What gets taught in medical schools?

Annie Herbert
Centre for Paediatric Epidemiology & Biostatistics

Royal Statistical Society
Monday 13th May, 2013
Introduction

- Burwalls
- The Blue Book
- Results of 14/40 UK medical/dental schools
- Summary
Burwalls

- Meeting of teachers of medical statistics (est. 1980)
- Small (~20-30 participants)
- ~1 representative from each medical school
- Exchange of ideas, networking, introduction for new starters
- Has been the origin of many classic stats publications

Recently have a Burwalls website
The Blue Book (1)

The Blue Book

Statistics Teaching for Medical and Dental students in the UK

This is the online version of the 'Blue Book', which describes the provision of statistics teaching to medical

***Please note that, unless otherwise stated, this information is VERY out of date.***

It is envisaged that up-to-date information will be obtained at the 2002 Burwalls meeting for teachers of the
Site last modified: 11th April 2002

David Walsh

- University of Aberdeen (***updated***)
- Queen’s University of Belfast (***updated***)
- University of Birmingham
- University of Bristol (***updated***)
- University of Cambridge (***updated***)
- De Montfort University
- University of Dundee
- University of Edinburgh
- University of Glasgow (***updated***)

UNIVERSITY OF ABERDEEN

ORGANISATION OF STATISTICS TEACHING
Statistics teaching is provided by statisticians in the Department of Public Health and is organised by Jill Molloin.

UNDERGRADUATE STATISTICS CURRICULUM
Currently, there is no formal statistics teaching on the MB ChB degree course. Applied statistics is taught within the core course of the intercalated BSc in Medical Statistics. The class is then split and receives one lecture on common statistical methods in epidemiology or statistical methods in laboratory medicine.

METHOD OF TEACHING
Three lectures.

NUMBER OF STUDENTS
30-40 students.

TEACHING STAFF
Jill Molloin and Lorna Aucott share the teaching.

ASSESSMENT
Multiple-choice questions are included within the core course examination.

POSTGRADUATE TEACHING
The Department runs an Applied Statistics course and students undertaking MSc courses in Health Services and Public Health Research, Nutrition and Clinical Nutrition each year. The teaching consists of 24 hours of lectures and 12 hours of practical work and runs in the first semester. Practical work is intended to reinforce the material covered in the course.

The Department also contributes to the taught course programme for PhD students in the Medicine and Medical Sciences Faculty. First-year PhD students attend a week-long course each year and are then assigned to a research team. The Department runs the statistics unit of the Aberdeen Occupational Health Course. The teaching consists of 16 hours of lectures as part of a week-long course.
The Blue Book (2)

- Lists each UK medical and dental school and how they teach stats
  - No. students/staff
  - Curriculum
  - Assessment
  - Timing of lectures/exams
  - Contact details for at least one member of staff

- Includes postgraduates, e.g., Masters in Public Health
Latest update (1)

- Burwalls 2011

- Included computer packages/recommended literature

- Form emailed out to everyone in the original book
  - 8 London medical schools
  - 20 non-London medical schools
  - Liverpool and London Schools of Hygiene & Tropical Medicine
  - 2 Dental schools

...and 8 extra medical/dental schools
Latest update (2)

- 40 forms sent out in total
- 20 replied
- 12 medical schools and 2 dental schools gave information
When?

Academic years when medical statistics is taught

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<th>Years</th>
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Legend:
- Any Teaching
- Particular Combination
How much?

Average number hours taught per academic year

No. hours

0 20 40 60 80

Frequency

0 20 40 60 80
What subjects and to what level? (1)

Frequency of teaching and level of basic topics

- Types of Variable: 90% Concept only, 10% Calculations, 0% Don't teach
- Distributions: 80% Concept only, 20% Calculations, 0% Don't teach
- Summary Statistics: 60% Concept only, 40% Calculations, 0% Don't teach
- Population/Sample: 100% Concept only, 0% Calculations, 0% Don't teach
- Graphs: 50% Concept only, 50% Calculations, 0% Don't teach
- Confidence Intervals: 40% Concept only, 60% Calculations, 0% Don't teach
- Hypothesis Testing/P-values: 30% Concept only, 70% Calculations, 0% Don't teach
What subjects and to what level? (2)

Frequency of teaching and level of advanced topics

- **Comparing Two Means**
  - Don't teach: 0%
  - Calculations: 10%
  - Concept only: 90%

- **Comparing Two Proportions**
  - Don't teach: 0%
  - Calculations: 10%
  - Concept only: 90%

- **Linear Regression**
  - Don't teach: 0%
  - Calculations: 10%
  - Concept only: 90%

- **Logistic Regression**
  - Don't teach: 0%
  - Calculations: 10%
  - Concept only: 90%

- **Survival**
  - Don't teach: 0%
  - Calculations: 10%
  - Concept only: 90%

- **Multivariate**
  - Don't teach: 0%
  - Calculations: 10%
  - Concept only: 90%

- **Critical Appraisal**
  - Don't teach: 0%
  - Calculations: 10%
  - Concept only: 90%
... also mentioned:

- Agreement
- Bayesian analyses
- Causality
- Genetics
- Meta-analysis*
- Missing data
- Non-parametric testing
- Risk/Odds ratios*
- Sample size*
- Study design
- Systematic reviews

*Mentioned by at least three different universities
… and:

“…students are not expected to understand the mathematics on which statistical theory is based, or learn and use complicated formulae.”

“The aim of the module is to enable them to read a medical journal article critically, and does not enable them to undertake a research project.”

“They emphasise the practical application of statistical methods to real-life problems, rather than statistical theory.”
How are they assessed?

**Methods of Assessment**

- End of module exam
- Coursework
- Presentation
- MCQs
- A few questions with calculations
- Not assessed
- End of module exam + coursework
- MCQs + presentation
- MCQs + coursework

**Frequency**

- Included in Assessment
- Particular Combination

MCQ = Multiple Choice Question
What computer packages are used?

Use of computer packages for medical statistics teaching

- Excel
- R
- SPSS
- Stata
- StatsDirect
- None

Frequency
Which texts are recommended?

**Recommended literature in statistics teaching**

- An Introduction to Medical Statistics - M Bland
- Essential Medical Statistics - Kirkwood & Sterne
- Lecture Notes in Epidemiology & Public Health - R Farmer, R Lawrenson
- Medical Statistics at a Glance – Sabin & Petrie
- Medical Statistics: A Textbook for the Health Sciences – M J Campbell, D Machin & S J Walters
- Medical Statistics Made Easy - M Harris & G Taylor
- Practical Statistics for Medical Research - D G Altman
... also mentioned:
Half of universities teach in a one-off module during the medical degree.

Statistics teaching is generally less present as the medical course progresses through the years.

For assessment, around three quarters would give a targeted end-of-year exam or coursework, and would supplement these with MCQs.
Summary (2)

• Most universities use SPSS for teaching practical data analysis

• Between universities, the recommended reading is usually 2-3 texts and these are very varied

• Knowing who’s responsible for stats teaching to medical students appears to be more a networking/word of mouth thing!
Thanks for listening!

Any questions?

annie.herbert.12@ucl.ac.uk

www.burwalls.org.uk