



सत्यमेव जयते
Satyameva Jayate
Ministry of Health

RAJASTHAN ACTION PLAN FOR CONTAINMENT OF ANTIMICROBIAL RESISTANCE

(RAPCAR)

2024



Jointly developed by

Departments of Medical & Health, Medical Education, Animal Husbandry, Fisheries,
Agriculture, Dairy, Environment & Climate Change, Food Safety and Drug Control




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Message

The launch of our Rajasthan State Action Plan for Containment of Antimicrobial Resistance (RASCAR) marks a significant milestone in our state's healthcare journey. Antimicrobial Resistance poses a serious global public health threat in this century. The misuse of antibiotics is the key contributor to the emergence of multiple resistant organisms, posing significant challenges to effective treatment options.

Collaborative and coordinated efforts across sectors are essential to combating AMR. I am pleased that all the relevant departments under the Government of Rajasthan have come together in collaboration with the National Centre for Disease Control, MHPW, GCR and developed this document adopting the One Health approach.

Our commitment to containing AMR is underlined by the comprehensive nature of the RASCAR, which not only aims to mitigate the spread of resistant organisms but also strives to promote responsible and judicious use of antimicrobial agents. This action plan is designed to provide clear guidance and strategies to healthcare professionals, veterinarians, policymakers, and the public alike.

I am hopeful that the implementation of this action plan will result in the responsible use of antimicrobial agents and help preserve the efficacy of these vital drugs for both present and future generations.

Gajendra Singh Khilnatar
Health Minister, Government of Rajasthan



Message

We are proud to present the Rajasthan State Action Plan for the Containment of Antimicrobial Resistance (RACP-AR), an essential framework addressing the critical issue of AMR with defined objectives and strategic interventions.

Our plan adopts a multi-faceted strategy that includes strengthening surveillance systems to monitor resistance patterns, promoting the rational use of antimicrobials, improving infection prevention and control, and promoting research and development to discover new treatment options. Public awareness and education are central to our efforts, as informed communities are better equipped to prevent misuse and overuse of antimicrobials.

A collaborative effort involving stakeholders across the human, animal, and environmental sectors will ensure the successful implementation of this action plan, ensuring the effectiveness of treatments and a robust healthcare system.

This action plan demonstrates Rajasthan's commitment to preserving the efficacy of life-saving treatments and securing a healthier future for the people of Rajasthan. I hope all the Departments actively participate in the implementation of this plan, as our concerted efforts will be the key to achieving meaningful progress in combating antimicrobial resistance.


(Sudhanshu Pant)

Gayatri Rathore
IAS



Principal Secretary,
Department of Medical, Health &
Family Welfare
Government of Rajasthan

MESSAGE

Antimicrobial resistance poses a serious threat to public health globally, and Rajasthan is no exception. With the increasing misuse and overuse of antibiotics, the efficacy of these essential medications is being threatened. A rise in infections due to multi-drug-resistant organisms can jeopardize patient safety and strain our healthcare resources.

I am honoured to announce the launch of the Rajasthan State Action Plan for Containment of Antimicrobial Resistance (RAPCAR). This document marks a significant step forward in our collective efforts to combat one of the most pressing health challenges of our time.

Our state action plan represents a comprehensive and strategic approach to address this urgent issue. It outlines key interventions, including strengthening surveillance systems, enhancing stewardship programs, promoting responsible use of antimicrobials, and fostering community awareness. By implementing these strategies, we aim to safeguard the effectiveness of existing treatments and ensure better health outcomes for our people.

This plan is the result of collaborative efforts involving healthcare professionals, policymakers, and stakeholders from various sectors. It reflects our shared commitment to improving the quality of care and safeguarding the health of our people. I encourage everyone to actively contribute towards the implementation of this action plan.

Together, we can make a significant impact in curbing antimicrobial resistance and safeguarding our future generations.


(Gayatri Rathore)

Acknowledgments

We gratefully acknowledge the guidance and oversight provided by Smt. Shubhra Singh, former Additional Chief Secretary–Medical and Health, Smt. Gayatri Rathore, Principal Secretary Medical and Health, Dr (Prof) Atul Goel, Director General Health Services, and senior officials from the National Centre for Disease Control, Ministry of Health and Family Welfare to develop the Rajasthan Action Plan for Containment of Antimicrobial Resistance.

This document is based on inputs provided by officials and experts from Rajasthan's State Department of Medical & Health; Medical Education; Environment and Climate Change; Animal Husbandry, Dairy, Fisheries; Agriculture; Commissionerate of Food Safety and Drug Controller; Rajasthan State Pollution Control Board; Rajasthan Medical Service Corporations Limited (RMSCL); Ayurveda and Indian Medicine; State Education Board; Public Health Engineering Department; State Food and Civil Supplies Corporation; Dr. B Lal Institute of Biotechnology, Indian Medical Association, Rajasthan; State Veterinary Council; AIIMS Jodhpur; State Government Medical College– Sawai Man Singh (SMS) Medical College in Jaipur, Rabindra Nath Tagore Medical (RNT) College in Udaipur, Government Medical College Kota, Santar Patel Medical College (SPMC) in Bikaner, Jawaharlal Nehru Medical (JLN) College in Ajmer, Dr. Sampurnanand (SN) Medical College in Jodhpur, United Private Clinics & Hospitals Association of Rajasthan (UPCHAR), USAID RISE -Jhpiego, PATH, Khushi baby, CDC and WHO.

Additionally, we are grateful for the support of the USAID-funded and Jhpiego-implemented RISE project in facilitating the development of this action plan.

Abbreviations and Acronyms

AI	Artificial Intelligence
AIIMS	All India Institute of Medical Science
AMR	Antimicrobial Resistance
AMC	Antimicrobial Consumption
AMU	Antimicrobial Use
AMSP	Antimicrobial Stewardship Program
AST	Antibiotic Susceptibility Test
AYUSH	Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homoeopathy
BSI	Bloodstream Infections
BMW	Biomedical Waste Management
CAUTI	Catheter-Associated Urinary Tract Infections
CRBSI	Catheter-Related Bloodstream Infections
CDC	Centre for Disease Control
CPCB	Central Pollution Control Board
CME	Continuous Medical Education
CSIR	Council of Scientific & Industrial Research
CWG	Core Working Group
DBT	Department of Biotechnology
DDD	Daily Defined Doses
DMHS	Directorate of Medical & Health Services
EHR	Electronic Health Records
EQAS	External Quality Assurance Services
FSSAI	Food Safety and Standards Authority of India
GMP	Good Manufacturing Practices
HA	Hospital Administration
HAI	Healthcare-Associated Infections
HIS	Hospital Information System
ICAR	Indian Council of Agricultural Research
ICMR	Indian Council of Medical Research
ICU	Intensive Care Unit
IDSP	Integrated Disease Surveillance Program
ICC	Intersectoral Coordination Committee
IHMS	Integrated Hospital Management System
IEC	Information, Education, and Communication
IPC	Infection, Prevention & Control
IMA	Indian Medical Association
IVRI	Indian Veterinary Research Institutes

KAP	Knowledge, Attitude & Practice
LIMS	Laboratory Information Management System
LRTI	Lower Respiratory Tract Infections
MOHFW	Ministry of Health and Family Welfare
MBD	Micro Broth Dilution
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
NAP-AMR	National Action Plan on Antimicrobial Resistance
NARS-NET	National Antimicrobial Resistance Surveillance Network
NCDC	National Centre for Disease Control
NCC	National Cadet Corps
NIC	National Information Centre
NGO	Non-governmental organization
NHM	National Health Mission
NSS	National Service Scheme
OPD	Out Patient Department
PHED	Public Health Engineering Department
QA	Quality Assurance
RAPCAR	Rajasthan Action Plan for Containment of AMR
RAJSAR Network	Rajasthan State AMR Surveillance Network
RAJUVAS	Rajasthan University of Veterinary and Animal Sciences
RDDC	Regional Disease Diagnostic Centre
RUHS	Rajasthan University of Health Sciences
RH	Rural Health
RISE	Reaching Impact, Saturation and Epidemic Control
BCDFL	Rajasthan Cooperation of Dairy Federation Limited
RMSCL	Rajasthan Medical Services Corporation Limited
RSPCB	Rajasthan State Pollution Control Board
SAPCAR	State Action Plans for Containment of Antimicrobial Resistance
SDDC	State Disease Diagnostic Centre
SMS	Sawai Man Singh Medical College
SOP	Standard Operating Procedure
SPM	State Program Manager
SHFW	State Institute of Health and Family Welfare
TAG	Technical Advisory Group
TOR	Terms of Reference
UPCHAAR	United Private Clinics & Hospitals Association of Rajasthan
USD	United States Dollar
USAID	United States Agency for International Development
WAAW	World AMR Awareness Week
WHO	World Health Organization

Executive Summary

Antimicrobial Resistance (AMR) poses a significant and escalating threat to public health and the economy. This phenomenon occurs when microorganisms develop resistance to antimicrobial drugs, escalated by their misuse and overuse. The World Health Organization (WHO) estimated that AMR contributed to 4.95 million deaths in 2019, including 1.27 million directly attributed to resistant infections. In India, an increasing trend of broad-spectrum antibiotics like cephalosporin usage has been observed, reflecting shifts in prescription patterns and inconsistent availability of narrower-spectrum antibiotics.¹

The National Action Plan on Antimicrobial Resistance (NAP-AMR) has also addressed the development of State Action Plans for the Containment of AMR as one of its priorities. The Government of Rajasthan recognizes that AMR containment requires urgent and sustained action through strong leadership and concerted efforts. The state is committed to taking suitable actions towards the containment of AMR by developing and implementing the Rajasthan Action Plan for Containment of AMR (RAPCAR). The RAPCAR has been developed in alignment with the NAP-AMR, through the collaboration of various stakeholders across sectors. The process also involved two important workshops: a sensitization workshop and a consultation workshop focused on developing the RAPCAR. Inter-sectoral collaboration, coordination, and a One Health approach are essential and have been adopted as fundamental approaches. At the state level, an Intersectoral Coordination Committee (ICC), a Technical Advisory Group (TAG), and a Core Working Group (CWG), all featuring representation from various sectors have been established.

The RAPCAR outlines the following strategic objectives, ensuring strong governance and collaboration across sectors:

- Improved awareness and understanding of AMR, through effective communication, education, and training.
- Strengthen knowledge and evidence through surveillance and laboratory strengthening.
- Reduce the incidence of infection through effective infection prevention and control.
- Optimize the use of antimicrobial agents in health, animals, and food.
- Promote investments for AMR activities, research, and innovations for AMR containment.

This five-year action plan details interventions to protect public health, encourage responsible antimicrobial use, and maintain antibiotic effectiveness for future generations. The plan provides a concise overview of activities across the human, animal, environment, and food sectors to address the critical issue of antimicrobial resistance.

RAPCAR represents the stakeholder consensus and the state's proactive stance in addressing this global health crisis. Rajasthan aims to mitigate the AMR threat and safeguard antibiotic effectiveness for upcoming generations through cohesive strategy implementation and unwavering commitment.

¹ <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>
1. Global Action Plan on Antimicrobial Resistance: 5 Years to Drive Global Action. Geneva: World Health Organization; 2015. Available from: <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>

organism isolated from urine followed by *K. pneumoniae*, *P. aeruginosa*, and *Enterobacter* spp. Overall resistance was highest to fluoroquinolones (93.3% - 100%). Additionally, amongst confirmed catheter-related bloodstream infections (CRBSI), *P. aeruginosa* and Methicillin-susceptible *Staphylococcus aureus* were the most common pathogen isolated. The pathogens isolated from these confirmed CRBSI cases revealed maximum resistance to ciprofloxacin (100%).⁸ Another study from a tertiary care hospital of Jaipur, found *E. coli* to be the most common cause of catheter-associated urinary tract infections (CAUTI) followed by *Pseudomonas*, *Klebsiella*, and others. While 66.7% *E. coli* showed susceptibility to imipenem, only 31.8% *Pseudomonas* were susceptible to imipenem.⁹

While another study from Jodhpur highlighted the emergence of multidrug resistance in bloodstream infections (BSIs) due to Gram-positive organisms, this single-center prospective cohort study revealed Coagulase-negative staphylococci (36.1%) as the most common isolate followed by *Enterococcus* spp. (27.9%), MSSA (18%) and methicillin-resistant *Staphylococcus aureus* (MRSA) (14.7%). Vancomycin resistance in *Enterococci* was noted in 11.8% of the isolates and 5.9% were linezolid resistant. The authors further highlighted substantial mortality (42.6%) with Gram-positive BSIs, especially with MRSA BSIs.¹⁰

A 2020 study from western Rajasthan on the bacterial etiology of Lower Respiratory Tract Infection (LRTI) reported *Pseudomonas* species as the most common pathogen followed by *Klebsiella pneumoniae*, *Acinetobacter baumannii*, and other organisms. Amongst *Klebsiella* spp. high resistance was reported to cefepime (64.9%) and ceftazidime (63.9%), and imipenem resistance was reported in 50% of the isolates. High resistance rates to most antibiotics were also reported in *Acinetobacter* with 65.9 % resistant to imipenem and piperacillin-tazobactam.¹¹ Another study on chronic suppurative otitis media analyzing ear swabs found high culture positivity, predominantly of *P. aeruginosa* and *S. aureus*. These pathogens showed varying antibiotic sensitivity; 33.3% of *S. aureus* isolates were methicillin resistant.¹²

Studies among medical professionals and students have shown varying knowledge and practice levels. A pre-post intervention (HAI and Antibiotic resistance awareness campaign) study found that the combined Knowledge, Attitude, and Practice (KAP) score before the campaign was poor in 17.4% of participants, average in 61.6%, and excellent in 20.9% which later improved post campaign to 1.1% (poor), 8.14% (average) and 90.7% (excellent).¹³ A study amongst dental practitioners of Jaipur city, highlighted that the majority prescribe broad-spectrum antibiotics. Two-thirds responded that they do not advise culture sensitivity tests before recommending antibiotics.¹⁴

8. Chhabra AK, Chaturvedi N, Agarwal T, et al. Hospital-acquired bloodstream infections: current status, trends, and antibiotic resistance: a systematic literature review in a tertiary care center in North India. *Indian Journal of Hospital Administration*. 2022 Jan; 17(1):113-117. Available from: <https://doi.org/10.1188/2022.113>
9. Shrivastava S, Chaturvedi N, Agarwal T, et al. Hospital-acquired bloodstream infections: current status, trends, and antibiotic resistance: a systematic literature review in a tertiary care center in North India. *Indian Journal of Hospital Administration*. 2022 Aug; 17(4):274-278. Available from: <https://doi.org/10.1188/2022.274>
10. Shrivastava S, Chaturvedi N, Agarwal T, et al. Hospital-acquired bloodstream infections: current status, trends, and antibiotic resistance: a systematic literature review in a tertiary care center in North India. *Indian Journal of Hospital Administration*. 2022 Jan; 17(1):113-117. Available from: <https://doi.org/10.1188/2022.113>
11. Shrivastava S, Chaturvedi N, Agarwal T, et al. Hospital-acquired bloodstream infections: current status, trends, and antibiotic resistance: a systematic literature review in a tertiary care center in North India. *Indian Journal of Hospital Administration*. 2022 Jan; 17(1):113-117. Available from: <https://doi.org/10.1188/2022.113>
12. Shrivastava S, Chaturvedi N, Agarwal T, et al. Hospital-acquired bloodstream infections: current status, trends, and antibiotic resistance: a systematic literature review in a tertiary care center in North India. *Indian Journal of Hospital Administration*. 2022 Jan; 17(1):113-117. Available from: <https://doi.org/10.1188/2022.113>
13. Shrivastava S, Chaturvedi N, Agarwal T, et al. Hospital-acquired bloodstream infections: current status, trends, and antibiotic resistance: a systematic literature review in a tertiary care center in North India. *Indian Journal of Hospital Administration*. 2022 Jan; 17(1):113-117. Available from: <https://doi.org/10.1188/2022.113>
14. Shrivastava S, Chaturvedi N, Agarwal T, et al. Hospital-acquired bloodstream infections: current status, trends, and antibiotic resistance: a systematic literature review in a tertiary care center in North India. *Indian Journal of Hospital Administration*. 2022 Jan; 17(1):113-117. Available from: <https://doi.org/10.1188/2022.113>

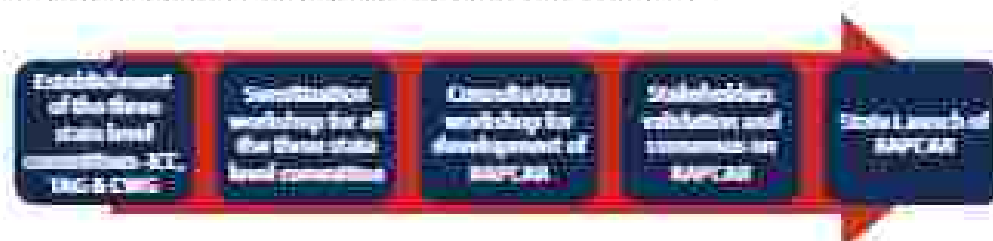
In the veterinary sector, a study among veterinarians and para-veterinarians revealed that veterinarians demonstrated a greater understanding of the consequences of antibiotic overuse and improper use leading to AMR.¹⁷ A study conducted to understand the prevalence and resistance pattern of *S. aureus* in dairy products reported a prevalence of 66.6% with high resistance to Penicillin-G (90%) and Ampicillin (75%) and 42.5% isolates were Methicillin-resistant.¹⁸ Studies on bovine mastitis revealed diverse antibiotic sensitivity patterns in *E. coli* and *S. aureus*. One study found *E. coli* highly susceptible to several antibiotics, including gentamicin and tetracycline. Another study in bovine subclinical mastitis reported 83.3% resistance to tetracycline, 83.5% Erythromycin, 75.9% Ampicillin, and 51.9% Methicillin-resistant *S. aureus*.¹⁹

A study focusing on farmers' understanding and behaviors towards antibiotic use and AMR revealed that 58.3% of farmers had some awareness about antibiotics, while 49.5% were unaware of AMR. Additionally, 77.8% vaccinate their animals; a significant number of Farmers (87%) obtain medicines from local pharmacists, and 11% use leftover medication. Only a small fraction (1.97%) accessed antibiotics through government hospitals or official supply channels.²⁰

The existing studies offer limited, isolated snapshots of the state's AMR situation. Despite these sector-specific insights, it is important to have a comprehensive assessment of AMR prevalence across Rajasthan. This fragmented knowledge of AMR in Rajasthan highlights the urgent need for a coordinated and collaborative state-wide approach to containment of AMR.

Steps towards curbing AMR in Rajasthan

The state government has taken significant steps to address the critical issue of AMR. To implement a multi-sectoral approach, three committees have been established at the state level: the Intersectoral Coordination Committee (ICC), Technical Advisory Group (TAG), and Core Working Group (CWG) (Annexures 1 and 2). These committees have representatives from various sectors (i.e., Medical & Health, Medical Education, Animal Husbandry, Dairy, Fisheries, Agriculture, Environment and Climate Change, Commissionerate of Food Safety and Drug Controller, Rajasthan State Pollution Control Board, JMSCT, Ayurveda and Indian Medicine, State Education Board, Public Health Engineering Department, State Food and Civil Supplies Corporation, AIIMS, Jaipur, State Government Medical Colleges, IICCHAR and development partners. During the development of RAPCAR, the state conducted intersectoral workshops, having representatives from all the relevant sectors at the state level.



17. Dhama RK, Mishra SK, Mishra A, Singh SP. Accessing the behavior and awareness of veterinarians and para-veterinarians towards antibiotic use and antimicrobial resistance in India. *Antibiotics in Rajasthan: Status and Trends*. 2024 Mar 11(1). Available from: <https://doi.org/10.2196/2024.1110000>
18. Jha N, Dandia, Gupta S. Prevalence and antibiotic resistance pattern of *Staphylococcus aureus* of dairy origin from Haryana (Eastern region, India). *Int J Journal of Microbiology and Bioprocess Technol*. 2019 Apr 6; 11(1): 1. Available from: <http://www.ijmicrobiol.com/papers/2019vol11no1/1101110000.pdf>
19. Sarda L, Purohit K. (2012). Mapping antibiotic resistance in bovine subclinical mastitis from Indian subcontinent. <http://www.biomedcentral.com/submit>. <https://doi.org/10.1186/1475-2875-11-100>
20. Dhama RK, Mishra A, Mishra SK, Singh SP. Understanding knowledge and attitude of farmers towards antibiotic use and Antimicrobial Resistance in Rajasthan, India. *Antibiotics*. 2024; 13(1):131-138. Available from: <https://www.mdpi.com/2074-4807/13/1/131>

In March 2023, the state organized a one-day sensitization workshop for members from all three interdepartmental committees on AMR, and relevant global and national initiatives to mitigate AMR. Through group discussions, participants identified potential activities for inclusion in the state action plan. In June 2024, a two-day multisectoral consultation workshop engaged technical committee members from different sectors in thorough discussions of the proposed activities and further developed the action plans. This session established implementation timelines, designated responsible stakeholders, and determined expected outputs. These collaborative efforts were crucial in developing RAPCAR, highlighting the state's dedication to creating a comprehensive and actionable AMR strategy.

Awareness and Education

The state has implemented comprehensive initiatives to raise awareness about AMR. Public engagement efforts, including World AMR Awareness Week (WAAW) observance, have been organized at both state and district levels, targeting medical colleges, healthcare facilities, schools, and the public. Activities during WAAW have included poster and slogan competitions on AMR, quizzes for postgraduate and undergraduate students, street performances in hospital waiting areas, wards, OPD, and public spaces, and radio/television discussions in local languages to raise awareness of AMR. These efforts represent a collaborative approach involving the Department of Medical & Health, Animal Husbandry, and the Department of Medical Education. Additionally, Continuous Medical Education (CME) programs have been organized at medical colleges to enhance professional knowledge and practices. This multifaceted strategy aims to educate various segments of society about the critical issue of AMR and promote responsible antimicrobial use.

Laboratory Capacity and Surveillance of AMR

Rajasthan has made significant strides in developing a robust AMR surveillance network. Three state institutions (Sriwal Man Singh Medical College, Jaipur; Sandar Patel Medical College, Bikaner and Rabindranath Tagore Medical College, Udaipur) are part of the National Antimicrobial Resistance Surveillance Network (NARS-Nets). The network focuses on the surveillance of nine priority bacterial pathogens of public health importance namely *Staphylococcus aureus*, *Enterococcus* spp., *Klebsiella* spp., *Escherichia coli*, *Pseudomonas* spp., *Acinetobacter* spp., *Salmonella enterica* serotypes Typhi and Paratyphi, *Vibrio cholerae*, *Shigella* spp., following the Standard Operating Procedures (SOPs) outlined by the National Centre for Disease Control (NCDC). SMS Medical College, Jaipur also participates in the monitoring of antimicrobial consumption, point prevalence study, usage patterns, and Hospital Acquired Infection (HAI) surveillance in selected Intensive Care Units (ICUs).

The Rajasthan State AMR Surveillance (RAJSAR) Network comprises seven government medical colleges and hospitals, seven private hospitals, and three corporate hospitals. Upon enrollment, all participating hospitals received training on WHONET, Standard Operating Procedures (SOPs), and Micro Broth Dilution (MBD) of colistin and vancomycin. SMS Medical College, Jaipur serves as the Nodal Centre, it collates the data and tracks AMR trends across the state, with the support of NCDC. The state plans to expand this network to achieve a more thorough understanding of the burden of AMR in the future. Along with this,

on an annual basis, the state conducts antimicrobial culture and susceptibility testing training for the district laboratory personnel.

In the animal sector, antibiotic susceptibility testing is being conducted at the district level for antibiotics that are specifically available and being used in the veterinary sector.

Infection, Prevention & Control

State-level training sessions on Infection Prevention and Control (IPC) practices have been conducted in 2023 by master trainers who have received training at the national level. Following national guidelines for IPC in healthcare settings, these sessions have equipped 268 healthcare professionals, including doctors and nurses from all the districts and medical colleges, with knowledge and skills on IPC to prevent AMR in healthcare facilities. The training was delivered in six separate batches. To complement these efforts, ongoing CME programs and seminars focusing on IPC and Bio-Medical Waste (BMW) management are regularly held. These initiatives serve a dual purpose: enhancing professional competencies and promoting cross-sector collaboration among human health, animal health, and environmental domains. The Rajasthan State Pollution Control Board (RSPCB) supports these collaborative efforts.

Optimizing the use of antimicrobials

State efforts to optimize antimicrobial usage include conducting public awareness sessions on responsible antibiotic use. Currently, antibiograms are being developed for the KUs at SMS Medical College and its affiliated hospitals. Based on these antibiograms, antibiotic policy has been created to promote the rational and judicious use of antibiotics. The agriculture department has implemented measures to promote awareness and optimize antibiotic use in fields, including periodic pauses in antibiotic application to allow soil replenishment.

Despite these efforts, Rajasthan faces challenges in implementing stringent regulatory frameworks to limit antimicrobial use in livestock and food animals, particularly for non-therapeutic purposes like growth promotion. The cross-cutting nature of AMR necessitates a coordinated approach that spans multiple sectors and programs.

Conclusion

To effectively combat AMR, Rajasthan recognizes the need for enhanced collaboration among various stakeholders, including human and animal health, food, environment, water and sanitation, and education sectors. The state aims to scale up and coordinate these diverse activities to maximize the impact of its AMR containment efforts, acknowledging that this complex issue requires a unified, multisectoral response.

Detailed Action Plan

Strategic Objective 1

Improve awareness and understanding of AMR through effective communication, education, and training.

Sub Objective 1.1

Increase awareness and improve communications regarding AMR in Rajasthan.

Strategic Intervention 1.1.1

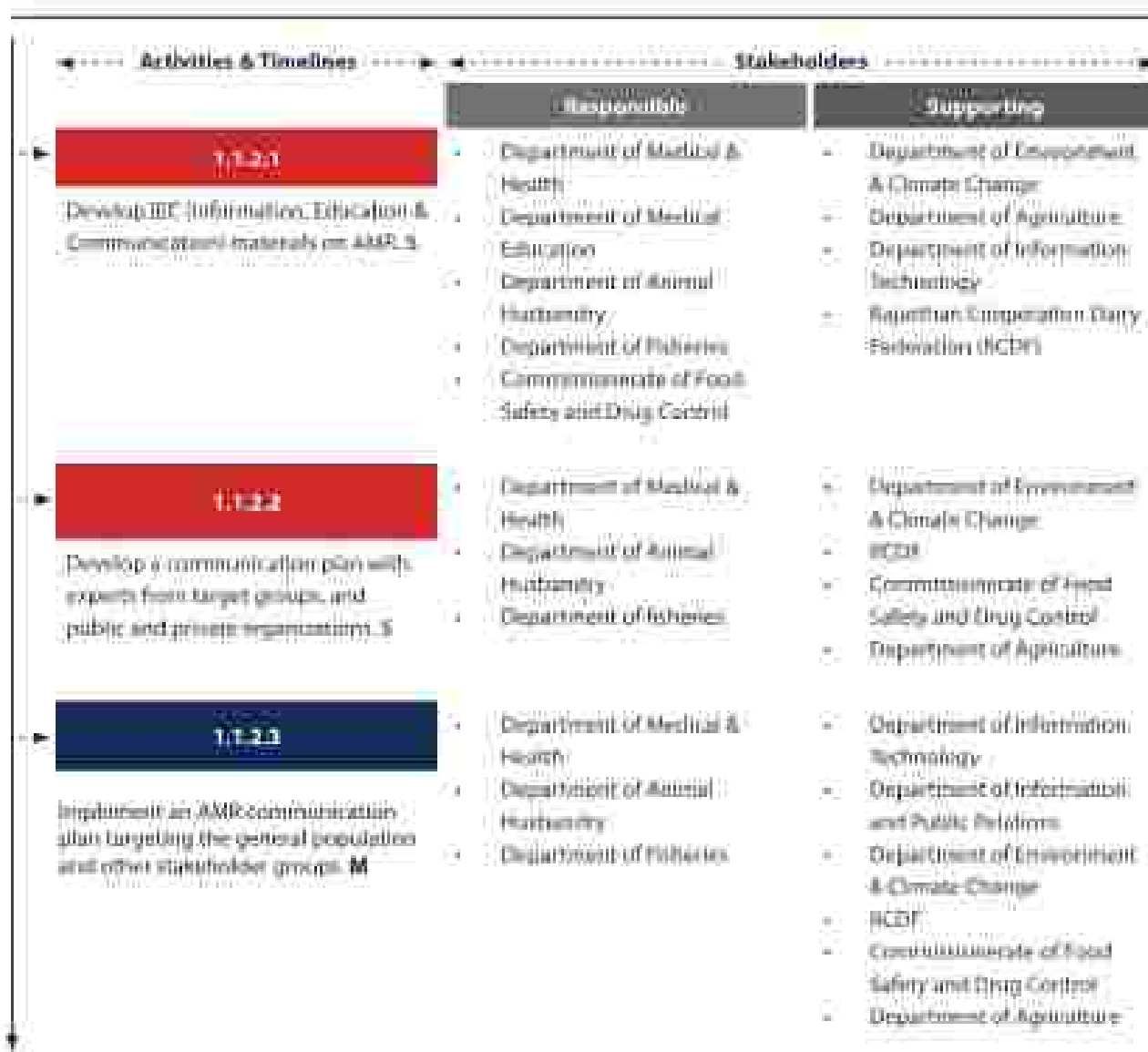
Assess understanding, knowledge, and awareness of antimicrobial resistance (AMR) and antimicrobial use (AMU) amongst key stakeholders/target groups- community, healthcare professionals, para healthcare professionals, farmers, veterinarians, etc.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>U.1.1.1</p> <p>Consolidate existing Knowledge, Attitude & Practice (KAP) studies on AMR and AMU across professionals in various sectors. 3</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry Department of Fisheries Department of Environment & Climate Change Commissionate of Food Safety and Drug Control Department of Agriculture 	<ul style="list-style-type: none"> Department of Medical Education (State Medical Colleges-Department of Community Medicine) Rajasthan State Pollution Control Board
<p>U.1.1.2</p> <p>Develop a protocol for the KAP survey based on existing studies, reports, and publications related to AMR and AMU. 5</p>	<ul style="list-style-type: none"> Department of Medical Education (State Medical Colleges-Department of Community Medicine & Microbiology) Department of Animal Husbandry Department of Environment & Climate Change 	<ul style="list-style-type: none"> Department of Medical & Health Veterinary Universities Rajasthan State Pollution Control Board
<p>U.1.1.3</p> <p>Conduct KAP and behavioral studies amongst key target groups- community, healthcare professionals, para healthcare professionals, farmers, veterinarians, etc. 5</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry Department of Environment & Climate Change Commissionate of Food Safety and Drug Control 	<ul style="list-style-type: none"> Department of Medical Education Department of Agriculture Rajasthan State Pollution Control Board

■ High (Less than 3 Months)
 ■ (M. Medium > 3-6 Weeks)
 ■ L. Long > 3 Months

Strategic Intervention 1.1.2

Development and dissemination of communication and information resources and products on AMR.



Timeline: **S** - Short-term (< 3 years) | **M** - Medium-term (3-10 years) | **L** - Long-term (> 10 years)

Strategic Intervention 1.1.3

Increase public awareness about antibiotic misuse, AMR, antibiotics in food, and the One Health approach, using IEC materials (videos, pamphlets, animations, etc.) to provide standardized information through media.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>1.1.3.1</p> <p>Create public awareness using social media in collaboration with various departments. 5</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry Department of Fisheries Department of Environment & Climate Change Commissionerate of Food Safety and Drug Control Rajasthan Cooperative Dairy Federation (RCDF) 	<ul style="list-style-type: none"> Department of Information, Technology & Communication, Rajasthan (DITC)
<p>1.1.3.2</p> <p>Develop a comprehensive joint awareness plan entailing the collaborative efforts of various departments, to strategically devise targeted campaigns aimed at increasing awareness. 5</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> RCDF Commissionerate of Food Safety & Drug Control Department of Fisheries Department of Environment & Climate Change
<p>1.1.3.3</p> <p>Organize awareness-rising events to celebrate the World AMR Awareness Week. 1</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry 	<ul style="list-style-type: none"> Department of Environment & Climate Change RCDF Commissionerate of Food Safety & Drug Control Veterinary Universities
<p>1.1.3.4</p> <p>Utilize the existing online government platforms to create awareness on AMR in the state. 6</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry 	<ul style="list-style-type: none"> National Information Centre (NIC) Rajasthan State Centre DOIT Development Partners

High (Red, 6-12w), (Low) (1w)

(M. Medium, > 3 Wards)

(L, Long, > 3 Years)

Strategic Intervention 1.1.4

Improve awareness regarding antibiotic use, antibiotic abuse, infection prevention, and antimicrobial resistance among school children, adolescents & young adults.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>1.1.4.1</p> <p>Develop a curriculum/ module/ course in alignment with the academic standards to educate students about AMR, its implications, and ways to contain it. M</p>	<ul style="list-style-type: none"> Secondary Education Department Department of College Education 	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Regulatory Board of Secondary Education
<p>1.1.4.2</p> <p>Conduct interactive activities, case studies, videos, and discussions to engage the students effectively. S</p>	<ul style="list-style-type: none"> Secondary Education Department Department of College Education 	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Regulatory Board of Secondary Education
<p>1.1.4.3</p> <p>Celebration of World AMR Awareness Week (MAAW) in schools and colleges in the State. S</p>	<ul style="list-style-type: none"> Secondary Education Department Department of College Education 	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Regulatory Board of Secondary Education

■ (M. Pharm; > 1 year)
 ■ (M. Med/MS; > 1-3 years)
 ■ (D. Vet/MS; > 3 years)

Strategic Intervention 1.1.5

Organize mass sensitization programs in schools and colleges, using already existing engagement platforms like the National Service Scheme (NSS), National Cadet Corps (NCC) Youth and Eco club.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>1.1.5.1</p> <p>1.1.5.1 Understand the reach of existing platforms, identify the key schools/colleges and conduct mass sensitization programs (LS)</p>	<ul style="list-style-type: none"> Secondary Education Department Department of College Education Veterinary Universities/ Agriculture Universities 	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry
Key Outputs	Outputs Indicators	
<ul style="list-style-type: none"> Consultation document/reportory of the KAP surveys. KAP surveys/studies conducted for identified key targeted groups. IEC materials & communication plan developed and disseminated. Awareness campaigns/events conducted across sectors. Curricular modules/courses with AMR related topics developed/modified. 	<ul style="list-style-type: none"> Number of KAP surveys conducted. Number of IEC materials/communication plans for AMR developed and disseminated. Number of awareness campaigns/events conducted. Number of curricula/modules developed/modified on AMR. 	

High (Red, > 30%) - 1 Year

(M. Medium, > 1-3 Years)

Low (Green, > 3 Years)

Sub-Objective 1.2

Improve knowledge and capacity of key stakeholders regarding AMR and related topics

Strategic Intervention 1.2.1

Inclusion of AMR and related topics as core components of professional education and training

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>1.2.1</p> <p>Review and revise curricula/resources for in-service training of different professionals and allied services. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Rajasthan University of Veterinary and Animal Sciences (RAUVAS) 	<ul style="list-style-type: none"> State Institute of Health & Family Welfare (SIHFW) Commissionerate of Food Safety & Drug Control

Strategic Intervention 1.2.2

To formulate a system of tailored training programs on AMR and IPC for healthcare providers at all levels of the health care delivery system.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>1.2.2</p> <p>Formulation and implementation of offline and online training programs for doctors, pharmacists, nurses, and other healthcare providers at all levels of the healthcare delivery system. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education 	<ul style="list-style-type: none"> Rajasthan Medical Council Nursing Council Pharmacy Council Para-medical council
<p>1.2.2</p> <p>Formulate and implement customized training programs for undergraduate and postgraduate students. M</p>	<ul style="list-style-type: none"> Department of Medical Education Rajasthan University for Health Services (RUHS) State Institute of Health & Family Welfare (SIHFW) 	<ul style="list-style-type: none"> Rajasthan Medical Council Nursing Council Pharmacy Council Para-medical council

High (Red, 6-12w), (Low)

(M. Medium, >1-3 w/m)

(L. Low, >3 m/m)

Strategic Intervention 1.2.3

Devise a system for training other users of antibiotics, like farmers, veterinary doctors (and students), livestock handlers, and fisheries professionals.



Strategic Objective 2

Strengthen knowledge and evidence through surveillance and laboratory strengthening.

Sub Objective 2.1

Strengthen microbiology laboratory capacity to detect AMR in human, animal, food, and environment sectors.

Strategic Intervention 2.1.1

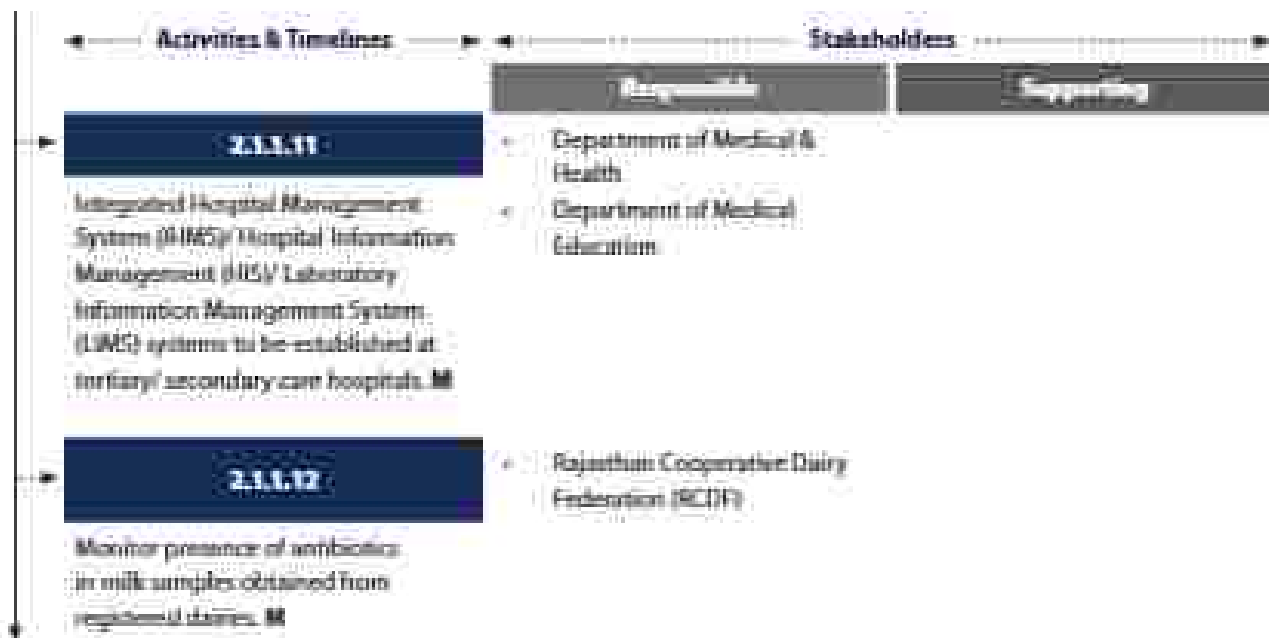
Strengthen capacity for laboratory-based detection of AMR in humans, animals, food, and environment.

Activities & Timelines	Stakeholders	
	Primary	Supporting
<p>2.1.1.1</p> <p>Develop strategy to strengthen microbiology laboratories for antimicrobial susceptibility testing (AST) in humans, animals, environment. S</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry Department of Environment and Climate Change 	<ul style="list-style-type: none"> National Centre for Disease Control (NCDC) Veterinary Universities Public Health Engineering Department (PHED) Laboratories
<p>2.1.1.2</p> <p>Strengthen capacity for the laboratory based detection of AMR in humans, animals, food & environment. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Commissionerate of Food Safety & Drug Control Department of Environment & Climate Change 	<ul style="list-style-type: none"> National level institutes/ reference laboratories Veterinary Universities Central Food Lab Jaipur & Central Drug Lab Jaipur PHED Laboratories
<p>2.1.1.3</p> <p>Assess the laboratory's resources, technical capabilities, and infrastructure to conduct tests, and AMR surveillance, including evaluation of the availability of trained personnel, appropriate equipment, and quality control procedures. S</p>	<ul style="list-style-type: none"> Department of Medical & Health for district hospital Department of Medical Education for medical colleges Department of Animal Husbandry Commissionerate of Food Safety & Drug Control Department of Environment & Climate Change 	<ul style="list-style-type: none"> NCDC Experts from various Medical Colleges Veterinary Universities ICMR Indian Veterinary Research Institute (IVRI) Central Food Lab Jaipur & Central Drug Lab Jaipur
<p>2.1.1.4</p> <p>Capacity building workshops for personnel from the Environment and Pollution Control Board and allied agencies regarding surveillance of antibiotic residues and AMR in the environment. M</p>	<ul style="list-style-type: none"> Department of Environment of Climate Change 	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Rajasthan State Pollution Control Board

Timeline: **S** - Short (<= 1 Year) **M** - Medium (> 1-3 Years) **L** - Long (> 3 Years)

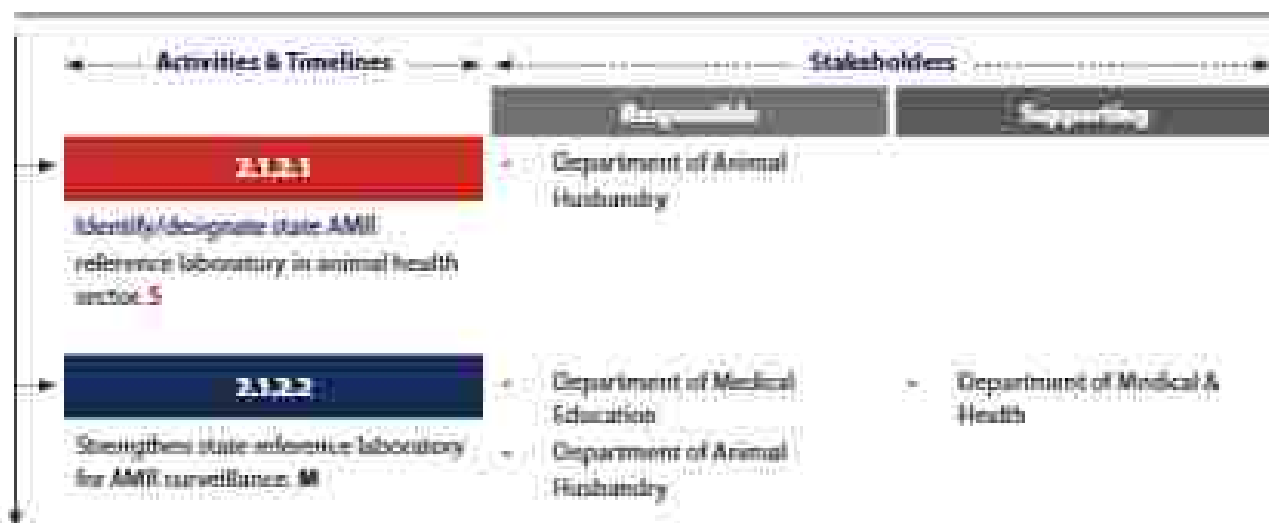
Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>2025</p> <p>Identify/establish/upgrade laboratories and networks for AMR surveillance. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry 	<ul style="list-style-type: none"> NCDC
<p>2024</p> <p>Revise existing standard operating procedures as per state requirement. S</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry 	<ul style="list-style-type: none"> Medical Colleges District Hospitals Veterinary Universities
<p>2027</p> <p>Ensure dissemination and implementation of all the standardized procedures to collect, store, transport, process, and analyze samples for culture and AMR testing. S</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Commissionate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Medical Colleges District Hospitals Veterinary Universities Central Food Lab Jaipur Central Drug Lab Jaipur
<p>2024</p> <p>Organize joint training workshops for bacterial identification, antimicrobial susceptibility testing (AST) and data harmonization across all sectors. M</p>	<ul style="list-style-type: none"> Department of Medical Education (Block Centre- SMC, Medical College) 	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry Sentinel AMR surveillance sites of state
<p>2023</p> <p>Establishment of regular Quality Assurance activities according to the guidelines (EQAS) in the identified laboratories. L</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Department of Environment & Climate Change 	<ul style="list-style-type: none"> NCDC Rajasthan State Pollution Control Board
<p>2020</p> <p>Strengthen AMR surveillance through digital data documentation and management system across all levels of healthcare facilities. L</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education 	

Timeline: **S** (Short, < 1 year) **M** (Medium, > 1-3 years) **L** (Long, > 3 years)



Strategic Intervention 2.1.2

Designate/ strengthen State AMR reference laboratory in human, animal, food, and environment sectors.



Key Outputs	Output Indicators
<ul style="list-style-type: none"> Enhanced Laboratory Capacity and Standardization for AMR detection and testing. Establishment of HDAS in laboratories and improved quality assurance in laboratory testing. State reference laboratories for AMR testing identified/strengthened. 	<ul style="list-style-type: none"> Number of laboratories strengthened, and SOPs revised for AMR detection. Number of laboratories enrolled in HDAS. Number of reference laboratories identified/strengthened for AMR testing.

Timeline: **S** (Short, < 1 year) | **M** (Medium, > 1-3 years) | **L** (Long, > 3 years)

Sub Objective 2.2

Strengthen surveillance for AMR in humans, animals, food, and environment.

Strategic Intervention 2.2.1

Establish and operationalize State networks for surveillance of AMR in all sectors.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>2.2.1.1</p> <p>Establish a state surveillance network for surveillance of AMR in animals and food. S</p>	<ul style="list-style-type: none"> Department of Animal Husbandry Commissionerate of Food Safety & Drug Control 	
<p>2.2.1.2</p> <p>Expand AMR surveillance network with laboratories from both the public and private sector in a phased manner. L</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education 	
<p>2.2.1.3</p> <p>Strengthening of AMR surveillance network by upgrading the antimicrobial susceptibility testing. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry 	
<p>2.2.1.4</p> <p>Develop AMR surveillance annual report based on data generated by state reference laboratories. L</p>	<ul style="list-style-type: none"> Department of Medical Education (Model Centre for RAJGARH SMS Medical College) Department of Medical & Health Department of Animal Husbandry 	<ul style="list-style-type: none"> National Centre for Disease Control (NCDC)
<p>2.2.1.5</p> <p>Conduct annual multi-sectoral meetings for sharing surveillance data, knowledge sharing, and refresher training to curb AMR. S</p>	<ul style="list-style-type: none"> Department of Medical & Health 	<ul style="list-style-type: none"> Department of Medical Education Department of Animal Husbandry Commissionerate of Food Safety & Drug Control
<p>2.2.1.6</p> <p>Develop and implement plan for surveillance of antimicrobial residues in animal, food sector. M</p>	<ul style="list-style-type: none"> Department of Animal Husbandry Department of Agriculture Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control

Timelines: (S) Short (<1 Year) (M) Medium (>1.2 Year) (L) Long (>3 Year)

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>2.2.1.7</p> <p>Establish labs for detection of antimicrobial residues in animal, food, and environment sector. M</p>	<ul style="list-style-type: none"> Department of Animal Husbandry Department of Environment & Climate Change Rajasthan State Pollution Control Board Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control
<p>2.2.1.8</p> <p>Ensure data sharing by regional and district laboratories with the State reference Laboratory in animal health sector. S</p>	<ul style="list-style-type: none"> Department of Animal Husbandry 	
<p>2.2.1.9</p> <p>Testing of antibiotic residues in food, vegetables, dairy products, and animal food sources as per ISSAI guidelines. M</p>	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control 	

Key Outputs	Output Indicators
<ul style="list-style-type: none"> Laboratory network for AMR surveillance in all sectors established/expanded. Plan for surveillance of antimicrobial residues developed and implemented with functional state level testing laboratories. 	<ul style="list-style-type: none"> Number of laboratories under state AMR surveillance networks. Number of labs conducting antibiotic residues testing in animal, food and environment sector.

(Timeline: S: Short (< 1 Year) | M: Medium (> 1-3 Years) | L: Long (> 3 Years)

Strategic Objective 3

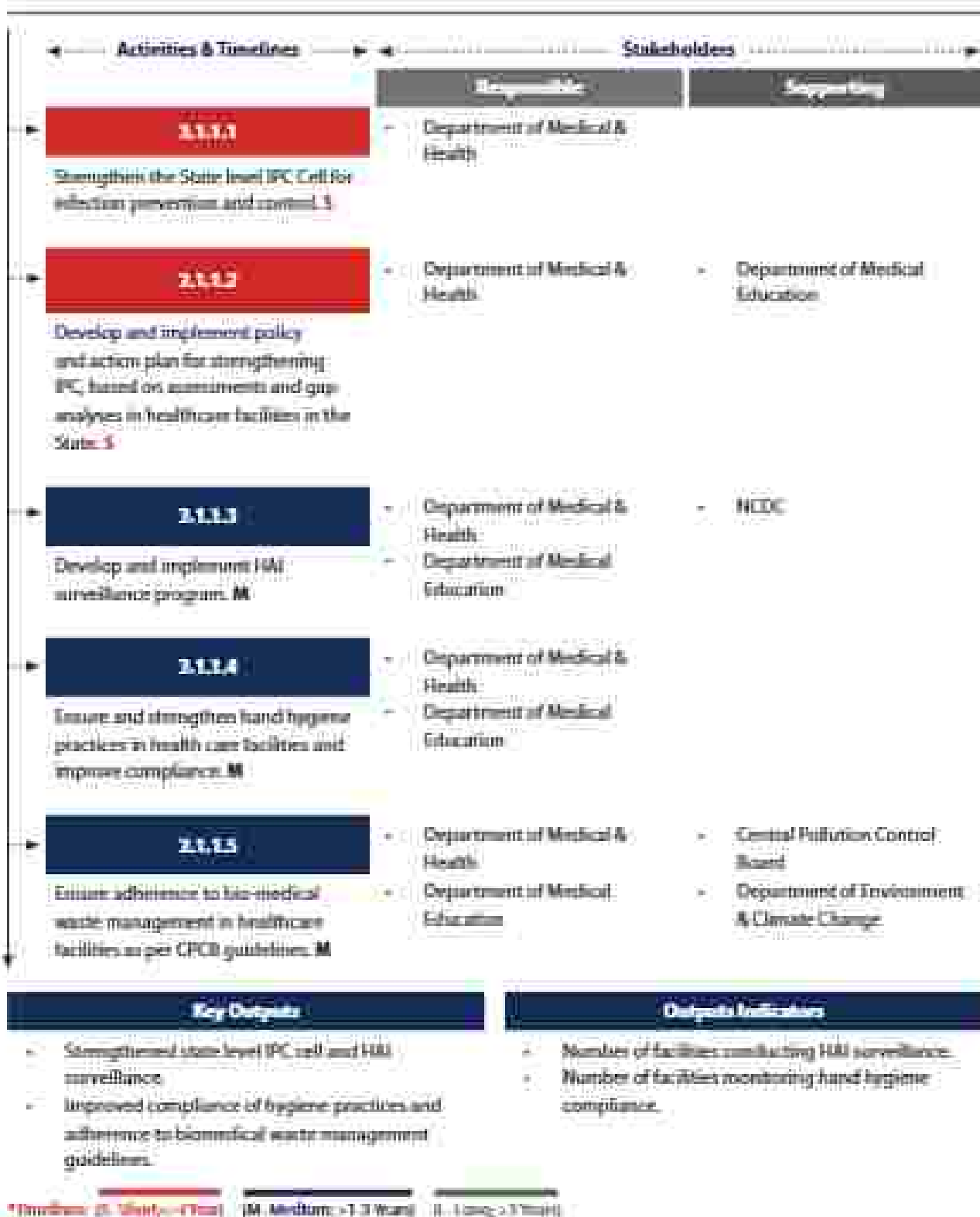
Reduce the incidence of infection through effective infection prevention and control.

Sub Objective 3.1

Develop and establish a state plan for IPC in health care.

Strategic Intervention 3.1.1

Implementation of infection prevention and control policies and guidelines in human health.



Sub-Objective 3.2

Establish IPC programmes in veterinary settings and animal husbandry.

Strategic Intervention 3.2.1

Development and implementation of infection prevention and control programme in animal and food sector.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>12.1.1</p> <p>Establish IPC coordinating unit within Rajasthan for Department of Animal Husbandry, Agriculture, Dairying & Fisheries. M</p>	<ul style="list-style-type: none"> Department of Animal Husbandry Rajasthan Cooperative Dairy Federation (RCDF) 	<ul style="list-style-type: none"> Department of Agriculture Department of Fisheries
<p>12.1.2</p> <p>Develop and implement state plans for IPC in animals, fisheries, and food sector. M</p>	<ul style="list-style-type: none"> Department of Animal Husbandry 	<ul style="list-style-type: none"> Department of Agriculture Department of Fisheries RCDF
<p>12.1.3</p> <p>Develop and implement a training module and plans for biosecurity/biosafety practices. M</p>	<ul style="list-style-type: none"> Department of Animal Husbandry 	
<p>12.1.4</p> <p>Monitor the implementation of IPC in animals, fisheries, and food sector. L</p>	<ul style="list-style-type: none"> Department of Animal Husbandry Department of Fisheries 	<ul style="list-style-type: none"> Department of Agriculture RCDF Commissionerate of Food Safety & Drug Control
<p>12.1.5</p> <p>Increase compliance of routine immunization in animals and biosafety measures. S</p>	<ul style="list-style-type: none"> Department of Animal Husbandry 	<ul style="list-style-type: none"> RCDF
<p>12.1.6</p> <p>Increase compliance of sterilization & disinfection practices in veterinary hospitals. S</p>	<ul style="list-style-type: none"> Department of Animal Husbandry 	

Timeline: (L-Long > 1 Year)

(M-Medium > 12 Week)

(L-Long > 1 Year)

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>1.2.2</p> <p>Monitor compliance with IPC practices during the production/processing of food & food storage. S</p>	<ul style="list-style-type: none"> Department of Agriculture Commissionate of Food Safety & Drug Control Department of Animal Husbandry 	<ul style="list-style-type: none"> ICDF Department of Fisheries
<p>1.2.3</p> <p>Develop standard operating procedures (SOPs) for IPC in animal health and food. S</p>	<ul style="list-style-type: none"> Department of Animal Husbandry Commissionate of Food Safety & Drug Control Department of Fisheries Rajasthan Cooperative Dairy Federation (RCDF) 	<ul style="list-style-type: none"> Department of Agriculture
<p>1.2.4</p> <p>Develop a policy on registration and licensing of farms, slaughterhouses, agro farms, fish processing units and veterinary care units. M</p>	<ul style="list-style-type: none"> Department of Environment & Climate Change Local self-Government Department (Nagar Nigam) 	<ul style="list-style-type: none"> Department of Animal Husbandry Commissionate of Food Safety & Drug Control
<p>1.2.5</p> <p>Develop appropriate biosecurity guidelines and Standard Operating Procedures (SOPs) on waste management for farms, feed manufacturers, slaughterhouses, food processing units, health, and veterinary care facilities, sewage treatment plants, and good manufacturing practices (GMPs) for meat processing units. M</p>	<ul style="list-style-type: none"> Department of Animal Husbandry Rajasthan State Pollution Control Board 	<ul style="list-style-type: none"> Commissionate of Food Safety & Drug Control Local self-Government Department (Nagar Nigam) Department of Environment & Climate Change
<p>1.2.6</p> <p>Revise and review the biosecurity guidelines, SOPs, and good manufacturing practices. S</p>	<ul style="list-style-type: none"> Commissionate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Department of Animal Husbandry Department of Agriculture ISSAI

Timeline: **S**, Short (<1 year) **M**, Medium (>1-3 years) **L**, Long (>3 years)

Key Outputs	Outputs Indicators
<ul style="list-style-type: none"> State IPC coordinating unit established for departments of animal husbandry, agriculture, dairying & fisheries. Development and implementation of state plans for IPC in animal husbandry, fisheries and food. Development of SOPs for Standardization of IPC practices and biosecurity guidelines in animal health and food sectors. 	<ul style="list-style-type: none"> Number of meetings conducted by state IPC coordination units. Number of reports of implementation activities of state plans for IPC. Number of SOPs/ guidelines developed/ revised.

Sub-Objective 3.3

Strengthen infection prevention, control in the community, and reduce environmental contamination with antimicrobial resistant genes, resistant pathogens, and antimicrobial residues.

Strategic Intervention 3.3.1

Develop strategic interventions to reduce the impact of AMR on the environment.



Key Outputs	Outputs Indicators
<ul style="list-style-type: none"> SOPs developed for safe disposal of expired antimicrobials. 	<ul style="list-style-type: none"> Number of facilities implementing SOPs.

*Timeline: (P-Short < 4Year) (M-Medium > 4-7Year) (L-Long > 7Year)

Strategic Objective 4

Optimize the use of antimicrobial agents in health, animals, and food.

Sub-Objective 4.1

Ensure uninterrupted access to high-quality antimicrobial medicines.

Strategic Intervention 4.1.1

Strengthen quality, safety, and access to antimicrobials.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>4.1.1.1</p> <p>Strengthen state regulatory authority regarding the use and access to antimicrobials and enforce regulations to minimize substandard, spurious, falsely labelled, and labelled antimicrobials. M</p>	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Pharmacy Council
<p>4.1.1.2</p> <p>Ensure implementation of H and H1 schedules. S</p>	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Pharmacy Council
<p>4.1.1.3</p> <p>Disseminate information, announcements, notifications for pharmacies periodically. S</p>	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Pharmacy Council & Pharmaceuticals
<p>4.1.1.4</p> <p>Restrict/ ban the non-therapeutic use of critically important antimicrobials for humans and as growth promoters for disease prevention in animals. M</p>	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Pharmacy Council
<p>4.1.1.5</p> <p>Conduct regular inspections and follow-ups for the usage of antimicrobials in animals. S</p>	<ul style="list-style-type: none"> Department of Animal Husbandry 	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control

M Medium (> 3-6 mo) | **S** Short (< 3 mo) | **L** Long (> 1 year)

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>4.1.1.1</p> <p>Ensure compliance of pharmacies and drug dispensing units to existing regulatory guidelines. M</p>	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Pharmacy Council
<p>4.1.1.2</p> <p>Strengthen quality management system for supply chain management of antimicrobials in government sector. M</p>	<ul style="list-style-type: none"> Rajasthan Medical Service Corporation Limited (RMSCL) Commissionerate of Food Safety & Drug Control Department of Animal Husbandry 	<ul style="list-style-type: none"> Department of Medical & Health
<p>4.1.1.3</p> <p>Ensure the availability of first-line antimicrobials across all healthcare facilities. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Rajasthan Medical Service Corporation Limited (RMSCL) 	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control
<p>4.1.1.4</p> <p>Ensure the availability of antimicrobials for animals as enlisted in govt orders. M</p>	<ul style="list-style-type: none"> Department of Animal Husbandry 	
<p>4.1.1.5</p> <p>Develop and implement drug/antibiotic take-back programs in a phase-wise manner across healthcare facilities. L</p>	<ul style="list-style-type: none"> Department of Medical & Health 	<ul style="list-style-type: none"> Local self-Government Department (Nagar Nigam) Rajasthan State Pollution Control Board Commissionerate of Food Safety & Drug Control
<p>4.1.1.6</p> <p>Implement and monitor the sale of antibiotics as per state and national guidelines. L</p>	<ul style="list-style-type: none"> Commissionerate of Food Safety & Drug Control 	<ul style="list-style-type: none"> Department of Medical & Health Department of Animal Husbandry

Key Outputs

- Improved regulation, compliance and oversight of antimicrobial use.
- Development of take back policy for antimicrobials.

Output Indicators

- Number of regulations strengthened.
- Number of facilities implementing take-back programs.

Timeline: **S** (Short, <1 year) **M** (Medium, >1-3 years) **L** (Long, >3 years)

Sub-Objective 4.2

Establish the state surveillance system for antimicrobial use.

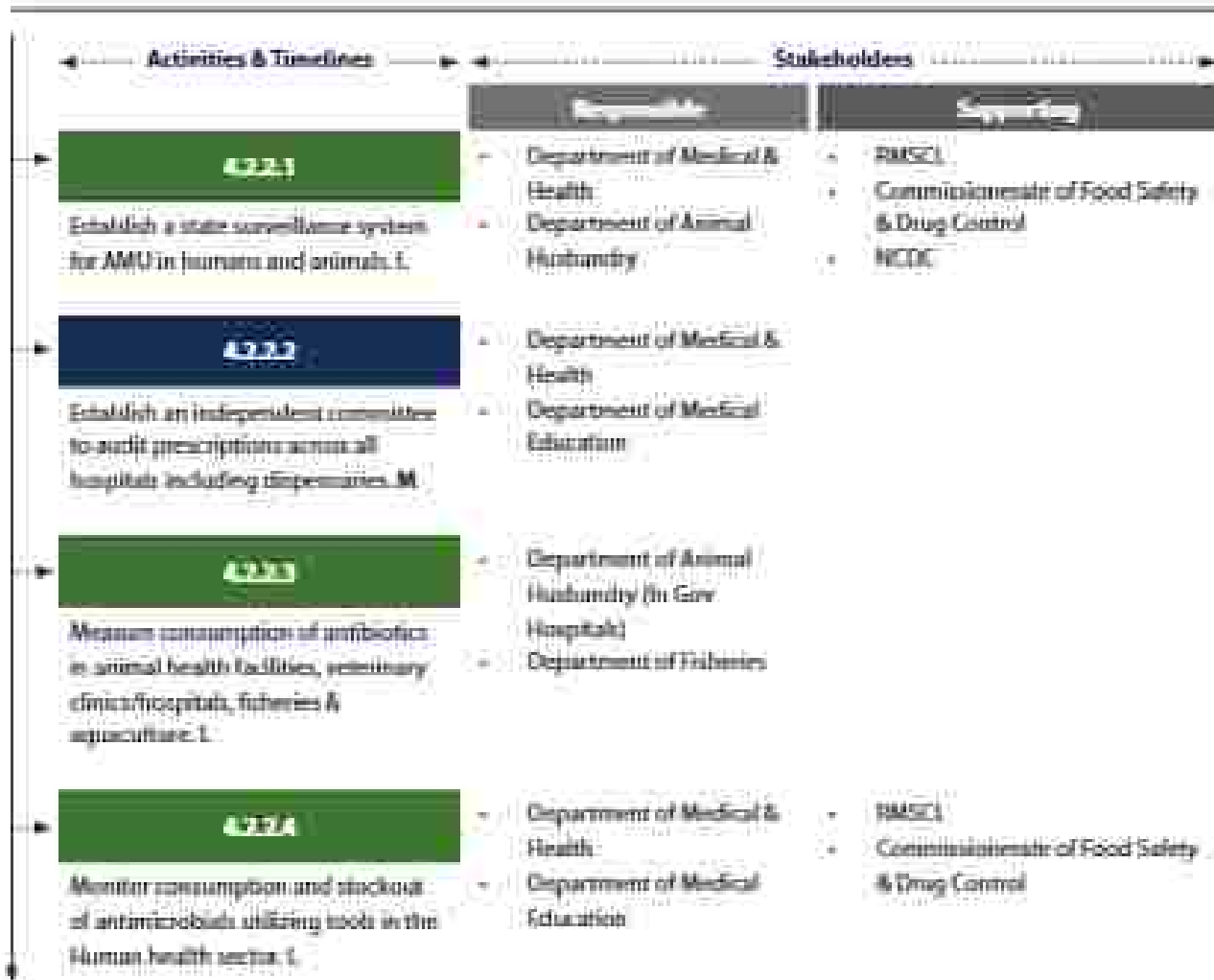
Strategic Intervention 4.2.1

Regulate and optimize the use of antimicrobials in animals and food.



Strategic Intervention 4.2.2

Establish State surveillance system for antimicrobial use (AMU) in humans, animals, agriculture & food.



I: Immediate (0-3 Months) M: Medium (3-12 Months) L: Long (12 Months)



Key Outputs	Output Indicators
<ul style="list-style-type: none"> Surveillance system for AMU established in human and animal sector. Monitoring system for antibiotic utilisation/consumption established. 	<ul style="list-style-type: none"> Number of facilities enrolled under AMU surveillance system. Number of facilities measuring consumption of antibiotics.

(High Risk, > 200 beds, > 1 year)
(M. Medium, > 1-3 Wards)
(L, Low, > 3 months)

Sub-Objective 4.3

Improve appropriate use of antimicrobials in healthcare.

Strategic Intervention 4.3.1

Improve appropriate use of antimicrobials in healthcare facilities

Activities & Timelines	Stakeholders	
	Organisational	Supporting
<p>4.3.1.1</p> <p>Establish and implement Antimicrobial Stewardship Programs (AMSPs) in tertiary and secondary healthcare facilities. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education 	<ul style="list-style-type: none"> NCDC
<p>4.3.1.2</p> <p>Develop/implement local guidelines on appropriate antimicrobial use in all healthcare facilities after wide discussions across all departments to improve ownership and acceptability. L</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education 	<ul style="list-style-type: none"> NCDC United Private Clinics & Hospitals Association of Rajasthan (UPCHAJ) Indian Medical Association (IMA)
<p>4.3.1.3</p> <p>Create electronic health records (EHR)/state health cards and ensure implementation of AMCs at all healthcare facilities. L</p>	<ul style="list-style-type: none"> Department of Medical & Health 	<ul style="list-style-type: none"> NC DOH Department of Medical Education IMA NCDC UPCHAJ
<p>4.3.1.4</p> <p>Establish monitoring and evaluation system for effective stewardship program. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education 	

Key Outputs	Output Indicators
<ul style="list-style-type: none"> AMSP in healthcare facilities established and implemented along with development of appropriate policies and SOPs. Monitoring and evaluation system established for effective management of stewardship program. 	<ul style="list-style-type: none"> Number of healthcare facilities implementing AMSPs. Number of guidelines/ SOPs/ policies developed/ implemented. Number of monitoring and evaluation reports available.

Timeline: **S** Short (<1Yr) **M** Medium (1-3Yrs) **L** Long (>3Yrs)

Strategic Objective 5

Promote investments for AMR activities, research, and innovations for AMR containment.

Sub-Objective 5.1

Encourage basic and operational research for AMR containment.

Strategic Intervention 5.1.1

Encourage basic and operational research for AMR containment.

Activities & Timelines	Stakeholders	
	Responsible	Supporting
<p>5.1.1.1</p> <p>Identify priorities for developing research projects related to AMR. M</p>	<ul style="list-style-type: none"> Department of Medical Education Department of Animal Husbandry Veterinary Universities 	<ul style="list-style-type: none"> Department of Medical & Health
<p>5.1.1.2</p> <p>Develop and implement projects in basic, translational, and operational research related to AMR. M</p>	<ul style="list-style-type: none"> Department of Medical Education Department of Medical & Health Rajasthan University Health Science (RUHS) Department of Animal Husbandry Veterinary Universities 	
<p>5.1.1.3</p> <p>Conduct research in rapid diagnosis of microbial infections and resistance in humans, animals; alternatives for antimicrobials; in field of IPC and prevention of HAI. M</p>	<ul style="list-style-type: none"> Department of Medical & Health Department of Medical Education Department of Animal Husbandry Veterinary Universities 	<ul style="list-style-type: none"> Rajasthan University Health Science (RUHS) Indian Council of Medical Research (ICMR) ICMR

Key Outputs	Output Indicators
<ul style="list-style-type: none"> Basic, translational, and operational research priority projects were identified, developed and implemented for AMR in the state in different sectors. Advancements in Rapid microbial diagnosis, antimicrobial alternatives, and in field of IPC. 	<ul style="list-style-type: none"> Number of research priorities identified. Number of research projects conducted.

Timeline: S. Short (<1 year) | M. Medium (>1-3 years) | L. Long (>3 years)

Governance & Coordination Mechanism



A three-tiered governance structure designed to manage and coordinate the state-level response to combat AMR.

- **Intersectoral Coordination Committee (ICC):** Positioned at the top, this committee is responsible for leading and overseeing the state's response, ensuring effective coordination across various sectors, and driving the implementation of strategies.
- **Technical Advisory Group (TAG):** Serving as the second tier, this group provides essential technical guidance and expert advice, reviews strategic plans, and recommends best practices to enhance the effectiveness of interventions.
- **Core Working Group (CWG):** At the base of the structure, this group acts as the operational arm within each sector, focusing on the execution of plans and managing day-to-day coordination activities.

This integrated framework fosters a collaborative approach, leveraging leadership, technical expertise, and operational execution to achieve shared objectives in combating AMR.

Activities to establish Governance and Coordination mechanism
Focal points are to be identified by each sector for effective collaboration and coordination. *
ICC and TAG committee to identify activities requiring intersectoral coordination. *
ICC committee is to meet at least annually & TAG is to meet at least every six months to review the status and progress of the identified activities. †

Strategic Objective 1 (SoC)		Strategic Objective 2 (SoC)		Strategic Objective 3 (SoC)		Strategic Objective 4 (SoC)	
<p>Strategic Objective 1 Improve awareness and understanding of AMR through education, training, and training.</p>	<p>Development of policy and guidelines for AMR. Implementation of awareness campaigns and training for health workers. Involvement of private sector organizations.</p>	<p>Medium Term (1-3 Years) Establishment of AMR surveillance and reporting systems. Development of training programs for health workers. Promotion of responsible use of antimicrobials.</p>	<p>Long Term (>3 Years) Promotion of AMR awareness and responsible use of antimicrobials. Establishment of AMR surveillance systems.</p>	<p>Strategic Objective 2 Strengthen surveillance and reporting of AMR in health facilities and community settings.</p>	<p>Establishment of AMR surveillance systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Medium Term (1-3 Years) Establishment of AMR surveillance systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Long Term (>3 Years) Promotion of AMR awareness and responsible use of antimicrobials. Establishment of AMR surveillance systems.</p>
<p>Strategic Objective 2 Reduce the use of antimicrobials in health facilities and community settings.</p>	<p>Development of AMR surveillance and reporting systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Medium Term (1-3 Years) Establishment of AMR surveillance systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Long Term (>3 Years) Promotion of AMR awareness and responsible use of antimicrobials. Establishment of AMR surveillance systems.</p>	<p>Strategic Objective 3 Strengthen surveillance and reporting of AMR in health facilities and community settings.</p>	<p>Establishment of AMR surveillance systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Medium Term (1-3 Years) Establishment of AMR surveillance systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Long Term (>3 Years) Promotion of AMR awareness and responsible use of antimicrobials. Establishment of AMR surveillance systems.</p>
<p>Strategic Objective 3 Strengthen surveillance and reporting of AMR in health facilities and community settings.</p>	<p>Development of AMR surveillance and reporting systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Medium Term (1-3 Years) Establishment of AMR surveillance systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Long Term (>3 Years) Promotion of AMR awareness and responsible use of antimicrobials. Establishment of AMR surveillance systems.</p>	<p>Strategic Objective 4 Promote responsible use of antimicrobials in health facilities and community settings.</p>	<p>Establishment of AMR surveillance systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Medium Term (1-3 Years) Establishment of AMR surveillance systems. Implementation of AMR reporting systems. Promotion of AMR surveillance systems.</p>	<p>Long Term (>3 Years) Promotion of AMR awareness and responsible use of antimicrobials. Establishment of AMR surveillance systems.</p>

Strategic framework to combat Antimicrobial Resistance (AMR) in Rajasthan

Stakeholder Mapping* to RAPCAR

Stakeholders	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5
Department of Medical & Health	■	■	■	■	■
Department of Medical Education (State Medical Colleges)	■	■	■	■	■
Department of Animal Husbandry	■	■	■		
Commissionerate of Food Safety and Drug Control	■	■	■	■	
Department of Environment & Climate Change	■	■	■		
Department of Agriculture	■		■		
Department of Fisheries	■		■		
Rajasthan State Pollution Control Board	■	■	■		
Rajasthan Cooperative Dairy Federation			■		
Secretary Education Department	■				
College Education Department	■				
Local Self Government Department			■		
Rajasthan Medical Service Corporation Limited				■	
Ayurveda, Yoga, and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH)					■
Veterinary Universities	■				■
Agriculture Universities	■				■

*Mapping is based on Responsible Stakeholder

Annexure 1: Terms of Reference (TORs) of state level committee

A. Intersectoral Coordination Committee

The roles and responsibilities of the ICE AMR are as follows: -

1. Lead and facilitate the coordination of the State response to the threat of AMR.
2. Oversee progress of State efforts to combat AMR and ensure implementation of RAPCAR.
3. Ensure information sharing to reinforce AMR-related activities amongst all sectors.
4. Ensure coordination of the health system and other sectors to achieve the AMR-related public health goals.
5. Review and revise terms of reference of the technical advisory group on AMR.
6. Facilitate and synergize existing and new initiatives to achieve the goal of combating AMR in Rajasthan.
7. Facilitate collaboration with internal and external agencies and organizations for AMR-related activities.
8. Endorse RAPCAR and ensure adequate logistic and resource mobilization to cover any funding gap.

Frequency of Meeting: Once every year

Intersectoral Coordination Committee for AMR			
1.	Principal Secretary	Department of Environment and Climate Change	Member
2.	Secretary	Department of Medical, Health and Family Welfare	Chairperson
3.	Secretary	Department of Animal Husbandry, Dairy and Fisheries	Member
4.	Mission Director	National Health Mission	Member
5.	Managing Director	Rajasthan Medical Service Corporations Limited (RMSC)	Member
6.	Joint Secretary	Public Health Engineering Department	Member
7.	Managing Director	Rajasthan State Food and Civil Supplies Corporation	Member
8.	Managing Director	Rajasthan Co-operative Dairy Federation Limited	Member
9.	Commissioner	Department of Agriculture & Panchayat Raj	Member
10.	Commissioner	Commissionerate of Food Safety and Drug Control	Member
11.	Commissioner	Department of Medical Education	Member
12.	Director Public Health	Directorate of Medical Health Services (DMHS)	Member
13.	Director	Department of Ayurveda & Indian medicine	Member
14.	Add. Director (AMR)	Directorate of Medical Health Services (DMHS)	Member Secretary
15.	Add. Director & AMR Nodal Officer	NCDIC, New Delhi/MOHFW	Member
16.	SPO (IDSP) & State Nodal Officer — AMR	DMHS	Member
17.	State Microbiologist & AMR Focal Point	DMHS	Member
18.	Academic Head (PH)	AIIMS, Jaipur	Member

B. Technical Advisory Group

The roles and responsibilities of the TAG are as follows-

1. Provide technical inputs and expert advice for initiatives to combat AMR in Rajasthan.
2. Provide technical advice and reports to the Inter-sectoral Committee on Antimicrobial Resistance (IC-AMR).
3. Review the activities and outputs of the Core working group.
4. Monitor and guide the implementation of NAPCAR in the State including:
 - a. AMR surveillance in the State
 - b. Monitoring the rational use of antibiotics
 - c. IPC implementation and surveillance of HAs
 - d. Antimicrobial stewardship practices to optimize antimicrobial use
 - e. Increase awareness and understanding of AMR Research and innovations.

Frequency of Meeting: Once every six months

Technical Advisory Group for AMR			
1.	Director (Public Health)	Directorate of Medical Health Services (DMHS)	Chairperson
2.	Adit Director (IHI)	DMHS	Member-Secretary
3.	Adit Director (IA)	DMHS	Member
4.	Adit Director & AMR Nodal Officer	NCDCC New Delhi/MOHFW	Member
5.	State Program Manager (SPM)	National Health Mission	Member
6.	SRO (DSP) & State Nodal Officer – AMR	DMHS	Member
7.	State Microbiologist & AMR Focal Point	DMHS	Member
8.	Chief Food Analyst and Drug Controller	DMHS	Member
9.	Deputy Director	State Veterinary Council	Member
10.	HOD	Department of Microbiology, SMS Medical College	Member
11.	Nodal for AMR	Department of Microbiology, SMS Medical College	Member
12.	Regional Coordinator One Health	Department of Microbiology, SMS Medical College	Member
13.	HOD & AMR Focal Point	Department of Microbiology, SN Medical College, Jaipur	Member
14.	HOD & AMR Focal Point	Department of Microbiology, JNT Medical College, Udaipur	Member Secretary
15.	HOD & AMR Focal Point	Department of Microbiology, SP Medical College, Bikaner	Member
16.	HOD & AMR Focal Point	Department of Microbiology, Govt. Medical College, Kota	Member
17.	HOD & AMR Focal Point	Department of Microbiology, J.N Medical College, Ajmer	Member
18.	AMR Focal Point	Department of Pathology, SMS Medical College	Member

Extended Advisory Group for AMR

19.	AMR Focal Point	Department of Pharmacology, SMS Medical College	Member
20.	AMR Focal Point	Public Health and Engineering Department	Member
21.	AMR Focal Point	Department of Environment and Climate Change	Member
22.	AMR Focal Point	Pollution Control Board	Member
23.	AMR Focal Point	Department of Animal Husbandry	Member
24.	AMR Focal Point	Department of Fisheries	Member
25.	AMR Focal Point	Department of Ayurveda and Indian Medicine	Member
26.	AMR Focal Point	Rajasthan Co-operative Dairy Federation Limited	Member
27.	AMR Focal Point	Department of Agriculture	Member
28.	AMR Focal Point	Rajasthan State Food and Civil Supplies Corporation	Member
29.	ED (Logistics)	Rajasthan Medical Service Corporation Limited (RMSCL)	Member
30.	AMR Focal Point, Virology	Department of Microbiology, AIMS Jodhpur	Member
31.	AMR Focal Point, Bacteriology	Department of Microbiology, AIMS Jodhpur	Member
32.	Consultant Paediatrics (Pvt. N.H. Jodhpur)	Indian Medical Association	Member
33.	AMR Focal Point	UPCIWA (United Private Clinics & Hospitals Association of Rajasthan)	Member
34.	Technical Consultants	Development Partners working in AMR in state	Member

