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Background

What is Antimicrobial Resistance (AMR)?

- AMR happens when bacteria change and become resistant to antibiotics used to treat the infections they cause.
- AMR occurs naturally over time, usually through genetic changes. However, the misuse and overuse of antimicrobials is accelerating this process.
- The main cause of antibiotic resistance is antibiotic use. When we use antibiotics, some bacteria die but resistant bacteria can survive and even multiply.
- The overuse of antibiotics makes resistant bacteria more common.
Magnitude of threat

• Resistance has emerged even to newer & more potent antimicrobial agents like Carbapenems.

• Rapid spread of multi-drug resistant bacteria and lack of new antibiotics to treat infections caused by these organisms pose a rapidly increasing threat to human health which urgently needs to be tackled if we are to contain the problem and prevent untreatable illness from becoming a reality.

• If not taken seriously, AMR:
  • Threatens to compromise past global public health gains, particularly those related to maternal and child health, Tuberculosis, and HIV/AIDS.
  • Adversely affect advances in medicine, including the safety and success of surgical procedures, cancer treatment, and organ transplant
  • Puts attainment of the UN Sustainable Development Goals (SDGs) at risk
  • Threatens Global Universal Health Coverage (UHC)

• There is a growing understanding that strengthening systems for the prevention and management of infection will benefit both AMR control and UHC goals.
Possible AMR Pathways

- Human beings
  - Travelers
  - Occupational exposure
  - Through pets
  - Hospitalized patients

- Travel
- Hospital
- Non-animal food
- Environment
- Wildlife
- Animal Foods
- Farm animals
- Other animals
Potential AMR pathways

• There are major gaps in data on AMR in foodborne bacteria and their potential impacts on both animal and human health.

• Transmission pathways of AMR are abundant and complex, and ways to prevent or reduce transmission to human beings must be identified.

• Awareness of proven AMR transmission pathways should be increased among consumers to help reduce the risk of transmission.

• Further research is needed to:
  • better understand the potential of various sources (e.g. pets, animal foods, non-animal foods, water etc.) to harbour and transmit AMR to their humans
  • identify most effective methods to increase risk awareness
  • Interventions/strategies for promoting behaviours to mitigate AMR transmissions at the human-animal/environment interface.
National Programme on AMR Containment
National Programme on AMR Containment

• MOHFW giving due cognizance to the problem of AMR, conceived a nationwide programme to combat AMR crisis.
• After seeking approval from Standing Finance Committee (SFC) “National Programme on Containment of Antimicrobial Resistance” was initiated during the 12th Five year Plan (2013).
• Primary objective of programme: to strengthen lab capacity for AMR surveillance in state medical colleges in phased manner to generate geographically well represented AMR surveillance data, which would act as evidence to develop strategies to contain the problem of AMR in the country.
• 10 state medical college labs in 8 states finally given GIA under the programme by March 2017(fund disbursal challenges)
SFC approved for 2017-2020

- Approved under SFC as a Central Sector Scheme
- National AMR surveillance network Network (NARS-Net) expanded in phased manner, currently includes 30 state medical college labs in 24 states/UTs
- India enrolled onto Global AMR Surveillance System (GLASS) in 2017.
- Annual AMR surveillance data for 2017, 2018 and 2019 and 2020 has been uploaded onto GLASS
- National AMR surveillance annual reports generated for last 4 years and shared with key stakeholders
Objectives of the Programme

• Establish laboratory based AMR surveillance system in the country to generate quality data on antimicrobial resistance for pathogens of public health importance.

• Strengthen infection control practices and establish surveillance of Healthcare associated infections

• Conduct surveillance of antimicrobial usage and Antimicrobial stewardship activities (AMSP) in health care settings to promote rational use of antimicrobials

• Generate awareness amongst health care providers and community on AMR and rational use of Antimicrobials.

Objectives of the programme currently aligned with human health related activities under 4 strategic priorities of National action plan on AMR (NAP-AMR) launched in April 2017
National Programme on AMR Containment....cont.

- The activities under the programme during FY 2021-26 to be expanded and aligned with human health related activities under 4 strategic priorities of NAP-AMR

- **Additional/expanded activities:**
  - NARS-Net to be expanded to at least 70 state medical colleges by 2026 in all states/UTs
  - To include surveillance of AMR in fungal pathogens and molecular characterisation of the newer mechanisms of resistance at the NRLs – bacterial and fungal
  - To implement various AMR containment activities for human health as committed under the National action plan on AMR
    - Strengthen Infection prevention and control and surveillance of health care associated infections
    - Conduct antimicrobial consumption studies
    - Establish/strengthen antimicrobial stewardship practices
  - Support states in development of State AMR surveillance networks
NARS-Net: Establishing standardised AMR surveillance

- **Clinical samples:** blood, urine, aspirated pus and other body fluids
- **Limited panel of antibiotics**
- **Pathogens:** *Staph aureus*, *Enterococcus* spp., *Escherichia coli*, *Klebsiella* spp., *Pseudomonas* spp., *Acinetobacter* spp., *Salmonella enterica* serotype Typhi and Paratyphi
- Recently added *Candida* spp. in blood stream infections
- Minimum data fields and
- **Standardized AST methodology**
- Reporting frequency (quarterly)
- Site visits for onsite monitoring and support
- Trainings on WHONET and specialized lab techniques namely Broth-micro dilution (BMD)
- Review meetings
Standardized reporting platform: WHONET

• Why WHONET?
  • Available at no cost
  • Desktop version does not require internet
  • Facilitates reporting to WHO GLASS

• Unique functions
  • Both options of primary data entry and importing data from other lab information systems
  • Analysis of AMR data, including cumulative antibiograms
  • Outbreak detection (clustering)
Quality Assurance

- **Standardized internal quality control (IQC)**
  - Specific guidance documents developed and trainings given

- **External Quality Assessment**
  - Network labs send isolates to National Reference Lab (NRL) at NCDC quarterly to confirm ability of labs to correctly identify and perform AST
  - All participating surveillance sites to enroll in microbiology EQAS scheme by Indian Association of Medical Microbiology (IAMM) and maintain score > 80% on panels of standardized isolates received every four months
National AMR surveillance network (NARS-Net)

- National Reference lab for bacterial AMR at NCDC and fungal AMR at VPCI.
- Detecting and responding to emerging AMR threats – submitted by network sites to NCDC for confirmation, mobilize local public health authorities to contain novel threats
Other activities under the programme

• Supporting sites (trainings, onsite support) for developing local antibiograms and share with clinicians
• Surveillance of antimicrobial consumption initiated is 20 network hospitals
• Supporting strengthening of IPC
• Surveillance of HAIs (collaboration with ICMR-AIIMS-CDC network)
• Media material developed for strengthening awareness:
  • Judicious use of antibiotics developed
  • Importance of IPC to prevent infections and thereby reduce use of antimicrobials
  • Messages for social media platform
• National treatment Guidelines released in 2016
• National Guidelines on Infection Prevention and Control for Health care Facilities released in Jan 2020
International Collaborations

• WHO country office
• CDC India team
• Indo-Netherlands- One Health AMR Pilot project: Integrated AMR surveillance across sectors; concluded recently, being expanded to other districts
• Indo-Sweden- Surveillance of AMC and strengthen AMSP at a tertiary care hospital
• Indo-UK- Fleming Fund project: Strengthen state level AMR surveillance networks in 3 states, National level training of trainers on Infection Prevention and Control; training material made available at NCDC website
• Participate in sessions on AMR at JWG meetings, G20 meetings, BRICS meetings
**Way forward**

- NAP-AMR coordination unit under MoHFW
- Whole of government approach to contain AMR, dedicated funding for NAP-AMR activities within each sector
- Establishment of Infection prevention and Control unit (IPC) under MoHFW for strengthening Infection Prevention and Control
- Support development of State action plans and monitor their implementation
- AMR dashboard with real time update on AMR activities on MoHFW website with linkages of AMR dashboard on website of other stakeholder ministries/departments
- Review previous NAP-AMR and engage appropriate stakeholders within each sector to develop sector wise plans and subsequently integrate all sectoral plans to develop practical and implementable new NAP-AMR along with an operational and monitoring and evaluation plan
- Post release of new NAP-AMR, frequent consultations (six monthly) of intra-sectoral and intersectoral experts to review progress of NAP-AMR implementation
- Regular meetings of TAG and ISCC for monitoring implementation of NAP-AMR
Fig. 1 Factors leading to development of antimicrobial resistance and prevention measures at different levels.
Thank you