

Public Health Education for Medical Students

A guide for medical schools

On behalf of Academic Departments of
Public Health in the United Kingdom

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Introduction

In 2003, the General Medical Council (GMC) published an updated version of *Tomorrow's Doctors: recommendations on undergraduate medical education* (1). It stated that: "*The health and safety of the public must be an important part of the curriculum*", and that: "*Learning opportunities must help students explore knowledge, and evaluate and integrate evidence critically*". In relation to the health of the public in the curriculum: "*graduates must understand the issues and techniques involved in studying the effect of diseases on communities and individuals, including:*

- a. assessing community needs in relation to how services are provided.*
- b. genetic, environmental and social causes of, and influences on the prevention of, illness and disease; and*
- c. the principles of promoting health and preventing disease, including surveillance and screening."*

This document is for people working in medical education, and suggests how the GMC recommendations can be implemented. It outlines the broad principles that should guide the development of undergraduate public health education, and explains the role of departments of public health.

A workshop organized by the Heads of Academic Departments of Public Health in the United Kingdom (HOADs), involving staff from most of the departments listed in the appendix, was held in May 1996. This defined important principles of undergraduate

public health education, which were used to develop a first edition of this guide.

The intervening years have seen many changes in medical education and to the National Health Service (NHS), which students go on to serve. In 2005, a survey highlighted much variability between medical schools in the nature of public health education (2) and many challenges faced by educators responsible for delivering it. Modernizing Medical Careers has reinforced the need to build on robust undergraduate public health education. A follow-up workshop involving participants from most of the same institutions was held at the King's Fund in May 2007, to review the broad principles that should guide public health education for medical students.

“The superior physician helps before the early budding of disease.”

HUANG TI (2697-2597 BC)
The Yellow Emperor's Textbook of Medicine

The importance of public health

Clinical medicine is concerned with diagnosing illness, treating disease, promoting health, and relieving pain and distress in individual patients. Public health is concerned with improving the health of populations and reducing inequalities in health. It is commonly defined as (3):

“the science and art of preventing disease, prolonging life and promoting health through the organised efforts of society.”

Public health goals can be identified in three main domains:

- *Improving services* is concerned with the organization and delivery of safe, high quality services for prevention, treatment, and care.
- *Health protection* is concerned with measures to control infectious disease risks and environmental hazards (such as chemicals, poisons, and radiation), including public health emergencies.
- *Health improvement* is concerned with societal interventions (e.g. in housing, education, employment, family/community life, and lifestyle) that are not primarily delivered through health services, aimed at preventing disease, promoting health, and reducing inequalities.

Effective medical practitioners must be concerned with contributing to each set of goals.

The science of public health is therefore concerned with making a diagnosis of a population's health problems, establishing the causes and effects of those problems, and determining effective interventions. The art of public health is to create, advocate for, and use opportunities to implement effective solutions to population health and health care problems.

Prevention is as much a part of the medical role as cure. Doctors have often looked beyond their individual patients to improve the health of the population. Their education at all levels should ensure that they are equipped to make the most of this approach.

“Whoever wishes to investigate medicine properly should ... consider ... the mode in which inhabitants live, and what are their pursuits, whether they are fond of drinking and eating to excess, and given to indolence, or are fond of exercise and labour.”

HIPPOCRATES (5TH CENTURY BC)

On Airs, Waters and Places.

Learning about public health makes better doctors

Learning about public health, and the sciences and disciplines underpinning public health [Box 1], brings benefits both to the practice of clinical medicine and to the population.

Box 1

The sciences and disciplines that underpin public health

- *Epidemiology & Demography*
- *Health Economics*
- *Medical Statistics*
- *Sociology, Psychology & Management Sciences*

Doctors can learn to practise medicine more effectively, despite clinical uncertainty, by applying critical appraisal skills to their decision-making. The application of epidemiology to clinical practice is often called ‘clinical epidemiology’. This involves using diagnostic tests efficiently, weighing up the benefits, risks and costs of treatments, and understanding the natural history of patients’ diseases to help prevent disease and promote health in individual patients.

Doctors with a clear understanding of their role within the wider context of health and social care will influence the planning and organization of services. They can ensure that the development and delivery of health service interventions will benefit patients, and advocate for interventions that will make a difference to large numbers of people.

“Medical instruction does not exist to provide individuals with an opportunity of learning how to make a living, but in order to make possible the protection of the health of the public.”

RUDOLF VIRCHOW (1821-1902)

Lecture to medical students

The goals of undergraduate public health education

Undergraduate medical education aims to produce safe and effective doctors. The public health curriculum aims to develop many of the attributes required of an independent practitioner [Box 2] (4). In defining medical professionalism, a Working Party (2005) of the Royal College of Physicians (RCP) noted that the core values of:

“integrity, compassion, altruism, continuous improvement, excellence, working in partnership with members of the wider healthcare team.....underpin the science and practice of medicine, form the basis for a moral contract between the medical profession and society. Each party has a duty to work to strengthen the system of healthcare on which our collective human dignity depends.” (5).

This moral contract is particularly relevant to deliver public health goals, including improving health care quality. In addition, equity is a core value in public health. Mindful of human rights, doctors should aim to respect, protect, and fulfil the right of all groups to best possible health. In recommending a national forum to lead on giving a united view from the medical profession about ‘health’, the RCP Working Group considered that:

“Common interests, which reflect common values, include national health strategies; the services and resources required to meet the future health needs of the population; ethical issues; horizon scanning; public health advocacy; and the structural organisation of the health system.” (5)

Box 2

The General Medical Council's 'attributes of the independent practitioner' include (4):

- *“...reasoning and judgement in the application of knowledge to the analysis and interpretation of data, in defining the nature of a problem, and in planning and implementing a strategy to resolve it;*
- *...knowledge of the physical, behavioural, epidemiological and clinical sciences upon which medicine depends;*
- *...understanding of the aetiology and natural history of diseases;*
- *...understanding of the social, cultural and environmental factors which contribute to health or illness, and the capacity of medicine to influence them;*
- *...understanding the principles, methods and limitations of preventive medicine and health promotion;*
- *...recognition of the need for the doctor to collaborate in prevention, diagnosis, treatment and management with other health care professionals and with patients themselves;*
- *...appropriate use of diagnostic and therapeutic resources, and appreciation of the economic and practical constraints affecting the provision of health care;*
- *...understanding of the contribution of research methods, and interpretation and application of others' research in the doctor's own specialty.” (GMC, 1993)*

No single set of educational objectives will necessarily apply similarly to every medical school, as educational contexts differ. The updated set of public health educational goals [Box 3] should, applied flexibly, also contribute to contemporary expectations of medical professionalism.

Box 3

Educational goals that can be used to develop the public health medicine curriculum.

Medical students should be able to:

- *discuss the nature of health, disease, and their population determinants;*
- *demonstrate a population perspective on health, disease, and medical treatment;*
- *describe the principles and practice of health promotion and disease prevention;*
- *use epidemiology, data handling, and public health skills in the practice of evidence-based clinical medicine;*
- *outline methods of communicable disease control and the scope of the doctor's role and responsibilities in health protection;*
- *describe the principles and practice of population health needs assessment, health care planning, resource allocation, and health care evaluation;*
- *define the key features of the National Health Service as a health care system subject to organizational change;*
- *discuss the achievements, potential, and ethics of public health, and lessons to be learnt from how the public health function has developed.*

The students need to be able to use their understanding of public health to benefit patients. The English national strategy, *Choosing Health* (6), endorses the wider role required of doctors to make improvements in the population's health. Such health strategies are useful for focusing students' studies about the population perspective. The need for generalist practitioners to take a population perspective is another clear example of why public health skills are an essential part of a doctor's education. Awareness of the history and changing environment of the health services will enable students to manage the inevitable changes [Box 4] that will occur during their working careers, and to learn from the past. In particular, students need to understand how and why an individual patient's and the population's best interests do not always coincide, and the potential ethical challenges from this tension.

Box 4

Changes affecting the practice of medicine

- *Epidemiological*, e.g. changing patterns of disease, the ageing population;
- *Organizational*, e.g. National Health Service and social care reforms;
- *Political*, e.g. changes to the welfare state, changes in government;
- *Professional*, e.g. changes in concepts of 'professionalism';
- *Social*, e.g. the persistent gap between rich and poor, changing public expectations;
- *Technological*, e.g. advances in genetics, advances in treatment options.

Several medical schools have framed learning outcomes in terms of the competencies they wish students to acquire, and some schools will

loosely align these with the Faculty of Public Health core competencies for specialty practice, but formulate them at a more appropriate level for undergraduates. Competencies may be less relevant, however, than the attitudes and knowledge needed to fulfil an appropriate future role in the health care system. Safe doctors fit for practice at Foundation level require critical appraisal skills, an understanding of the clinical governance in its many different aspects, and how to make cost-effective clinical decisions that are in the patient's and population's best interests. Undergraduate medical education should emphasize the essential epidemiological and ethical principles that underpin these transferable skills.

“The truth is, that medicine, professedly founded on observation, is as sensitive to outside influences, political, religious, philosophical, imaginative, as is the barometer to changes in atmospheric density”

OLIVER WENDELL HOLMES (1809-1894)
Currents and Counter-currents in Medical Science

The resources for public health education

Medical faculties are responsible for ensuring that the GMC recommendations on public health education are fulfilled. The medical school's 'department of public health' should share in the responsibility, leadership, and co-ordination of such efforts. The delivery of public health education should involve a range of departments including primary health care, occupational health, child health, and medicine.

There is no single design and management structure of the curriculum that will ensure effective public health education. The local circumstances and context will determine the approaches to be taken. Nevertheless, departments of public health can and should provide access to staff trained in the range of disciplines central to public health [Box 1]. They should have a varied experience of: education, health services and clinical research (and evaluation), and clinical, social, and health promotion services. Traditionally, there has been no 'service increment for teaching' allocated to support public health staff, which will have affected how local public health involvement in the curriculum has developed.

It is essential to use the skills of the relevant disciplines to benefit student education. The GMC recommendations need investment to be directed at strengthening and developing these disciplines so that the medical school can deliver a robust public health education for future doctors. Staff development should promote aspects outlined in *Tomorrow's Doctors* such as: modern educational theory and evidence, role-modelling, and skills in tutoring, small-groupwork, assessment, and programme evaluation. Web-based resources are an increasingly critical source of educational material. Effective information and

communication technology support is therefore vital for effective curriculum implementation.

It is inescapable that we all attach most significance and devote most learning time to things that ‘count’, i.e. are formally assessed. Public health-related disciplines should feature in summative assessments (i.e. those that ultimately count towards academic progress and the achievement of an award). Public health-related disciplines feature in ‘Finals examinations’ in less than half of all United Kingdom medical schools (2). The assessment methods used should relate, as appropriate, to what is being tested, e.g.

- multiple choice or extended-matching items should explore applied epidemiological knowledge and understanding
- written answer questions and written project work should explore critical analysis for clinical practice and related attitudes
- objectively structured, directly observed exercises should explore specific practical skills

Development of the appropriate assessment techniques requires material support.

“The aim of medicine is to prevent disease and prolong life, the ideal of medicine is to eliminate the need of a physician”

WILLIAM J MAYO (1861-1939)

Proceedings of the National Education Association

Maintaining excellence

The United Kingdom has a strong tradition of public health practice and education. This needs reinforcing, particularly by medical schools striving to achieve educational excellence despite rapid changes, rising expectations, and reduced resources.

A central challenge remains how to excite interest in clinical students whose focus is understandably oriented towards the clinical care of individual patients. Some topics that might generate enthusiasm include:

- International public health – electives may provide particular exposure to major global burdens of disease.
- Politics of health – contemporary health policy – What needs to change to tackle health inequalities?
- Health protection – What do all doctors need to do to fulfil their responsibilities to control communicable disease and prevent harm from environmental hazards?
- Research and data analysis – How might they make a big difference to improving the quality of clinical care?

The breadth of public health disciplines and the way they can overlap with many other themes in contemporary medical undergraduate curricula ('Patients in society', 'Personal and professional development', etc.) can make the topic seem disparate. Overarching frameworks can help knit the subject together, reinforce elements of a coherent public health curriculum, and provide a way of tracking spiral progression of learning (e.g. Liverpool's 'Seven Pointers' [Box 5]).

Box 5***Liverpool Seven Pointers toward a Population Perspective on Health***

- 1 What public health issues are raised by this problem?
- 2 How does this problem affect the population (who, when, where, by how much, and why)?
- 3 What are the health needs of the population in relation to this problem?
- 4 How can the burden of this problem be reduced?
- 5 How should health (and other) services be organized and delivered to address this problem?
- 6 What are the main research and development issues raised by the problem?
- 7 What are the main public health policy implications of this problem?

The three domains – health and social services improvement, health protection, health improvement and addressing health inequalities – provide another familiar framework around which to present public health activity.

Contemporary examples (“Avian ‘flu’, not the Broad Street pump – again!”) may well engage students’ interest, but a sense of history in public health (and in medicine, generally) – as captured in landmark studies – helps place recent health policy and technological development in its proper context.

Diversity in individual learning approaches suggests that, whatever the overall educational philosophy of the whole programme, a judicious mix of different methods – including small group and project work, practical experience, etc – are more likely to meet students’ needs.

Where possible, public health frameworks and principles are best illustrated in the context of everyday clinical practice. Problem-based learning features in the curricula of many medical schools and in some it underpins the whole educational system. More evidence is required as to the effectiveness of different approaches to public health education. Attachments/visits to individual families, primary care trusts, school health clinics, prisons, and other relevant institutions can heighten understanding of public health in practice. Most importantly, public health education needs to be participative and delivered enthusiastically.

Finally, each faculty needs to learn from other medical schools, services outside 'teaching hospitals', educationalists, and patients themselves. The National Network of Medical School Educators in Public Health and the Regional Public Health Teaching Networks provide scope to share and learn from good and innovative practice elsewhere.

Appendix: List of departments of public health (or equivalent) in the United Kingdom with a responsibility for public health education for medical undergraduates.

- *Department of Public Health*, University of Aberdeen;
- *Department of Epidemiology and Public Health*, The Queen's University of Belfast;
- *Department of Public Health and Epidemiology*, University of Birmingham;
- *Department of Public Health and Primary Care*, University of Brighton & Sussex;
- *Department of Social Medicine*, University of Bristol;
- *Institute of Public Health*, University of Cambridge;
- *Department of Epidemiology and Public Health*, University of Dundee;
- *Department of Public Health and Primary Care*, University of East Anglia;
- *Public Health Sciences, Division of Community Health Sciences*, University of Edinburgh;
- *Department of Public Health*, University of Glasgow;
- *Department of Health Sciences*, University of York - for the Hull/York Medical School;
- *Department of Public Health*, School of Medicine, Keele University;
- *Division of Public Health*, Nuffield Institute for Health, University of Leeds;
- *Department of Epidemiology and Public Health*, Leicester University;
- *Division of Public Health*, The University of Liverpool;
- *Department of Public Health and Primary Care, Charing Cross and Westminster Medical School*, University of London;
- *Department of Epidemiology and Public Health, Imperial College School of Medicine at St Mary's*, University of London;

- *Department of Public Health Sciences, King's College London School of Medicine;*
- *Institute of Clinical Education, Peninsula Medical School, Universities of Exeter and Plymouth;*
- *Wolfson Institute of Preventive Medicine, Barts and the London, Queen Mary School of Medicine and Dentistry, University of London;*
- *Department of Primary Care and Population Sciences, Royal Free Hospital School of Medicine, University of London;*
- *Department of Public Health Sciences, St George's Hospital Medical School, University of London;*
- *Department of Epidemiology and Public Health, University College, University of London;*
- *School of Epidemiology and Health Sciences, University of Manchester;*
- *Institute of Health and Society, Newcastle University;*
- *Department of Public Health, University of Nottingham;*
- *Department of Public Health and Primary Care, University of Oxford;*
- *Department of Public Health Medicine, University of Sheffield;*
- *Wessex Institute of Health Research and Development, University of Southampton;*
- *Department of Applied Public Health Medicine, University of Wales College of Medicine.*

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References

- 1 General Medical Council. *Tomorrow's Doctors. Recommendations on undergraduate medical education*. London: General Medical Council, 2003.
- 2 Gillam S; Bagade A. Undergraduate public health education in UK medical schools – struggling to deliver. *Medical Education* 2006; 40(5): 430-436(7).
- 3 Committee of Inquiry into the future development of the Public Health Function. *Public Health in England*. London: Her Majesty's Stationery Office, 1988 (Command 289). [“The Acheson Report”]
- 4 General Medical Council. *Tomorrow's Doctors. Recommendations on undergraduate medical education*. London: General Medical Council, 1993.
- 5 Royal College of Physicians. *Doctors in society: medical professionalism in a changing world. Report of a Working Party of the Royal College of Physicians of London*. London: RCP, 2005.
- 6 Department of Health. *Choosing health: Making healthy choices easier*. London: The Stationery Office, 2004 (Command 6374).