

Strategic priority 1

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

Awareness and communication

Objective 1.1

Increase awareness and improve communications regarding AMR in India

Strategic interventions

1.1.1. Assess understanding, knowledge and awareness of antimicrobial resistance (AMR) and antimicrobial use (AMU) amongst key stakeholders/target groups

Activities

1.1.1.1. Consolidate the existing available KAP studies across general population, professionals in health, veterinary, pharmaceutical and environment, farmers and food processing sector (ICMR, CHEB, PHFI, ICAR, MoFPI, MoEFCC) **S**

1.1.1.2. Conduct behavioural studies and KAP (knowledge attitude and practice) surveys amongst in general population (as a priority), health professionals (including AYUSH), veterinary professionals, pharmaceutical industry, environment professionals, food processing sector and farmers (ICMR, PHFI, ICAR, MoCF, MoFPI, MoEFCC) **S**

Key output

- Baseline and trends in knowledge, attitude, practices and behaviour of different segments of populations on AMR and its use, in general population, farmers, professionals and industry

1.1.2. Document existing communication and information resources and products on AMR

1.1.2.1. Identify and consolidate existing communication/information resources/products on AMR in various sectors/stakeholder groups (CHEB, ICMR, PHFI, ICAR, MoAFW, MoEFCC, MoFPI, MoCF) **S**

- Define a time period of the content to be sought for consolidation (2011 onwards); identify and list national/international partners (best practices/learnings) towards consolidating the AMR database on communication

1.1.2.2. Map expertise of stakeholders – individual and organizations (public and private) – to develop communication strategy and materials (CHEB, ICMR, ICAR, MoAFW, MoEFCC, MoFPI, MoCF) **S**

Key outputs

- Consolidated communication and information resources on AMR available
- Stakeholder map of communication expertise on AMR developed

1.1.3. Utilize communications to promote AMR awareness, targeting key stakeholders

1.1.3.1. Develop a cross-cutting and sustained communication programme on antimicrobial resistance and use, at national, state and district levels

- Evidence-based communication programme with a focus on general population predominantly, followed by farmers & dairy/poultry/meat/fish suppliers and all stakeholders to promote rational use of antibiotics; focus on basics i.e. prevention through hand hygiene, clean water, sanitation, biosafety in animal farms, etc.; high impact IEC contents e.g. relatable stories from the general population in form of videos etc.; 360 degree multi-media campaign involving new as well as traditional media including mass & mid-media and inter-personal communication;

include awareness generation and behaviour change as an essential component of any public policy; adapt and adopt features of successful AMR communication programme from other countries (individual sectors); government (centre and state) may consider a Health Cess to fund public health campaigns on AMR

(Communication agency/agencies identified by Media and Communications unit of MoHFW, MoAFW, MoEFCC and CHEB) **S**

1.1.3.2. Implement AMR communication programme targeting general population and key stakeholders in all sectors, through partnership & collaborative approach including NGOs and private sector (Communication agency/agencies identified by Media and Communications unit of MoHFW MoAFW, MoEFCC and CHEB) **S-M-L**

Key output

- Cross-cutting, comprehensive and sustained communication programme for AMR containment at national, state, district and peripheral level

Education and training

Objective 1.2

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

Strategic interventions

1.2.1. Strengthen and consolidate AMR and related topics as core components of professional education and training

Activities

1.2.1.1. Review and revise curricula of professionals in human health (MCI, DCI, PCI, INC, NBE, etc.) **S**

1.2.1.2. Review/revise curricula of professionals in animal health (VCI) **S**

1.2.1.3. Review/revise curricula of professionals in food industry, agriculture and environment (VCI, DARE, ?Fisheries Council, MoHRD, UGC, etc.) **S**

1.2.1.4. Review and develop curriculum and resources for in-service training of different

professionals and allied services

- Develop a module on AMR to bring together the segmented knowledge being imparted under different subjects (microbiology, pharmacology, medicine, PSM, etc.)

(MCI, DCI, INC, PCI, VCI, NBE, CPCB, NGOs) **M**

Key outputs

- Professional curricula revised
- Training module developed on AMR (for in-service and pre-service trainings)

1.2.2. Introduce concept of AMR and appropriate use of antimicrobials as part of school curriculum

1.2.2.1. Develop module on AMR and appropriate use of antimicrobials for school children (CHEB, CBSE/ICSE/State Education Boards) **M**

Key output

- Module on AMR and antimicrobials developed for school children

1.2.3. Strengthen capability and skills of key stakeholders

1.2.3.1. Conduct Training Needs Analysis (TNA) across all sectors (ICMR, ICAR, CPCB, CSE) **S**

1.2.3.2. Develop training resources on antibiotic resistance and use for capacity development among professionals in human health (NIHFW) **S**

1.2.3.3. Develop training resources on antibiotic resistance and use for capacity development among professionals in animal health, food industry, agriculture and environment (ICAR, CPCB, FSSAI, VCI) **S**

1.2.3.4. Implement trainings on AMR for all key stakeholders as an essential component of the phased NAP implementation (Professional bodies representing human health (including IMA/State Medical Associations), animal health, food industry, agriculture; subject experts – clinicians, microbiologists, pharmacologists, epidemiologists, public health, environmental scientists, veterinarians, food and agriculture

scientists, social & behavioural scientists); academic institutes – universities and medical nursing dental veterinary science colleges and NGOs) **M**

Key output

- National AMR training plan and information products (including antimicrobial use) developed for key stakeholders in human health, animal health, food industry, feed industry, agriculture, environment and pharmaceutical industry

1.2.4. Improve inter-departmental as well as intersectoral communication

1.2.4.1. Develop a strategy towards enabling the institutions to ensure communication and data sharing among their microbiologists and clinicians (antibiotic policy, etc.) (ICMR) **S**

1.2.4.2. Design AMR training/orientation programmes that would train a composite group of representatives from all sectors and stakeholders (CHEB) **M**

1.2.4.3. Develop a strategy towards enabling communication, interaction among different sectors influencing AMR (MoHFW, MoAFW, MoCF, MoEFCC) **S**

Key output

- Mechanisms established for inter-departmental and intersectoral communication

Key stakeholders: MoHFW, MoAFW, NCDC, ICAR, ICMR, Ministry of Consumer Affairs Food and Public Distribution, Ministry of Information and Broadcasting, Medical Council of India (MCI), Indian Nursing Council (INC), Veterinary Council of India (VCI), Pharmacy Council of India (PCI), Dental Council of India (DCI), National Board of Examinations (NBE), National Institute of Pharmaceutical Education and Research (NIPER), Central Health Education Bureau (CHEB), Ministry of Chemicals and Fertilizers (MoCF), Ministry of Environment Forest and Climate Change (MoEFCC), Ministry of Food Processing Industries (MoFPI), Central Pollution Control Board (CPCB), Centre for Science and Environment (CSE), WHO, FAO, OIE, ...

Strategic priority 2

Strengthen knowledge and evidence through surveillance

Laboratory capacity

Objective 2.1

Strengthen microbiology laboratory capacity for AMR surveillance in human, animal, food and environment sectors*

Strategic interventions

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

Activities

2.1.1.1.1. Develop national strategy based on system/lab assessments to strengthen microbiology laboratories (including private sector) for antimicrobial susceptibility testing (AST) in medical labs, ensuring quality assurance and community data (NCDC, ICMR) **S-M**

2.1.1.1.2. Develop national strategy based on system/lab assessments to strengthen microbiology laboratories (including private sector) for antimicrobial susceptibility testing (AST) in animals, food, ensuring quality assurance (DAHDF, ICAR, FSSAI) **S-M**

2.1.1.1.3. Develop national strategy based on system/lab assessments to strengthen microbiology laboratories (including private sector) for antimicrobial resistance and antimicrobial residues in the environment, including waste from farms, factories and healthcare settings (MoEFCC, ICMR, ICAR, NCDC) **S**

2.1.1.1.4. Strengthen capacity for laboratory-based surveillance of AMR with species level

* Animals include food animals (i.e. terrestrial livestock such as poultry, dairy and aquatic livestock such as fisheries), pets and other large animals. Food is primarily from animal sources and includes honey, milk, eggs, meat, fish and sea food. However, it does not exclude agricultural produce such as cereals, fruits and vegetables.

identification of bacteria in humans during health and disease; surveillance labs under national network including private sector (NCDC, ICMR)

- **Short term** (<1 year): 10-15 labs; **medium term** (1–3 years): 15-30 labs; **long term** (>3 years): >30 labs

2.1.1.5. Strengthen capacity for laboratory-based surveillance of AMR in animals, food and environment (MoAFW, MoEFCC/CPCB, FSSAI, ICAR, DAHDF) **M**

2.1.1.6. Establish routine EQAS for all surveillance laboratories (ICMR, IAMM, ICAR, MoEFCC) **M-L**

2.1.1.7. Organize joint training workshops for bacterial identification, AST and data harmonization in humans, animals, food and environment (NCDC, ICMR, WHO; DAHDF, ICAR, FSSAI, FAO, OIE; MoEFCC, UNEP) **S-M**

Key outputs

- Strategic plan developed to strengthen microbiology laboratories for AMR surveillance in humans, animals, food and environment
- Training workshops held for AST in medical labs, animal and food labs and environmental labs

2.1.2. Designate national reference laboratories for AMR surveillance in humans (also in animals, food and environment sectors) as a pre-requisite for enrolment in GLASS

2.1.2.1. Identify and strengthen national reference laboratories for confirmation and detailed characterization of target pathogens and external quality assessment scheme for AMR organized in human health (NCDC, ICMR) **S**

2.1.2.2. Identify and strengthen national reference laboratory(ies) for confirmation and detailed characterization of target pathogens and external quality assessment scheme for AMR in animal and food sector (ICAR, DAHDF, FSSAI) **S**

2.1.2.3. India's enrolment in global AMR surveillance system (GLASS) (NCDC) **S-M**

Key outputs

- National AMR reference labs designated
- India enrolled in GLASS

Surveillance of AMR

Objective 2.3

Strengthen surveillance for antimicrobial resistance in humans, animals, food and environment

Strategic interventions

2.3.1. Establish standards and coordination mechanisms for national surveillance of AMR

2.3.2. Standardize data analysis and information management for AMR surveillance

Activities

2.3.1.1. Establish an inter-sectoral expert group on integrated AMR surveillance (NCDC, WHO) **S**

2.3.1.2. Define comprehensive standards for national coordination of AMR surveillance – including surveillance standards at various healthcare levels, drug-bug combinations – in a phased approach for strengthening AMR surveillance in humans, animals, food and environment, including private sector (NCDC, ICMR, ICAR, MoEFCC, CSE, WHO, FAO) **S**

2.3.1.3. Organize annual national consultation to strengthen AMR surveillance programme in humans, animals, food and environment (NCDC, ICAR, ICMR, MoEFCC, WHO, FAO) **S-M-L**

Key outputs

- National AMR surveillance standards established in human, animals, food and environment

2.3.2.1. Define mechanisms and modalities for data collection, collation & analysis and information management at central, state and district level to increase health intelligence for AMR in humans (NCDC, ICMR, WHO) **S**

2.3.2.2. Define mechanisms and modalities for data analysis and information management at central, state and district level for AMR surveillance in animals and food (including fisheries)

(DAHDF, ICAR, FSSAI, FAO) **S**

2.3.2.3. Define mechanisms and modalities for data analysis and information management at central, state and district level for AMR surveillance in environment (MoEFCC) **S**

Key outputs

- National mechanisms for data analysis/information management for AMR surveillance implemented in humans, animals, food and environment

2.3.3. Strengthen AMR surveillance data/information management in human, animals, food and environment

2.3.3.1. Implement mechanisms to collate and analyse AMR surveillance data into useful information in humans, animals, food and environment, including the private sector and make an online database available to all stakeholders (NCDC, ICMR, DAHDF, ICAR, MoEFCC, WHO, FAO) **S-M-L**

Key outputs

- AMR surveillance database available in humans, animals, food and environment
- Annual report of national AMR surveillance with data from all sectors published

2.3.4. Establish surveillance of antimicrobial residues/contaminants in food and environment

2.3.4.1. Develop national framework for surveillance of antibiotic residues/contaminants in food from animals (MoAFW, FSSAI, CSE) **S**

2.3.4.2. Develop national framework for surveillance of antibiotic residues/contaminants in environment including waste from farms, factories (pharmaceutical industry, making animal feed, processing meat, dairy, fish), veterinary and human health care settings (MoEFCC, MoCF, MoAFW, MoHFW, CSE) **M**

2.3.4.3. Develop standards for antibiotic residues in food from animals such as chicken, eggs, milk and fish (FSSAI) **S**

2.3.4.4. Develop standards for antibiotic residues in industrial effluents and waste from farms, human health care and veterinary care

settings (CPCB, MoEFCC) **M**

2.3.4.5. Collate and analyse antibiotic residue surveillance data from food into useful information (DAHDF, ICAR, FSSAI) **M**

2.3.4.6. Collate and analyse antibiotic residue surveillance data from environment into useful information (MoEFCC, CPCB, ICAR) **M**

Key outputs

- Standards for antibiotic residues, national framework and results of surveillance of antibiotic residues in food and linkages with AMR developed and published
- Standards for antibiotic residues, national framework and results of surveillance of antibiotic residues in environment and linkages with AMR developed and published

Key stakeholders: NCDC, ICMR, DAHDF, ICAR, FSSAI, MoEFCC, Ministry of Drinking Water and Sanitation (MoDWS), Bureau of Indian Standards (BIS), Central Pollution Control Board (CPCB), Indian Association of Medical Microbiologists (IAMM), Centre for Science and Environment (CSE), WHO, FAO, OIE, UNEP, ...

Strategic priority 3

Reduce the incidence of infection through effective infection prevention and control

Infection prevention and control in healthcare

Objective 3.1

Develop and establish a stratified national plan for infection prevention and control (IPC) in health care

Strategic intervention

3.1.1. Ensure development and implementation of infection prevention and control policies and strategies across all tiers of healthcare system

Activities

3.1.1.1. Define terms of reference and scope and establish national coordinating unit (NCU) for infection prevention and control (Patient Safety Unit, MoHFW) **S**

3.1.1.2. Define core elements of IPC, and establish standardized definitions for each of these elements at different tiers of health care settings in public and private facilities (NCU, MoHFW, WHO) **S**

3.1.1.3. Conduct IPC assessments and gap analyses at different levels and all categories of health care settings (NCU) **S-M**

3.1.1.4. Streamline hand hygiene and sanitation as components of performance monitoring/performance payment within different schemes or quality programmes like Swachh Bharat Abhiyaan and Kayakalp, Swachh Swasth Sarvatra initiatives (MoDWS, MoHFW) **S**

3.1.1.5. Develop national IPC standards and targets in different tiers of healthcare settings, and a phased implementation plan based upon risk and need based matrix, patient and healthcare worker/professionals/attendants/vendors and community safety, designing interventions, including reuse of single use devices (NCU) **S**

3.1.1.6. Develop national IPC implementation

plan (in a phased approach) based upon risk and need based matrix, patient and healthcare worker/ professionals/attendants/vendors and community safety with clearly defined interventions (NCU) **S**

3.1.1.7. Establish a standardized surveillance program on health care associated infections (HCAIs) in a tiered network that utilizes uniform case definitions, methodologies, and reporting mechanisms (NCU) **M-L**

3.1.1.8. Develop capacity – infrastructure and skilled human resources with adequate financial resources to implement the national IPC plan (NCU) **S-M-L**

3.1.1.9. Develop monitoring and evaluation framework to assess the phased implementation of national IPC plan (NCU) **S-M**

3.1.1.10. Incorporate IPC in curricula for education and training of professionals in human health (NCU) **S-M**

Key outputs

- IPC national coordinating unit established and its scope defined
- Core elements of IPC for different tiers of health care settings established
- National IPC standards developed and targets defined
- National IPC plan with M&E framework endorsed and implemented
- National HAI surveillance established in identified facilities

Infection prevention in animal health

Objective 3.2

Establish infection prevention and control programmes in veterinary settings and animal husbandry

Strategic intervention

3.2.1. Ensure development and implementation of infection prevention and control programme in animal and food sector

Activities

3.2.1.1. Include biosafety, biosecurity, hygiene and infection prevention and control in curricula for education and training of animal health and food professionals and workers

(MoHRD, DAHDF, MoAFW, VCI, CPCB) **M**

3.2.1.2. Establish IPC coordinating unit within MoAFW (at centre and state levels), with designated staff and defined terms of reference (MoAFW, CPCB) **S**

3.2.1.3. Train staff in KVK and village level for biosafety and biosecurity principles and practices (MoAFW) **M-L**

3.2.1.4. Increase awareness in community for good production practices (proper hygiene/sanitation/practices of IPC); demonstrate profitability in various production systems (Extension services – Krishi Vigyan Kendra [KVK], MoAFW, Pashumitra) **S-M-L**

3.2.1.5. Develop, implement and monitor the national plan for IPC in animal and food sector (DAHDF, MoFPI, CPCB) **M**

Key outputs

- IPC programme for animal and food sector implemented and monitored at national and sub-national level

Hygiene, sanitation and infection prevention in the community

Objective 3.3

Strengthen infection prevention outside healthcare settings to limit the development and spread of AMR

Strategic interventions

3.3.1. Promote personal hygiene through behavioural change activities

Activities

3.3.1.1. Assess knowledge and practices of personal hygiene in different social groups (NCU, MoDWS) **S**

3.3.1.2. Develop behaviour change communication and social mobilization campaigns to promote IPC (NCU, hired professional experts) **M**

3.3.1.3. Implement sustained IPC campaigns that are socially and culturally acceptable in local context, under the aegis of Swachh Bharat Abhiyaan and Kayakalp program in collaboration with academic organizations and

communication experts (NCU, MoHFW, MoDWS) **M**

3.3.1.4. Ensure engagement of mass media and new IT tools (mobile technology etc.) (NCU, UNICEF) **S**

3.3.1.5. Ensure appropriate immunization against VPDs (MoHFW/Immunization Division) **M**

3.3.1.6. Involve community leaders in media campaigns, information, education, communication at village level, schools, showcase importance in the community (MoDWS, UNICEF, NGOs) **S**

Key output

- Behaviour change communication and social mobilization campaign developed and implemented

3.3.2. Strengthen infection prevention and hand hygiene compliance, in different social groups

3.3.2.1. Assess knowledge, attitude & practice of IPC (with emphasis on hand hygiene) in different social groups in community (NCU, MoDWS, UNICEF, NGOs) **S**

3.3.2.2. Develop national hand hygiene campaign in alignment with Global Hand Hygiene Day (NCU, MoDWS, UNICEF, HISI, NGOs) **M**

3.3.2.3. Implement IPC campaign under the aegis of Swachh Bharat Abhiyaan and Kayakalp program in collaboration with academic organizations (NCU, MoDWS, UNICEF, HISI, NGOs) **S**

3.3.2.4. Reinforce behaviour change through IEC and social mobilization campaigns to promote personal hygiene including patient attendants (NCU, MoDWS, UNICEF, NGOs) **M-L**

3.3.2.5. Educate and train children about importance of hand hygiene at school level (NCU, MoHRD, UNICEF) **S**

3.3.2.6. Enhance awareness of IPC and hand hygiene amongst farmers and fishermen (Krishi Vigyan Kendras/Pashumitras) **S-M-L**

Key outputs

- Documentation of KAP study on IPC practices with emphasis on hand hygiene
- Hand hygiene campaign implemented

Objective 3.4

Align healthcare support industry with infection prevention and control

Strategic interventions

3.4.1. Develop and strengthen alliances for IPC

Activities

3.4.1.1 Identify area of collaboration keeping healthcare need, patients and healthcare workers' safety and long-term industry perspective in alignment (NCU) **S-M**

3.4.1.2. Collaborate with other Government bodies and ministries, regulatory and industry partners as needed (NCU) **S-M-L**

3.4.1.3. Establish a board for IPC professionals in public and private healthcare institutions, to review devices or modalities in healthcare (existing and future), to review their infection prevention and control mechanisms and adequacy (NCU) **M-L**

3.4.1.4. Align health care support industry to manufacture single-use devices (SUDs) in line with "Make in India" initiative (NCU) **S-M**

Reduce environmental spread of AMR

Objective 3.5

Reduce environmental contamination with resistant genes, resistant pathogens and antimicrobial residues

Strategic interventions

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

Activities

3.5.1.1. Develop policy on registration of farms, factories, slaughter houses, wet markets, aquaculture units, food processing units, feed manufacturers, health care facilities, veterinary care facilities (MoEFCC, MoAFW, MoHFW, MoFPI, CDSCO) **M-L**

3.5.1.2. Based on environment risk assessment develop guidelines for locating farms, factories, slaughter houses, wet markets, processing units, feed manufacturers, health care facilities,

veterinary care facilities; ensuring compliance by strengthening existing guidelines and enforcement strategies related to payments, benefits, etc. (MoHFW, MoAFW, MoFPI, MoEFCC) **M-L**

3.5.1.3. Develop policy & implementation mechanisms on extended producers responsibility for expired/unused antibiotics (CDSCO) **M-L**

3.5.1.4. Develop and implement a strategy and operational plan to reduce environmental impact on AMR (MoEFCC, CPCB) **S-M-L**

- Effluent/waste management – set standards and monitor antibiotic residues and bacterial load in effluents (**S-M-L**); disinfection at treatment plant to remove bacteria (**S**); using waste from unorganized sector to generate biogas (**M**) develop necessary legislation, awareness & incentives; develop tool for environment risk assessment; develop SOPs and implement best practices (**S-M-L**)
- Education/awareness – inclusion of biosecurity in farmer-field school curriculum or similar such approaches (**S**); sector-specific manuals and guidelines on progressive management pathways to improve environment management (**M**)

Key output

- National plan with guidelines and standards developed and implemented to reduce environmental impact of AMR

Key stakeholders: MoHFW, MoAFW, MoEFCC, MoDWS, Ministry of Food Processing Industries, NCDC, DAHDF, ICAR, ICMR, HISI, CSE, CPCB, SPCB, WHO, FAO, UNEP, ...

Strategic priority 4

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

Regulated access to high-quality antimicrobials

Objective 4.1

Ensure uninterrupted access to high-quality antimicrobial medicines

Strategic intervention

4.1.1. Strengthen national regulatory authorities for improved quality, safety and efficacy of antimicrobials

Activities

4.1.1.1. Review and strengthen national regulatory authority and regulations regarding use and access to antimicrobials, as per levels of healthcare (CDSCO, MoHFW, DoP, WHO) **S-M-L**

- Regulatory enforcement to prohibit sale of antimicrobials as OTC under Drugs & Cosmetics Act, and Rules
- Review placement of high end antimicrobials as well as new antibiotics in Schedule X/HI of national regulations
- Create a focal point for networking for information exchange among states, and establish an online forum on use and access as per level of healthcare
- Expedite regulatory processes to ensure uninterrupted supply of quality assured antimicrobials

4.1.1.2. Strengthen and enforce regulations to minimise substandard, spurious, falsely labelled and falsified antimicrobials (CDSCO) **S-M-L**

4.1.1.3. Establish a quality management system for supply chain management of antimicrobials (MoCF, MoHFW) **S-M-L**

- Strengthen governance to ensure uninterrupted supply of quality antimicrobials
- Monitor safety of new antimicrobials

through pharmacovigilance and strengthen regulations to eliminate substandard and spurious antimicrobials

Key outputs

- National regulatory authority strengthened and regulations implemented
- Quality management system implemented for supply chain management of antimicrobials

4.1.2. Create/develop and enforce enabling regulatory framework and intersectoral coordination for regulations on use of antimicrobials in animals and food safety

4.1.2.1. Establish independent regulatory authority for veterinary and fisheries sectors (MoAFW, FSSAI) **S-M**

4.1.2.2. Restrict and phase-out non-therapeutic use of antimicrobials such as their use as growth promoters and disease prevention in animals (Veterinary regulatory authority, CDSCO) **S-M-L**

4.1.2.3. Foster development of antimicrobial policies and evidence-based standard treatment guidelines for food animals (MoAFW, ICAR) **S-M**

4.1.2.4. Restrict and gradually eliminate the use of restricted antibiotics, which are critically important for humans in non-human sectors especially food-producing animals (Veterinary regulatory authority, FSSAI, CDSCO) **M-L**

4.1.2.5. Restrict antibiotics in animal feed, feed premix; ensure registration and use of registered products only; regulate their importation, direct distribution and online marketing; ensure appropriate labelling (BIS, CDSCO, ICAR, DAHDF) **S**

4.1.2.6. Ensure prescription sale of antibiotics and their use under supervision; regulate bulk selling, importation and labelling for species-specific use (CDSCO) **S**

4.1.2.7. Labelling of food from animals produced with or without routine use of antibiotics (FSSAI) **S**

4.1.2.8. Develop policy for freshwater/inland fisheries to regulate freshwater/inland

4.1.2.9. Consider fast track implementation of the Codex Alimentarius and OIE guidelines on antimicrobial resistance (Veterinary regulatory authority, DAHDF) **S-M-L**

Key output

- Regulatory mechanism established for assuring rational use of antibiotics in food and animal sector

Surveillance of antimicrobial use

Objective 4.2

Establish the national surveillance system for antimicrobial use

Strategic intervention

4.2.1. Institutionalise national surveillance system for antimicrobial use (AMU) in humans, animals, agriculture & food sectors

4.2.2. Establish a monitoring system to assess antimicrobial consumption in humans, animals & food sectors

Activities

4.2.1.1. Develop methodology to estimate national consumption of antibiotics through an expert consultation (MoHFW, MoAFW, WHO, FAO) **S**

4.2.1.2. Use AMC tool to measure consumption of antibiotics at healthcare facilities (MoHFW, WHO) **S-M-L**

4.2.1.3. Ensure registration of and data collection from manufacturers, sellers, prescribers and bulk users (farmers and feed manufactures) of antibiotics (CDSCO, DAHDF) **S**

4.2.1.4. Standardise tools to measure consumption of antibiotics in animal health facilities, food and agriculture (MoAFW, FAO, CDSCO, NPPA) **S-M**

4.2.1.5. Organise training workshops to develop capacity to measure consumption and use of antibiotics (MoHFW, MoAFW, WHO, FAO) **S-M-L**

4.2.1.6. Organize national consultation to strengthen AMU surveillance programme in human, animal and food sectors (MoHFW, CDSCO, MoAFW) **S-M-L**

4.2.2.1. Develop monitoring framework to estimate national consumption of antimicrobials through an expert consultation (MoHFW, MoAFW, WHO, FAO) **M-L**

- 4.2.3. Foster optimal use of antimicrobials
- 4.2.3.1. Ensure capacity development of institutions for antibiotic audits and feedback to ensure optimal use (MoHFW, WHO) **S-M-L**
- 4.2.3.2. Regulate the establishment of committees to develop and update hospital formularies and STGs; provide training, CME, establish system for audits and review (MoHFW, CDSCO) **M-L**
- 4.2.3.3. Implement systems to ensure compliance with standard treatment guidelines (STGs) (MoHFW, DME) **M-L**

Key outputs

- National surveillance for antimicrobial use established in human, animal and food sectors
- Feedback mechanism established for all stakeholders
- Annual national AMU surveillance report published and disseminated

Antimicrobial stewardship in human health

Objective 4.3

Improve appropriate use of antimicrobials in healthcare

Strategic interventions

4.3.1. Establish antimicrobial stewardship programmes in healthcare facilities

Activities

- 4.3.1.1. Define and regularly update national antimicrobial use guidelines; encourage development and use of similar guidelines at regional, and district level facilities (NCDC) **S**
- 4.3.1.2. Ratification and dissemination of national guidelines from stakeholders (NCDC & professional associations – IMA, IDA, API, FOGSI, IAP, HISI, ASI, etc.) **S**
- 4.3.1.3. Define terms of reference for multidisciplinary antimicrobial stewardship committees and teams at various levels of healthcare facilities, with M&E framework (NCDC) **S**
- Expert consultation to develop the terms of reference for AMS committees/teams at various levels of health care facilities

4.3.1.4. Develop resources for AMS programmes and implement trainings in a phased manner (MoHFW – hospital division, professional associations) **S**

- Identify a diverse pool of technical experts for collecting and collating evidence for NAMSP; and creating training packages and resources
- Engage or identify centre(s) with capability for providing

e-training and e-resources for self-learning and refresher trainings

4.3.1.5. Establish M&E framework for antimicrobial stewardship (Hospital division, MoHFW) **S**

- Expert consultation to develop M&E framework for AMSP at different levels of healthcare facilities

4.3.1.6. Develop operational plan to implement facility-based AMSP at different levels of healthcare; identify and strengthen capacities of 6-8 institutions in different parts of country with functional AMSP who are willing to be future nodal centres for regional trainings (Hospital division, MoHFW) **M**

4.3.1.7. Implement the operational plan at selected tertiary care hospitals, district hospitals, sub-district and primary healthcare facilities in a phased manner (Hospital division, MoHFW) **M**

4.3.1.8. Develop robust data management systems for AMSP that also facilitate the generation of facility-level specific or regional antibiograms (Hospital division, MoHFW) **M**

4.1.1.9. Streamline antibiotic use in various central and state schemes by introducing quality indicators linked to performance monitoring/appraisal and innovative financial mechanisms (Hospital division, MoHFW) **M**

Key outputs

- Antimicrobial stewardship programmes implemented in selected health facilities in a phased manner
- Regular review of AMS programmes

done

Objective 4.4**Improve appropriate use of antimicrobials in the community***Strategic interventions*

4.4.1. Increase awareness of appropriate antimicrobial use among provider, dispenser, and consumer populations

4.4.2. Monitor antimicrobial use in community settings

Activities

4.4.1.1. Develop awareness campaigns targeted at prescribers, providers and dispensers regarding existing rules/law and appropriate use of antimicrobials (MoHFW, NIHFW, UNICEF, NGOs) **S-M-L**

4.4.1.2. Develop awareness campaigns targeted at consumers and community, including schools and colleges, regarding patient risks of inappropriate antibiotic use (MoHFW, NIHFW, UNICEF, MoHRD, CBSE, NGOs) **S-M-L**

4.4.2.1. Use AMC tool to measure antimicrobial use in community settings, including standalone clinics and pharmacies (MoHFW) **S-M-L**

4.4.2.2. Initiate surveillance to measure antimicrobial use in selected community settings (MoHFW) **S-M-L**

Objective 4.5**Strengthen the legislation regarding various facets of antimicrobials***Strategic intervention*

4.5.1. Strengthen legislation to regulate prescription and dispensing of antimicrobials

Activities

4.5.1.1. Organize a consultation with regulatory bodies to review current legislations on antimicrobial prescription and feasibility to strengthen existing legislations and introduce new legislations (MoHFW, CDSCO, FSSAI) **S-M**

4.5.1.2. Identify additional regulatory interventions or support needed to effectively implement current Schedule H1 and X restrictions (MoHFW, CDSCO) **S-M-L**

Key output

- Legislation and regulations strengthened and implemented to optimise use of antibiotics

Objective 4.6**Mandate periodic training for prescribers, dispensers and medical trainees***Strategic interventions*

4.6.1. Develop structured (and mandatory) training programmes on optimal antimicrobial use

Activity

4.6.1.1. Collaborate with regulatory bodies to mandate periodic training to optimise antibiotic use through pre-service and in-service trainings (MoHFW, MCI, PCI) **M-L**

Key output

- Collaborations forged with regulatory bodies

Antimicrobial stewardship in animal husbandry and food**Objective 4.7****Improve appropriate use of antimicrobials in animals***Strategic interventions*

4.7.1. Establish antimicrobial stewardship programmes for rational use of antimicrobials in animal facilities, agriculture, and food processing units

Activities

4.7.1.1. Develop and implement operational plan for antimicrobial stewardship (AMS) in animal facilities, with a One Health approach (MoAFW, DAHDF, MoFPI, MoEFCC, FAO) **M-L**

- Support small and mid-size poultry, dairy and fish farmers to reduce use of antibiotics, avoid non-therapeutic use and move to safer alternatives; issue “pond health cards” to promote the health of fish farms through a systematic farm-specific assessment and feedback mechanism; develop and implement biosecurity practices across food animal production sectors and support small-and-medium scale entities in installing necessary systems, enhance capacity and infrastructure

Key output

- Antimicrobial stewardship programmes implemented in animal facilities

Objective 4.8**Ensure optimal use of antimicrobial agents in animals (terrestrial and aquatic) and agriculture**

Strategic interventions

4.8.1. Establish and implement national policies on use of antimicrobial agents in animals and agriculture

Activities

4.8.1.1. Develop national plan on restricting (ban/phase off) use of critically important antibiotics (MoAFW, CDSCO, CSE, ICAR, VCI, DAHDF) **S-M**

- Evidence-based policy guided by data generated from well implemented antimicrobial stewardship programmes across various sectors

4.8.1.2. Implement and monitor national plan to restrict use of critically important antibiotics in animals/agriculture (MoAFW, CDSCO) **M-L**

- Existing advisory on use of antibiotics in food producing animals 2014, should be updated clearly stating a plan for implementation, backed up by strong legislative support; develop national level monitoring targets and indicators for critically important antibiotics in animals/agriculture

Key output

- System established and implemented to restrict use of critically important antibiotics in animals and agriculture

Key stakeholders: MoHFW, CDSCO, MoAFW, NCDC, ICAR, ICMR, CDSCO, CSE, FAO, OIE, WHO, ...

Strategic priority 5

Promote investments for AMR activities, research and innovations

Financing for AMR

Objective 5.1

Prepare the economic case for sustainable investments for AMR interventions

Strategic interventions

5.1.1. Strategize to secure sustainable funds for implementation of the NAP-AMR

Activities

5.1.1.1. Assess impact of AMR – morbidity, mortality and cost of AMR in India (IEG, PHFI, ICMR, WHO) **S**

5.1.1.2. Develop the operational plan (with costs) of the plan to implement NAP-AMR (MoHFW, WHO, finance experts) **S**

5.1.1.3. Estimate the investment gap for NAP-AMR, and develop resource mobilization plan for sustainable action against AMR (MoHFW, MoF, WHO) **S**

5.1.1.4. Define centre-state & other stakeholders' roles in implementation & financing (Niti Aayog) **S**

- Based on defining these roles for centre and state – develop a long term resource mobilization plan with clear roles of different stakeholders (all ministries) **S-M**

Key outputs

- Impact of AMR and cost-benefit analysis documented
- Resource mobilization plan endorsed and implemented

Research and innovations

Objective 5.2

Identify priorities for basic and operational research to optimize use of antimicrobials and improve infection prevention and control in human and animal health

5.2.1. Foster research and innovations to tackle AMR

5.2.1.1. Review need for new medicines, vaccines and diagnostics as well as other innovations (ICMR, ICAR, DBT, CSIR) **S-M-L**

5.2.1.2. Define research priorities for AMR innovations (ICMR, ICAR, DBT, CSIR) **S**

5.2.1.3. Develop and implement strategy/plan to promote research for innovations to tackle AMR (ICMR, ICAR, DBT, CSIR) **S-M-L**

Key outputs

- National research priorities for AMR defined and published
- National strategy/plan developed to foster research and innovations to tackle AMR
- Development of new antibiotics, alternative tools and diagnostics supported

5.2.2. Prepare a national operational research agenda

5.2.2.1. Organize expert consultation to identify current gaps in knowledge and priority topics for research (ICMR, ICAR, DBT, CSIR) **S**

5.2.2.2. Publish the national research agenda for AMR (ICMR, ICAR, DBT, CSIR) **S-M-L**

Key output

- Annual publication of operational research agenda on AMR

5.2.3. Encourage research for evidence-informed policy-making

5.2.3.1. Coordinate basic research projects in humans, animals, food and environment sectors (ICMR, ICAR, DBT, CSIR) **S-M-L**

5.2.3.2. Fund and pilot basic and operational research projects in humans, animals, food and environment (ICMR, ICAR, DBT, CSIR) **S-M-L**

Key output

- Evidence generated based on AMR research

Key stakeholders: MoHFW, MoAFW, Ministry of AYUSH, Ministry of Finance, ICAR, ICMR, DoP, CSIR, DBT, PHFI, Ministry of Science and Technology, FAO, WHO, ...

Strategic priority 6

Strengthen India's commitment and collaborations on AMR at international, national and sub-national levels

International role

Objective 6.1

Strengthen India's commitment on AMR through collaborations

Strategic interventions

6.1.1. Strengthen intersectoral coordination of AMR activities

Activities

6.1.1.1. Establish and strengthen cross-cutting intersectoral coordinating mechanisms on AMR, for oversight of India's multi-sector AMR initiatives/response at the highest level (by HFM and PMO) (MoHFW, Niti Aayog) **S**

6.1.1.2. Review India's existing collaborations on AMR and identify priority areas of action to strengthen the coordination mechanisms (MoHFW, WHO) **S**

Objective 6.2

Strengthen international collaborations to promote India's contribution towards tackling AMR

Strategic interventions

6.2.1. Strengthen and streamline international collaborations on AMR and with donors and partners

Activities

6.2.1.1. Review India's existing collaborations on AMR and identify priority areas as well as coordination mechanisms (NCDC, WHO) **S**

6.2.1.2. Establish an annual forum on AMR for donors and partners to share information and facilitate coordinated mobilization of resources for prioritized AMR activities (WHO, MoHFW) **S-M-L**

6.2.1.3. Collaborate with other countries to combat AMR (NCDC, DAHDF, ICMR, ICAR) **S-M-L**

Key output

- International collaborations

strengthened and established

National role

Objective 6.3

Strengthen national collaborations to tackle AMR with disease control programmes

Strategic interventions

6.3.1. Strengthen drug resistance containment activities & linkages

Activities

6.3.1.1. Strengthen HIV/STI resistance activities (NACO) **S-M-L**

6.3.1.2. Strengthen MDR/XDR-TB activities (CTD) **S-M-L**

6.3.1.3. Strengthen drug resistance activities for malaria (NVBDCP) **S-M-L**

6.3.1.4. Strengthen drug resistance activities in Leprosy and NTDs (NLP) **S-M-L**

6.3.1.5. Strengthen IDSP's AMR activities (IDSP) **S-M-L**

6.3.1.6. Establish linkages to share best practices and information amongst vertical disease programmes and national AMR programme (MoHFW) **S-M-L**

Key output

- Integrated AMR containment in alignment with vertical disease programmes

Sub-national role

Objective 6.4

Strengthen sub-national collaborations to tackle AMR

Strategic interventions

6.4.1. Establish AMR as a state-level priority

6.4.2. Develop State Action Plans on AMR (SAP-AMR) aligned to NAP-AMR

Activities

6.4.1.1. Convene state-level advocacy meetings to prioritise action against AMR with One Health approach (MoHFW, MoAFW, MoEFCC, MoDWS, WHO, FAO) **S-M-L**

6.4.2.1. Convene regional stakeholder workshops to develop SAP-AMR (MoHFW, MoAFW, MoEFCC, MoDWS, WHO, FAO) **S-M-L**

6.4.2.2. Organize a stakeholder consultation on SAP-AMR in selected states (in first phase) (State Governments) **S**

Key output

- SAP-AMR developed – in 5 selected states in first phase – and subsequently in all States/UTs

Key stakeholders: MoHFW, MoAFW, MoEA, NCDC, CWG-AMR, DHR/ICMR, MoF, donors and partners, key officials/AMR stakeholders in states, Niti Aayog, PMO office, NACO, CTD, NVBDCP, NLEP, IDSP, WHO,