

INTRODUCTORY MEDICAL STATISTICS

To be held virtually on
May 2024 - Thursday 9th PM and Friday 10th AM

Faculty: James Potts and Cosetta Minelli [course organisers], and Chloe Bloom
National Heart and Lung Institute (NHLI) at Imperial College London

Course administrator: Magda Wheatley

Provisional PROGRAMME

Thursday 9th May – Afternoon

<i>Time</i>	<i>Session number, lecture title and summary points covered</i>	<i>Presenter</i>
13.30 – 13.45	Welcome and Introduction Welcome and introduction to the course. Illustration of use of Mentimeter (online voting tool) for classroom exercise	
13.45 – 14.50	1. Basic epidemiological concepts The hierarchy of evidence; Differences in study designs; The problem of confounding in observational studies. Classroom exercise	Cosetta Minelli Emeritus Reader in Medical Statistics, NHLI
14.50 – 15.00	Tea break	
15.00 – 15.30	2. Descriptive statistics Calculating and interpreting descriptive statistics for different types of data (quantitative, ordinal and qualitative data): mean, median, mode, and standard deviation, percentiles, frequency distribution; Understanding the normal distribution and impact of skewness in the data. Classroom exercise	James Potts Medical Statistician, NHLI
15.30 – 16.00	3. Inferential statistics – Estimation Estimating parameters of interest in the population; Difference between standard error and standard deviation; Calculating and interpreting confidence intervals for means and proportions. Classroom exercise	Chloe Bloom Clinical Senior Lecturer in Respiratory Epidemiology, NHLI
16.00 – 16.10	Tea break	
16.10 – 17.10	4. Inferential statistics – Hypothesis testing Testing a hypothesis and meaning of the p-value; Choosing a test based on the type of data and variable; Illustration of the t-test and the chi-squared test. Classroom exercise	Cosetta Minelli
17.10 – 17.30	Questions & Answers	

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Friday 10th May – Morning

<i>Time</i>	<i>Session number, lecture title and summary points covered</i>	<i>Presenter</i>
9.00 – 9.30	5. Type I and II errors in hypothesis testing Understanding the two types of errors when testing a hypothesis; Multiple testing and ways to address it. Classroom exercise	Cosetta Minelli
9.30 – 10.00	6. Sample size calculations Sample size and power calculations - why we need them and what parameters we need to perform them; Examples of sample size calculations for: comparing proportions (binary outcome), and comparing means (continuous outcome)	James Potts
10.00 – 10.10	Tea break	
10.10 – 11.10	7. Correlation and Simple Linear Regression (continuous outcomes) Testing the relationship between two quantitative variables: correlation vs. regression; Parametric and non-parametric correlation; Concept and assumptions of simple linear regression; Links between correlation and simple linear regression. Classroom exercise	James Potts
11.10 – 11.30	8. Multiple Linear Regression (continuous outcomes) Moving from simple to multiple linear regression; Interpreting the results from multiple linear regression; Recognising the impact of confounding. Classroom exercise	Chloe Bloom
11.30 – 11.40	Tea break	
11.40 – 12.10	9. Different measures of risk (binary outcomes) Relative vs. absolute measures of risk; Odds Ratio and Relative risk, and difference between them; Absolute Risk Reduction/Increase; Number Needed to Treat/Harm	Chloe Bloom
12.10 – 12.40	10. Simple and Multiple Logistic Regression (binary outcomes) Understanding the basic concepts of logistic regression; Interpreting the results from simple and multiple logistic regression. Classroom exercise	James Potts
12.40 – 13.00	Questions & Answers Final Q & A session; Some online statistics resources	

Accreditation (6 CPD points) is currently being sought