Antimicrobial Resistance: threat and action. Opportunities and challenges for the health policies

Consumo de antibioticos y trasmision de resistencia entre humanos y animals: un riesgo real?

Madrid, 5th June 2018
Impact of antimicrobials on infectious disease in Europe
Burden of infectious disease is in the under 5s
Multidrug-resistant *Acinetobacter spp.*

2014 EARS-net

2016 CAESAR
Economic Impact

- Economic Costs of AMR May Be as Severe as During the Financial Crisis
- AMR could reduce GDP substantially, but unlike in the recent financial crisis, the damage could last longer and affect low-income countries the most.

AMR Impact on Livestock Production

AMR reduces livestock production

- Poor animal health
- Restrictions on exports by trade partners

This particularly affects low- and middle-income countries
Factors Contributing to AMR

Holmes et al., 2016
ANTIMICROBIAL RESISTANCE FROM THE LABORATORY TO INTERNATIONAL POLITICS

2015

2016

2016

2017-2018
AMR and SDGs

AMR strikes hardest on the poor
→ Rate of resistance is high
→ Lack affordable treatment

Untreatable infections in animals threaten sustainable food production for our population

Antimicrobials are fundamental components of all health systems

Antibiotic residues from hospitals, pharmaceutical companies and agriculture contaminate the water

*Cumulative costs of AMR is predicted to be US $120 trillion by 2050

It is crucial to balance access, innovation and conservation of antimicrobials to contain AMR

All of which require multi-stakeholder partnerships

Global Action Plan's 5 Strategic Objectives

1. Improve awareness and understanding
2. Strengthen knowledge through surveillance & research
3. Reduce the incidence of infection
4. Optimize the use of antimicrobial medicines
5. Ensure sustainable investment

Develop National Action Plan
Bring AMR to the UNGA
THE ONE HEALTH COLLABORATION

World leader in food & agriculture

World leader in animal health & welfare

World leader in human health

Tripartite Agreement / Collaboration
(Common priorities including antimicrobial resistance)
Ad-hoc Inter Agency Coordination Group

Global Action Plan's 5 Strategic Objectives

1. Improve awareness and understanding
2. Strengthen knowledge through surveillance & research
3. Reduce the incidence of infection
4. Optimize the use of antimicrobial medicines
5. Ensure sustainable investment

Develop National Action Plan
World Antibiotic Awareness Week
(12 – 18 November 2018)

Antibiotic resistance is a global health crisis that should be addressed with the utmost urgency.
- Dr. Tedros Adhanom Ghebreyesus, Director General World Health Organization

Misuse of **ANTIBIOTICS** puts us all at risk.

Taking antibiotics when you don’t need them speeds up antibiotic resistance. Antibiotic resistant infections are more complex and harder to treat. They can affect anyone, of any age, in any country.

Always seek the advice of a healthcare professional before taking antibiotics.
Global Action Plan's 5 Strategic Objectives

1. Improve awareness and understanding
2. **Strengthen knowledge through surveillance & research**
3. Reduce the incidence of infection
4. Optimize the use of antimicrobial medicines
5. Ensure sustainable investment

Develop National Action Plan
Surveillance of AMR is key for collecting information that can be used

- to assess the spread and magnitude of AMR
- to inform burden of disease estimates
- to drive local, national and global action: guidelines
Total Number of Isolates Reported (2000-2014)

2,680,831
Klebsiella pneumoniae Percentage Non-susceptibility (I+R) to Imipenem
Data Source: ReLAVRA

ReLAVRA 2014
More than one fourth of WHO Member States are enrolled in GLASS
(52 countries – 30% of the world population)
GLASS First Report


• GLASS implementation steps over 2016-2017
• Results from first data collection: April to July 2017
• Information of the status of national surveillance systems (42 countries) and AMR data (22 counties).

✓ 21 high-income countries, 16 middle-income countries and 5 low-income countries
Global Action Plan's 5 Strategic Objectives

1. Improve awareness and understanding
2. Strengthen knowledge through surveillance & research
3. **Reduce the incidence of infection**
4. Optimize the use of antimicrobial medicines
5. Ensure sustainable investment

Develop National Action Plan
Preventing Infections

Infection Prevention and Control
- Core Components implementation manuals and assessment framework
- Hand Hygiene Day
- Guidelines

Vaccines
- AMR in new vaccine development
Implementing Antibiotic Stewardship & IPC

- AB stewardship and IPC should be integrated in national action plans
- Financial restrictions pose as a challenge for some countries
  - Important to consider non-traditional stewards (e.g. community health workers) in resource-limited settings
- Collaboration among countries and taking a multidisciplinary approach to AB stewardship is crucial

Global Action Plan's 5 Strategic Objectives

1. Improve awareness and understanding
2. Strengthen knowledge through surveillance & research
3. Reduce the incidence of infection
4. Optimize the use of antimicrobial medicines
5. Ensure sustainable investment

Develop National Action Plan
Priority pathogens for R&D

Critical needs:

Drug-resistant TB
Gram-negative bacteria:
- Carbapenem-resistant *A. baumannii*
- Carbapenem-resistant *P. aeruginosa*
- Carbapenem-resistant and 3rd generation cephalosporin resistant *Enterobacteriaceae*

Antibacterial agents in clinical development

• **51** new antibiotics in the clinical pipeline
• **33** against priority pathogens
• **~9** are innovative
• Pipeline is insufficient to treat priority pathogens & TB
• Of **10 phase-I** antibiotics to tackle gram-negative bacteria only **1-2** will make it to market in **7 years**

Source: http://apps.who.int/iris/bitstream/10665/258965/1/WHO-EMP-IAU-2017.11-eng.pdf?ua=1
Pipeline is not promising: Stewardship

- Invest in rationale use of Antimicrobials
- Only when necessary
- When necessary use the right antimicrobial (simplest)

Source: http://apps.who.int/iris/bitstream/10665/258965/1/WHO-EMP-IAU-2017.11-eng.pdf?ua=1
Global Action Plan's 5 Strategic Objectives

1. Improve awareness and understanding
2. Strengthen knowledge through surveillance & research
3. Reduce the incidence of infection
4. Optimize the use of antimicrobial medicines
5. Ensure sustainable investment

Develop National Action Plan
Economic Case

- Sample Investment Cases for ministries of finance in middle and low income countries
- AMR as a development issue
- Costing and tools for inclusion in plans and budgets
Huge variation in the burden of infectious disease
Burden of infectious disease: low income countries

Burden of Infectious Disease

Progress in developing an AMR National Action Plan
Global Action Plan's 5 Strategic Objectives

1. Improve awareness and understanding
2. Strengthen knowledge through surveillance & research
3. Reduce the incidence of infection
4. Optimize the use of antimicrobial medicines
5. Ensure sustainable investment

Develop National Action Plan
Progress in developing multisectoral AMR National Action Plans Feb 2018
Progress is better in High income countries

Governance Arrangements

Figure 1: One Health working arrangements

<table>
<thead>
<tr>
<th></th>
<th>LIC</th>
<th>MIC</th>
<th>HIC</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No formal multi-sectoral governance or coordination mechanism exists.</td>
<td>23%</td>
<td>43%</td>
<td>49%</td>
</tr>
<tr>
<td>B</td>
<td>Multi-sectoral working group(s) or coordination committee on AMR established that includes representatives of human health, animal health, environment and other sectors, with Government leadership.</td>
<td>35%</td>
<td>20%</td>
<td>11%</td>
</tr>
<tr>
<td>C</td>
<td>Multi-sectoral working group(s) is (are) functional, with clear terms of reference, regular meetings, funding for its activities and reporting/accountability arrangements defined.</td>
<td>39%</td>
<td>25%</td>
<td>11%</td>
</tr>
<tr>
<td>D</td>
<td>Joint working on issues including agreement on common objectives, including restriction of use of critically important antimicrobials.</td>
<td>9%</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>E</td>
<td>Integrated approaches implemented to monitor progress on the national AMR action plan and extent of AMR.</td>
<td>9%</td>
<td>7%</td>
<td>4%</td>
</tr>
</tbody>
</table>

No response

World Health Organization
Stewardship reportedly better in high food producing countries

Antimicrobial Stewardship & regulation in human health

Antimicrobial stewardship & regulation in animal and crop production

Legend:
- A No national policy or legislation regarding the quality and efficacy of antimicrobials and their use in animals, and crops.
- B National policy for antimicrobial stewardship and governance developed.
- C Legislation and regulations approved on import, marketing authorisation, production, distribution and prudent use of high-quality veterinary medicinal products including antimicrobials, based on international standards.
- D Implementation of legislation and regulations on responsible and prudent use of antimicrobials in animals and ensuring safe food supplies.
- E Antimicrobials given to animals are only used to control or treat infectious diseases, under veterinary supervision.

No response
Implementation is happening

Antimicrobial stewardship in human health

Antimicrobial stewardship in animal & crop production
Implementation Challenges

- Resources
- Governance
- Integration with broader agendas & programmes
- Monitoring
- Prioritisation
Conclusion: Multi-sectoral approach needed

- Raise awareness economic and societal costs: investments needed

- Political engagement and high-level coordination of multi-sectoral activities against AMR needed

- Ensure public & private investment in new medicines, diagnostic tools & vaccines while ensuring access to these measures is equitable and affordable

- Encourage the engagement of stakeholders from their countries, including civil society, academic and research institutions, the public and policy makers
HIC could contribute by:

- Demonstrating achievements of NAP implementation
- Making dedicated resources available
- Participating in the global surveillance system for AMR (GLASS)
- Developing public awareness campaigns and sharing experience
- Reducing use of antimicrobials in human, agriculture & environment

Three-pronged approach to reactivate the R&D pipeline:

1. Increasing funding
2. Support clinical development phase promising antimicrobials
3. Delinking R&D investments from sales revenues.
Thank You!

Acknowledgements
WHO AMR Secretariat
Regional AMR Team
ReLAVRA