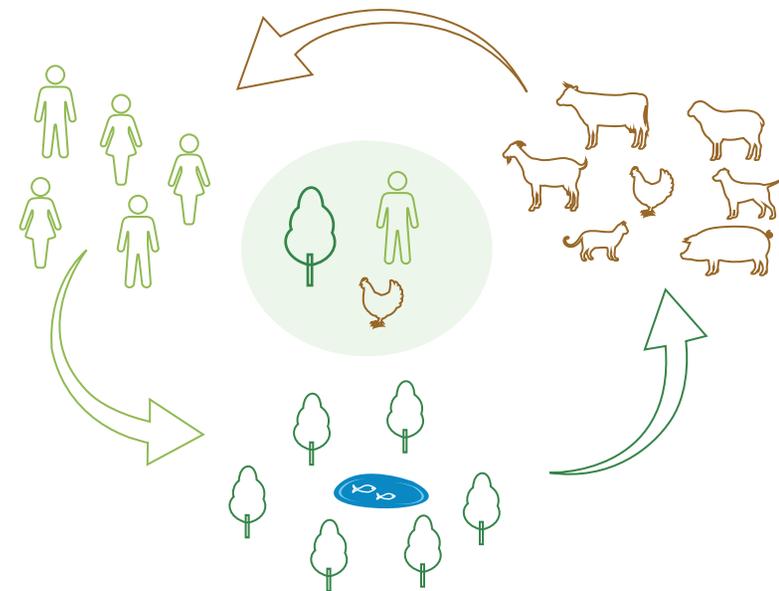
- AMR (Antimicrobial Resistance) is a complex, multifaceted problem that threatens human and animal health, the global economy, and national and global security that demands an integrated and holistic multi-sectoral One Health(OH)approach. The rates of AMR have been rising disproportionately in the past few decades. India holds the fourth position in the world when it comes to antibiotic consumption by food animals, accounting for 3% of the global consumption. Adopting an integrated approach to food safety throughout the food chain “from farm to fork” is critical to prevent foodborne diseases and other safety hazards. With the implementation of the Food Safety and Standards Act, 2006, India was able to lay down science-based standards for foods to ensure the availability of safe and wholesome food for human consumption. The areas for OH intervention for preventing food safety hazards include outbreak investigation of foodborne illness, laboratory network for pathogen identification, joint research and surveillance of the foodborne pathogen, and improving animal health to help minimise food contamination infectious pathogens, training, and demonstration programs on food safety measures.
- The field of climate change represents an excellent opportunity for researchers to work across disciplines to integrate diverse data sources, develop cross-cutting methodologies, and answer questions about the broader effects of environmental health on human health and animal welfare. The control of the vector-borne disease cannot be addressed without considering the impact of natural and man-made environmental changes on patterns of disease vector proliferation.
- To prevent the spread of new animal-borne diseases and save people from becoming victims, the OH system must be implemented. It refers to a system in which different sectors collaborate and communicate to improve public health results. “It is impossible to preserve human health without taking into account the effects of human activities that disturb ecosystems, intrude on habitats, and accelerate climate change. Pollution, vast deforestation, intense cattle production, antibiotic overuse, and present systems of growing, consuming, and exchanging food are all examples of these activities.
- The Wildlife Conservation Society (WCS) introduced the term “One World-One Health” in 2007 along with 12 recommendations (the Manhattan Principles) that focused on establishing a more holistic approach to preventing epidemic disease and maintaining ecosystem integrity.
- To achieve the ‘One Health’ vision, challenges on veterinary manpower shortages, restricted/improper disease reporting, the lack of information sharing between human and animal health institutions, and inadequate coordination on food safety at slaughter, distribution, and retail facilities, and others must be addressed.
- While there is an increased focus on preventing and predicting diseases in human health, the animal health sector lacks proper disease prevention, reporting, surveillance, forecasting, and laboratory diagnosis. Another major challenge is setting up surveillance programs, and there is a lack of support from partners. Milder zoonotic diseases that pose a low and medium risk which when not addressed can convert into the major problem are not monitored. There is a lack of awareness. Wild zoonosis is a domain that lacks proper attention. One main challenge is that the collaboration and coordination among the stakeholders are not sufficient to adopt a standard One Health protocol.

# Status

## Government Initiatives

- Although the OH approach is in an early stage in India, there are many cross-cutting policies and regulatory measures that are operating and conducive for further development of the approach. Owing to the public health importance of zoonotic diseases in India, a National Standing Committee on Zoonosis was formed in 2007. The Food Safety and Standards Act, India, stipulates the limits for contaminants, naturally occurring toxic materials, antibiotic residues, pesticides, heavy metals, veterinary drug residues, etc. Government-initiated control programs for zoonotic and highly communicable diseases such as rabies, brucellosis, and food-and-mouth disease are also available. The Centre of Zoonosis, National Centre for Disease Control, India, has published a manual for handling zoonotic diseases.
- The Department of Animal Husbandry and Dairying (DAHD) has launched several schemes to mitigate the prevalence of animal diseases. Additionally, the government is working on revamping programmes that focus on capacity building for veterinarians and upgrading the animal health diagnostic system, such as Assistance to States for Control of Animal Diseases (ASCAD). India's National Action Plan (NAP) against AMR marks a significant step in terms of the government's convergent effort to tackle AMR issues. Recently, funds were sanctioned for setting up a 'Centre for One Health' at Nagpur.

## Human health, animal health and ecosystems are inextricably linked



### Human health

At least **60%** of all human diseases have their origin in animals



### Animal health

Diseases in food producing animals globally amount to a loss of **20%** in production



### Ecosystem

Any emerging disease in the last 30 or 40 years results from encroachment into wild lands and changes in demography (Peter Daszak, EcoHealth Alliance)

- The Indian Council of Medical Research (ICMR) initiated an Antimicrobial Resistance Surveillance and Research Network (AMRSN) in 2013 to generate relevant evidence on the extent of drug resistance, and nationally representative reliable data on AMR was not existent in India. The main goal of the AMRSN is to monitor the trends in susceptibility profiles of clinically important and pathogenic organisms of human health by including comprehensive molecular studies, creating data management systems and dissemination of information to stakeholders, and promoting intervention to reduce the AMR. In addition to the above, the Ministry of Health and Family Welfare, Government of India, initiated the Antimicrobial stewardship (AMSP) activities. As a part of this and in order to promote rational use of antibiotics among the healthcare providers, a series of sensitisation and training workshops have been organised in different healthcare facilities in the country for the benefit of the practicing clinicians. Standard treatment guidelines developed by NCDC for rational use of antibiotics have been made available to clinicians across the country.
- The Pashu Aadhaar system, also known as the Information Network for Animal Productivity and Health (INAPH), developed by the National Dairy Development Board (NDDB), was introduced in August 2019. The INAPH assigns a Unique Identification Number (UID) to each animal and keeps a record of all the necessary information about the bovines. This helps the government manage the country's vast numbers of livestock; now Government of India has tagged 14.62 crore livestock with a unique ID Number.
- The National Health Policy 2017 identifies antimicrobial resistance as a problem and calls for effective action to address it. National Action Plan on Anti-Microbial Resistance (NAP – AMR) 2017-2021 was issued by the Government of India. ICAR, in collaboration with FAO, established “Indian Network of Fishery and Animal Antimicrobial Resistance (INFAAR)” for AMR surveillance in pathogens from fish, livestock, and poultry. Presently 21 laboratories (18 from ICAR and 3 from universities) are partners of this program. It is proposed to expand the network gradually, thus making INFAAR a pan-India network to meet the national needs. Manual on Veterinary Drug Residue Analysis including antibiotics, 2018 was released by FSSAI.
- Kerala was the first state in the country to have ramped up efforts to control AMR, and this plan was guided by WHO and was launched in October 2018. It is called Kerala AMR Strategic Action Plan (KARSAP) and has been operationalised through a One Health response. Madhya Pradesh is the second state to have a plan for antimicrobial resistance. The Madhya Pradesh State Action Plan for Containment of Antimicrobial Resistance (MP-SAPCAR) focuses on a ‘One Health’ approach to contain AMR through six key strategic priority areas and multi-sectorial involvement.
- Recently a multi-disciplinary and multi-country collaborative research project had been sanctioned by the United Kingdom Research & Innovation (UKRI) under the Global Challenges Research Fund (GCRF), namely GCRF One Health Poultry Hub. It is for a period of five years for five intuitions in India, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai and Anand Agricultural University (AAU), Gujarat, along with medical partners Christian Medical College, Vellore, and Gujarat Biotechnology Research Centre (GBRC), Ahmedabad and Jawaharlal Nehru University (JNU), New Delhi.

## Private sector initiatives

- Many private players have adopted good practices in poultry and livestock management, creating a healthy environment under the complete supervision of veterinarians. The farmers are being trained in good practices, provided technical support, engaged in skill-building activities, and supported to increase their farm and off-farm productivity, yield, and incomes.
- Many Quick Service Restaurants (QSR's) source poultry from certified partners who follow strict safety measures, rear their chickens/meat products in bio-secure farms, and implement health & safety checks at every stage of the poultry rearing process. Every batch of chicken/meat sourced comes with a health certificate that details their health history through the entire rearing phase. Every single bird is inspected by a trained husbandry quality controller before it is butchered to ensure that the bird is healthy and disease-free. Additionally, there are also efforts being made by industry bodies such as the Confederation of Indian Industry and Industry partners who are building the capacity of food business operators on prevention and control of Avian Influenza.

## Vision 2030

- **Adopt One Health Approach for preventing fatalities among humans arising out of antimicrobial resistance and unregulated use of antibiotics.**
- **Prevent Human Health fatalities by strengthening capacity towards early prediction, detection, and diagnosis of zoonotic pathogens in wildlife, livestock, and human populations and data capture aligned to the One Health Approach. Ensure sustainable growth of workforce development and emergency response systems based on Scientific Research, Technology, and Infrastructure.**

# Pathways

## IMPLEMENTATION



**Enhance holistic partnership** for sustainable development, complemented by multi-stakeholder partnership across ministries, industry, non-government organisations, communities, society including pharma, poultry and meat sector, dairy sector, veterinary community wildlife experts, epidemiologists, research institutions, and testing labs in animal and human health, consumers and others to mobilise, share knowledge, expertise, technology, and financial resources.

**Implement Strategic priorities** under National Action Plan - Anti Microbial Resistance including, improving awareness and understanding of AMR through effective communication, education, and training, strengthening knowledge and evidence through surveillance, reducing the incidence of infection through effective infection prevention and control, optimising the use of antimicrobial agents in health, animals, and food

**Strengthen India's leadership** on AMR.

**Consolidate Disease Surveillance mechanism** for animal health & monitoring disease surveillance systems and information systems for animal productivity & animal disease reporting system. Strengthen the work on alternatives to antibiotics like herbal preparations, competitive non-pathogenic organisms (Lactobacillus & Saccharomyces), antimicrobial peptides, etc.

**Strengthen human resource development**, including Public Health Veterinarians, food microbiologists, environmentalists, fish microbiologists, and Medical Professionals for quality research, risk assessment, measures to combat AMR, quality slaughterhouse byproducts, quality food products, etc.

# Pathways

## POLICY



**Strengthen early warning systems** on global health risks through early detection, diagnosis, mitigation, and monitoring of the effectiveness of actions on Zoonotic and Anthroozoonosis diseases. Establish a single agency or framework that embraces all inter-disciplinary sectorial players under a single umbrella to carry forward the ‘One Health Cycle.’

**Standardise guidelines regarding antibiotic use**, limiting the use of antibiotics as over-the-counter medications, banning or restricting the use of antibiotics as growth promoters in animal livestock, and pharmacovigilance including prescription audits inclusive of antibiotic usage – in the hospital and community.

**Strengthen regulations on the usage** of antibiotics in animal health, plant health & human health and ensure harmonisation with each other. Leverage development and implementation of Antibiotic Stewardship programs.

**Develop the economic case** of sustainable investment that takes into account the needs of all countries and increases investment in new medicines, diagnostic tools, vaccines, and other interventions.

## KNOWLEDGE AND RESEARCH



**Enhance scientific research** and upgrade technological capabilities of resources and infrastructure related to AMR, Zoonotic Disease control, Hygiene, and Biosecurity Measures by encouraging innovation in these areas through public and private research and increasing development spending.

**Develop & disseminate guidelines** on best practices for slaughterhouses & informal market operations and create mechanisms to operate ‘One Health’ at every stage down to all levels.

**Increase the awareness** of farmers, livestock managers, and environmentalists regarding the One Health approach and zoonotic diseases.

**Promote research and study** on risk assessment on the use of animal origin products as agricultural inputs.

**Institutionalise a national disease registry** of zoonotic diseases.

**Ensure increased use of technology** to improve the living environment of animals and monitor and treatment of diseases. Organize prevention through increased vaccination coverage.