

PUBH5018 Introductory Biostatistics

Core

Credit points: 6

Semester: 1 (Session 1)

Delivery mode: 42 hours (12x3 hour sessions + 6 hours extra. This unit may be undertaken in face to face or online/distance mode.)

Pre-requisites:

Co-requisites:

Unit coordinator: Mr Kevin McGeechan, School of Public Health

Summary

This unit aims to provide students with an introduction to statistical concepts, their use and relevance in public health. This unit covers descriptive analyses to summarise and display data; concepts underlying statistical inference; basic statistical methods for the analysis of continuous and binary data; and statistical aspects of study design. Specific topics include: sampling; probability distributions; sampling distribution of the mean; confidence interval and significance tests for one-sample, two paired samples and two independent samples for continuous data and also binary data; correlation and simple linear regression; distribution-free methods for two paired samples, two independent samples and correlation; power and sample size estimation for simple studies; statistical aspects of study design and analysis. Students will be required to perform analyses using a calculator and will also be required to conduct analyses using statistical software (SPSS). It is expected that students spend an additional 2 hours per week preparing for their tutorials. This unit may be undertaken in face to face or online/distance mode. Computing tasks are self-directed.

Aim

This unit provides students with an introduction to statistical concepts, their use and relevance in public health.

Learning objectives

At the end of this unit students will be able to:

1. Summarise statistical data using tables, graphs and appropriate summary statistics.
2. Interpret significance tests and confidence intervals.
3. Compare two samples using the t test for continuous variables and the chi-squared test for categorical data, in both paired and unpaired cases, calculate confidence intervals for the main results, and summarise the conclusions from such an analysis.
4. Compare two samples using non-parametric tests, in both paired and unpaired cases, and summarise the conclusions from such an analysis
5. Analyse the association between two variables using scatter plots, parametric and non-parametric measures of correlation and simple linear regression.
6. Calculate the sample size required for simple studies.
7. Create a statistical analysis plan detailing the major steps in the statistical design and analysis of a study.
8. Use statistical software to present and analyse data.

Content

- Summarising and displaying data; sampling
- Probability distributions
- Sampling distribution of the mean
- Confidence interval and significance tests for:
 - one-sample and paired continuous data
 - for a proportion and paired binary data
 - for two independent proportions
 - for the means of two independent samples
- Correlation and simple linear regression
- Distribution-free methods for two independent samples, two paired samples and correlation
- Sample size estimation
- Statistical aspects of study design and analysis
- Implementing methods using statistical software

Instructional format

The unit will be provided in flexible mode: 1 x 2-hour plus 11 x 1-hour lectures and 11 x 2-hour tutorials (or equivalent on-line work), 2 x 1-hour self directed learning to use SPSS, 10 weekly self directed learning sessions for SPSS of approx 0.5 hours, question-and-answer session (for revision) Lectures are available in both face to face and online modes. There will be a limited number of on-line tutorial groups and students will need to nominate themselves for these groups. Those with a genuine reason (e.g. not living in Sydney) will be given preference.

Assessment

1 x 4 page assignment	30%
<i>This must be repeated if the first attempt is unsatisfactory.</i>	
Formative assessment.	Optional
<i>Does not contribute to assessment</i>	
1 x 2.5 hr formal open-book exam	70%

The final examination for this unit of study will be held at the University of Sydney. A student who participates in an online tutorial group may nominate an alternative venue and supervisor for this exam, but will need to make appropriate arrangements for supervision, based on criteria provided by the School. The venue and arrangements must meet the requirements of the School. If these requirements cannot be met, the student will be required to attend the final examination at the University of Sydney.

Learning materials

Unit Notes (supplied by Department)

Recommended references:

Armitage P, Berry G, Matthews JNS (2002). *Statistical Methods in Medical Research*

4th edition. Oxford: Blackwell Scientific Publications.

Bland M (2000). *An Introduction to Medical Statistics* 3rd edition Oxford: Oxford University Press

Other references are listed in the Unit Notes.

Notes

Access to a computer linked to the internet will be required to use WebCT. Access to SPSS statistical software will also be required. Students can access WebCT and SPSS using the computers in the student laboratory located on campus in the School of Public Health.

Students who wish to study off campus will have to make their own arrangements for computer and internet access. A student edition of SPSS can be purchased for installation on a PC. Further details will be provided on enrolment.