ANALYSIS OF ANTIBIOTIC PRESCRIPTION PRACTICES IN OUTPATIENT SETTINGS: DEVELOPING AN INNOVATIVE TOOL

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Drivers of emergence and spread of AMR

Exposure to antibiotics

Emergence of AMR

Consumption data:
- aggregated antibiotic volumes
- Granular data: facility/patient level data

ATC/DDD methodology at import/production and distribution
Aims and Objectives

[Interventions relating to antibiotic use typically focus on the prescriber, dispenser or end user]

⇒ …..but there are few protocols that can assess use at this level

[The task was to COLLECT AND ANALYZE data using a tool assessing several metrics to facilitate use for more than one purpose]

⇒ Assessment/monitoring
⇒ Problem identification and investigation
⇒ Intervention design
For outpatient settings, only “traditional” surveys methods like

- WHO Drug Indicator Survey (DIS): indicating the volume of use (% of prescriptions with one or more antibiotics)

- Medicine Use Evaluation: assessing the (appropriate) use of a particular antibiotic
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
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<th>2</th>
<th>3</th>
<th>2.6</th>
<th>2.3</th>
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<tbody>
<tr>
<td></td>
<td>Average number of medicines/patient</td>
<td>3.5</td>
<td>2.8</td>
<td>3</td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>% of medicines prescribed by generic name</td>
<td>76%</td>
<td>98%</td>
<td>67%</td>
<td>78.4%</td>
<td>98%</td>
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<tr>
<td></td>
<td>% of patients with one or more antibiotics</td>
<td>79%</td>
<td>86%</td>
<td>75%</td>
<td>62%</td>
<td>69%</td>
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<tr>
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<td>% of patients with one or more injections</td>
<td>12%</td>
<td>16%</td>
<td>6%</td>
<td>1%</td>
<td>40%</td>
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<tr>
<td></td>
<td>% of medicines being antibiotics</td>
<td>44%</td>
<td>41%</td>
<td>31%</td>
<td>36.7%</td>
<td>38%</td>
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<tr>
<td></td>
<td>% of prescribed medicines not in UCG/EMHSL</td>
<td>12%</td>
<td>0.2%</td>
<td>7%</td>
<td>2.3%</td>
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OPD Antibiotic Survey: Methodology

Sample frame: the pts on antibiotics from a DIS (or another sample of OPD pts with Antibiotics)

⇒ 100/200 pts to make it simple

☐ Raw data: serial No, age, gender, diagnosis (all), treatment (all)

☐ Simple analysis on excel file:

⇒ Indication for antibiotic (bacterial infection diagnosis)? Yes or No
⇒ Class of antibiotics
⇒ Oral VS injectable
⇒ Correct antibiotic for diagnosis as per UCG
⇒ Distribution of diagnosis and of antibiotics
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<tr>
<th>No</th>
<th>Client</th>
<th>OPD No</th>
<th>Month</th>
<th>Age</th>
<th>Sex</th>
<th>Requiring Antibiotic YES or</th>
<th>Antibiotics Prescribed</th>
<th>Adherence to UCG 2016</th>
<th>Number of Abx prescribed</th>
<th>Other Medicines</th>
<th>Amoxyl</th>
<th>Metro</th>
<th>Levofoxxacin</th>
<th>Ampidoci</th>
<th>Pen-V</th>
<th>Cotrimoxazole</th>
<th>Ciprofloxacin</th>
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</tbody>
</table>
Dx justifying (or not) Abx use

Upper respiratory tract infections, malaria, diarrhoea, non infective diagnosis, fungal infections...

<table>
<thead>
<tr>
<th>Hospital</th>
<th>% Patients Needing Abx</th>
<th>% Patients Possibly Needing Abx</th>
<th>% Patients Not Needing Abx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hosp 1</td>
<td>28%</td>
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<tr>
<td>Hosp 2</td>
<td>44%</td>
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<tr>
<td>Hosp 3</td>
<td>28%</td>
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</tr>
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<td>Hosp 4</td>
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<td></td>
</tr>
<tr>
<td>Hosp 5</td>
<td>26%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- Green: % patients needing Abx
- Yellow: % patients possibly needing Abx
- Red: % pts not needing Abx
Number of Antibiotics per Prescription

To be interpreted according to common diagnosis
Percentage OPD pts with injectable Abx

- Hosp 1: 0% prescription with only oral antibiotics, 20% with at least 1 injectables
- Hosp 2: 20% prescription with only oral antibiotics, 80% with at least 1 injectables
- Hosp 3: 40% prescription with only oral antibiotics, 60% with at least 1 injectables
- Hosp 4: 60% prescription with only oral antibiotics, 40% with at least 1 injectables
- Hosp 5: 80% prescription with only oral antibiotics, 20% with at least 1 injectables

Legend:
- Green: % prescription with only oral antibiotics
- Yellow: % prescription with at least 1 injectables
Adherence to Clinical Guidelines

Hosp 1: 27% Pts not treated according to guidelines, 73% Pts treated according to guidelines
Hosp 2: 23% Pts not treated according to guidelines, 77% Pts treated according to guidelines
Hosp 3: 28% Pts not treated according to guidelines, 72% Pts treated according to guidelines
Hosp 4: 39% Pts not treated according to guidelines, 61% Pts treated according to guidelines
Hosp 5: 31% Pts not treated according to guidelines, 69% Pts treated according to guidelines
Most Common Diagnoses at OPD

**Hospital 1**
- GE INFECTIONS
- PUD GASTRITIS
- NON INFECTIOUS...
- ASPECIFIC BACTERIAL...
- OTHER FOCAL BACT INF
- FUNGAL INFECT (ONLY)
- SKIN...
- URTI
- RTI
- STI/PID
- UTI

**Hospital 4**
- Diarrhea
- Back pain
- Malaria
- Fungal skin diseases
- Allergies (varies)
- VCC (vaginal...)
- PUD GERD gastritis
- Other bacterial...
- PID (pelvic...)
- Soft tissue infection
- UTI (urinary tract...)
- RTI
- URTI
Most commonly prescribed Abx

Hospital 2

- Cefixime
- Ceftriaxone
- Gentamycin
- Doxycycline
- Erythromycin
- Azithromycin
- Secnidazole
- Ampicillin
- Ciprofloxacin
- Ampiclox
- Metro
- Amoxyl

Hospital 3

- Metronidazole
- Ciprofloxacin
- Nitrofurantoin
- Levofloxacin
- Benzylpenicillin
- Cefixime
- Tinidazole
- Norfloxacin
- Doxycycline
- Ampiclox
- Gentamicin
- Ceftriaxone
- Amoxicillin

WATCH
Prescription Audits

- What Antibiotics are prescribed for a particular diagnosis?

**URTI prescription audit**
- cefixime metro
- cefixime
- erythromycin
- Amoxi-metro
- Ampiclox
- Amoxicillin

**LRTI/RTI Prescription Audit**
- Metronidazole
- Ciprofloxacin
- Cotrimoxazole
- Orfloxacin+Ornida...
- Amoxyl
- Erythromycin
For what diagnosis is a particular Antibiotic prescribed

**METRONIDAZOLE MUE**

- (RTI, typhoid, herpes...)
- PUD
- Enteric Fever
- Urethritis/STI/PID
- UTI
- Candidiasis/V.Candida...
- Gastritis/GERD

**AMOXICILLIN MUE**

- Other Dx
- PUD
- UTI
- STI/PID
- URTI
- RTI
Benefits

- Allows for rapid assessment of multiple quality indicators (volume and use) at one time and on one sample.
- Allows for analysis of prescribing practices and giving feedback to policy makers, managers and prescribers.
- Provides evidence of prescribing issues and thus guiding interventions.
- Allows for monitoring and assessment of the impact of corrective interventions.
- Antibiotics of importance can be identified and collated with resistance data.
- A simple tool requiring basic skills in excel.
Limitations

- The survey relies on retrospective data...
- The data source, OPD Registers, are bulky. Extracting the data may limit its use to cross sectional surveys rather than routine surveillance
- The tool does not take into account differences in supply chain; prescriptions may be limited to what is available as opposed to what is appropriate
- Does not produce DDD metrics
- Analysis not yet standardized
Lessons and recommendations

- Recognized that the data sources are available at facility level:
  - Stock cards for volume metrics
  - OPD Patient Registers for both volume and prescribing patterns (use)

- Need to provide practical and simple tools for data collection, analysis and interpretation
  - Further work to standardize tool
Acknowledgements

- The Ministry of Health Pharmacy Department
- USAID-funded Uganda Health Supply Chain (UHSC) project implemented by Management Sciences for Health (MSH)
- Medicine and Therapeutics Committees (MTC) in 7 Regional Referral Hospitals:
  → Survey developed and implemented in the framework of a revitalization intervention of MTCs