Ethiopia’s Experiences on Antimicrobial Resistance Prevention and Containment

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UNGA September 21, 2016, New York: AMR was the 4th health agenda that followed a Political Declaration

H.E., Ban Ki-moon called AMR “a fundamental, long-term threat to human health, sustainable food production and development….These trends are undermining hard-won achievements under the MDGs, including against HIV/AIDS, TB, malaria and the survival of mothers and children. If we fail to address this problem quickly and comprehensively, AMR will make providing high quality universal health coverage more difficult, if not impossible.”

“…Without AMR containment, the SDGs for 2030, such as ending poverty, ending hunger, ensuring healthy lives, reducing inequality, and revitalizing global partnerships are unlikely to be achieved …” (World Bank Sep 2016)
Outline

- Public Health and Economic Impacts of AMR
- Evidences on Antimicrobials Resistance Containment
- Ethiopian Experiences on AMR Prevention and Containment
- Summary and lessons
- Recommendation for enhanced AMR containment in Africa
Public Health Impacts of AMR

1. Increased Premature Deaths
2. Prolonged illness, infectiousness, transmission of Resistant MOs
3. AMR infections are at increased risk of worse clinical outcomes
4. MDR infections lead to limited or nonexistent alternatives
5. AMR limit the use of technologies:
   - Transplants
   - Cancer Chemotherapy
   - Surgery
   - Rheumatoid arthritis
   - Dialysis
6. AMR threatens hard won health-related MDGs and achieving SDGs and Public Health Response to communicable diseases
Deaths attributable to AMR every year

Economic Impacts of AMR
Societal costs thrice than direct healthcare costs

**Increased Direct Costs**
- Increased costs of disease surveillance
- Longer hospital stays
- Additional investigations, such as laboratory tests and x-rays
- MDR infections lead to expensive and more toxic alternative treatments
- Greater likelihood of death due to inadequate or delayed treatment
- Increased annual investment and spending in healthcare, high for low income countries

**Increased Indirect Costs**
- Reduced quality of life and productivity
- Longer absenteeism for patients and care takers, increased costs to firms and leading to increased product prices
- Increased burden and psychosocial impact
- Increases in cost of private insurance coverage
- Additional number of people living in poverty to 24 million in high AMR impact scenario \(^1\)
- AMR effects go beyond the health sector i.e. affecting GDP, 3.8\% & may double by 2050 \(^1\)
- Reduced output and trade in livestock and livestock products\(^1\)

\(^1\) World Bank September 2016
Is AMR Reversible?

What Global Evidences do we have?

Changes in AMs use are paralleled by changes in the prevalence of AMR
Seasonal pattern of antibiotics prescriptions and *Escherichia coli* resistance, showing 1-month lag

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Seasonal pattern of antibiotics prescriptions and *Escherichia coli* resistance, showing 1-month lag

Seasonal pattern of antibiotics prescriptions and MRSA resistance, showing 1-month lag
Relationship between antibiotics consumption and AMR for *S. pneumoniae*: the more use, the more AMR
Cephalosporin Resistance after stopping its use in Poultry in Quebec, Canada
Reduction of Antimicrobials Use after introduction of vaccines in aquaculture
Ethiopia Experiences on Antimicrobial Resistance Prevention and Containment
Approaches to Prevention and Contain of AMR in Ethiopia
Outline of Ethiopia AMR Containment Events

Before 2006: Efforts by Ethiopian chapter for APUA and Ethiopian INRUD
2006: TWG and stakeholders call for action meeting
2008: Baseline on magnitude (surveillance/survey) and factors on AMR
2009: Advocacy, dissemination and press releases
2008 to date: One Health, multi-institution & multi-disciplinary AMR containment advisory committee
2011: AMR containment strategy and follow on Plan of Action (POA)
2009 to date: Development/revision of Guidelines, manuals, and job aids for AMs stewardship
2008 to date: Post marketing surveillance (PMS) of AMs at least once a year
2012 to date: IPPS guidelines, TOTs, capacity building, supplies, and IECs
2013 to date: AMR containment advocacy commemoration day and antibiotics awareness week every year
2008 to date: Multifaceted advocacy & interventions (too many to list here) and evidences for scale up
2010 to date: Continued empowerment and awareness raising and evaluation
2015 to date: Second revised five years AMR prevention & containment strategy 2015-2020
2014/5, 2016 and to date: AMs use and AMR surveillance/survey (continued)
2017 January: Revised AMR Intervention POA
Scope of the AMR Baseline Survey

Washington, March 2008, AMR Baseline Scope and Resources
Baseline Report: Magnitude, Trends and Determinants of AMR 2011 to 2014
Examples of Interventions, AMR Containment

Educational, Managerial and Regulatory Interventions

- Medicines Use Evaluations, Clinical Audit, and Feedback and follow on interventions
- Standardization of practices and AMs use policy being tested
- Client and Community Empowerment & awareness: Adherence counseling, Group Educations, Mass media broadcasts, SBCC/IECs
- Capacity building pre-service and in service, CPD
- Establishing/strengthening of HFs IPCs, DTCs/AMs stewardship committees
- Application of Treatment Guidelines, lists, Formulary, Manuals and job aids
- Non-human use
- Interventions research and indicators
- Monitor AMs Use and AMR Trends over years
- Improving access to AMs
- Fight counterfeit and Post Marketing Surveillance of AMs
Examples of AMs Stewardship Job Aids and Guidelines
Examples of Empowerment and Awareness Interventions
mass media, group education at HFs, adherence counseling, IEC/BCC

Example of
Live TV Programs on AMR Containment

- Coverage and watched by audiences$^2$
- Change in knowledge of the audiences$^3$
- ?? Change in behavior and practices
- Changes on AMR use over time$^4$ (confounders)

Number of Electronic and Print Mass Media Medicines Use Broadcasts by Year

Antimicrobials Prescribing Practices over 20 years and across Hospitals in Ethiopia
Antimicrobials Prescribing Practices and Performance of Hospitals in Ethiopia (group 1)
Where are we now?

So What?
Revised AMR Prevention & Containment Strategy: 2015 to 2020
5 Strategic Objectives and 16 Priority Areas, 126 Interventions

STRATEGY for the PREVENTION and CONTAINMENT of ANTIMICROBIAL RESISTANCE for ETHIOPIA

Addis Ababa
October 2015

Ethiopian Food, Medicine and Healthcare Administration and Control Authority

1. Raise awareness and understanding and improve education on antimicrobial use, resistance prevention, and containment through effective communication and training

2. Strengthen the knowledge and evidence on antimicrobial use and resistance through one-health surveillance and research

3. Improve infection prevention and contain the spread of resistant microorganisms across human and animal communities and health care settings through individual and environmental sanitation, hygiene, and infection prevention measures

4. Optimize the use of antimicrobials in human and animal health through effective stewardship practices

5. Strengthen and establish national alliances and partnerships, governance arrangements, and resource mobilizations for the prevention and containment of AMR at all levels
Example

*Staphylococcus aureus* Resistance Over Years in Ethiopia
Staphylococcus aureus Resistance Over Years in Ethiopia

Interventions
Look for evidences on Complementary/Alternative Options for MDR Containment

AMs alone may not be the solution for MDRO treatment

1. Use of probiotics and prebiotics.
   - **Probiotics**: Live micro-organisms that confer a health benefit on the host when consumed in adequate amounts\(^1\)
   - **Prebiotics**: non-digestible food ingredients that beneficially affect the host by selectively stimulating the growth and/or activity of bacteria in the colon, and thus improve host health\(^1\)

2. **Silver nanoparticles** both effective and environmentally benign: Particles adhere to target microbes and become depleted of silver as they work against the bacteria & degrade easily\(^2\)

3. **Antimicrobial Copper surfaces** reduce increasing Healthcare Associated Infections\(^3\)

4. **Bacteriophages**: Virus infect and replicates within only target bacterium.

5. Daily **bathing with chlorhexidine-impregnated washcloths** reduce the risks of acquisition of MDROs and development of hospital-acquired infections\(^5\)... reports of resistance\(^6\)

6. **Lysins**: enzymes that directly & quickly act on bacteria

7. **Immune stimulation**: Boosts patient’s immune system

8. **Antibodies**: bind to bacteria restricting their ability to cause disease

1. APUA 2012:30(2):3
3. Journal of Infection Control and Hospital Epidemiology
Summary and Lessons

- The importance of having a **Baseline** and AMR **Strategy** and POA
- Factors contributing to AMR are many. *No single best intervention.*
- Improving **access** (not excess) to- and promote rational use of AMs
- Strengthen AMs use and AMR surveillance
- Strengthen multi-sectoral and multidisciplinary **One Health approach**
- Evidenced based and generic interventions for scale up
- Empowerment and sustained awareness
- AMR Containment in the context of Health/Pharmaceutical Systems Strengthening
- Look for evidences for Alternative/Complementary interventions for MDR treatment
- Collaborations in innovation and sustain effectiveness
Recommendations for enhanced AMR Containment in Africa

- The Impacts of AMR is high in Africa and will increase more unless effective, multifaceted and synergistic interventions are taken
- AMR is a long term threat
- African countries are at different levels of AMR containment
- African CDC to establish a coordinating unit and focal person on AMR containment: Mapping, networking, generating evidences, and sharing experiences among countries
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