What can the AMR response learn from the COVID-19 response and vice versa?

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WMA Scientific Session
October 7th, 2021

Outline of the presentation:
1. Introduction to Antimicrobial Resistance (AMR)
   - the global situation
   - the AMR patient pathway and programmatic AMR response
   - WHO initiatives at national and global level
2. COVID-19 and AMR: differences, similarities and lessons learned

Assignment:
"Explore and identify ‘issues’ arising from the COVID-19 epidemic that are relevant to ensuring a more comprehensive coordinated response to the growing threat of antimicrobial resistance."

AMR demands a comprehensive multisectoral response

Drivers of Antimicrobial Resistance

- Humans: Misuse and overuse of antimicrobials, Poor access to quality, affordable medicines, vaccines and diagnostics, Impact of Antimicrobial Resistance
- Terrestrial and aquatic animals: Misuse and overuse of antimicrobials
- Food and feed: Transmission of resistant pathogens
- Plants and crops: Poor infection and disease prevention and control

- Water, sanitation and hygiene: Lack of access to clean water, sanitation and hygiene
- Environment: Discharge of waste
- Inability to treat infections
- Increased mortality
- Economic damage
- Inability to treat infections
- Economic damage
- Inability to treat infections

In 2018, WHO, FAO and OIE signed a Memorandum of Understanding (MoU) signaling their joint cooperation and strong focus on AMR in the context of the “One Health” approach. This was followed by the establishment of a standing Tripartite Joint Secretariat (TJS) within WHO to lead and coordinate the global response to AMR.

Each agency works with constituencies and addresses AMR issues according to its mandate and comparative advantage, but these overlap, and the Tripartite will address these areas where joint action is necessary and most impactful.

Drug-resistant infections caused by AMR are silently affecting the lives of thousands worldwide, a threat often referred to as “the silent pandemic”.

Every third minute a child dies from sepsis due to antibiotic-resistant infections.

AMR is a One Health issue, affecting and being affected by humans, animals and the environment.

If nothing is done, there will be 10 million AMR-related deaths by 2050; 9 million of which in low- and middle-income countries.*


Strategic Objectives Global AMR Action Plan (WHA 2015)

1. Improve awareness and understanding of antimicrobial resistance through effective communication, education and training
2. Strengthen the knowledge and evidence base through surveillance and research
3. Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures
4. Optimize the use of antimicrobial medicines in human and animal health
5. Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new medicines, diagnostic tools, vaccines and other interventions

But where is the diagnostic pathway?

Global AMR data: progress in reporting

<table>
<thead>
<tr>
<th>Number of sites</th>
<th>Hospitals</th>
<th>Outpatients</th>
<th>Inpatients</th>
<th>Other institutions</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD countries</td>
<td>888</td>
<td>2,394</td>
<td>158</td>
<td>744</td>
<td>5,084</td>
</tr>
<tr>
<td>LE countries</td>
<td>3,097</td>
<td>44,519</td>
<td>4,329</td>
<td>8,283</td>
<td>64,120</td>
</tr>
<tr>
<td>Total</td>
<td>3,985</td>
<td>46,913</td>
<td>5,487</td>
<td>9,127</td>
<td>59,241</td>
</tr>
</tbody>
</table>

Number of patients with suspected infection

<table>
<thead>
<tr>
<th>Number of sites</th>
<th>Blood stream</th>
<th>Urinary tract</th>
<th>Respiratory tract</th>
<th>Gastro-intestinal tract</th>
<th>Sexually transmitted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD countries</td>
<td>81,920</td>
<td>415,679</td>
<td>7,477</td>
<td>2,847</td>
<td>2,016</td>
<td>507,923</td>
</tr>
<tr>
<td>LE countries</td>
<td>262,265</td>
<td>1,424,011</td>
<td>10,735</td>
<td>9,567</td>
<td>18,572</td>
<td>1,706,578</td>
</tr>
<tr>
<td>Total</td>
<td>344,185</td>
<td>1,839,680</td>
<td>18,212</td>
<td>21,414</td>
<td>21,688</td>
<td>2,214,495</td>
</tr>
</tbody>
</table>

Most reporting countries show an increase in the number of surveillance sites!
Preliminary information on SDG indicators for AMR in BSI

Low- and middle-income countries (LMICs) need urgent support and analysis of underlying causes.

Note:
* Countries that reported < 100 isolates with antibiotic susceptibility testing results were excluded from the analysis.

Percentage resistance

Global Antimicrobial Resistance and Use Surveillance System (GLASS)

Routine diagnosis and surveillance require strengthening

Quality microbiological test performed

Patient specimen collected

Infection suspected

Access to healthcare

Population at risk

Data completeness & representativeness: need national surveys!

Challenges of surveillance based on routine clinical patient sampling in referral hospitals comes with biases and may not reflect the real magnitude of the AMR problem in the population!

AMR Patient Pathway: put the patient at the center of the AMR response!

Primary health care

1. Prevention

2. Access

3. Diagnosis

4. Treatment

Health care facility

Community

National programmes, policies, guidelines, regulations, surveillance (AMR, AMU, AMC) etc.

Actions at all levels including national regional level

The 6 interdependent building blocks of a programmatic AMR response require strong national health systems

Political commitment & governance

Early diagnosis in EQA lab network

Access to appropriate treatment

Prevention of infection

Uninterrupted quality supply chain

Surveillance & evidence generation

Awareness – Education – Regulations
Political commitment for implementation of National Action Plans (NAPs)?

145 countries developed tripartite NAPs, but most are not costed

Note: *Data from regional offices and other alternate sources show 143 total NAPs developed as of March 4, 2021 - this discrepancy could be because of lower response rate due to COVID-19 for 2019-2020 TriACSS (136 responses in 2019-20 vs 159 responses in 2018-19)**

Percentages are calculated from 194 total Member States

<table>
<thead>
<tr>
<th>Tripartite Annual Self Assessment Survey (TrACSS) rounds</th>
<th>NAPs, Developed</th>
<th>NAPs Funded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-2015</td>
<td>40% (19)</td>
<td>60% (26)</td>
</tr>
<tr>
<td>2016-2017</td>
<td>65% (33)</td>
<td>75% (45)</td>
</tr>
<tr>
<td>2017-2018</td>
<td>60% (31)</td>
<td>80% (49)</td>
</tr>
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</table>

WHO Costing and Budgeting tool for AMR National Action Plans

**Purpose**
- Support countries in costing and budgeting AMR national action plans

**Value**
- Encourages prioritization - development of operational plans with priority activities is a prerequisite for costing
- Modular approach - can be used separately by departments/sectors and then consolidated
- Maps existing funding sources and gaps
- Based on pilots in 6 countries

Launch – 13 October 2021
- Global webinar including country experiences

Link to the WHO intro video: [https://youtu.be/xkML_N1hx40](https://youtu.be/xkML_N1hx40)

National Antimicrobial Stewardship programme

Core elements

<table>
<thead>
<tr>
<th>National plan &amp; strategies</th>
<th>National Action Plan on AMR</th>
<th>AMS as a priority</th>
<th>Dedicated NAP funding</th>
<th>TWG on AMS (116)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registries &amp; guidelines</td>
<td>National Essential Medicines List</td>
<td>AMS classification</td>
<td>Clinical guidelines</td>
<td>National AMR surveillance</td>
</tr>
<tr>
<td>National AMR surveillance data</td>
<td>Antibiotic Awareness Campaigns</td>
<td>Pre and in-service training</td>
<td>Health professionals</td>
<td>Local evidence generation</td>
</tr>
</tbody>
</table>

Progress: Adoption of “AWaRe” Classification into National Essential Medicines List (EML)

- 13.0% (17) have adopted the AWaRe classification into their National Essential Medicines List (levels C-E)
- 61.1% (80) have knowledge about the AWaRe classification and plan to adopt it over the next few years (level B)

WHO GPW13 Target - Access Group antibiotics ≥ 60% of total national antibiotic consumption

34 countries (23%) have adopted the AWaRe classification into their National Essential Medicines List (levels C-E)
80 countries (57.1%) have knowledge about the AWaRe classification and plan to adopt it over the next few years (level B)
**Antimicrobial pipeline: Pharma exiting antimicrobial R&D**

Limited incentives for investment

- 2016
- 2017
- 2018

>70% pre-clinical pipeline driven by small medium size enterprises

**WHO’s global activities in antimicrobial R&D**

- Priority setting and pipeline
- Fostering R&D
- Fostering access

**Identification of Priorities (2017)**

Global Priority Pathogens List: 13 pathogens prioritized to guide R&D

- **High Priority**
- **Medium Priority**
- **Low Priority**

**GAP Objective 5: R&D**

- Priority Pathogens List
- Clinical and Pre-Clinical Pipeline Analysis
- Fungal Priority Pathogens List
- Communicable Diseases Rapid Response Fund (GAVI)
- WHO Innovation Challenges
- WHO Innovation Challenge Fund

**ANTIBIOTICS: PRECIOUS BUT DIMINISHING RESOURCE**

SECURE: The antibiotic facility

SECURE will provide countries with sustainable access to:

1. new antibiotics to address drug-resistant infections
2. existing antibiotics that are not widely available or that suffer from frequent supply chain interruptions and/or shortages

- SECURE will establish a quality assured portfolio driven by public health and clinical needs and
- be open to all interested countries and other eligible entities

Infection, prevention and control

Stronger hygiene and infection prevention measures, including vaccination, strong hand hygiene, appropriate aseptic technique, consistent maintenance of clean, hygienic medical facilities, equipment and practices along with thoughtful and thorough surveillance, monitoring and evaluation measures can limit the spread of resistant microorganisms and reduce antimicrobial misuse and overuse.

Curricula for health facility cleaning staff to improve IPC and environmental cleaning (finalization phase)

- Poor basic cleanliness is a major cause of perinatal morbidity and mortality
- Cleaners are a neglected HCW group with limited access to sufficient cleaning supplies and adequate training on IPC
- WHO updated a training curriculum for cleaning staff in collaboration with WHO IPC hub, WHO Health Workforce and WASH, and London School of Hygiene and Tropical Medicine

Next steps

- develop a facilitators guide to standardize training approach
- implementation pilot in 4 countries
- Global dissemination

Problem: limited AMR evidence base, especially in LMICs

- Knowledge gaps related to the burden and factors associated with AMR?
- New/improved interventions for AMR prevention, diagnosis, care and treatment?
- Best way to deliver these interventions?

Objectives

1. Identify and prioritize research questions
2. Catalyse investment and scientific interest among researchers, donors, health professionals and private sector
3. Guide the translation of research into action
**COVID-19 and AMR: similarities and differences**

**Shared issues**
- Governance / coordination / regulations
- Both poor and rich communities affected
- Diagnostic capacity and IPC
- Rational use of medicines
- Human resource capacity
- Supply chain management
- National surveillance and evidence generation

**Differences**
- Awareness, visibility and advocacy
- Immediate vs longer term economic threat
- R&D funding, capacity and pace
- Market dynamics
- Use of digital health solutions
- Prioritization of HR capacity
- Trust in social media and science

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**AMS and COVID-19**

**WHO clinical management of COVID-19 interim guidance**

- For suspected or confirmed **mild** COVID-19 – recommend against antibiotic therapy or prophylaxis
- For suspected or confirmed **moderate** COVID-19 – recommend that antibiotics **should not be prescribed** unless there is clinical suspicion of a bacterial infection
- For suspected or confirmed **severe** COVID-19 – recommend the use of empiric antimicrobials to treat all likely pathogens, based on clinical judgement, patient host factors and local epidemiology and this be done as soon as possible, ideally with blood cultures obtained first. **Antimicrobial therapy should be assessed daily for de-escalation.**

**COVID-19 lessons relevant to the AMR response**

**New(er) lessons**
- Impressive global R&D and FDA response, both pace and quality, is possible
- Weak pandemic response everywhere
- Societal mistrust (science & governance)
- Role of social media
- Potential of digital health
- Preaching equity / practicing ‘nation first’

**Very old lessons**
- No equitable global distribution
- Most public health systems are weak
- Governance, operations and $$$
- Human resource capacity
- Supply chain management
- Laboratory capacity, IPC
- Vulnerable groups suffer
- Market dynamics prevail

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**AMR and COVID-19**

**Literature**

Bacterial and Fungal Coinfection in Individuals With Coronavirus: A Rapid Review To Support COVID-19 Antimicrobial Prescribing®

*Clinical Infectious Diseases* (2021) 72(12), e199-e208

7-8% hospitalized COVID-19 patients had secondary co-infections:
- higher proportion of ICU patients
- most common: *Mycoplasma pneumoniae, Pseudomonas aeruginosa, Haemophilus influenzae*

72% received antibiotic therapy - broad-spectrum antibiotics
Antimicrobials, vaccines and IPC were game changers....

Penicillin increased survival from 10% to 90% among patients with pneumonia & BSI

The cost of inaction is too high!

Join us in the World Antimicrobial Awareness Week 2021
18-24 November!