Public health education for medical students: rising to the professional challenge

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ABSTRACT

Public health competencies, especially as they relate to the management of chronic disease, will be of increasing importance to the global health-care workforce. The General Medical Council’s recommendations on basic medical education have helped to entrench the position of public health and related disciplines. Tomorrow’s Doctors has recently been updated. This article describes the indicative goals that should underpin the development of undergraduate medical education in public health, presented in a national statement. The statement was originally produced on behalf of academic departments of public health and related disciplines in UK medical schools. The dearth of evidence in this field leaves many questions for future educational research.

Keywords education, employment and skills, public health

The delivery of undergraduate medical education in public health is a worldwide challenge. The ‘what’, ‘how’, ‘when’ and ‘why’ of such education have been contested since the nineteenth century.¹ Obstacles to facilitating learning of public health-related disciplines are philosophical and practical. The advent of evidence-based health care has reaffirmed the importance of clinical epidemiology (albeit skewing the public health model biomedically), but many people consider public health a postgraduate endeavour². In the UK, successive health service reforms and staff shortages have hampered progress.

The General Medical Council (GMC) re-emphasized public health education in Tomorrow’s Doctors.³⁴ Without clear clinical relevance, however, it risks being undermined by the ‘hidden curriculum’⁵ (i.e. the prevailing rites, conventions and assumptions that affect what students learn formally and informally from the ‘intended’ curriculum). Modernizing Medical Careers has reinforced the need to build on robust undergraduate public health education.⁶⁷ ‘Health promotion, patient education and public health’ and ‘infection control’ have become explicit elements of education in the Foundation years.⁶ In the latest Tomorrow’s Doctors, a public health dimension permeates all three sets of proposed learning outcomes for the medical graduate:⁸

- as a scholar and scientist, e.g. ‘[applying] to medical practice the principles, method and knowledge of population health and the improvement of health and healthcare’⁹¹⁷
- as a practitioner, e.g. ‘based on the available evidence’¹⁰²⁰
- as a professional, e.g. the responsibility for ‘protecting and promoting the health of individual patients, their dependants and the public’.¹¹²⁶

Concerns have been highlighted⁹ from various countries about the fate of public health in undergraduate curricula.²¹⁰–¹³ While some curricula that integrate learning across basic science, behavioural science, clinical science and population health science, in a clinical context, report students’ positive perceptions of public health,¹⁴¹⁵ some students struggle with the subject.¹⁶–¹⁸ Evidence suggests that many students’ social responsiveness declines at medical school,¹⁹–²¹ with few reports of their preventive medical practice improving.²² Negative role-modelling is a detrimental aspect of the hidden curriculum. For example, Régo and Dick²³ found that less than half of students considered faculty to be positive about population and psychosocial issues. Evidence rarely focuses on ‘how’ students learn crucial public health concepts.²⁴

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This paper examines a national statement, first issued following a workshop in 1996 with educators from academic public health departments in UK medical schools. They agreed via small group work a minimum set of public health educational goals applicable to their very different local curricula. In 2005, a survey of medical schools found variable delivery of public health education and confirmed many challenges facing the departments. In 2008, the statement was updated following another workshop, then circulated for further comment to participants and all heads of academic departments of public health with this responsibility. Extracts are reproduced below with interleaved comments. Given the scant evidence-base, potential research questions are suggested.

**Introduction**

In 2003, the GMC published an updated version of *Tomorrow’s Doctors: recommendations on undergraduate medical education*. 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, to suggest 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.

**Comment**

The national statement sought to raise public health awareness amongst ‘key staff outwith public health departments’ who make, implement or influence policy in undergraduate medical education. Previous international debate about medical schools including the health of populations in their mission remains a powerful reminder of the social contract required to make the public health education of medical students ‘everyone’s business’:

- How do medical educators and clinicians (from outwith public health departments) value this subject, and what is the effect of their role-modelling?
- How have medical schools adapted curricula better to meet the health needs of local populations?

**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:

*the science and art of preventing disease, prolonging life and promoting health through the organized efforts of society.*

Public health goals can be identified in three main areas. Within ‘health services’, public health 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, including public health emergencies. ‘Health improvement’ is concerned with societal interventions to prevent disease and promote health that are not primarily delivered through health services. Effective medical practitioners must be concerned with contributing to each set of goals [...].

**Comment**

This analogy between individual and population ‘diagnosis’ is an accepted way of highlighting the relationship and relevance of public health to clinical practice:

- How does the ‘medical socialization’ of students shape their views about the public’s health?

**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.

Comment
Highlighting the population dimension to doctors’ use of evidence-based practice again reinforces its clinical salience, but there is no consensus about how medical students should learn principles of ‘evidence-based medicine’, let alone how it should integrate with public health education itself. International collaborations have highlighted the importance of producing doctors better suited to population need.

- Would promoting healthier attitudes in students to their own personal preventive health care improve their appreciation of the relevance of public health to clinical practice?
- Is it feasible to assess whether doctors with a good public health education (plus organizational and political awareness) have a greater population impact?
- How best should evidence-based health care be learnt?

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 for an independent practitioner (Box 2). 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.

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 we 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.**

Box 2 The General Medical Council’s ‘attributes of the independent practitioner’

- “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.

The students need to be able to use their understanding of public health to benefit patients. The national strategy, *Choosing Health*, endorsed the wider role required for 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 ethical challenges this can present [...].

**Box 3 Educational goals that can be used to develop a public health medicine curriculum**

Medical students should be able to:

- discuss the nature of health, disease and their population determinants;
- take a population perspective on health, disease and medical treatment;
- discuss 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;
- describe 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.

**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.

**Comment**

Setting them in the context of the social obligations of professionalism reinforces the proposed indicative public health goals for medical students. These goals are the broad principles that should guide curricula, and complement the RCP’s view of professionalism as: ‘a set of values, behaviours, and relationships that underpins the trust the public has in doctors’ (p. 14) with a population dimension to professional practice, but might be perceived differently through the lens of different specialties and career intentions.37 Expectations of Day 1 foundation doctors should also be realistic:

- Is good public health awareness associated with good professionalism?
- Within those public health goals, what ‘skills’ are essential to good (safe) clinical practice?

**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) [...].

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 group work, 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 students attach most significance and devote most learning time to things that ‘count’ (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 final examinations in less than half of all UK medical schools.25

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.

Comment
Ensuring that public health education is appropriately resourced and assessed is a key obligation of decision-makers in medical schools. This might appear self-evident and yet public health academics often find themselves outwith the main resource allocation decision-making mechanisms:
• What are the costs and benefits of different models of public health education for medical students?
• How are public health and related disciplines most effectively assessed?

Maintaining excellence
The UK 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. [...] 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 improvement (addressing health inequalities), health and social care, health protection—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 is being incorporated into the curricula of many medical schools and more evidence is required as to the effectiveness of different approaches. Attachments/visits to individual families, primary care trusts, school health clinics, prisons and other relevant institutions can heighten the understanding of public health in practice. Most importantly, public health education needs to be participative and delivered with passion.

Finally, each faculty needs to learn from other medical schools, services outside teaching hospitals, educationalists and patients themselves. The national network for public health teachers in medical schools and the regional public health teaching networks provide scope to share and learn from good and innovative practice elsewhere.

Comment
The international literature suggests a frequent problem securing and maintaining medical students’ interest in public health, although senior students may realise the clinical relevance of material previously perceived as dry, boring and hard to grasp. Some longitudinal evidence from Quebec medical schools suggested that the Sherbrooke change to a community-oriented, problem-based curriculum significantly improved its graduates’ continuity of care and provision of preventive care, without compromising their diagnosis and management skills, but such evidence of impact is scarce. Sharing educational goals, frameworks and good practice should promote better public health education in this country, as well as better social accountability (a recurring aspiration in many countries), while heeding local circumstances:
• How do students learn about public health in different models of undergraduate medical education, e.g. in
problem-based and/or integrated curricula versus more conventional curricula?

- What is the impact of a public health theme, closely integrated with clinical parts of the curriculum?
- What is the impact of ‘non-expert’ facilitators of public health education in integrated problem-based curricula?

**Conclusion**

Better use of the undergraduate time available for public health education should be made by:

- medical schools developing clear educational goals;
- using evidence-based educational practice underpinned by robust theory;
- taking a pragmatic approach to the ‘need to know’ versus ‘nice to know’ in the curriculum; and
- resourcing a clear public health contribution to curriculum development, implementation and assessment.

Good undergraduate public health education should prepare new doctors for their foundation training equivalent (and for enhancement beyond that). This statement should help public health educators enlist the support of other crucial staff in harnessing students’ interest in wider health issues. Presenting the statement for debate here, however, highlights the dearth of public health educational research (and unanswered questions), an issue of international concern.

While more biomedically palatable elements such as clinical epidemiology may excite students, their social responsibilities and need to understand social determinants of health (‘the causes of the causes’\(^{40}\)) cannot be neglected:

... All doctors have a role in the maintenance and promotion of population health, through evidence-based practice. Some will enhance the health of the population through taking on roles in health education or research, service improvement and re-design, in public health and through health advocacy. Notwithstanding the primacy of the individual doctor-patient relationship, the doctor must appreciate the needs of the patient in the context of the wider health needs of the population... (p. 2)

**References**


