Strengthening systems to prevent antimicrobial resistance: Results from the West Bank, Uganda, and Georgia

March 28, 2018

The webinar will begin momentarily; during the webinar, please type your questions for the speakers in the Chat box.
Welcome from the Webinar Moderator

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Regional Director, East Africa
USAID ASSIST Project
University Research Co., LLC
Today’s speakers

Tamar Chitashvili, MD, MHP&M
Senior Quality Improvement Advisor, Maternal and Child Health and Non-communicable Diseases
USAID ASSIST Project, URC

Lisa Dolan-Branton, RN, MPH
Senior Quality Improvement Advisor
USAID ASSIST Project, URC

Garance Fannie Upham
Vice President
World Alliance Against Antibiotic Resistance
Editor in Chief, AMR Control
Global problem of antimicrobial resistance (AMR)

- AMR is rising to dangerously high levels
- New resistance mechanisms, spreading globally & threatening our ability to treat common infectious diseases.
- Worsened health outcomes
- Higher cost for payers and the society

Common challenges
- Inappropriate use and prescription
- Poor infection prevention and control
- Weak surveillance
- Limited new tools/
- Insufficient use of existing mechanisms

“The pipeline for new tools to combat drug resistance is almost dry”, WHO 2017

WHO Global Action Plan on AMR

Goal: To ensure, for as long as possible, continuity of the ability to treat and prevent infectious diseases with effective and safe medicines that are quality-assured, used in a responsible way, and accessible to all who need them.

- Improve awareness and understanding of antimicrobial resistance
- Strengthen knowledge through surveillance and research
- Reduce the incidence of infection
- Optimize the use of antimicrobial agents
- Develop the economic case for sustainable investment in countering antimicrobial resistance
ASSIST’s key strategies to strengthen systems to prevent AMR

<table>
<thead>
<tr>
<th>Leadership/Management</th>
<th>Human Resources</th>
<th>Information Systems</th>
<th>Service Delivery</th>
<th>Medicines/Supplies</th>
<th>Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enhance capacity in quality improvement (QI), data analysis and use for evidence-based decisions</td>
<td>• Build capacity: clinical knowledge and skills, QI, and using evidence-based clinical recommendations in surveillance of AMR and rational antibiotic practices</td>
<td>• Improve generation, regular collection, analysis, reporting, and use of quality clinical/non-clinical data for continuous QI to improve IPC, AMR surveillance, and rational antibiotic use</td>
<td>• Improve compliance with evidence-based care practices (content) and organization of health service delivery (process) for common childhood conditions and IPC measures</td>
<td>• Improve prescribing &amp; use of recommended medicines and reduce prescription and use of not-recommended antibiotics or route of administration and suboptimal dosage</td>
<td>• Reduce cost of treatment by rational use of antibiotics (1st choice, generics, optimal dose and route) and reduce inefficiencies in process of care</td>
</tr>
<tr>
<td>• Generate evidence on effectiveness and cost-effectiveness of rational prescription of antibiotics</td>
<td>• Enhanced teamwork and group problem-solving</td>
<td></td>
<td>• Enhanced teamwork and group problem-solving</td>
<td></td>
<td>• Focus on high-impact, cost-effective interventions for high burden/mortality conditions</td>
</tr>
</tbody>
</table>
Three applications of improvement methods to reduce AMR

- **West Bank** improvement collaborative with 22 public and private hospitals to reduce hospital-acquired infections (HAI)

- Improve Integrated Management of newborn and Childhood Illness (IMNCI) in 10 facilities in **Northern Uganda**

- Improve outpatient and hospital management of childhood respiratory tract infections (RTI) in 19 health facilities in **Georgia**
WHO Action Plan Objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training
Institutionalize a system to control HAIs across 22 hospitals in the West Bank by Sept 30, 2017.
Collaborative methodology

• **Learning sessions**: Three 2-day hospital clinical QI, leadership and lab track sessions (February, May, August)

• **Video calls (ECHO) & YouTube Channel**
  - Lab track: 7 calls with an average 17.4 Hospitals
  - Hospital QI track: 14 calls with an average 15.3 Hospital
  - AMS: 5 mos series for MDs and PharmD's

• **Coaching visits**
  - Hospital QI teams: 70 visits (February- July)
  - Laboratory Track: 18 visits (April-July)

• **Practical skills training**
  - Shadowing expert microbiologists by Micro Lab Techs (21 total)
  - Shadowing expert MDs/PharmD's with active antibiotic management programs (20 total)
WhatsApp Laboratory group

• Extremely dynamic and active WhatsApp group
  – All microbiology members are on this group
  – “We consult with each other”
  – Share interesting growth of bacteria
  – Share interesting cases
WHO Action Plan Objective 2: Strengthen the knowledge and evidence base through surveillance and research
Improved QI data collection and use by hospital teams in the West Bank

• Data collection and Submission
  – February: 11 hospitals submitted
  – March: 19 hospitals submitted
  – April: 20 hospitals submitted
  – May: 22 hospitals submitted
  – June: 20 hospitals submitted
Antibiograms for every hospital and the system as a whole in the West Bank
WHO Action Plan Objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures
Changes to improve hand hygiene in the West Bank

**Infrastructure**
- Deploying alcohol gel
- Posting signs and posters
- Finding partners to help **adapt infrastructure** to build sinks
- Updating engineering plans for renovations

**Data**
- Accurately measuring compliance through **careful observation**
- Gathering **data by discipline and ward**
- Sharing & publicly posting data

**Workforce**
- **Training** staff on optimal handwashing technique & required moments of hygiene
- Educating & **engaging families and visitors**
- Working with nursing **students** to help with data collection, education, and reminders
- **Rewarding staff** for high rates of compliance
- Leadership working with **physicians**
Improvements in hand hygiene processes and outcomes in the West Bank (Feb-June 2017)

% compliance with hand hygiene indicators over time, Feb-June 2017

- % sinks with running water
- % sinks with liquid soap
- % sinks with paper towels
- % of work areas with alcohol rub available in plain sight

% compliance with hand hygiene

Number of facilities reporting data

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Improvements in transmission-based precautions and outcomes in the West Bank (Feb-June 2017)

Improvement in transmission-based precautions, Feb-June 2017

- % patients in contact isolation visibly identified as in isolation
- % patients in contact isolation with protective gloves available at the barrier
- % patients in contact isolation with single use aprons/gowns available at the barrier
- % patients in contact isolation with waste bag/waste container available at the barrier
- % patients in contact isolation with alcohol rub or hand washing facilities available at the barrier or in sight of the barrier
- % isolated patients with all 5 components of TBP process in place

Number of facilities reporting data:
- Feb-17
- Mar-17
- Apr-17
- May-17
- Jun-17

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Country-wide standardization of patient isolation, PPE & hand hygiene methods

USAID Applying Science to Strengthen and Improve Systems
WHO Action Plan Objective 4:
Optimize the use of antimicrobial medicines in human and animal health
Inappropriate prescription of antibiotics is widespread in different settings

Inappropriate prescription of antibiotics to treat common childhood conditions
(use without clinical indications, use of non-1st or 2nd choice antibiotic, incorrect dosing and/or route)

Poor assessment and classification practices

Poor knowledge and skills to diagnose and manage common childhood conditions

Limited availability of 1st choice antibiotics, including recommended dosage and form

Misconceptions among careers of the need to prescribe multiple medications, including antibiotics to treat common childhood conditions

Baseline Findings

<table>
<thead>
<tr>
<th>Antibiotic prescription practice</th>
<th>Geo</th>
<th>Ug</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st line antibiotic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumonia</td>
<td>36%</td>
<td>42%</td>
</tr>
<tr>
<td>RTI</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Recommended dosage (w/age)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumonia</td>
<td>75%</td>
<td>0%</td>
</tr>
<tr>
<td>RTIs</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>Unjustified antibiotic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for URTI/cough or cold diarrhoea</td>
<td>46%</td>
<td>83%</td>
</tr>
<tr>
<td>Malaria</td>
<td>39%</td>
<td>55%</td>
</tr>
<tr>
<td></td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>Route: Parenteral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(outpatient)</td>
<td>23%</td>
<td></td>
</tr>
</tbody>
</table>

USAID Applying Science to Strengthen and Improve Systems
Poor assessment and classification practices in Uganda (*direct observation of > 770 OPD visits, children 2m-5 years*)

**IDENTIFIED GAPS**
- Poor standardization and completeness of medical documentation for using data for quality improvement
- Limited availability of scales and thermometers
- Limited time of care providers
- Limited knowledge of signs and symptoms of common conditions

**TESTED CHANGES**
- Establishing the triage places for sick children
- Involve village health workers in assessment of vital and danger signs
- Adapted registers to document essential data for clinical decisions (e.g. RR, temperature)
- Peer clinical review and feedback by experienced staff
- Developed and displayed job aids
- Bi-weekly coaching by district staff

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Baseline intervention N=212 % (n)</th>
<th>Endline control N=295 % (n)</th>
<th>Endline Intervention N=271 % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Children assessed for three general danger signs</strong> (able to drink/BF, vomits everything, has convulsions)</td>
<td>0% (0)</td>
<td>0%</td>
<td>45% (134)</td>
</tr>
<tr>
<td><strong>Assessment of three main symptoms</strong> (cough, diarrhea and fever)</td>
<td>22% (47)</td>
<td>32% (86)</td>
<td>93% (273)</td>
</tr>
<tr>
<td><strong>Vital signs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• RR assessed in children with respiratory problems</td>
<td>15% (27)</td>
<td>2% (3)</td>
<td>82% (176)</td>
</tr>
<tr>
<td>o Temperature measured</td>
<td>33% (71)</td>
<td>20% (53)</td>
<td>97% (286)</td>
</tr>
<tr>
<td>o Stiff neck (if fever)</td>
<td>0% (0)</td>
<td>0% (1)</td>
<td>59% (115)</td>
</tr>
<tr>
<td>o Weight measured</td>
<td>21% (45)</td>
<td>42% (113)</td>
<td>100% (293)</td>
</tr>
<tr>
<td><strong>IMCI based diagnosis</strong></td>
<td>21% (44)</td>
<td>10% (28)</td>
<td>81% (238)</td>
</tr>
</tbody>
</table>
Correct classification is essential for better antibiotic prescription practices: change from broad RTI diagnosis to proper classification and treatment of cough or cold (Uganda)

Antibiotic treatment for cough and cold or RTI reduced by 56% compared to control facilities from the baseline (p<0.0001)
Identified Gaps

- Poor knowledge and skills in evidence-based diagnosis and care; limited understanding of signs/symptoms of specific clinical conditions
- Poor knowledge and skills to search, apprise and use medical literature

Tested/Implemented Changes

- Developing/distributing job aides
- Needs-based on-job clinical and QI trainings, coaching
- Peer-review of medical documentation, case presentations, case review, directly observed consultations
- Non-financial/promotion incentives for high performing providers
- Internal clinical supervision by experienced staff
- Organizing workshops for other care providers
- Translating research into Practice (TRIP) trainings
- Utilizing videos, developed by Global Health Media Project

Addressing gaps in poor knowledge and skills of care providers

% of providers who correctly answered questions

- Outpatient care of severe pneumonia: 96% at endline, 75% at baseline
- Care of Diarrhea with no dehydration: 96% at endline, 31% at baseline
- Indications of antibiotics for Diarrhea: 88% at endline, 0% at baseline
- Outpatient care of fever: 100% at endline, 38% at baseline
- Recommended care for cough or cold: 100% at endline, 3% at baseline
- Care for young Infants with PSBI: 97% at endline, 3% at baseline
- Care of Diarrhea with no dehydration: 96% at endline, 0% at baseline
- Outpatient care of severe pneumonia: 96% at endline, 6% at baseline

Uganda: Groupwork, case study discussions

Georgia: Direct-observed consultations and feedback
Improved antibiotic prescription practices in Georgia

**Outpatient**

- EB antipyretic practices (acetaminophen or ibuprofen if t>38.5°C): 5% baseline, 32%*** attributable difference
- Antibiotics prescribed in guideline recommended dosage: 38% baseline, 32%*** attributable difference
- % of charts with Aminopenicilins prescribed: 17% baseline, 32%* attributable difference
- Evidence-based first-line antibiotic use: 8% baseline, 71%*** attributable difference
- Justified antibiotic use: 19% baseline, 68%*** attributable difference

**Inpatient**

- EB antipyretic practice (acetaminophen or ibuprofen if t>38.5°C): 31% baseline, 63%*** attributable difference
- Antibiotics prescribed in guideline recommended dosage: 69% baseline, 17%** attributable difference
- % of charts with aminoglycosids prescribed: 43% baseline, -34%*** attributable difference
- Evidence-based first-line antibiotic use: 36% baseline, 33%*** attributable difference

Baseline and attributable improvement in management of RTIs at ambulatories (n=212 random charts) and hospital management of pneumonia (n=274 random charts)

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Rationalized prescription practices for treatment of common childhood conditions, Uganda

% of children 2mo-5yrs with pneumonia to whom first line antibiotic was prescribed
% of children 2mo-5yrs with a classification of cough or cold to whom an antibiotic is prescribed
% of children 2mo-under 5 years with malaria, treated with concurrent unjustified antibiotics therapy
% of children under 5yrs with a diagnosis of diarrhea, where antibiotics or other non-EB treatment is prescribed

Improvement in intervention sites compared to control sites in correct dosage of 1st line antibiotic is +80%, P<0.0001
### Improved access/availability of essential medications in Uganda

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Baseline intervention (Jan 2016) n=10</th>
<th>End line control (Mar 2017) n=10</th>
<th>End line intervention (Mar 2017) n=10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of <strong>Ampicillin (IM or IV)</strong></td>
<td>75%</td>
<td>30%</td>
<td>100%</td>
</tr>
<tr>
<td>Number of stock out days per month in facilities with stock outs</td>
<td>30</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td><strong>Amoxicillin (Oral)</strong></td>
<td>90%</td>
<td>70%</td>
<td>60%</td>
</tr>
<tr>
<td>Number of stock out days per month</td>
<td>30</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Availability of <strong>Gentamicin (IM or IV)</strong></td>
<td>40%</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Number of stock out days per month</td>
<td>22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Addressing misconceptions and appropriate use of antibiotics by caregivers

**IDENTIFIED GAPS**
- Misconceptions among parents of the need to prescribe antibiotics to treat pediatric RTIs
- Inappropriate use of antibiotics (sold over the counter) by caregivers

**TESTED CHANGES**
- Educating and counselling parents on correct administration of the antibiotics
- Counselling careers on rational antibiotic use at every visit
- Posters on rational antibiotic use
- Discussing the issue at medical conferences, meetings, shared success efforts
- Shared the communication massages via local media and TV by well-respected clinicians, including heads of respiratory association

**Indicators**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Baseline intervention</th>
<th>End line control</th>
<th>End line Intervention</th>
<th>End line Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uganda: Education of caregiver on administration of antibiotics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Explained</td>
<td>41% (69)</td>
<td>2% (3)</td>
<td>100% (147)</td>
<td></td>
</tr>
<tr>
<td>• Demonstrated</td>
<td>34% (69)</td>
<td>1% (1)</td>
<td>64% (49)</td>
<td></td>
</tr>
<tr>
<td>• Explained correct administration of anti-malarials</td>
<td>20% (14)</td>
<td>7% (5)</td>
<td>100% (96)</td>
<td></td>
</tr>
<tr>
<td><strong>Georgia: improved knowledge and practice of caregivers on antibiotics use during RTI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Patients without prescription of any irrelevant antibiotic</td>
<td>3% (2)</td>
<td>2% (1)</td>
<td>31% (10)</td>
<td>8% (5)</td>
</tr>
<tr>
<td>• “Per-os” route of antibiotic</td>
<td>77% (40)</td>
<td>78% (30)</td>
<td>93% (14)</td>
<td>70% (21)</td>
</tr>
</tbody>
</table>

“I was afraid to see my ill child suffering and not give him antibiotics. Now I know that antibiotics are dangerous when not needed.”

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WHO Action Plan Objective 5: Develop the economic case for sustainable investment that takes account of the needs of all countries and increase investment.
## Economic evaluation of child care improvement interventions in Georgia and Uganda

<table>
<thead>
<tr>
<th>Country</th>
<th>Clinical conditions</th>
<th># of patients</th>
<th>Total cost in USD</th>
<th>Cost-saving per patient</th>
<th>Total cost saving in USD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Georgia</strong></td>
<td>RTI amb</td>
<td>26236</td>
<td>22,484</td>
<td>4.9</td>
<td>127,802</td>
</tr>
<tr>
<td></td>
<td>Pneumonia hosp</td>
<td>1544</td>
<td>14,989</td>
<td>12.1</td>
<td>18,614</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>37,473</strong></td>
<td></td>
<td></td>
<td><strong>146,416</strong></td>
</tr>
<tr>
<td><strong>Uganda</strong></td>
<td>cough or cold/RTI</td>
<td>45,621</td>
<td>2,146</td>
<td>0.13</td>
<td>5820</td>
</tr>
<tr>
<td></td>
<td>Pneumonia</td>
<td>10,841</td>
<td>2146</td>
<td>0.03</td>
<td>302</td>
</tr>
<tr>
<td></td>
<td>Malaria</td>
<td>120,768</td>
<td>2,146</td>
<td>0.02</td>
<td>3006</td>
</tr>
<tr>
<td></td>
<td>Diarrhoea</td>
<td>16,502</td>
<td>2,146</td>
<td>0.05</td>
<td>823</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>8,584</strong></td>
<td></td>
<td></td>
<td><strong>9,951</strong></td>
</tr>
</tbody>
</table>

### Uganda: ICER per improved abx prescription practices

<table>
<thead>
<tr>
<th>Intervention</th>
<th>ICER/USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationalized antibiotic prescription for cough and cold</td>
<td>0.08</td>
</tr>
<tr>
<td>Pneumonia treated with adequate dosage first line antibiotic</td>
<td>0.25</td>
</tr>
<tr>
<td>EB treatment of Diarrhoea without concurrent abx</td>
<td>0.30</td>
</tr>
<tr>
<td>Evidence-based treatment for PSBI, including initial treatment and referral or full outpatient treatment</td>
<td>3.14</td>
</tr>
</tbody>
</table>

**ICER does not include cost of compliance or non-compliance, including economic effects of unsafe use of Abx, AMR etc.**
Participants should use the chat function to post questions (send to “All panelists”). Responses to questions not addressed during the webinar will be posted afterwards on: https://www.usaidassist.org/content/legacy-webinar-series-preventing-antimicrobial-resistance-west-bank-uganda-georgia
Closing Remarks

Mirwais Rahimzai, MD, MPH
Regional Director, East Africa
USAID ASSIST Project
University Research Co., LLC
Resources to learn more:
www.usaidassist.org/content/legacy-webinar-series-preventing-antimicrobial-resistance-west-bank-uganda-georgia

- AMR CONTROL 2017:
  - Using quality improvement to address hospital-acquired infections and antimicrobial resistance
  - Improving rational antibiotic treatment of common childhood conditions in Uganda
  - Embedding quality improvement through a learning collaborative to reduce and sustain hospital-acquired infections in the West Bank
  - The Economics of Reducing Antibiotic Use to Reduce Antimicrobial Resistance

- Improving Integrated Management of Newborn and Childhood Illnesses in Northern Uganda. *Int J Integr Care* 2017

- Rationale for improving integrated service delivery: reduced cost and improved care in Georgia. *Int J Integr Care* 2015

- West Bank HAI Collaborative Tools
Upcoming webinar: Strengthening the power of the OVC platform to achieve epidemic control through community linkages

Wednesday, April 25, 2018 9:00-10:00am

Register at:
https://zoom.us/webinar/register/WN_fy-5Qy0zRGOP3kkj4o6WRg