

# INTRODUCTORY MEDICAL STATISTICS

To be held virtually on  
November 2024 - Thursday 21<sup>st</sup> PM and Friday 22<sup>nd</sup> AM

**Faculty:** James Potts [course organiser],  
Professor Maia Lesosky and Dr Chloe Bloom [co-presenters]  
National Heart and Lung Institute (NHLI) at Imperial College London  
**Course administrator:** Magda Wheatley

## PROVISIONAL PROGRAMME

**Thursday 21<sup>st</sup> November – Afternoon**

<i>Time</i>	<i>Session number, lecture title and summary points covered</i>	<i>Presenter</i>
13.30 – 13.45	<b>Welcome and Introduction</b> Welcome and introduction to the course. Illustration of use of Mentimeter (online voting tool) for classroom exercise	
13.45 – 14.50	<b>1. Basic epidemiological concepts</b> The hierarchy of evidence; Differences in study designs; The problem of confounding in observational studies. <a href="#">Classroom exercise</a>	<b>Prof Maia Lesosky</b> Chair of Medical Statistics, NHLI
14.50 – 15.00	<b>Tea break</b>	
15.00 – 15.30	<b>2. Descriptive statistics</b> 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. <a href="#">Classroom exercise</a>	<b>James Potts</b> Medical Statistician, NHLI
15.30 – 16.00	<b>3. Inferential statistics – Estimation</b> Estimating parameters of interest in the population; Difference between standard error and standard deviation; Calculating and interpreting confidence intervals for means and proportions. <a href="#">Classroom exercise</a>	<b>Dr Chloe Bloom</b> Clinical Senior Lecturer in Respiratory Epidemiology, NHLI
16.00 – 16.10	<b>Tea break</b>	
16.10 – 17.10	<b>4. Inferential statistics – Hypothesis testing</b> 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. <a href="#">Classroom exercise</a>	<b>Prof Maia Lesosky</b>
17.10 – 17.30	<b>Questions &amp; Answers</b>	

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## Friday 22<sup>nd</sup> November – Morning

<i>Time</i>	<i>Session number, lecture title and summary points covered</i>	<i>Presenter</i>
9.00 – 9.30	<b>5. Type I and II errors in hypothesis testing</b> Understanding the two types of errors when testing a hypothesis; Multiple testing and ways to address it. <a href="#">Classroom exercise</a>	<b>Prof Maia Lesosky</b>
9.30 – 10.00	<b>6. Sample size calculations</b> 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)	<b>James Potts</b>
10.00 – 10.10	<b><i>Tea break</i></b>	
10.10 – 11.10	<b>7. Correlation and Simple Linear Regression</b> (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. <a href="#">Classroom exercise</a>	<b>James Potts</b>
11.10 – 11.30	<b>8. Multiple Linear Regression</b> (continuous outcomes) Moving from simple to multiple linear regression; Interpreting the results from multiple linear regression; Recognising the impact of confounding. <a href="#">Classroom exercise</a>	<b>Dr Chloe Bloom</b>
11.30 – 11.40	<b><i>Tea break</i></b>	
11.40 – 12.10	<b>9. Different measures of risk</b> (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	<b>Dr Chloe Bloom</b>
12.10 – 12.40	<b>10. Simple and Multiple Logistic Regression</b> (binary outcomes) Understanding the basic concepts of logistic regression; Interpreting the results from simple and multiple logistic regression. Classroom exercise	<b>James Potts</b>
12.40 – 13.00	<b>Questions &amp; Answers</b> Final Q & A session; Some online statistics resources	

**Accreditation (6 CPD points) to be sought**