DATA ANALYSIS: STATISTICS

DESIGNING CLINICAL RESEARCH AND BIOSTATISTICS

DATES

Wednesday, 13 May 2020 and Thursday, 14 May 2020, 9am - 5pm

VENUE

Evenlode Room, IT Services, 13 Banbury Road, Oxford

COURSE OBJECTIVES

1. Develop core statistical skills for interpreting clinical and epidemiological data
2. Provide knowledge of statistical methods and study design used in medical research
3. Enable participants to develop the skills needed to analyse data for their own research projects

AUDIENCE

No prior statistical knowledge is assumed for this course. The course is designed for anyone who requires a basic understanding of clinical research and data analysis. It will enable non-statisticians to interpret medical research and undertake their own research studies.

COURSE DIRECTORS

Daniel Prieto-Alhambra

Maria Sanchez

COURSE ADMINISTRATOR

Mahkameh Mafi (mahkameh.mafi@ndorms.ox.ac.uk)

SPEAKERS

David Culliford (University of Southampton)

Maria Sanchez (University of Oxford)

Danielle Robinson (University of Oxford)

Samuel Hawley (University of Oxford)

Anjali Shah (University of Oxford)

Leena Elhussein (University of Oxford)

COURSE FEES*

NDORMS staff/students: free (please contact the course administrator)

Other University of Oxford staff: £140 (please follow this link)

Other University of Oxford students: £70 (please follow this link)

Other (NHS/Other Universities/alumni): £210 (please contact the course administrator)

Other (private): £420 (please contact the course administrator)

Other (commercial): £630 (please contact the course administrator)

*Meals and accommodation not included.

AGENDA

Day 1

Time	Session	Content	Lead Tutor
09.00-09.15	**Registration**		
09.15-09.45	Talk 1: Research Question	• Course aims • Defining the research question	Maria Sanchez
09.45-10.45	Talk 2: Study Design	• Types of study design • Strengths and limitations • Assessing causality	Samuel Hawley
10.45-11.00	Talk 3: Introduction to Statistical Software Packages	• SPSS • Stata • R	Samuel Hawley
11.00-11.15	**Coffee**		
11.15-11.30	Talk 4: Looking At Data	• Describing and displaying • Checking and cleaning	Danielle Robinson
11.30-12.00	Practical 4	• Describing the data • Importing and Exporting Data	
12.00-12.45	Talk 5: Reproducibility	• Coefficient of variation • Bland Altman Plot • Intra-class Correlation Coefficient • Kappa	Danielle Robinson
12.45-13.30	**Lunch**		
13.30-14:00	Practical 5	• Reproducibility tests	
14:00-14.45	Talk 6: Statistical distributions	• Introduction to distributions • Normal, skewed, Poisson • Kernel density plots • Q-Q plots • Test for normality (K-S test)	David Culliford
14.45 – 15:00	**Coffee**		
15:00-15:45	Practical 6	• Statistical distributions	
15.45-16.15	Talk 7: Sample Sizes	• Sample size calculation	David Culliford
16:15-17:00	Practical 7	• Sample size estimation	

Day 2

Time	Session	Content	Lead Tutor
09.15-09.45	Recap	• Q&A session	David Culliford
09:45-10:30	Talk 8: Statistical tests	• Introduction to tests • Standard Error • p values and Confidence intervals • t-test • ANOVA (one way) • chi squared test	David Culliford
10.30-11.00	Practical 8	• Statistical tests	
11.00-11.15	**Coffee**		
11:15-11:30	Talk 9: Transformations	• Assumptions of tests • Transforming data	Anjali Shah
11:30-12:00	Talk 10: Regression	• Linear Regression • Logistic regression	Anjali Shah
12:00-12:45	Practical 9/10	• Transformations and regression	
12.45-13.:30	**Lunch**		
13.30-13.45	Talk 11: Interactions	• Recap of confounding • What are interactions?	Anjali Shah
13.45-14.00	Practical 11	• Interactions and confounding	
14.00-14.15	Talk 12: Diagnostics	• Linearity • Normality • Outliers • Heteroskedasticity • Recap	Maria Sanchez
14.15-14.30	**Coffee**		
14.30-17.00	Practical 12	• Strategies of Analysis	