

Madhya Pradesh
State Action Plan for Containment of
Antimicrobial Resistance
(MP-SAPCAR)



Jointly developed by Departments of
Animal Husbandry, Farmer Welfare & Agriculture Development,
Fisheries, Health & Family Welfare, Labour, Medical Education,
Public Work & Environment

Madhya Pradesh
State Action Plan for Containment of
Antimicrobial Resistance
(MP-SAPCAR)

26 July 2019

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Abbreviations & acronyms

AMR	Antimicrobial Resistance
AIIMS	All India Institute of Medical Sciences, Bhopal
EQAS	External Quality Assessment Scheme
GAP-AMR	Global Action Plan on Antimicrobial Resistance
GMC	Government Medical College, Bhopal
HIV	Human Immunodeficiency Virus
IDSP	Integrated Disease Surveillance Programme
IIMAR	Indian Initiative for Management of Antibiotic Resistance
IPC	Infection Prevention and Control
MDR/ XDR -TB	Multi Drug Resistant and Extensively Drug Resistant Tuberculosis
MPPHSCL	Madhya Pradesh Public Health Services Corporation Limited
MP-SAPCAR	Madhya Pradesh State Action Plan for Containment of AMR
NAP-AMR	National Action Plan on Antimicrobial Resistance
NCDC	National Centre for Disease Control
NDVSU	Nanjaji Deshmukh Veterinary Science University
NIRTH	National Institute for Research in Tribal Health
NRDWP	National Rural Drinking Water Programme
NTD	Neglected Tropical Diseases
OTC	over the counter
SOP	Standard Operating Procedure
STI	Sexually Transmitted Infections
TB	Tuberculosis
UNICEF	United Nations Children's Fund
WASH	Water Sanitation and Hygiene
WHO	World Health Organization

Message from Chief Minister




I am glad to learn that the Department of Public Health and Family Welfare, Government of Madhya Pradesh in partnership with stakeholders has developed the State Action Plan for Containment of Antimicrobial Resistance.

Antimicrobial Resistance is a global public health problem. Raising public awareness about appropriate use of antibiotics is a major focus of the strategy to tackle antimicrobial resistance.

Improving public and professional awareness of antimicrobial resistance is a key to reduce antimicrobial resistance.

I am sure that the plan addresses the concern of antibiotic misuse in human and animal health in the State and will help manage antimicrobial resistance that threatens public health.

I wish all the success to the Department in their endeavours and hope that the efforts will bring a distinct identity to the State.



(Shri Kamal Nath)

Message from Health Minister



एन्टीबायोटिक दवाओं का प्रतिरोध चिकित्सकीय जगत के सामने बड़ी चुनौती के रूप में उभर रहा है। मरीज के ईलाज में दवाओं की भूमिका होती है, परंतु दवाओं का अत्यधिक सेवन या बिना चिकित्सकीय परामर्श के सेवन जीवन के लिए खतरा भी हो सकता है।

आज जहां नई नई बीमारियों की संख्या में वृद्धि हुई है। वहीं इन बीमारियों को ठीक करने के लिए एन्टीबायोटिक की संख्या आज भी सीमित है। इसका कारण अत्यधिक एन्टीबायोटिक्स का प्रयोग, ओवरडोज एवं एन्टीबायोटिक दवाओं का ओवर द काउन्टर विक्रय।

एन्टीबायोटिक प्रतिरोध के बढ़ते खतरे व भविष्य में गहराते संकट को गंभीरता से लेते हुए प्रदेश ने इस ओर ठोस कदम उठाने का निर्णय लिया है। स्वास्थ्य विभाग एवं एम्स भोपाल द्वारा किये गये सम्मिलित प्रयासों से विभाग ने राज्य स्तरीय एन्टीबायोटिक पॉलिसी का निर्माण किया है। प्रयासों को आगे बढ़ाते हुए विभाग द्वारा अन्य विभाग जहां एन्टीबायोटिक दवाओं का उपयोग होता है उनके साथ मिलकर एन्टीबायोटिक के प्रतिरोध की रोकथाम हेतु राज्य स्तरीय एक्शन प्लान विकसित किया गया है। इस पहल से मध्यप्रदेश पूरे देश में केरला के बाद दूसरा प्रदेश है, जिसके द्वारा एन्टीबायोटिक दवाओं के प्रतिरोध की रोकथाम हेतु कड़े प्रयास किये जा रहे हैं।

मुझे आशा है कि विभागों द्वारा किये जा रहे सतत् प्रयासों से एन्टीबायोटिक दवाओं के अत्यधिक उपयोग में कमी आएगी जो जन-मानस के स्वास्थ्य को लाभान्वित करेगा।


(तुलसीराम सिलावट)

Message from Principal Secretary, Health



Antimicrobial resistance (AMR) has been identified as a global health threat with serious health, political and economic implications it threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi no longer susceptible to the common medicines used to treat them. The contributing factors that have led to AMR are now better understood. These included irrational prescription of antibiotics by doctors, over the counter sale of antibiotics, direct sale of drugs to patients by pharmacists, Self-medication and lack of knowledge regarding appropriate use of antibiotics among consumers and the public. Beside these factors widespread use of antibiotics in veterinary sector is also playing contributory role. Needless to say, the behavioral pattern of the health care providers and public is of paramount importance in the emergence of antimicrobial resistance.

National Action Plan on Antimicrobial Resistance is a welcome step by the Ministry of Health and Family Welfare, Government of India which addresses the intervention strategies required for AMR containment. Aligning with this, Department of Health and Family Welfare, Government of Madhya Pradesh and the subject experts of All India Institute of Medical Science, Bhopal, MP have jointly developed **State Antibiotic Policy** that clearly articulate the sets of strategies and activities to be adhered to for antimicrobial treatment in all hospitals and achieve optimal health outcomes for patients.

Taking our efforts towards the next level Department of Health and Family Welfare, Government of Madhya Pradesh has developed a **“State Action Plan for Containment of Antibiotic Resistance”**. With this Madhya Pradesh has become the second State in the country after Kerala which has developed its own State Action Plan. I hope that the efforts being made by the Department in this direction will yield optimal results which will benefit the public in the time days to come.

(Pallavi Jain Govil)

Message from Health Commissioner



Antimicrobial resistance (AMR) poses a serious global threat to human, animal, and environment health. This is due to the emergence, spread, and persistence of multidrug-resistant (MDR) bacteria or “superbugs.” MDR bacteria exist across the animal, human, and environment triangle and there is interlinked sharing of these pathogens in this triad. The plausible causes of “the global resistome” or AMR include excessive use of antibiotics in animals (food, pets, aquatic) and humans, antibiotics sold over-the-counter, poor sanitation/hygiene, and release of nonmetabolized antibiotics or their residues into the environment through manure/feces. To address this global threat, it is utmost important to understand various drivers of antibiotic resistance.

Understanding the importance of increasing AMR, the Ministry of Health & Family Welfare, Government of India has formulated the National Action Plan on Antimicrobial Resistance (NAP-AMR) in alignment with Global Action Plan (GAP-AMR).

I am happy to share that the State Health Department is persistently working towards addressing this issue. As a stepping stone the department has already developed the “State Antibiotic Policy”. Expanding the efforts department has also succeeded in developing the State Action Plan for Containment of Antibiotic Resistance by bringing all the stakeholders on the same page.

I hope all stakeholders will make a meaningful contribution in this issue.

A handwritten signature in black ink, appearing to be 'Nitesh Vyas'.

(Nitesh Vyas)

Message from Mission Director, NHM



Antibiotic resistance is pervasive and affecting the treatment of infectious diseases. Though antibiotic resistance occurs naturally, misuse of antibiotics in humans and animals is accelerating the process. A large number of infections such as pneumonia, tuberculosis, and UTI are becoming difficult to treat as antibiotics used to treat them have become less effective now. Though antibiotics have proven to be a boon in fixing many ailments, their excessive and irrational use of antibiotics drugs has led to anew problem of resistance to these drugs.

Recent reports estimate that, without concerted action, by 2050 resistance to antimicrobial drugs will cause up to 10 million deaths a year globally and reduce global gross domestic product (GDP) by 2 to 3.5 per cent. Considering the alarming threat, serious efforts are being made globally to combat this problem. The Department of Health and Family Welfare Government of Madhya Pradesh is tirelessly working to address this issue. Towards this, “State Action Plan for Containment of AMR” has been developed by the department with the support of various stakeholders.

I look forward to the plan being implemented efficiently at all levels where antibiotics are used. I believe that the efforts made so far will contribute significantly in addressing this issue in future.


(Chhavi Bhardwaj)

Background

Antimicrobial Resistance (AMR) is the ability of microorganisms to develop resistance against antimicrobial drugs. A global public health problem, AMR has the potential to wash away medical success achieved so far and bring us back to a pre-antibiotic era. Although evolution of AMR is a natural phenomenon, many factors have contributed to its acceleration. Impact of antimicrobial resistance is also phenomenal, as it leads to prolonged illness, extended duration of therapy, increased risk of mortality, higher costs for patients and healthcare, as well as an increased risk of further spread of resistant microbes.

AMR has been flagged as a national and international priority by governments and relevant stakeholders, worldwide. Various global initiatives including the Global Action Plan on AMR (GAP-AMR) have helped to shape national agendas on AMR.

India formulated its National Action Plan on AMR (NAP-AMR) and the same was endorsed on 19 April 2017 at the Inter-Ministerial Consultation on Antimicrobial Resistance. Currently the Indian states are at varying stages of developing their State Action Plans for Containment of Antimicrobial Resistance. The framework of the State Action Plan rests on a One Health approach across defined strategic priorities, in alignment with the NAP-AMR.

The Government of Madhya Pradesh has committed to take suitable actions to address antimicrobial resistance in the state by involving relevant stakeholders to develop the Madhya Pradesh State Action Plan for Containment of Antimicrobial Resistance (MP-SAPCAR), aligned with the National and Global Action Plans. Inter-sectoral collaboration and a One Health Approach are crucial and integrated in the Madhya Pradesh government's approach.

The National Action Plan on Antimicrobial Resistance (NAP-AMR) has six strategic priorities and 16 focus areas:

1. Improve awareness and understanding of AMR through effective communication, education and training
 - a) Communication and information resources – to raise awareness amongst all stakeholders, including policy makers, public and farmers
 - b) Education and training – to improve the knowledge and behaviour of professionals
2. Strengthen knowledge and evidence through surveillance
 - a) Strengthen laboratories – in human, animal, food and environment sectors – for evidence-informed policy-making
 - b) Surveillance of AMR – in human, animal/food and environment sectors – for evidence-informed policy-making
3. Reduce the incidence of infection through effective infection prevention & control
 - a) Healthcare – to reduce the burden of infection
 - b) Animal health/food – to reduce spread of AMR and antimicrobials through animals and food
 - c) Community and community environment – to reduce the spread of AMR and antimicrobials in the community and environment
4. Optimize the use of antimicrobial agents in health, animals and food
 - a) Regulations, access and surveillance of antimicrobial use – to ensure rational use without affecting access to antimicrobials
 - b) Antimicrobial stewardship in healthcare – to optimise use of antimicrobials in humans
 - c) Animal health, agriculture – to optimise use of antimicrobials in animal and food sectors
5. Promote investments for AMR activities, research and innovations
 - a) New medicines and diagnostics – to ensure availability of effective diagnostics and drugs to treat infections
 - b) Innovations – to develop alternative approaches to manage infectious diseases
 - c) Financing – to ensure sustainable resources for containment of AMR
6. Strengthen India's leadership on AMR
 - a) International collaborations – to ensure India's contributions towards global efforts to contain AMR
 - b) National collaborations – to facilitate collaborations among vertical disease control programmes and national stakeholders
 - c) State level collaborations – to ensure action at the ground level against AMR

Containment of AMR in Madhya Pradesh

There are some existing initiatives for AMR containment in Madhya Pradesh. These are outlined below according to the strategic priorities of the Indian NAP-AMR and are based on the background document – AMR and its Containment in Madhya Pradesh.

Awareness generation on AMR is essential to improve the basic understanding of factors contributing to emergence of AMR. Indian Initiative for Management of Antibiotic Resistance (IIMAR, Madhya Pradesh) has been actively involved since 2008, for advancing messages on promotion of prudent use of antibiotics to reduce the possibility of spread of antibiotic resistance. Under an ongoing Indo-Swedish collaborative research project between RD Gardi Medical College, Ujjain and Karolinska Institutet, Stockholm, Sweden, APRIAM – antibiotic stewardship programme including infection prevention and control and waste water treatment: Implementation research in hospital and community in India – Hand Hygiene Team, is leading a campaign titled '*Swachh Bharat – Swastha Bharat*' since 2011, to improve hygiene practices among health care workers and the community.

Strengthening laboratory capacity and AMR surveillance systems is also essential for assessing baseline AMR burden and providing evidence-based information for action. Laboratory Strengthening under Integrated Disease Surveillance Programme (IDSP) is aimed at upgradation of health laboratories at all levels, from peripheral to national reference laboratories, as well as for establishment of quality assurance system to improve quality of laboratory data. IDSP is active in Madhya Pradesh. Mahatma Gandhi Memorial Medical College, Indore is part of the AMR network of laboratories under National Centre for Disease Control (NCDC).

Since food of animal origin also represents the major route of human exposure to foodborne pathogens, AMR surveillance in animals is as critical as it is in human health. AMR surveillance in animals and antibiotic residue studies in animal products is being conducted at the Nanaji Deshmukh Veterinary Science University (NDVSU) Jabalpur.

Application of good IPC measures across human health, animal health and agriculture help to prevent infections and limits use of antibiotics. Application of good IPC measures to animal husbandry is also important to reduce antimicrobial residues in environment. Madhya Pradesh Fisheries Federation actively conducts pre-stocking seed checks to control infections in reservoir farms. Madhya Pradesh government has adopted demand-based approach to Water, Sanitation and Hygiene (WASH) and developed *Maryada* guidelines with technical support from UNICEF. The WASH programme supports water and sanitation, *Nirmal Bharat Abhiyan* and National Rural Drinking Water Programme (NRDWP), thereby ensuring access to safe water and basic sanitation services.

Swachh Bharat Abhiyan (Clean India Mission) is a mega plan launched by the Indian Government to meet the target of Clean India and eradicate open defecation by 2019. According to the '*Swachh Survekshan 2017*' announcement on cleanliness ranking of 434 cities, Ministry of Urban Development has declared Indore as the cleanest city in India, followed by Bhopal. Overall, 22 cities in Madhya Pradesh figured among top 100 cleanest cities in the country. Madhya Pradesh government has committed to make the state as a 'model state' in terms of cleanliness and sanitation.

Kayakalp Abhiyan was launched in the state (in July 2015), which included strict compliance for infection control, waste management and hygiene promotion. Standard Treatment Guidelines for Madhya Pradesh (2014) have been compiled by Directorate of Health Services and issued by Department of Public Health & Family Welfare. Launch of annual antibiogram reports compiling the antibiotic susceptibility profile of clinically significant pathogens, by the All India Institute of Medical Sciences (AIIMS) Bhopal, is a step towards fostering the Antimicrobial Stewardship Programme. AIIMS Bhopal has also initiated the formulation of Hospital Antibiotic Policy on an annual basis, based on the prevalent antibiogram and the 'National Treatment Guidelines for Antimicrobial Use in Infectious Diseases'. Department of Public Health and Family Welfare with technical assistance from AIIMS Bhopal developed and launched the State Antibiotic Policy in 2018.

According to the National Institute of High Security Animal Diseases in Bhopal, Madhya Pradesh, increased protein demand in India has resulted in intensive farming coupled with antibiotic use. Laws are needed to regulate the indiscriminate use of antibiotics in poultry as farmers use antibiotics as a stopgap measure instead of adhering to better hygiene and sanitation. There is currently no disease occurrence in fish culture reservoirs, as reported by Madhya Pradesh Fisheries Federation. Growth promoters are not applied in fish culture reservoirs.

Research and innovations on newer antimicrobials is critical as the world is running out of effective antibiotics to fight even simple infections. The National Institute for Research in Tribal Health (NIRTH) Jabalpur, one of the research institutes under the Indian Council of Medical Research, is engaged in research activities to address health problems of the tribal population. The Nanaji Deshmukh Veterinary Science University (Jabalpur), Amity Institute of Biotechnology (Gwalior) and Pinnacle Biomedical Research Institute (Bhopal) are also actively involved on various research projects to explore alternative approaches to fight bacterial infections.

Fostering inter-sectoral collaborations for better engagement on AMR activities is crucial to cross sectoral working. Government of Madhya Pradesh has expressed willingness to support public private partnerships, to move forward towards AMR containment goals. Various challenges in development and implementation of MP-SAPCAR may include communication gaps, untrained personnel, weak laboratory systems, low quality surveillance data, regulatory issues and poor inter-sectoral collaboration. However, strong support from the policy makers and dedicated stakeholders, as well as ongoing efforts at hospitals and research institutes, cast optimism on successful future outcomes for AMR containment in Madhya Pradesh.

The next section briefly describes various activities undertaken at the Madhya Pradesh State Workshop on AMR that was organized in November 2017 and brought together all relevant stakeholders on a common platform and initiated the formulation of MP-SAPCAR. During the World Antibiotic Awareness Week (November 2018), many stakeholders met at AIIMS Bhopal under the chairmanship of Director and discussed the future roadmap of MP-SAPCAR. All stakeholders again met in

January 2019 under the chairmanship of Principal Secretary Health to review and revise the initial draft of MP-SAPCAR.

State Workshop on Antimicrobial Resistance

The Madhya Pradesh State Workshop on AMR was organized by the Directorate of Health Services, Madhya Pradesh at Bhopal on 13 November 2017, with technical support from NCDC and WHO Country Office for India. The theme for the workshop was *“Combating AMR in Madhya Pradesh – Towards an Agenda for Action”*. The workshop aimed at awareness generation on AMR among all representatives and participants, as well as discuss various options for formulation of the Madhya Pradesh State Action Plan for Containment of Antimicrobial Resistance (MP-SAPCAR), aligned to the NAP-AMR.

The event brought together stakeholders from human health (public and private), animal/food sector, Food and Drugs Administration, Pollution Control Board, environment, research and state health administration on one forum, thereby emphasizing upon the importance of a cross-sectoral approach towards containing AMR.

The first session comprised of presentations on global and national initiatives, to provide an understanding on causes of AMR, negative impact across all sectors (human health, animal/agriculture sector, and environment) and various initiatives undertaken at global and national levels to combat the problem.

After completion of proceedings on information sharing, the participants were segregated in groups based on their domain of expertise, to reflect on strategic activities for collaborative containment of AMR, with a focus on ‘One Health’ approach. The groups were based on the strategic priorities of the state action plan as mentioned below:

- (i) Awareness and understanding – communications and trainings;
- (ii) Knowledge and evidence – laboratories and surveillance;

- (iii) Infection prevention and control – human health, animal/food and community;
- (iv) Optimizing use of antibiotics – regulations and antibiotic consumption, antimicrobial stewardship in humans and animals;
- (v) Research, innovations and sustainable financing; and
- (vi) Collaborations and convergence

The workshop resulted in active engagement of all stakeholders, with key takeaway messages as follows:

- Information and communication as well as education and training are essential to generate awareness and improve understanding among public, students, as well as health professionals (doctors, nurses, pharmacists, laboratory and paramedical staff), and stakeholders from animal husbandry (including farmers), food and drugs administration
- AMR surveillance activities are important to generate evidence to guide policy making at the state and institutional levels
- Strengthening of Hospital Infection Control Programme was emphasized
- Formulation of Antimicrobial Stewardship Programme and Hospital Antibiotic Policy was considered essential to optimize antimicrobial/antibiotic use
- Compliance to Standard Guidelines for Treatment of Infectious Diseases, was considered important to optimize use of antibiotics in healthcare
- Involvement of regulatory bodies to control sale and access of antibiotics was highlighted
- Research on alternative remedies shall be a focus area under innovations
- Role of cross-sectoral collaboration and networking was regarded as critical for the overall success of AMR containment activities

The next section has been drafted by compilation of activities proposed by the participants during the group work, with an aim to achieve specific objectives.

Madhya Pradesh State Action Plan for Containment of Antimicrobial Resistance (MP-SAPCAR)

The State AMR workshop identified 6 strategic priorities of the Madhya Pradesh State Action Plan for Containment of Antimicrobial Resistance (MP-SAPCAR):

1. Awareness and understanding

2. Knowledge and evidence

3. Infection prevention and control

4. Optimizing use of antibiotics

5. Research and innovations

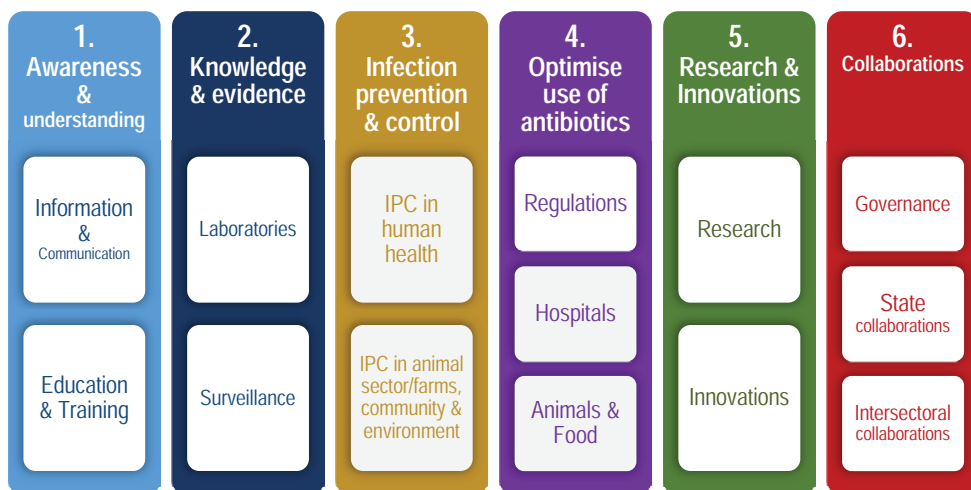
6. Collaborations

MP-SAPCAR – 6 strategic priorities

The Madhya Pradesh State Action Plan for Containment of Antimicrobial Resistance (MP-SAPCAR) has the following 14 focus areas:

1. Improve awareness and understanding of AMR through effective communication, education and training
 - Focus area 1: Information and communication
 - Focus area 2: Education and training
2. Strengthen knowledge and evidence through surveillance
 - Focus area 3: Laboratories
 - Focus area 4: Surveillance
3. Reduce the incidence of infection through effective infection prevention and control (IPC)

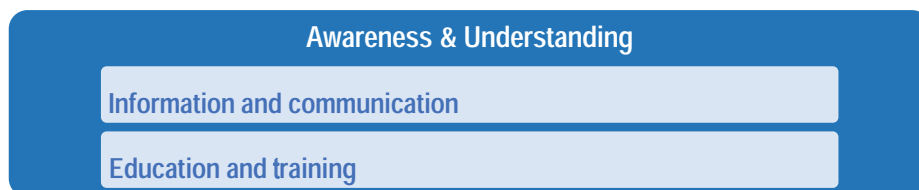
- Focus area 5: IPC in human health
 - Focus area 6: IPC in animal sector/farms, community and environment
4. Optimize the use of antimicrobial agents in health, animals and food
 - Focus area 7: Regulations
 - Focus area 8: Hospitals
 - Focus area 9: Animals and food
 5. Promote investments for AMR activities, research and innovations for AMR containment
 - Focus area 10: Research on AMR
 - Focus area 11: Innovations
 6. Strengthen Madhya Pradesh's commitment and collaborations on AMR
 - Focus area 12: Governance mechanisms
 - Focus area 13: State collaborations
 - Focus area 14: Intersectoral mechanisms



MP-SAPCAR – 14 focus areas

A monitoring and evaluation framework is an integral part of MP-SAPCAR and shall ensure monitoring and implementation of MP-SAPCAR.

Strategic priority 1: Improve awareness and understanding of AMR through effective communication, and education and training



Focus area 1: Information and communication

Objective: To increase awareness and understanding regarding AMR, especially among the students and public, in Madhya Pradesh

- 1.1. Non-professional education for school and college students through role plays, social media, advertisements and FM radio (**Directorate of Higher Education, Directorate of Health Services**)
Timeline: upto 3 years
- 1.2. Non-professional education for public by role plays, social media, advertisements and FM radio (**Directorate of Higher Education, Directorate of Health Services, Directorate of Medical Education**)
Timeline: within 1 year
- 1.3. Conduct focus group discussions (**Medical Health Officers of districts, AIIMS Bhopal, GMC & other Medical Colleges, Pollution Control Board**)
Timeline: within 1 year
- 1.4. Utilize social media for awareness generation (**Medical Health Officers of districts, AIIMS Bhopal & other Medical Colleges, Pollution Control Board**)
Timeline: within 1 year

Objective: To increase awareness and improve communication regarding AMR in animal sector (veterinary, animal husbandry and fisheries) in MP

- 1.5. Consolidate existing information and conduction of knowledge, attitude and practice (KAP) and behavioural studies across general population, farmers, professionals (healthcare, AYUSH, veterinary, environment) and industry (food processing, pharmaceutical)

Timeline: within 1 year

- 1.6. Conduct teaching programmes, seminars, workshops; audio-visual aids for facilitation (**Directorate of Health**, Directorate of Medical Education, GMC and other medical colleges)

Timeline: within 1 year

- 1.7. Conduct focus group discussions (**Directorate of Health**, Directorate of Medical Education, GMC and other medical colleges, NGOs)

Timeline: within 1 year

- 1.8. Utilize social media for awareness generation (**Colleges** – medical and veterinary, Pollution Control Board)

Timeline: within 1 year

Objective: To increase awareness and improve communication regarding AMR in pharmaceutical sector (including pharmaceutical companies, medical stores) in Madhya Pradesh and at level of MP Pollution Control Board

- 1.9. Awareness and instructions for implementation of Drug and Cosmetic Act (**Drug Controller**, Pharmacy Council, Chief Medical & Health Officers of districts, MP Pollution Control Board)

Timeline: within 1 year

- 1.10. Conduct seminars and workshops (**MP Pollution Control Board**, healthcare providers, registered medical bodies like IMA, IAP, FOGSI and Nursing Home Association)

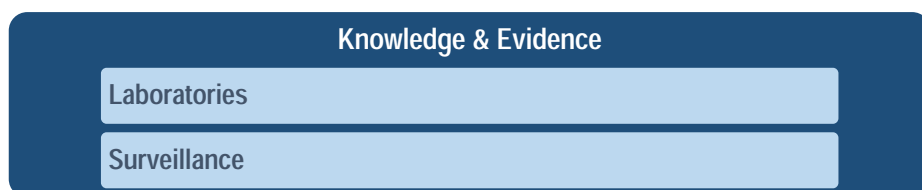
Timeline: 1 – 3 years

Focus area 2: Education and training

Objective: Capacity building of key stakeholders regarding AMR in Madhya Pradesh

- 1.11. Education programmes for nodal officers at state and district level (**Directorate of Medical Education, Department of Animal Husbandry, Director Nursing, Medical Council, Dental Council**)
Timeline: upto 3 years
- 1.12. Conduct teaching programmes, seminars, workshops; audio-visual aids for facilitation of training on AMR (**Chief Medical and Health Officers of districts. AIIMS Bhopal, GMC & Medical Colleges, Pollution Control Board**)
Timeline: within 1 year
- 1.13. Professional education programmes for doctors and nurses (**Directorate of Medical Education, Director Nursing, Department of Animal Husbandry, Medical Council of India, Dental Council of India, registered medical bodies like IMA, IAP, FOGSI and Nursing Home Association**)
Timeline: upto 3 years
- 1.14. Professional education programmes for pharmacists (**Directorate of Medical Education, Department of Animal Husbandry, Pharmacy Council, MP Medical Council, MP State Dental Council**)
Timeline: upto 3 years
- 1.15. Targeted education and training on AMR for veterinary and food professionals and awareness programme for farmers (**Department of Animal Husbandry, Department of Agriculture**)
Timeline: upto 3 years
- 1.16. Targeted education on AMR and training programme for environment regulators (**Department of Environment, Pollution control board**)
Timeline: upto 3 years

Strategic priority 2: Strengthen knowledge and evidence through surveillance



Focus area 3: Laboratories

Objective: To strengthen laboratory capacity and establish quality systems for culture and antibiotic sensitivity testing in Madhya Pradesh, which cater to needs of health, animal husbandry, food and environment sectors; to ensure uniform implementation of quality standards by conducting regular training and monitoring activities throughout Madhya Pradesh

- 2.1. Strengthen and standardize microbiology laboratories in health, animal husbandry, fisheries, food and environment sectors (**State Departments of Health, Animal Husbandry, Fisheries, MP Pollution Control Board**)
Timeline: 1 year
- 2.2. Develop SOPs for laboratory activities (Medical & veterinary laboratories)
Timeline: 6 months
- 2.3. Promote NABH and NABL accreditation among health care providers, with at least microbiology lab at 1 medical college and 1 district HQ hospital in each district accredited as a pilot project (**Departments of Health Services and Medical Education**, registered medical bodies like IMA, IAP, FOGSI and Nursing Home Association)
Timeline: 3 years
- 2.4. Procurement of equipment as per need of SOPs (**Madhya Pradesh Public Health Services Corporation Limited – MPPPHSCL**, autonomous bodies)
Timeline: 6 months – 1 year

- 2.5. Development of systems for proper treatment and disposal of laboratory waste (**Respective institutes, State Pollution Control Board**)
Timeline: 2 months after receipt of funds
- 2.6. Ensuring uninterrupted supply of consumables (**MPPPHSCL**)
Timeline: 3 months
- 2.7. Participation in External Quality Assessment Scheme (EQAS) and inter laboratory comparison programmes (**Directorate of Health Services, Accredited EQAS provider**)
Timeline: 2 years
- 2.8. Recruitment of adequate manpower at all levels consistent with expected sample load of laboratory (**State Health Department, Directorate of Medical Education**)
Timeline: At the earliest; funds: at government level
- 2.9. Regular training and monitoring of performance of recruited manpower for compliance to SOPs (**Teaching institutes – medical and veterinary**)
Timeline: Every 6 months

Focus area 4: Surveillance

Objective: Establish state level AMR surveillance across all sectors, based on WHO priority list of pathogens

- 2.10. Adapt national AMR surveillance standards/SOPs for Madhya Pradesh (**Directorate of Health, Directorate of Medical Education**)
Timeline: within 1 year
- 2.11. Establish a network of AMR laboratories for AMR surveillance using WHONET, starting with NABH and NABL accredited facilities (**Directorate of Health, Directorate of Medical Education**)
Timeline: 6 months
- 2.12. Ensure generation of antibiograms from various levels of hospitals
Timeline: within 1 year

- 2.13. Sharing of AMR data within the network
Timeline: 1 – 3 years
- 2.14. Compilation of data/information and analyse the trends
Timeline: 2 years
- 2.15. Dissemination to all stakeholders, to facilitate judicious use of antibiotics
(Directorate of Health, Directorate of Medical Education)
Timeline: upto 3 years
- 2.16. Establish surveillance of AMR in animals and animal products such as poultry, dairy, fish **(Dept of Animal Husbandry, Dept. of Fisheries)**
Timeline: upto 1 year
- 2.17. Surveillance of antimicrobial residues in retail food **(Food & Drug Administration)**
Timeline: upto 1 year
- 2.18. Surveillance of AMR and antimicrobial residues in waste from farms, wet markets, slaughter houses, food processing units, sewage/common effluent treatment plants, veterinary or healthcare, pharmaceutical settings **(State Pollution Control Board)**
Timeline: upto 1 year
- 2.19. Surveillance of antibiotic use at producer, seller and user level **(Drug Control Department,** Department of Animal Husbandry, Department of Fisheries)
Timeline: upto 1 year
- 2.20. Surveillance of antibiotic use and AMR in crops **(Department of Agriculture)**
Timeline: upto 1 year

Strategic priority 3: Reduce the incidence of infection through effective infection prevention and control (IPC)



Focus area 5: IPC in human health

Objective: To control infection in healthcare, through IPC activities

- 3.1. Formation of unified IPC committees in all hospitals, as per directive of Govt. of India/ICMR (**Hospital Infection Control Committees**, Hospital Medical Superintendents, Directorate of Medical Education and Directorate of Health)
Timeline: within 1 year
- 3.2. Assign Infection Control Nurses in all hospitals from the available nurses and strengthen their capacity for implementation of IPC measures (**Directorate of Health**)
Timeline: within 1 year
- 3.3. Strengthen capacity for diagnostic stewardship for better utilization of microbiology laboratories (**Directorate of Health and Directorate of Medical Education**)
Timeline: within 3 years

Focus area 6: IPC in animal sector/farms, community and environment

Objective: To control spread of antimicrobial resistance in animal sector/farms, community and environment, by conducting awareness sessions on IPC practices.

- 3.4. Formulation of stringent regulations and their implementation across animal/farms (**Central Drug Control Department**, State Drug Control Department, Department of Animal Husbandry)

Timeline: within 1 year

- 3.5. Organise activities to generate awareness about IPC amongst farmers and community and strengthen IPC in animal and food sectors (**Department of Animal Husbandry**)

Timeline: within 1 year

- 3.6. Develop/adopt policy on registration/licensing of food animal farms, slaughter houses, fish/meat/dairy processing units, animal feed manufacturing units, health and veterinary care units (**Department of Animal Husbandry**)

Timeline: within 3 years

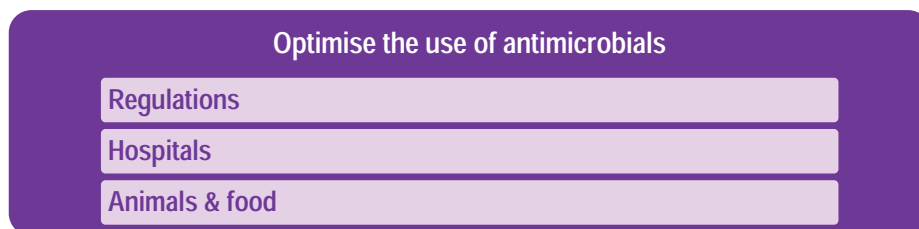
- 3.7. Develop/adopt appropriate biosecurity guidelines, siting guidelines and Standard Operating Procedures (SOPs) on waste management for farms, feed manufacturers, slaughter houses, processing units, health and vet-care facilities, sewage treatment plants and good manufacturing practices (GMPs) for fish/meat/dairy processing units (**Department of Animal Husbandry**)

Timeline: within 3 years

- 3.8. Less risky litter/manure management approaches such as biogas generation (in-house or common plants) to be preferred over land application of manure. Proper composting for treatment of litter/manure should be encouraged only under very high level of supervision along with use of more bio-manure/ decreased use of antibiotics along with pesticides in fruit and vegetable garden (**Department of Animal Husbandry**, Department of Agriculture)

Timeline: within 3 years

Strategic priority 4: Optimize the use of antimicrobial agents in health, animals and food



Focus area 7: Regulations

Objective: Regulate access to high quality antimicrobials

- 4.1. Strict implementation of regulations to stop OTC sale of drugs for human/animal use (**Food and Drugs Administration**, Directorate of Health)
Timeline: upto 3 years
- 4.2. Ban sub-standard and spurious drugs in the state (**Food and Drugs Administration**)
Timeline: within 1 year
- 4.3. App for H1 drugs made by food and drug department for TB drugs to be expanded for all H1 drugs including antibiotics (**Food and Drugs Administration**)
Timeline: within 1 year
- 4.4. Ban OTC sale of antibiotics (**Food and Drugs Administration**)
Timeline: within 1 year
- 4.5. No antibiotics to be sold without a valid prescription/stop OTC sale of antibiotics (**Pharmacists associations**, State Drug Controller)
Timeline: 6 months – 1 year
- 4.6. Review and implement regulations regarding use of antimicrobials in food animals (**Department of Animal Husbandry**)
Timeline: within 1 year

Focus area 8: Hospitals

Objective: Development of Antibiotic Stewardship Programme in healthcare

- 4.7. Develop State and institutional antibiotic policies and handbooks for rational empirical antibiotic use (**Chief Medical and Health Officer, AIIMS Bhopal**, Directorate of Health Services, Department of Animal Husbandry)
Timeline: upto 3 years
- 4.8. Align state government pharmacy inventories according to MP antibiotic policy (**Chief Medical and Health Officer, AIIMS Bhopal**, Directorate of Health)
Timeline: upto 1 year
- 4.9. Each state and central government health sector to mentor 2-3 private set-ups (**Chief Medical and Health Officer, AIIMS Bhopal**, Directorate of Health, Department of Animal Husbandry)
Timeline: upto 3 years
- 4.10. Regulation / validation checks mechanisms shall be established for prescribing higher antibiotics by various cadres of doctors (**Chief Medical and Health Officer, AIIMS Bhopal**, Directorate of Health Services)
Timeline: upto 1 year
- 4.11. Prescription audits of state government hospitals and nursing homes (**Chief Medical and Health Officer**, Directorate of Health Services)
Timeline: upto 1 year

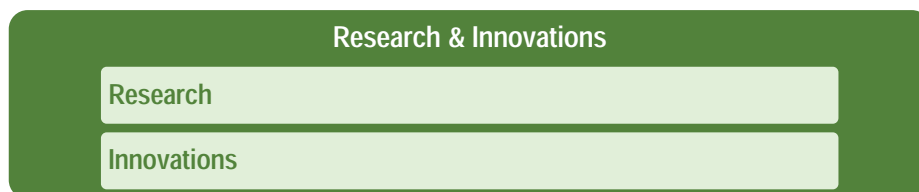
Focus area 9: Animals and food

Objective: Optimize the use of antimicrobials in veterinary and aquaculture

- 4.12. Collect data on antimicrobials in animal feed (including quantitation)
Timeline: 1 year
- 4.13. Establish a state surveillance system by collecting data on use (and presence) of antimicrobials in animal food (milk, milk products, poultry and fish)
Timeline: within 1 year

- 4.14. Steps to be taken to prevent use of “*antibiotics for human use*” as “*antibiotics for growth promotion in veterinary and aquaculture*”
Timeline: 1 year
- 4.15. Improve appropriate use of antimicrobials in animals and agriculture – treatment and prophylaxis; and in fodder (**Department of Animal Husbandry**)
Timeline: 1 – 3 years
- 4.16. Ban/restrict use of critically important antimicrobials for human medicine, in animals and fisheries (**Department of Animal Husbandry**)
Timeline: 1 – 3 years
- 4.17. Ban/gradually phase off the use of high priority critically important antimicrobials for use in animals (**Department of Animal Husbandry**)
Timeline: 1 – 3 years
- 4.18. Ban the use of antibiotics as growth promoters in animals (**Department of Animal Husbandry**)
Timeline: 1 – 3 years
- 4.19. Ban/gradually phase off the use of antibiotics for non-therapeutic use such as disease prevention (**Department of Animal Husbandry**)
Timeline: 1 – 3 years
- 4.20. Develop/adopt policy on registration/licensing of manufacturers, distributors, sellers of antibiotics, feed and feed premixes (**Department of Animal Husbandry**)
Timeline: 1 – 3 years
- 4.21. Develop/adopt regulations to monitor antibiotic use in animals and antibiotics used in feed/feed premix including their sale, labelling, registration, prescription, import, online sale (**Department of Animal Husbandry, State Drug Controller**)
Timeline: 1 – 3 years
- 4.22. Develop and implement drug/antibiotic take back programmes across the value chain (antibiotic production to sale and further use)
Timeline: 1 – 3 years

Strategic priority 5: Promote investments for AMR activities, research and innovations for AMR containment



Focus area 10: Research on AMR

Objective: To establish baseline data on status of current research on AMR in Madhya Pradesh; promote investments for research on AMR

- 5.1. Review of literature and compilation of research activities on AMR in Madhya Pradesh to develop knowledge base (**Directorate of Health**, AIIMS Bhopal, GMC Bhopal, Nanaji Deshmukh Veterinary Science University Jabalpur)
Timeline: upto 1 year
- 5.2. Compile list of AMR stakeholders, including institutes and relevant investigators, working on AMR in Madhya Pradesh (**Directorate of Health**, AIIMS Bhopal)
Timeline: upto 1 year
- 5.3. Develop an online repository of AMR containment in Madhya Pradesh; share knowledge resources (online and offline) for knowledge management to create AMR Community of Practice
Timeline: 1 – 3 years
- 5.4. Methodology and search engine optimization to be established to guide future searches (**State Departments** of health, animal husbandry, fisheries, agriculture, environment)
Timeline: 1 – 3 years
- 5.5. Identify critical gaps in existing research strategies on AMR containment in Madhya Pradesh – across all sectors – human, animal, food, environment

(**State Departments** of health, animal husbandry, fisheries, agriculture, environment)

Timeline: 1 – 3 years

- 5.6. Promote research to develop new antimicrobials, diagnostics, vaccines and alternatives (**Department of Health**, Department of Animal Husbandry)

Timeline: upto 3 years

- 5.7. Conduct research on zoonotic bacteria

Timeline: upto 3 years

- 5.8. Utilize shared resources and laboratories for research (**State Departments** of health, animal husbandry, fisheries, agriculture, environment)

Timeline: 1 – 3 years

- 5.9. Estimate requirements for funds and human resources and allocate resources

Timeline: upto 1 year

- 5.10. Facilitate evidence-based policy formulation

Timeline: upto 3 years

Focus area 11: Innovations

Objective: Promote investments for development of alternate strategies for combating AMR

- 5.11. Generate investments to fund research on rapid diagnostic kits

Timeline: upto 3 years

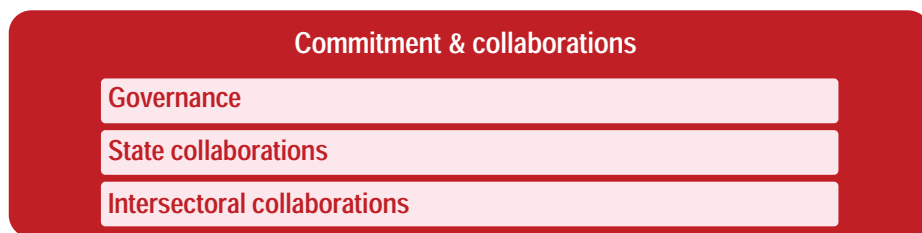
- 5.12. Raise resources and investments to fund research & development on biofilms, herbal extracts and phytochemical products

Timeline: upto 3 years

- 5.13. Develop an app for mobile phones to ensure easy access to treatment guidelines for doctors, to optimise antimicrobial use (**Directorate of Health Services**, Chief Medical and Health Officer, AIIMS Bhopal)

Timeline: upto 1 year

Strategic priority 6: Strengthen MPs commitment and collaborations on AMR



Focus area 12: Governance mechanisms

Objective: To strengthen governance mechanisms on AMR containment

- 6.1 Establish state level governance mechanisms on AMR containment, comprising of Advisory Committee; Technical Committee and Core AMR Team
Timeline: upto 6 months
- 6.2 Establish state committee for Antimicrobial Stewardship (AMS)
Timeline: upto 6 months

Focus area 13: State collaborations

Objective: To strengthen state collaborations on AMR containment with focus on convergence of activities and establish AMR as a state level priority

- 6.3 Share knowledge and resources amongst different levels (districts, divisions and central level), for management for AMR containment
Timeline: upto 1 year
- 6.4 Ensure fund allocation for various AMR activities, without duplication
Timeline: upto 6 months
- 6.5 Share best practices across different levels
Timeline: 1 – 2 years

- 6.6 Collaborate with other states to combat AMR
Timeline: upto 1 year
- 6.7 Strengthen AMR activities in HIV/STI, TB, malaria, leprosy & NTDs
Timeline: upto 1 year
- 6.8 Strengthen engagement of IDSP in AMR activities
Timeline: upto 1 year

Focus area 14: Intersectoral mechanisms and private sector engagement

Objective: To strengthen intersectoral mechanisms and private sector engagement for AMR containment in Madhya Pradesh

- 6.9 Establish linkages and information sharing (including best practices) amongst disease control programmes in Madhya Pradesh (RNTCP, NACP, NVBDCP etc.) and State AMR programme
Timeline: upto 1 year
- 6.10 Engage the private sector in healthcare, animal husbandry, diagnostics and pharmaceuticals for AMR containment through surveillance of AMR, IPC activities, surveillance of antimicrobial consumption, surveillance of healthcare associated infections and antimicrobial stewardship (**Department of Health**, Department of Animal Husbandry, State Drug Controller, Indian Medical Association)
Timeline: 1 – 3 years

Monitoring and Evaluation Framework

MP-SAPCAR Priority	Input (basic resources)	Process (activities)	Outputs (results at programme level)	Outcomes (results at population level)
1. Awareness and Understanding	MP State Antibiotic Policy NHM and AIIMS Bhopal collaboration for containment of AMR IIMAR activities coordinated by RDGMC, Ujjain	AMR awareness campaign among students, public, media, govt and private health care providers at various level (district & sub-district level), pharmacists, vets and others	Number of print articles covering AMR Total number of minutes of audio-visual clips aired	AMR awareness levels in target populations, e.g. % of population who know that it is inappropriate to use antibiotics for viral infections Knowledge, attitudes and practices of health workers and vets on AMR and its implications for antimicrobial use and misuse (via online survey)
2. Knowledge and Evidence	Resource Centre of Tropical and Infectious Diseases (RCTID) established at AIIMS Bhopal	Number of microbiology laboratories participating in quality assurance programme SOPs established for AMR surveillance in animals, aquaculture and environment	Surveillance systems established for AMR in human, animals, food	Reducing trends of MDR <i>E. coli</i> , <i>Klebsiella</i> spp., <i>Pseudomonas aeruginosa</i> , <i>Salmonella</i> , <i>Acinetobacter</i> spp., MRSA and <i>Enterococcus</i> spp.
3. Infection Prevention & Control	Active QA team at NHM Tropical and infectious disease Help Centre (THC) at AIIMS Bhopal	% hospitals with functioning IPC/HICC committee % hospitals with adequate IPC nurses AMR issues incorporated in biosecurity guidance for farms and slaughterhouses	Hib/rotavirus/typhoid, PCV vaccine coverage across MP Proportion of acute health care facilities with IPC programme in place (including monitoring of hand hygiene) Number of health facilities with WASH facilities Number of commercial farms compliant with IPC guidelines and good practices	Average hand hygiene compliance rates in hospitals and PHCs % HAI rates in health facilities under Kayakalp Number of hospitals with effective BMW management Number of pharmaceutical companies manufacturing antibiotics with effluent treatment plants Number of licenses applied/received –MP Pollution Control Board

MP-SAPCAR Priority	Input (basic resources)	Process (activities)	Outputs (results at programme level)	Outcomes (results at population level)
4. Optimizing Use of Antibiotics	<p>Number of notices issued by Food and Drugs Administration for OTC sale of antibiotics</p> <p>Online system for distribution of drugs to Govt. hospitals</p> <p>AMSP network established</p>	<p>Treatment guidelines reviewed and updated as per MP Antibiotic Policy for human health</p>	<p>Numbers of hospitals with updated AB guidelines based on local AMR pattern</p> <p>Percentage of medical colleges/hospitals with Antimicrobial stewardship programme</p> <p>Implementation of ban/restrictions on antibiotic premixed food in animal husbandry and aquaculture</p>	<p>Monitoring of total amount of antibiotics consumed (state level)</p> <p>% of antibiotics tested by State Drug Controller with acceptable quality.</p> <p>Banning incorporation of antibiotics in animal food</p> <p>Involvement of veterinarians in implementation of MP-SAPCAR</p>
5. Research and Innovations	<p>AMR research network established</p>	<p>MP State AMR research agenda established</p>	<p>Financial sources to be identified</p> <p>% major hospitals and labs reporting to government</p>	<p>% of fund used for service delivery, teaching, training and research</p>
6. Collaborations	<p>Annual stakeholder meeting during WAAW</p>	<p>AMR Steering Committee and AMR Technical Committee established</p>	<p>Intersectoral coordination meetings organized to share results from each sector</p>	<p>Number of meetings held of AMR governance mechanisms</p> <p>% of points implemented by next meeting</p> <p>Data/information from MP-SAPCAR reported to State and Central Government 6 monthly</p>

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