e-Bug pack evaluation: Preliminary results from the Czech Republic, England and France.

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Background Information

Antimicrobial resistance remains one of the key problems within community and hospital settings in Europe

Over 50% of adults still believe that antibiotics work on coughs and colds. To reduce expectations for antibiotics in the long term we need to change the behaviour of our future generation of adults – our children

e-Bug, an educational resource pack and accompanying website, sponsored by DG-SANCO of the European Commission and involving 18 EU countries, was designed to enhance student knowledge at primary and secondary school levels on four key areas:

- Introduction to Microbes
- Spread of Infection
- Treatment of Infection
- Prevention of Infection

Study Aim

To measure the effectiveness of the e-Bug pack in improving children's knowledge on the topics outlined above when used within the National Curriculum in England, France and the Czech Republic.

Methodology

Teaching during the academic year 2008/09, using the draft *e-Bug* pack, was given by junior and senior school teachers.

1358 students across 45 junior schools and 1636 students across 46 senior schools took part in the evaluation. Data cleansing prior to analysis resulted in a total of 610 junior school and 1000 senior school questionnaires, matched before and after, across all 3 countries.

Qualitative data was obtained via
- Teacher focus groups
- Qualitative teacher questionnaire on each topic
- Qualitative student questionnaire on each topic

Quantitative questionnaires were completed by all students at three different time points to assess students
- Baseline Knowledge (Immediately before pack use)
- Knowledge Change (Immediately after pack use)
- Knowledge Retention (6 weeks after pack use)

Control groups refer to classes which were taught the microbiology section of the curriculum without e-Bug

Data collected from all three countries was combined and analyses was performed in STATA, version 10, using xtlogit and xtreg commands for the dichotomous and continuous outcomes, respectively, for the first set and xtmelogit and xtmixed, respectively, for the second set.

Junior Schools

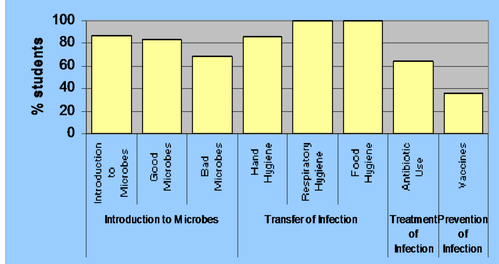
Quantitative Data Overview

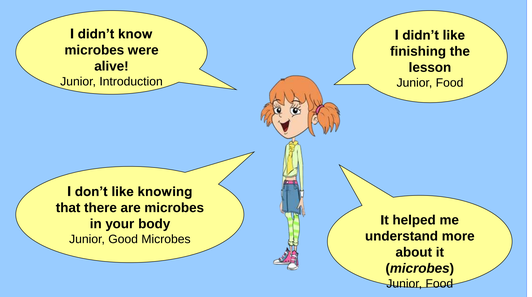
Table 1. Student percentage knowledge change for control and e-Bug groups at 3 different time points (baseline knowledge, knowledge change and knowledge retention) when compared to e-Bug at baseline, by pack section

Topics	Control Baseline Knowledge	Control Knowledge Change	e-Bug Knowledge Change	Control Knowledge Retention	e-Bug Knowledge Retention
Micro organisms	-7.1 (-11.6, -2.5)	12.5 (9.1, 15.9)	24.0 (21.3, 26.6)	15.1 (11.8, 18.3)	22.2 (19.4, 25.0)
Good / Bad Microbes	-4.6 (-9.2, 0.0)	12.4 (8.4, 16.4)	30.9 (27.7, 34.0)	17.0 (13.2, 20.8)	30.9 (27.6, 34.2)
Spread of Infection	0.6 (-3.1, 4.3)	1.4 (-1.3, 4.1)	11.6 (9.5, 13.6)	1.7 (-0.9, 4.2)	12.8 (10.6, 15.0)
Treatment (antibiotics) and Prevention of Infection	-3.0 (-7.3, 1.3)	5.0 (1.5, 8.4)	11.8 (9.1, 14.5)	4.4 (1.1, 7.6)	11.0 (8.2, 13.8)

Qualitative Data Overview

Figure 1. Percentage of junior school students questioned who rated the activity ≥ 3 in a scale of 1 - 5





Senior Schools

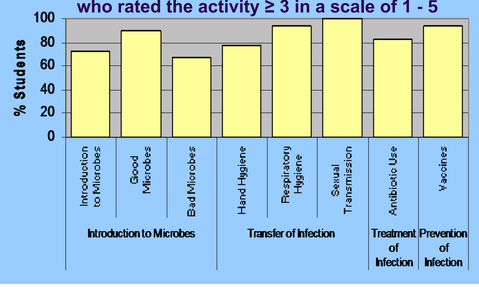
Quantitative Data Overview

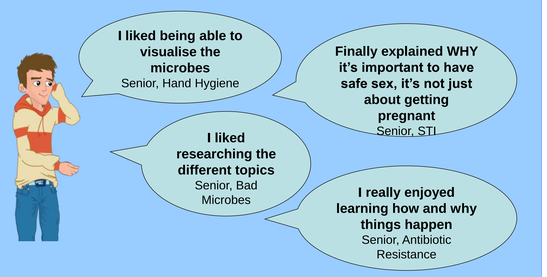
Table 2. Student percentage knowledge change for control and e-Bug groups at 3 different time points (baseline knowledge, knowledge change and knowledge retention) when compared to e-Bug at baseline, by pack section

Topics	Control Baseline Knowledge	Control Knowledge Change	e-Bug Knowledge Change	Control Knowledge Retention	e-Bug Knowledge Retention
Micro organisms	- 6.3 (-9.6, -3.0)	5.9 (3.2, 8.6)	10.7 (9.3, 12.2)	2.9 (0.4, 5.3)	11.8 (10.2, 13.4)
Spread of Infection	-3.5 (-6.9, -0.2)	2.4 (-0.7, 5.5)	8.4 (6.8, 10.1)	-0.5 (-3.3, 2.3)	8.6 (6.8, 10.4)
Treatment (antibiotics) and Prevention of Infection	-5.0 (-8.9, -1.1)	6.9 (3.4, 10.4)	18.1 (16.3, 20.0)	6.1 (2.9, 9.2)	17.9 (15.8, 19.9)

Qualitative Data Overview

Figure 2. Percentage of senior school students questioned who rated the activity ≥ 3 in a scale of 1 - 5





Summary

Quantitative Results

- With one exception (Spread of Infection in control schools) in the junior school, student knowledge significantly improved in all areas in both control and e-Bug schools.
- For both school groups the control and e-Bug schools retained the knowledge after 6 weeks.
- A significantly higher percentage of students taught using e-Bug **increased and retained** their knowledge, as opposed to students who were taught using other resource materials, at both Junior and Senior school level.

Qualitative Results

- Students and teachers generally preferred the more hands on approach to lessons in the pack as opposed to the more research based lessons
- Group work or paired activities were preferred by the majority of schools as opposed to individual based learning
- The incorporation of more IT (i.e. the option to enter graph results online) would be welcomed by the majority of schools
- The Treatment and Prevention of Infection sections of the pack were thought to be too difficult for lower learning abilities or less academically minded students
- All teachers agreed that the inclusion of background information for the teachers was beneficial although some would have liked more detail

Conclusion

- Although the draft pack can be viewed as a success there is a need to modify various sections of both the junior and senior schools packs to make them more appealing
- Required pack modifications will include
  - Provide links to junior pack for lower ability Senior school classes
  - Include more video clips and images
  - Suggest activities be done in groups or pairs
  - Include more explanations for students i.e. why do things happen!
  - Provide more ICT resources
  - Advise teachers to be more involved
  - Suggest explanations of how to present practical activities
- The data from this evaluation will be used to further improve the packs
- The e-Bug packs have been translated into associated partner languages
- The full e-Bug resource (packs, game and website) will be officially launched in September 2009

For more information on this project see EU Network corner poster or contact cliodna.mcnulty@hpa.org.uk or donna.lecky@hpa.org.uk