World Health Organization SE Asia
The South-East Asia Region Antimicrobial Stewardship 2022, Webinar Series

Rational Use of Medicines and Anti-Microbials

Empower School of Health
‘House keeping’ Announcements

• Kindly mute your mic and turn off video
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• If you wish to ask a question by voice during the QA sessions, please raise your hand
• When – and only when you are invited to speak – please remember to Unmute and turn on your video
• The slide deck will be shared to participants
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<tr>
<th>Topic</th>
<th>Session Time</th>
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<td>Introduction, Housekeeping</td>
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<td>Presentation: Introduction to Rational Use of Medical products</td>
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<td>Prof. Andy Barraclough</td>
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<td>First Q &amp; A Session</td>
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<td>How to address AMR and RMU</td>
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<td>Dr. Sangeeta Sharma</td>
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Webinar Objective

❖ Antimicrobial Stewardship programs are critical in optimizing antimicrobial use for better health outcomes.
❖ This webinar will discuss the importance, role and operational of Rational Use of Medicine approaches and programs within an overall Antimicrobial Stewardship function.
Dr. Sangeeta Sharma

• Working as Professor, Dept. of Neuropsychopharmacology, Institute of Human Behaviour & Allied Sciences (IHBAS)
• President, Delhi Society for Promotion of Rational Use of Drugs (DSPRUD).
• Qualification & Certification: M.D (Pharmacology), QM&AHO, MBA (HCA); The Harvard Medical School Quality Leadership Program (HQUAL); The Balridge Excellence Framework for Health Care Award; Certified External Assessor NQAS
• Actively working in the forefront of promoting rational use of medicines esp antimicrobial use, medication safety, quality in health care.
• Rich and diversified professional and managerial experience in healthcare.
• She has conducted ~300 workshops to build capacity for doctors, nurses and pharmacists.
• One of her pioneering work is a book “Standard Treatment Guidelines: a Manual for Medical Therapeutics” which is in its 6th edition. First edition was published in 2002. Several Indian states have adopted/adapted this book.
• She is serving on the Ethics Committee of several national and academic institutions.
• She is State Nodal Officer for AMR Containment, Delhi State
Speaker:

Prof. Andy Barraclough
Global Public Health Expert

He is the Professor of Public Health and Director of Training at the Empower School of Health.
Andy is one of the co-authors of the ‘Yellow Book’, Managing Drug Supplies by MSH and WHO, and the e-Handbook of Health Systems in Action for Managing Medicines.
He has over 30 years of experience of working with major International Funding Institutions, bilateral donors and the private sector in low and middle income countries. The main focus of previous experience includes effective management of pharmaceuticals, vaccines and medical commodities, and especially the implementation of programs for the introduction of new medicines and rapid diagnostics for neglected tropical diseases.
He has presented on Rational Use of Medicines at many conferences, seminars and webinars in the SE Asia region, and has authored the RUM training courses for the Empower School of Health Master’s Degree Course in Healthcare Procurement and Supply Chain Management.
Most recently, he has authored the GOARN Supply Chains for Emergency Response Covid-19 Platform, pandemic preparedness training modules and presented at the series of webinars on AMR in the era of Covid-19.
Rational Use of Medicines - Focus on Antimicrobials

Sangeeta Sharma
Professor & Head
IHBAS

&

President, DSPRUD
Practical implications of the access framework

1. Rational Selection & Use
2. Affordable prices
3. Sustainable financing
4. Reliable Health & Supply systems

ACCESS TO ESSENTIAL MEDICINES
What is the problem?

- People are dying because
  - the drugs are not there.....
  - are poor quality.......
  - are used irrationally........

- Limited resources only do not explain the shortage of drugs
Practical implications of the access framework

1. Rational Selection & Use
2. Affordable prices
3. Sustainable financing
4. Reliable Health & Supply systems

ACCESS TO ESSENTIAL MEDICINES
What is rational use of drugs?

The rational use of drugs requires that patients receive medicines appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and the community (WHO 1985)
Access vs Excess Paradox

Goal of a Healthcare system

Too many different types Pills available

- One molecule – several brands available for the same drug- manufactured by different companies.
- Thousands of formulations available.

Universal and equal access to reasonable health care

Public health system unsatisfactory
Table 9. Comparison of RUM practices of public health facilities among ASEAN Member States

<table>
<thead>
<tr>
<th>Strategy/ Intervention</th>
<th>BRN</th>
<th>KHM</th>
<th>IDN</th>
<th>LAO</th>
<th>MYS</th>
<th>MMR</th>
<th>PHL</th>
<th>SGP</th>
<th>THA</th>
<th>VNM</th>
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<tbody>
<tr>
<td>Average number of medicines prescribed per patient contact in public health facilities (mean)</td>
<td>2</td>
<td>2.5</td>
<td>3.51</td>
<td>2</td>
<td>3</td>
<td>No data</td>
<td>2</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
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<tr>
<td>% of medicines prescribed in outpatient public health care facilities that are in the national EML (mean)</td>
<td>100%</td>
<td>99%</td>
<td>78%</td>
<td>78%</td>
<td>No data</td>
<td>No data</td>
<td>93.10%</td>
<td>85%</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>% of patients in outpatient public health care facilities receiving antibiotics (mean)</td>
<td>No data</td>
<td>55%</td>
<td>48%</td>
<td>53%</td>
<td>No data</td>
<td>No data</td>
<td>63.30%</td>
<td>No data</td>
<td>No data</td>
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**KEY POINT**
lack of reliable up-to-date data.
Much is over 10 years old.
Little regular reporting of RUM indicators
Need for Prescription Audits
Change in Distribution of DALYS by Broad Cause Group, developing regions

Though non-communicable diseases is a growing challenge but communicable diseases burden is still not over

<table>
<thead>
<tr>
<th>Group</th>
<th>1990</th>
<th>2020</th>
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<tbody>
<tr>
<td>Group I</td>
<td>41.9%</td>
<td>17.6%</td>
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<tr>
<td>Communicable, maternal, perinatal and nutritional conditions</td>
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<tr>
<td>Group II</td>
<td>47.4%</td>
<td>68.7%</td>
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<tr>
<td>Non-communicable diseases</td>
<td></td>
<td></td>
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<tr>
<td>Group III</td>
<td>10.7%</td>
<td>13.7%</td>
</tr>
<tr>
<td>Injuries</td>
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Growing dependence on private sector

- 50-90% of all drug purchases are private
- 25% to 75% illness episodes self-medicated
- 1/2 consumers buy 1-day supply at a time
- 50% of people worldwide fail to take drugs correctly
Global epidemic of irrational use of medicines
Irrational prescribing = pathological prescribing

- Extravagance in prescribing (Over prescribing, newer expensive drugs, using multiple drugs)
Overuse vs. underuse paradox

Underuse (at lesser doses or not providing a medical intervention that could have been helpful to the patient).
Irrational use of drugs = pathological prescribing

- Failure of providing available, safe and effective drugs/vaccines
  - Polio, measles vaccines
- Incorrect administration, dosages or duration
- Use of drugs including FDCs of doubtful, unproven efficacy, uncertain safety status
  - Use of loperamide for acute diarrhoea
Global epidemic of irrational use of medicines
Irrational prescribing = pathological prescribing

Overuse (using Drugs for conditions where they are ineffective)
- Misuse of antibiotics
- Overuse of injections
Antibiotics are the most important weapons for the treatment of many infectious diseases caused by bacteria.

A number of subsequent antimicrobial discoveries quickly followed and changed the history of medicine.
The Golden Age of Antimicrobials

KEY
Actinomycete natural products
Other bacterial natural products
Fungal natural products
Synthetic antibiotics
*Indicates that synthesis was inspired by a natural product

Salvarsan is no longer in clinical use
Salvarsan
Sulfonamides

Macrolides
Glycopeptides
Tuberculosis antibiotics
Polymyxins
Nitrofurans
Pyridinamides
Phosphonates

Aminoglycosides
Tetracyclines
Amphenicols
Polypeptides
Bacitracin
Penicillins
Sulfones
Salicylates

Ansamycins
Lincomamides
Streptogramins
Cycloserine
Fusidic acid
Cephalosporins
Eritromycins
Quinolones
Azoles*
Phenazines*
Diaminoopyridines
Enthambutol
Thioamides

Carbapenems
Mupirocin
Monobactams

Lipopeptides
Pentomutins
Oxazolidinones

First synthetic antibiotic used clinically
Penicillin discovered
Penicillin approved for clinical use
Penicillin resistance identified
Plasmid borne resistance to sulfonamides
Resistance to sulfonamides
Resistance to salvarsan
Streptomycin discovered
MRSA first detected
VRE first detected
Plasmid borne colistin resistance in Enterobacteriaceae
VRESA first detected
First actinomycete genome sequenced
UN declares AMR a "fundamental threat"


Current Opinion in Microbiology 2019, 51:72–80
The Rise & Fall of Antibiotics

Problem with new antibiotics

- Antibiotics R & D has not responded to the urgent need of new antibiotics
- Lack of investment in antibiotics R & D
- Falling clinical and preclinical antibiotic pipelines
- Development process is not economical as antibiotics are costly to produce, low prices with restricted use
- Regulatory hurdles

A Failing Market – Between 1960-2000, No Major Classes were Introduced

Factors responsible for inappropriate use

**Patient-parent factors**
- Consumer demands
- Time conscious society
- Economic rationalism
- Misconceptions about:
  - What antimicrobials do
  - Fever requiring antibiotics
  - Belief in physician healing power
  - Economic concerns (missing work)

**Physician-provider factors**
- Real or perceived pressure
- Technological advances
- Self-economic concern (patient loss)
- Economic concern (patient loss)
- Litigation concern
- Physician fallibility:
  - Inadequate knowledge
  - Cognitive dissonance (i.e., knowledge but failure to act on it)
Factors responsible for inappropriate use

**Managed care factors**
- Cost-saving pressure to substitute therapy for diagnostic tests
- Reduced appointment time/patient less explanation time
- Responsiveness to patient complaint about “inadequate antibiotic use”

**Industry factors**
- Misleading or erroneous advertising
- Promotion issues

**Social factors**
- Poverty
- Unnecessary demand among wealthier popn
- Globalization - travel
Nine common problems with antibiotic prescribing

- Overprescribing
- Wrong choice
- Overly broad spectrum
- Wrong route
- Wrong dose
- Wrong duration
- Irrational combination
- Omission/delayed dose
- Wrong dose interval
Development & Spread AMR

- Overuse of antibiotics and injections for non-bacterial/trivial infections
- Nearly half of the in-patients receive antibiotics
- Use of broad-spectrum antibiotics/Irrational combinations
- Failure to prescribe in accordance with clinical guidelines
- Inappropriate self-medication.
Twelve Core Interventions

- 1. A mandated multi-disciplinary national body to coordinate medicine use policies
- 2. Clinical guidelines
- 3. Essential medicines list based on treatments of choice
- 4. Drugs and therapeutics committees in districts and hospitals
- 5. Problem-based pharmacotherapy training in undergraduate curricula
- 6. Continuing in-service medical education as a licensure requirement
- 7. Supervision, audit and feedback
- 8. Independent information on medicines
- 9. Public education about medicines
- 10. Avoidance of perverse financial incentives
- 11. Appropriate and enforced regulation
- 12. Sufficient government expenditure to ensure availability of medicines and staff

Adopt enabling Treatment Guidelines
First Q & A session
Settings that favor antimicrobial resistance

Immune compromised patients e.g.

- ICU
- Oncology unit
- Dialysis unit
- Rehabilitation unit
- Transplantation unit
- Burn unit
Human and Non-human use of antibiotics

Ensuring veterinary antibiotics remain effective to treat animal diseases is just as important to protect both human and animal health.
Antibiotic resistance getting worse globally but fixes could be simple

**FIGURE ES-1**: Percentage of *Staphylococcus aureus* isolates that are methicillin resistant (MRSA) in selected countries, 1999–2014
Development & Spread of AMR

- Overuse, misuse, and irrational use by doctors
- Non-compliance and self medication by patients
- Use in animal husbandry, aquaculture and agriculture
- Antimicrobial use is a **KEY** driver of resistance
COVID-19 Pandemic & Antibiotic Overuse exaggerated the AMR crisis

- Co-existing bacterial infection
- Severe bacterial HAI infections
- Nearly all moderate to severe COVID-19 patients are being treated with broad-spectrum antibiotics, which not only may have limited results but are also associated with higher mortality.
- Use of Watch group antibiotics in mild COVID

No specific therapy

Using broad-spectrum antimicrobials

- HCQ and CQ
- Lopinavir + ritonavir
- Remdesivir
NEW CDC DATA

MORE THAN HALF OF ANTIBIOTIC PRESCRIBING FOR SELECTED EVENTS IN HOSPITALS WAS NOT CONSISTENT WITH RECOMMENDED PRESCRIBING PRACTICES

ANTIBIOTIC PRESCRIBING WAS NOT SUPPORTED IN:

- 79% of patients with community-acquired pneumonia
- 77% of patients with urinary tract infections
- 47% of patients prescribed fluoroquinolone treatment
- 27% of patients prescribed intravenous vancomycin antibiotic

HOSPITAL PRESCRIBERS & PHARMACISTS CAN IMPROVE PRESCRIBING:

- Optimize antibiotic selection
- Re-assess antibiotic treatment when the results of diagnostic testing are available
- Use the shortest effective duration of therapy

FIND RESOURCES ON HOW TO IMPROVE HOSPITAL
Multisectoral multidimensional & multifaceted problem

- Biological
- Technical
- Economical
- Regulation
- Education
- Behaviour
AMR – Can it be halted?

- NO, it can only be contained
- The main priority is to prevent infection
- Containment is a next best option
Antibiotics are precious!!
We need to preserve them

timesofindia.indiatimes.com › ... › Civic Issues

Delhi: Last-resort antibiotics fail; 10 die in 22 months in AIIMS ...

Oct 22, 2019 - Between January 2016 and October 2017, AIIMS Trauma Center had 22 patients who didn't even respond to colistin — a last-resort antibiotic.

Superbug gene that resists "last resort" antibiotics detected in US for the first time

BY MICHAEL IRVING
June 14, 2019

Strategies to improve use of drugs

**Economic:**
- Offer incentives
  - Institutions
  - Providers and patients

**Managerial:**
- Guide clinical practice
  - Information systems/STGs
  - Drug supply / lab capacity

**Educational:**
- Inform or persuade
  - Health providers
  - Consumers

**Regulatory:**
- Restrict choices
  - Market or practice controls
  - Enforcement
AMR & One Health Actions

**Multisectoral**
- Department of Health and Family Welfare
- Department of Public Health
- Department of Rural Development and Panchayats
- Department Woman and Child Development
- Department of Education

**Multistakeholder**
- Professionals
- Stakeholders
- Society
- Private Sector

**Multidisciplinary**

INTEGRATION
1. Awareness & Understanding
   - Communication
   - Education, training

2. Knowledge & Evidence
   - Surveillance – AMR, AMU
   - Laboratories
   - Operational research

3. Infection Prevention & Control
   - IPC in Healthcare
   - IPC in Animal health, food
   - IPC in Community

4. Optimise Use
   - Regulations, access
   - Antimicrobial stewardship
   - Animal health, agriculture

5. Investments, R&D
   - New medicines, innovations
   - Investments

All sectors

Global Action Plan - Antimicrobial Resistance [GAP-AMR]
NAP-AMR strategic priorities

1. Awareness & understanding
   - Communication & IEC
   - Education, Training

2. Knowledge & evidence
   - Surveillance of AMR
   - Laboratories

3. Infection prevention & control
   - Healthcare, HAI
   - Animal health
   - Community & environment

4. Optimise use
   - Regulations, access, AM use
   - Antimicrobial stewardship - human
   - AMS - animals, agriculture

5. Innovations R&D
   - New medicines, diagnostics, vaccines
   - Innovations
   - Financing

6. Leadership
   - International collaborations
   - National collaborations
   - SAPCAR

Human
Food/Animals
Environment
All sectors
Priority 4: Optimise antimicrobial use

- Strengthening regulatory capacity - Central Drugs Standard Control Organization & national drug regulators
- Access to uninterrupted, wide availability of essential medicines of assured quality
- Judicious use of critically important antimicrobials (CIA) - WHO CIA for human medicine
Objectives of antibiotic policy

- Ensure effective treatment
- Rational use of antimicrobials
- Recognize trends in AMR within institution
- Plan for identifying, admitting, transferring, discharging and readmitting patients
- Incorporate detection, prevention, control of antimicrobial resistance into institutional strategic goals
Adopt AWaRe as target for AMS

1. **To improve availability & access to antimicrobials**
   - **Access** (48) – should be available at all times as treatments for a wide range of common infections
   - **Watch** (110) – includes antibiotics recommended as 1st or 2nd choice treatments for a small number of infections; prioritized targets of AMS & monitoring
   - **Reserve** (22) – includes antibiotics such as colistin and some cephalosporins – last-resort options used only when all other alternatives have failed; Key target for AMS

Strategies to control antibiotic use

- **Antimicrobial cycling** - Scheduled rotation of antimicrobials used in hospital or unit (e.g., OPD, ICU) to reduce resistance by changing selective pressure.

- **Computer assistance** - Patient-specific recommendations at point of care (order entry).

- **Antibiotic “Time outs”** - Reassessment of continuing need & choice of antibiotics 48h after initiation of empirical antibiotics use to answer these key question:

  - At day 3 of AB use the order automatically expired
  - Prescriber alerted and prompted to complete continuation template
  - Template recommended either continuation or cessation of therapy
Strategies to control antibiotic use

- Develop & Update facility specific antimicrobial treatment guidelines as per AMR surveillance data.
- The golden rules of antimicrobial prescribing

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<tr>
<th>M</th>
<th>Microbiology guides therapy wherever possible</th>
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<tr>
<td>I</td>
<td>Indications should be evidence based</td>
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<tr>
<td>N</td>
<td>Narrowest spectrum required</td>
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<tr>
<td>D</td>
<td>Dosage appropriate to the site and type of infection</td>
</tr>
<tr>
<td>M</td>
<td>Minimise duration of therapy</td>
</tr>
<tr>
<td>E</td>
<td>Ensure monotherapy in most cases</td>
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Way forward

- Reduce the need for antimicrobials through vaccines, water & sanitation, and infection prevention.
- Preserve the power of antibiotics through RUM
- Recognize new antibiotics as a critical unmet need & work on alternatives to antibiotics
- Growing AMR burden need to be addressed with new antibiotics
  - Antimicrobial innovations
  - Drug regulatory approvals
Delhi Society for Promotion of Rational Use of Drugs (DSPRUD) Activities

Examples of RUM Implementation
State Action Plan to Combat Antimicrobial Resistance in Delhi (SAP-CARD)
Priority 1: Improve Awareness & Understanding of AMR
Antimicrobial use surveillance: A core component of RUM

Organizing National Workshops on Antibiotic consumption methodology jointly with USAID, WHO, NCDC & Govt Delhi
National Training of Trainers Workshops

Continuing Professional Development: The Solution for AMR Menace
Priority 4: Optimise antimicrobial use

Major Thrust areas Capacity Building
> 8000 healthcare professionals trained

Doctors
- Medication safety
- Patient safety & Quality in Healthcare
- Clinical audit
- Prescription audit
- Antibiotic policy & Antimicrobial stewardship

Nurses
- Infection prevention & control
- Safe nursing practices & Medication safety
- Critical care nursing

Pharmacists
- Good dispensing practices
- Good store management practices
- Dispensing errors
- Antibiotic rational use
Pioneering work with 20 years of experience in developing and updating Standard Treatment Guidelines
Nurse’s role in antimicrobial stewardship in monitoring RUM

Organizing training programmes on
Infection control
Safe nursing practices & Medication safety
Critical care nursing
The Essential Role of Pharmacists in RUM and Combating AMR & Antimicrobial Stewardship activities

IHPA and DSPRUD
Celebrating 60th National Pharmacy Week
Pharmacists: An integral part of healthcare
Webinar on Role of Pharmacist in Combating AMR

NOVEMBER 28, 2021
11AM - 1PM
CLICK HERE
Second Q & A session