COMBATTING ANTIMICROBIAL RESISTANCE IN PAEDIATRICS
The ARPEC Project

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On behalf of the ARPEC project team
1. Overview – Antimicrobial Resistance and Prescribing in European Children (ARPEC)

• Objective: Improve quality of antibiotic prescribing among children in Europe
  – Network of neonatal/paediatric treatment centres
  – Neonatal and paediatric surveillance methods
  – Educational program on neonatal and paediatric antibiotic prescription
2. Context/Public health problem

Why focus on antimicrobial resistance?
• Increased duration/cost of treatment
• Worse patient outcomes

Why focus on paediatrics?
• High rates of infection, non-specific presentation
• High consumption of antimicrobials (~50mil/y)
• Patterns of infection and resistance vary significantly by age
2. Context/Public health problem

What can we do?

• More prudent antibiotic prescribing

• Age-specific (hospital-acquired) infection and resistance surveillance data

• Improved paediatric treatment guidelines and education
3. Key activities - methodology

- 2010-2013 data collection
- 19 centres, 12 countries
- Children 0-18 years
- Community Prescribing: Database review
- Hospital Prescribing: PPS of 5921 and 17693 children in 2011/12
- Blood stream infection and resistance: 1848 isolates
- Guidelines from 84 centres
4. Results – Prescribing

• Variation by age and country

![Graphs showing variation in prescribing by age and country](image-url)
4. Results – Prescribing

- Too many broad spectrum antibiotics

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<thead>
<tr>
<th></th>
<th>UK</th>
<th>Italy</th>
<th>NL</th>
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<tbody>
<tr>
<td>Amoxicillin (44%)</td>
<td>Amoxicillin (25%)</td>
<td>Amoxicillin (45%)</td>
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<tr>
<td>Penicillin V (13%)</td>
<td>Amox/clav acid (23%)</td>
<td>Amox/clav acid (13%)</td>
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<tr>
<td>Erythromycin (10%)</td>
<td>Azithromycin (10%)</td>
<td>Azithromycin (8%)</td>
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<tr>
<td>Flucloxacillin (9%)</td>
<td>Cefaclor (9%)</td>
<td>Clarithromycin (7%)</td>
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<td>Trimethoprim (5%)</td>
<td>Cefixime (7%)</td>
<td>Pheneticillin (6%)</td>
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<tr>
<td>Amox/clav acid (4%)</td>
<td>Ceftibuten (3%)</td>
<td>Nitrofurantoin (4%)</td>
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<tr>
<td>Cefalexin (3%)</td>
<td>Cefpodoxim (2%)</td>
<td>Flucloxacillin (3%)</td>
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4. Results – Blood stream infections

• 37% of HAI in children vs. 13% HAI in adults
• Variation in resistance patterns by age, even among children
• High MDR Gram Negative BSI prevalence
  – High associated mortality – 15% (vs. 10% overall)
• High NICU/PICU BSI prevalence
  – High associated mortality – 10-15%
• Largely preventable!
4. Results – Treatment guidelines

- No guidelines in **11.9%** of centres
- Incomplete guidelines in **79.7%** of centres
5. Sustainability and transferability

• Specific data-driven quality indicators developed (ex. 70% amoxicillin) for publication and dissemination

• Web-based data collection tools suitable for paediatric antibiotic use and resistance surveillance worldwide developed

• Web-based paediatrician training program on antibiotic management developed, currently administered by ESPID
5. Sustainability and transferability

- Antimicrobial stewardship begun in many participating centres
- PENTA paediatric HIV research network reconstituted into PENTA-ID, now level 1 clinical trials network for antimicrobials
- Collaborations with FP7 Global Research in Paediatrics project (QIs), WHO DDD collaborating centre (DDD), TATFAR (PPS)
- Global Antimicrobial Resistance, Prescribing, and Efficacy Project (www.garpec.org) created
5. Sustainability and transferability

- Reporting from children’s hospitals to ECDC surveillance programs should be increased.
- ECDC should consider adapting existing tools for neonatal/paediatric surveillance.
- Quality indicators for optimal community and hospital prescribing should be created and published for clinicians and policymakers.
- All tertiary neonatal/paediatric centres should develop and implement stewardship programs.
- DG-SANCO should consider quality improvement program to address unacceptably high NICU/PICU HAI in Europe.
6. Project/ Programme ID Card

- 19 Partners
- 12 Countries
- €1.17 million budget, 59.49% EC funding
- 2010-2013
- http://arpecproject.eu/
7. Contact

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