MODULE SPECIFICATION

Academic Year	2026-27
Module Code	EPM202
Module Title	Statistical Methods in Epidemiology
Module Organiser(s)	Emily Webb, Rein Houben, Joshua Kayiwa
Contact	For students studying University of London Awards (initial registration 2025/2026 and prior years: Enquiries may be made via their Student Advice Centre at: Student Advice Centre. For students studying LSHTM awards (registration in 2026/2027 and onwards): Enquiries should be emailed to: EPsupport@lshtm.ac.uk
Faculty	Faculty of Epidemiology and Population Health
FHEQ Level	Level 7
Credit Value	**CATS** 15 **ECTS** 7.5
Mode of Delivery	Distance Learning
Mode of Study	Directed self-study, through online materials via the Virtual Learning Environment
Language of Study	English
Pre-Requisites	**Epidemiology students** must have passed EPM101 *Fundamentals of Epidemiology* and EPM102 *Statistics for Epidemiology*, and should have studied and have an understanding of EPM103 *Practical Epidemiology* and EPM105 *Writing and Reviewing Epidemiological Papers* prior to studying this module. **PG Diploma and MSc Public Health** students who wish to take this module are required to have passed both PHM101 *Basic Epidemiology* and PHM102 *Basic Statistics for Public Health and Policy*; a grade of at least 4 in PHM102 is recommended. In particular, for adequate preparation, students should have studied the optional PHM102 CAL Session on 'Measures of Effect in 2x2 Tables' and carried out all the practical exercises using statistical software in PHM102. **Students studying this module as an individual module** must have basic epidemiological knowledge and skills

	equivalent to EPM101 *Fundamentals of Epidemiology*, EPM102 *Statistics for Epidemiology*, EPM103 *Practical Epidemiology* and EPM105 *Writing and Reviewing Epidemiological Papers*.
Accreditation by Professional Statutory and Regulatory Body	Not currently accredited by any other body.
Module Cap (Maximum number of students)	There is no cap on the number of students who can register for this distance learning module.
Target Audience	**Statistical Methods in Epidemiology** is a compulsory module for students on the DL PG Diploma/MSc in Epidemiology and available to students as an elective module on the DL PG Diploma/MSc Public Health. It may also be taken as an "individual module" for those working in the field of epidemiology who wish to enhance their statistical skills within this discipline.
Module Description	This module equips students with the skills needed to analyse and interpret data from cohort, case-control and cross-sectional studies. It is aimed at students familiar with performing statistical analysis using statistical software who wish to acquire further skills in the statistical analysis and interpretation of epidemiological studies, and is assessed through a data analysis and reporting exercise.
Duration	Students may start their studies at any time from access of study materials (made available annually usually in October, depending on date of registration) until completion of their assessment (made available in January). Students registering after September (individual module students only) should note that introductory messages, and some online activities (for example discussion forums and/or real-time welcome sessions) may have already taken place before they get access to the Virtual Learning Environment (Moodle). All such messages and recordings (where applicable) will be available to access throughout the study year.
Last Revised (e.g. year changes approved)	March 2025

For students studying UoL awards (initial registration in 2025/2026 and prior years)

Programme(s) This module is linked to the following programme(s)	**Status**
PGCert/PGDip/MSc Epidemiology (Distance Learning - University of London)	Compulsory

For students studying LSHTM awards (registration in 2026/2027 and onwards)

Programme(s) This module is linked to the following programme(s)	**Status**
PGDip Epidemiology (Distance Learning)	Compulsory
MSc Epidemiology (Distance Learning)	Compulsory

Module Aim and Intended Learning Outcomes

Overall aim of the module
The overall module aim is to: • provide students with the key statistical knowledge and skills needed to analyse and interpret data from the common forms of epidemiological studies.

Module Intended Learning Outcomes
Upon successful completion of the module a student will be able to: 1. Explain the key statistical and epidemiological concepts which underlie the analysis of epidemiological data; 2. Perform analyses of data arising from epidemiological studies, using statistical software; 3. Investigate and assess confounding and effect modification in epidemiological data; 4. Interpret appropriately the results of these analyses, taking into account study design issues; 5. Write a clear report presenting and interpreting the results of an analysis of epidemiological data.

Indicative Syllabus

Session Content
The module is expected to cover the following topics: SM01 Introduction/Revision of key concepts SM02 Cohort studies SM03 Introduction to survival analysis SM04 Case-control studies SM05 Likelihood

Session Content
SM06 Introduction to multivariable regression SM07 Logistic regression 1 SM08 Logistic regression 2 SM09 Logistic regression 3 SM10 Matched case-control studies SM11 Introduction to Poisson and Cox regression SM12 Strategies of analysis SM13 Choice of controls in a case-control study SM14 Summary. In the first half of the module the focus is on issues specific to different types of study. The second half of the module deals with statistical modelling, multivariable analyses, and study design. The combined materials will enable students to choose and use the techniques appropriate for estimation and hypothesis testing in selected situations.

Teaching and Learning

Notional Learning Hours

Type of Learning Time	Number of Hours	Expressed as Percentage (%)
Directed self-study	70	47
Self-directed learning	30	20
Assessment, review and revision	50	33
Total	**150**	**100**

Teaching and Learning Strategy
Learning is self-directed against a detailed set of learning objectives using the materials provided. The key learning methods are: • Reading and reflecting on the CAL materials which introduce, explain and apply the principles and methods covered in the module. • Reading and reflecting on other resources which support the learning in the CAL sessions. • Completing practical exercises. • Accessing academic support which is available from the module tutors through the online discussion forums and occasional online webinars in which students are encouraged to participate. • Completing the self-assessed assignment which tests understanding of the principles and methods covered in the module, and helps preparation for the formative and assessed assignments. • Completing the formative assignment and reflecting on written feedback from module tutors.

Teaching and Learning Strategy
• Completing the assessed assignment and reflecting on written feedback from module tutors.

Assessment

Assessment Strategy
Formal assessment of the module will be by one assessed assignment contributing 100% of module marks. The assessed assignment will be made available in January. If a student fails the module overall, they are allowed one further attempt at the assignment. For both their formative and summative assessments, students are asked to analyse a dataset to address a research question and to prepare a brief report describing their analysis strategy and the results they obtained, discussing their results in the light of the methods used to obtain the data. The assessment tasks require students to demonstrate: the ability to select and apply appropriate statistical methods to a specific problem, including the investigation of confounding and effect modification; the ability to present their analysis strategy and results in an appropriate way; and the ability to interpret their findings appropriately in the light of the study design and research question. The formative assessment task enables students to prepare for their summative assessment, as both have the same format, but may cover different epidemiological study designs. The assessment tasks thus give students an opportunity to consolidate their learning and require students to apply their learning across the whole of the module.

Summative Assessment

Assessment Type	Assessment Length (i.e. Word Count, Length of presentation in minutes)	Weighting (%)	Intended Module Learning Outcomes Tested
Assessed Assignment	1500 words of text plus a maximum of 3 tables	100	1 – 5

Resitting assessment
Resits will accord with Chapter 8b of the LSHTM Academic Manual.

Assessment submission deadlines
The Formative Assignment must be submitted by 14 February. The Assessed Assignment must be submitted no later than 30 April. Both the FA and the AA can be submitted only once and must be submitted via the online Assignment Management System.

Resources

Indicative reading list

1. Textbook:
Kirkwood, B.R. and Sterne, J.A.C. *Essential Medical Statistics*. Blackwell Science, 2003

2. Journal articles relating to analysis and reporting
Altman, D. and Bland, M. Absence of evidence is not evidence of absence. *BMJ* 1995; 311:485

Wasserstein, R.L. and Lazar, N.A. The ASA's Statement on p-Values: Context, Process, and Purpose, *The American Statistician* 2016; 70:2, 129-133

Amrhein V., Greenland S., McShane B. Retire statistical significance. *Nature* 2019; 567:305-307

Westreich, D., Greenland, S. The table 2 fallacy: presenting and interpreting confounder and modifier coefficients. *American Journal of Epidemiology* 2013; 177:292-298

3. Journal articles relating to strategies of analysis
Victora, C., Huttly S.R., Fuchs, S.C., Olinto, M.T.A. The role of conceptual frameworks in epidemiological analysis: a hierarchical approach. *International Journal of Epidemiology* 1997; 26:224-227

Greenland, S., Daniel, R., Pearce, N. Outcome modelling strategies in epidemiology: traditional methods and basic alternatives. *IJE* 2016; 45:565-75

4. Journal articles relating to case-control studies
Vandenbroucke, J.P., Pearce, N. Case-control studies: basic concepts. *International Journal of Epidemiology* 2012; 43:1480-1489

Tann, C.J., Nakakeeto, M., Willey, B.A., Sewegaba, M., Webb, E.L., Oke, I., et al. Perinatal risk factors for neonatal encephalopathy: an unmatched case-control study. *Arch Dis Child Fetal Neonatal Ed*. 2018; 103:F250-F256

5. Journal articles relating to cohort studies
Gupta-Wright, A., Fielding, K., van Oosterhout, J.J., Alufandika, M., Grint, D.J., Chimbayo, E., et al. Virological failure, HIV-1 drug resistance, and early mortality in adults admitted to hospital in Malawi: an observational cohort study. Lancet HIV 2020; 7:e620-e628

Other resources

The Moodle Virtual Learning Environment (VLE) contains the key materials and resources for EPM202 as follows:

- Interactive study material, referred to as Computer Assisted Learning (CAL), which is the key learning material for the module. The CAL sessions are also available to download.
- Workbook (contain practical exercises to work through using statistical software)
- Readings (via the LSHTM online library)
- Discussion forums
- Assignments
- The following is also provided (if not already provided for core EPM1 or PHM1 modules):
- Statistical software will be provided (if not already provided for core modules)
- E-book: *Essential Medical Statistics* (Kirkwood, Sterne).

Moodle can be accessed from the first week of October, after module registration. Students who are taking this as an individual module or as part of the MSc/PG Diploma Public Health programmes will also have online access to the EPM1 computer-based sessions (this access will exclude tutor support and associated readings / workbooks/ textbooks).

Teaching for Disabilities and Learning Differences

The module-specific site on Moodle provides students with access to the module learning materials, including a study guide and online reading list (containing both essential and recommended readings), and additional resources including supplementary exercises and optional lecture recordings. All materials posted up on Moodle areas, including computer-based sessions, have been made accessible where possible (this includes an accessible printable version of each session). The LSHTM Moodle has been made accessible to the widest possible audience, using a VLE that allows for up to 300% zoom, permits navigation via keyboard and use of speech recognition software, and that allows listening through a screen reader. All students have access to "SensusAccess" software which allows conversion of files into alternative formats.

For Students studying University of London Awards (initial registration 2025/2026 and prior years:
For students with special needs, reasonable adjustments and support can be arranged – details and how to request support can be found on the University of London Worldwide website at: Inclusive practice and Access arrangements | University of London

For Students Studying LSHTM awards (registration 2026/2027 and onwards):
For students who require learning or assessment adjustments and support this can be arranged through the Student Support Services – details and how to request support can be found on the LSHTM Disability Support pages.