



THE UNIVERSITY OF  
BUCKINGHAM

MEDICAL SCHOOL

**MB ChB**

# **Unit Summary: Health and Disease in Populations**

## 1 *Educational Aims of the Unit*

The unit aims to enable students to make progress towards meeting some of the learning outcomes described in Tomorrow's Doctors (2009) relevant to 'The Doctor as Scholar and Scientist', 'The Doctor as a Practitioner' and 'The Doctor as a Professional'. The specific aims are for students to demonstrate how to interpret population-based studies of disease frequencies, risk factor associations and treatment effectiveness, to enable the practice of evidence-based medicine for the benefit of the health of patients and the population. In this unit, we aim to:

- Give students an introduction to the scientific basis of epidemiology.
- Enable students to understand the implications of epidemiological and health service data for their future practice.
- Facilitate students in the development of their practice of medicine, not only in terms of benefit for individual patients but for the population as a whole.
- Equip students with the skills to critically appraise the evidence for and against potential risk factors causing a disease or clinical interventions they may consider using.

## 2 *Learning Outcomes From Tomorrow's Doctors (2009)*

### **Outcomes 1: The Doctor as a Scholar and Scientist.**

8. The graduate will be able to apply to medical practice biomedical scientific principles.
  - e) Select appropriate forms of management for common diseases, and ways of preventing common diseases, and explain their modes of action and their risks from first principles.
9. Apply psychological principles, method and knowledge to medical practice.
  - a) Explain normal human behaviour at an individual level.
  - b) Discuss psychological concepts of health, illness and disease.
  - c) Apply theoretical frameworks of psychology to explain the varied responses of individuals, groups and societies to disease.
  - d) Explain psychological factors that contribute to illness, the course of the disease and the success of treatment.
10. Apply social science principles, method and knowledge to medical practice.
  - a) Explain normal human behaviour at a societal level.
  - b) Discuss sociological concepts of health, illness and disease.
  - c) Apply theoretical frameworks of sociology to explain the varied responses of individuals, groups and societies to disease.
  - d) Explain sociological factors that contribute to illness, the course of the disease and the success of treatment including issues relating to health inequalities, the links between occupation and health and the effects of poverty and affluence.
  - e) Discuss sociological aspects of behavioural change and treatment compliance.
11. Apply to medical practice the principles, method and knowledge of population health and the improvement of health and health care.
  - a) Discuss basic principles of health improvement, including the wider determinants of health, health inequalities, health risks and disease surveillance.

- b) Assess how health behaviours and outcomes are affected by the diversity of the patient population.
- c) Describe measurement methods relevant to the improvement of clinical effectiveness and care.
- d) Discuss the principles underlying the development of health and health service policy, including issues relating to health economics and equity, and clinical guidelines.
- e) Explain and apply the basic principles of communicable disease control in hospital and community settings.
- f) Evaluate and apply epidemiological data in managing healthcare for the individual and the community.
- g) Recognise the role of environmental and occupational hazards in ill-health and discuss ways to mitigate their effects.
- h) Discuss the role of nutrition in health.
- i) Discuss the principles and application of primary, secondary and tertiary prevention of disease.
- j) Discuss from a global perspective the determinants of health and disease and variations in health care delivery and medical practice.

12. Apply scientific method and approaches to medical research.

- a) Critically appraise the results of relevant diagnostic, prognostic and treatment trials and other qualitative and quantitative studies as reported in the medical and scientific literature.
- b) Formulate simple relevant research questions in biomedical science, psychosocial science or population science, and design appropriate studies or experiments to address the questions.
- c) Apply findings from the literature to answer questions raised by specific clinical problems.
- d) Understand the ethical and governance issues involved in medical research.

**Outcomes 2 - The doctor as a practitioner**

14. Diagnose and manage clinical presentations.

- g) Formulate a plan for treatment, management and discharge, according to established principles and best evidence, in partnership with the patient, their carers, and other health professionals as appropriate.

19. Use information effectively in a medical context.

- d) Access information sources and use the information in relation to patient care, health promotion, advice and information to patients, and research and education.
- e) Apply the principles, method and knowledge of health informatics to medical practice.

**Outcomes 3: The Doctor as a Professional**

20. The graduate will be able to behave according to ethical and legal principles. The graduate will be able to:

- e) Recognise the rights and the equal value of all people and how opportunities for some people may be restricted by others' perceptions.

21. Reflect, learn and teach others.

- b) Establish the foundations for lifelong learning and continuing professional development, including a professional development portfolio containing reflections, achievements and learning needs.
  - c) Continually and systematically reflect on practice and, whenever necessary, translate that reflection into action, using improvement techniques and audit appropriately for example, by critically appraising the prescribing of others.
  - d) Manage time and prioritise tasks, and work autonomously when necessary and appropriate.
  - e) Recognise own personal and professional limits and seek help from colleagues and supervisors when necessary.
22. Learn and work effectively within a multi-professional team.
- a) Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team.
  - b) Understand the contribution that effective interdisciplinary teamwork makes to the delivery of safe and high quality care.
23. Protect patients and improve care.
- c) Understand the framework in which medicine is practised in the UK, including: the organisation, management and regulation of healthcare provision; the structures, functions and priorities of the NHS; and the roles of, and relationships between, the agencies and services involved in protecting and promoting individual and population health.
  - d) Promote, monitor and maintain health and safety in the clinical setting, understanding how errors can happen in practice, applying the principles of quality assurance, clinical governance and risk management to medical practice, and understanding responsibilities within the current systems for raising concerns about safety and quality.
  - e) Understand and have experience of the principles and methods of improvement, including audit, adverse incident reporting and quality improvement, and how to use the results of audit to improve practice.
  - g) Demonstrate awareness of the role of doctors as managers, including seeking ways to continually improve the use and prioritisation of resources.

### *3 Teaching and Learning Strategies*

This module will run over twelve morning sessions, each lasting about three hours. Each morning will start with a small group session followed by one or two lectures after a half hour break. The small group sessions will be facilitated by a tutor using the worksheets in the module handbook. Students will be required to prepare for each of the small group sessions in their own time beforehand.

### *4 Unit Outline/Syllabus*

#### **Session 1:**

Lecture: Introduction to Health and Disease in Populations Module

Group work: Introduction to Epidemiology

#### **Session 2:**

Small Group Session: Prevalence Survey

Lecture: Births, Deaths and Populations

Lecture: Uses of Health Information

**Session 3:**

Group Work: Health Information

Lecture: Measuring Disease

**Session 4:**

Group work: Comparing Populations and Mortality Rates

Lecture: Sources of Variation

**Session 5:**

Group work: Sources of Variation

Lecture: Cohort Studies

**Session 6:**

Group work: Cohort Studies

Lecture: Guest Lecture

**Session 7:**

Group work: Mid-Module Assessment Feedback Session

Lecture: Case-Control Studies

**Session 8:**

Group work: Case-Control Studies

Lecture: Causality

**Session 9:**

Group work: Causality: Cause or Merely Association

Lecture: Randomised Controlled Trials 1

Lecture: Randomised Controlled Trials 2

**Session 10:**

Group work: Randomised Controlled Trials

Lecture: Reviewing the Evidence

**Session 11:**

Group work: Reviewing the Evidence

Lecture: From Research to Practice

**Session 12:**

Group work: Revision

Lecture: Revision

## 5 *Secondary Learning Outcomes*

In addition to meeting the outcomes described in Tomorrow's Doctors, at the completion of the unit students will be able to:

- Recognise the importance of the population (epidemiological) perspective in assessing disease frequency, in establishing the cause of disease and in assessing the benefits of treatment.
- Describe how to set about doing a study using sound methodological design in which the extent of a health problem is to be measured.
- Describe, evaluate and interpret routine and non-routine information relating to health, ill-health and healthcare in populations.
- Calculate and interpret a Standardised Mortality Ratio (SMR) and demonstrate why crude rate ratios can be misleading.
- Calculate confidence intervals using the error factor and interpret a 95% confidence interval appropriately.
- Perform and interpret tests of a null hypothesis.
- Describe the purpose, strengths and weaknesses of prevalence surveys, cohort studies, case-control studies and randomised controlled trials.
- Define bias, confounding and chance, and explain how and why we allow for them.
- Explain what is meant by a cause-effect relationship in an epidemiological context and the criteria for its evaluation.
- Read and critically appraise systematic reviews.

## 6 *Key Texts and/or Other Learning Materials*

- *Essentials of epidemiology in public health*. Ann Aschengrau, George R. Seage 2014 3rd Ed Jones & Bartlett Learning.

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