e-Bug
An European antibiotic educational resource for school children

Dr Donna Lecky
1. Why create an educational resource for school children?
We need to teach children about prudent antibiotic use as they are our future generation of antibiotic users

- But as important
- Half of children consulting their GP have an infection
  - Majority are respiratory
- Antibiotics are the most common childhood medicines

If we reduce childhood infections we reduce antibiotic use
e-Bug: the beginning

• Secured funding from DG-Sanco of the EU Commission

• Develop an EU wide educational pack and interactive website teaching children about antibiotic resistance and prudent antibiotic use

• Led by the HPA in England
e-Bug Collaboration

- **10 Associate Partners**
  - >316 million people
  - 61.4% EU population

- **8 Collaborating Partners**
  - >37 million people
  - 6.1% EU population
2. e-Bug Development

- Partner Inaugural meeting
- 3 month Research Period
- Teacher focus groups
- Student questionnaires
Partner Inaugural Meeting

• Link to current country campaigns
• Cover hygiene only
• In order to teach about antibiotic resistance it is important to teach about microbes
• Essential to highlight our good microbes
• 2 pack – junior and senior
Why 9-11 years & 12-15 year olds?

Student Age (years)

<table>
<thead>
<tr>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium FR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belgium FL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belgium GR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Britain ENG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Britain WAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Britain NIR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Britain SCO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Junior packs

Senior packs

- Pre school
- Primary
- Lower Secondary
- Upper Secondary
- Compulsory Full Time Education
Focus groups with teachers

- MUST link closely to the National Curriculum
- MUST be adaptable
- Important to have IT links
- Cover a range of teaching styles
- Student and teacher friendly
Character development

Clothing

Hair styles

Amy & Harry
Bug Character development

Good Bugs:
- **Penicillium**
- **Lactobacillus**

Bad Bugs:
- **Staphylococcus**
- **Campylobacter**
- **Influenza**
- **Dermatophyte**
1. **Micro-organisms**
   i. An Introduction
   ii. Useful Microbes
   iii. Harmful Microbes

2. **Spread of Infection**
   i. Hand Hygiene
   ii. Respiratory Hygiene
   iii. Food Hygiene (Junior only)
   iv. Sexual Transmission (Senior only)

3. **Prevention of Infection**
   i. The Body’s Natural Defences
   ii. Vaccinations

4. **Treatment of Infection**
   1. Antibiotic Use and Medicine
The Resource

e-Bug for Junior Schools

Welcome to e-Bug for Junior Schools

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug

Welcome to e-Bug
Platform game – photograph and zap microbes
Senior Detective Game

Pupils solve a microbial mystery

Using ‘Microbe Vision’ to find clues
3. The Evaluation Phase
Evaluation Process

• The evaluation was carried out in 3 countries
  - France
  - Czech Republic
  - United Kingdom

• Control and Intervention Schools

• Junior and Senior Schools

• Minimum of 151 students in each group
Evaluation Process

Quantitative Evaluation
- Baseline knowledge
- Knowledge change
- Knowledge retention

Qualitative Evaluation
- Teacher questionnaires
- Teacher focus groups
- Student questionnaires
### Quantitative Results

#### JUNIOR PACK INTERVENTION

<table>
<thead>
<tr>
<th>Introduction to Microbes</th>
<th>Change</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>32.5 (30.3, 34.7)</td>
<td>29.8 (27.0, 32.6)</td>
</tr>
<tr>
<td>London</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nice</td>
<td>30.0 (22.3, 37.8)</td>
<td>32.5 (24.3, 40.6)</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>36.4 (24.2, 48.5)</td>
<td>36.2 (23.8, 48.6)</td>
</tr>
<tr>
<td>Prague</td>
<td>†26.4 (18.0, 34.8)</td>
<td>†28.4 (19.9, 36.9)</td>
</tr>
<tr>
<td>Ostrava</td>
<td>†30.8 (22.7, 39.0)</td>
<td>†29.1 (21.0, 37.3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spread of Infection</th>
<th>Change</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>10.6 (8.6, 12.6)</td>
<td>12.2 (9.6, 14.8)</td>
</tr>
<tr>
<td>London</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nice</td>
<td>†6.2 (-0.3, 12.6)</td>
<td>†8.1 (1.2, 14.9)</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>15.5 (5.3, 25.7)</td>
<td>11.9 (1.5, 22.3)</td>
</tr>
<tr>
<td>Prague</td>
<td>9.4 (2.4, 16.5)</td>
<td>6.9 (-0.2, 14.1)</td>
</tr>
<tr>
<td>Ostrava</td>
<td>†8.6 (1.8, 15.4)</td>
<td>†10.7 (3.9, 17.5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment of Infection</th>
<th>Change</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>15.4 (12.6, 18.1)</td>
<td>14.6 (11.1, 18.1)</td>
</tr>
<tr>
<td>London</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nice</td>
<td>22.5 (14.6, 30.3)</td>
<td>†27.4 (19.0, 35.9)</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>30.8 (18.1, 43.5)</td>
<td>22.3 (9.3, 35.3)</td>
</tr>
<tr>
<td>Prague</td>
<td>†29.8 (21.2, 38.4)</td>
<td>26.0 (17.3, 34.7)</td>
</tr>
<tr>
<td>Ostrava</td>
<td>†28.3 (19.9, 36.6)</td>
<td>†20.0 (11.7, 28.3)</td>
</tr>
</tbody>
</table>

#### SENIOR PACK INTERVENTION

<table>
<thead>
<tr>
<th>Introduction to Microbes</th>
<th>Change</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>†18.9 (17.1, 20.7)</td>
<td>†19.1 (17.2, 20.9)</td>
</tr>
<tr>
<td>London</td>
<td>14.9 (3.9, 25.9)</td>
<td>14.7 (3.2, 26.1)</td>
</tr>
<tr>
<td>Nice</td>
<td>20.3 (12.9, 27.8)</td>
<td>20.2 (12.3, 28.0)</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>22.2 (15.4, 28.9)</td>
<td>24.5 (17.7, 31.2)</td>
</tr>
<tr>
<td>Prague</td>
<td>13.8 (7.2, 20.4)</td>
<td>†18.6 (12.1, 25.2)</td>
</tr>
<tr>
<td>Ostrava</td>
<td>†24.0 (17.6, 30.3)</td>
<td>†20.1 (13.7, 26.5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spread of Infection</th>
<th>Change</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>15.0 (13.0, 17.0)</td>
<td>13.9 (11.8, 15.9)</td>
</tr>
<tr>
<td>London</td>
<td>13.2 (3.1, 23.4)</td>
<td>11.8 (1.0, 22.5)</td>
</tr>
<tr>
<td>Nice</td>
<td>14.0 (6.9, 21.1)</td>
<td>12.2 (4.6, 19.9)</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>14.9 (8.5, 21.3)</td>
<td>12.7 (6.3, 19.2)</td>
</tr>
<tr>
<td>Prague</td>
<td>†14.2 (7.9, 20.6)</td>
<td>†14.2 (8.0, 20.5)</td>
</tr>
<tr>
<td>Ostrava</td>
<td>†16.5 (10.5, 22.6)</td>
<td>†14.5 (8.4, 20.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment of Infection</th>
<th>Change</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucester</td>
<td>24.4 (22.2, 26.7)</td>
<td>24.7 (22.4, 27.1)</td>
</tr>
<tr>
<td>London</td>
<td>16.2 (-3.1, 35.4)</td>
<td>22.0 (2.3, 41.6)</td>
</tr>
<tr>
<td>Nice</td>
<td>33.1 (21.9, 44.2)</td>
<td>34.5 (23.2, 45.8)</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>26.1 (15.4, 36.8)</td>
<td>32.4 (21.7, 43.1)</td>
</tr>
<tr>
<td>Prague</td>
<td>33.2 (22.6, 43.9)</td>
<td>34.4 (23.8, 44.9)</td>
</tr>
<tr>
<td>Ostrava</td>
<td>43.4 (33.0, 53.8)</td>
<td>†32.6 (22.1, 43.0)</td>
</tr>
</tbody>
</table>
Qualitative Results – Junior Schools

England

France

- Vaccines and antibiotic sections of the pack being the least preferred
- 3/11 French teachers stating they would not use the pack in the future
Qualitative Results – Senior Schools

Student opinions varied
Many English students stated that the activities were just OK (3 on the Likert scale)
1 French teacher stated that they would not use the pack in the future
Evaluation Conclusions

• A need to modify various sections of both resources to make them more appealing.

• Disliked sections comprised of activities which were independent research based and had no ‘hands on’ practical element.

• These sections also showed the least knowledge improvement

• Teacher criticism included
  – Not enough multimedia support
  – Some activities were too time consuming
  – Too much photocopying required
3. The future of e-Bug
Implementation in remaining EU countries

- ECDC are translating the e-Bug pack and website into the remaining 19 EU/EEA country languages
- We are currently identifying lead partners in these countries to take e-Bug forward by September 2011
3. e-Bug outside of the school
e-Bug Road Shows
e-Bug road shows

Family fun days

The stands are set up in a large hall with other exhibitors and families come to us whilst walking around the hall.
Other areas

- e-Bug and Sexual Relationship Education (SRE)
- e-Bug in Prisons and Youth Offender Institutions (YOI)
- Hospitals and Community nurses
Thank you

- ECDC for their ongoing support of the project
- All the partners involved in making it such a success

**Associate Partners:**
- Belgium (BE)  Herman Goossens
  - Niels Adriaenssens
  - Stijn De Corte
- Czech Republic (CZ)  Jiri Benes
  - Tereza Kopřivová Herotová
- Denmark (DE)  Jette Holt
  - Marianne Noer
- France (FR)  Pierre Dellamonica
  - Pia Touboul
  - Brigitte Dunais
- Greece (EL)  Jenny Kremastinou
  - Koula Merakou
  - Dimitri Gennimata
  - Natasha Barbouni
- Italy (IT)  Guiseppe Cornaglia
  - Raffaella Koncan
- Poland (PL)  Pawel Grzesiowski
  - Anna Olczak-Plenkowska
- Portugal (PT)  Antonio Brito Avo
- Spain (ES)  José Campos
- United Kingdom (UK)  Julius Weinberg

**Collaborating Partners:**
- Croatia  Arjana Tambic Andrasevic
- Finland  Pentti Huovinen
- Hungary  Gabor Ternak
- Ireland  Robert Cunney
- Latvia  Sandra Berzina
- Lithuania  Rolanda Valinteliene
- Slovakia  Tomáš Tesař
- Slovenia  Marko Pokorn

**Developmental Team:**
- Project Coordinator  Cliodna McNulty
- Pack Developer  Donna Lecky
- Web Lead  Patty Kostkova
- Web Developer  David Farrell
- Lead Administrator  Jill Whiting