

LF211-15 Epidemiology and Public Health

26/27

Department

Life Sciences

Level

Undergraduate Level 2

Module leader

Daniel Franklin

Credit value

15

Module duration

5 weeks

Assessment

Multiple

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Epidemiology is key to understanding disease patterns, predicting outbreaks, and shaping public health responses. This module explores how we define and measure disease, model its spread, and use evidence to inform health policy, bridging theory and real-world application.

The module is structured around three core themes:

Quantifying Disease – How do we measure disease in populations? This section covers case definitions, diagnostic accuracy, study designs, and key epidemiological metrics for both infectious and non-communicable diseases.

Disease Dynamics – How do infections spread? Using mathematical models, students will explore epidemic patterns, herd immunity, control and intervention, and various factors that influence the dynamics of infectious disease.

Public Health and Policy – How do we turn data into action? This section examines how epidemiological evidence guides interventions, and how decisions are made linking science to economics and policy.

[Module web page](#)

Module aims

Develop a foundational understanding of epidemiology by exploring how diseases are measured, studied, and modelled in populations.

Introduce key epidemiological methods and study designs.

Explore the dynamics of infectious disease transmission, using mathematical models.

Examine the role of epidemiology in public health decision-making.

Enhance analytical and critical thinking skills, enabling students to interpret epidemiological data, evaluate health risks, and apply findings to real-world public health challenges.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

This module introduces key concepts in epidemiology and public health, covering both infectious and non-infectious diseases in human and animal populations, with an emphasis on infectious disease dynamics. The content is structured around three equally weighted areas:

1. Assessing the Evidence – Measuring disease occurrence, evaluating risk factors, and establishing causality using epidemiological study designs and diagnostic accuracy measures.
2. Predicting Disease Dynamics – Understanding how infectious diseases spread, using mathematical models to explore epidemic patterns, herd immunity, and the impact of interventions.
3. Protecting Population Health – Applying epidemiological evidence to public health decision-making, including disease prevention strategies, vaccination policies, and managing health inequalities.

This structure ensures students develop quantitative, analytical, and applied skills to assess, predict, and manage disease at both individual and population levels.

Learning outcomes

By the end of the module, students should be able to:

- Apply epidemiological methods to measure and analyse disease patterns in populations
- Evaluate disease causation and risk factors
- Understand how to build and interpret basic epidemiological models
- Explain how infectious diseases spread dynamically
- Assess the role of epidemiology in public health

Indicative reading list

[Reading lists can be found in Talis](#)

Subject specific skills

Students will develop the ability to:

1. Analyse and interpret epidemiological data, using statistical and computational tools to assess disease risk, causality, and transmission patterns.
2. Evaluate diagnostic and screening methods, critically assessing their sensitivity, specificity, and real-world applicability in different population settings.
3. Apply mathematical models to simulate infectious disease transmission, exploring the effects of different transmission routes, intervention strategies, and population dynamics.
4. Assess public health policies based on epidemiological evidence, interpreting how scientific data informs decision-making in disease control, vaccination programs, and health inequalities.
5. Integrate knowledge from immunology, epidemiology, and public health, synthesising complex interactions between host immunity, pathogens, and societal factors in disease outcomes.

Transferable skills

1. Quantitative data analysis skills, including interpreting measures and using models to assess real-world health challenges.
 2. Independent and self-directed learning, building the ability to critically engage with scientific literature and epidemiological data.
 3. Problem-solving and analytical thinking, applying epidemiological concepts to assess risks, design studies, and evaluate public health interventions.
 4. Effective communication of complex data, translating epidemiological findings into clear, evidence-based conclusions for scientific and policy audiences.
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Study

Teaching split

Provider	Weighting
Life Sciences	70%
Warwick Mathematics Institute	30%

Study time

Type	Required
Lectures	15 sessions of 1 hour (10%)
Practical classes	6 sessions of 1 hour (4%)
Total	150 hours

Type	Required
Private study	97 hours 30 minutes (65%)
Assessment	31 hours 30 minutes (21%)
Total	150 hours

Private study description

97.5 hrs self-study and directed reading are expected

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group D2

	Weighting	Study time	Eligible for self-certification
In-class computer-based assignment	30%	30 hours	No
6 x 1 hr practical sessions- students will need to build an epidemiological model that will be assessed.			
Closed-book computer-based end-of-year examination	70%	1 hour 30 minutes	No
In-person locally-timetabled closed-book computer-based end-of-year examination			

Assessment group R2

	Weighting	Study time	Eligible for self-certification
Closed-book computer-based examination	100%		No
In-person locally-timetabled closed-book computer-based examination			

Feedback on assessment

Pastoral meetings with tutors

[Past exam papers for LF211](#)

Availability

Courses

This module is Core optional for:

- Year 2 of UIPA-C1L8 Undergraduate Life Sciences and Global Sustainable Development

This module is Optional for:

- Year 2 of UBSA-C1B9 Undergraduate Biomedical Science
- ULFA-C1A3 Undergraduate Biomedical Science (MBio)
 - Year 2 of C1A3 Biomedical Science
 - Year 2 of C1B9 Biomedical Science
- Year 2 of ULFA-C1A7 Undergraduate Biomedical Science with Industrial Placement (MBio)
- Year 2 of ULFA-CB18 Undergraduate Biomedical Science with Placement Year
- Year 2 of ULFA-B140 Undergraduate Neuroscience (BSc)
- Year 2 of ULFA-B142 Undergraduate Neuroscience (MBio)
- Year 2 of ULFA-B143 Undergraduate Neuroscience (with Industrial Placement) (MBio)
- Year 2 of ULFA-B141 Undergraduate Neuroscience (with Placement Year) (BSc)