Public health in the undergraduate medical curriculum – can we achieve integration?

David H. Stone MD, FRCP (Glasg), FFPHM
Director, Paediatric Epidemiology and Community Health (PEACH) Unit, Department of Child Health, University of Glasgow

Abstract
Public health is widely regarded by medical students as peripheral or even irrelevant to the acquisition of clinical knowledge and skills. This paper attempts to set out some of the reasons for this, to encourage innovative approaches to integrating public health with clinical teaching and to offer a theoretical framework of integrated public health education for curriculum development and evaluation. The points of convergence between public health and clinical practice should not be regarded as self-evident. A practical demonstration of the application of public health principles to clinical problem solving may be the most effective means of overcoming resistance. Almost anywhere that clinical services are provided is suitable for this purpose. Community clinics, health centres or general practices have obvious appeal but acute hospitals have important advantages arising from students’ preoccupation with clinical medicine. The main aim of integrated public health teaching is to facilitate the students’ acquisition of knowledge, skills and attitudes that promote the effective application of public health approaches to clinical practice. The interrelationships between clinical practice and public health may be represented in the form of a grid. The vertical headings are the clinical skills that relate to the different stages of the natural history of disease – from the pre-disease state through diagnosis, treatment and follow up. The horizontal headings describe four key public health dimensions: epidemiology, behaviour/lifestyle, environment and health policy. The text in the boxes suggests appropriate topics for discussion. The grid is also potentially useful for course documentation and content evaluation.

Introduction
Teaching undergraduate medical students about public health is often deeply problematic. In comparison with the major surgical and medical specialties, public health and its component subjects are widely regarded by students as peripheral or even irrelevant to their key educational aspiration – the acquisition of clinical knowledge and skills. This perception is partly justified in that public health educational objectives tend to relate to populations rather than individuals. Moreover, teachers of public health are usually products of the separate training and career structures of clinical and public health practitioners whereby the two are clearly demarcated with little scope for crossing disciplinary boundaries. The result is that traditional medical undergraduate curricula, more often than not, teach public health and clinical subjects in strict isolation from each other. This compartmentalization runs counter to the inte-
The postgraduate training syllabus for the Part I examination of the Faculty lists seven sections comprising the following subject areas: epidemiology, disease prevention and health promotion, health information, statistical methods, medical sociology and health psychology, social policy and health economics, and the organization and management of health care. At undergraduate level, UK medical schools cover these topics to a varying extent with epidemiology, health promotion, occupational and environmental health featuring in almost all courses. Given the widespread resistance of most medical students to non-clinical subjects, the course objectives of many schools refer to the way public health relates to the practice of clinical medicine, often emphasizing the contribution that public health knowledge and skills could make to improving clinical practice.

While an integrationist philosophy has clearly taken hold of many medical schools, few practical examples of how this can be achieved in practice have emerged. Over a quarter of a century ago, the International Epidemiological Association urged teachers to stimulate the interest of medical students by raising epidemiological issues during clinical teaching in hospitals and the community (Lowe & Kostrzewski 1973). Since then, some experimentation along these lines has been reported from various parts of the world including Israel (Stone 1988), the United States (Rosenberg et al. 1978) and Canada (Sackett et al. 1997). In the UK, a small number of medical schools have pioneered such an approach with mixed results. They include St Thomas’ Hospital, London (Heller & Peach 1984), Nottingham (Elwood 1985), Edinburgh (Fowkes et al. 1984) and Glasgow (Stone 1998).

Overcoming obstacles to public health teaching

Despite the best of intentions, public health is difficult to teach in an integrated manner alongside clinical disciplines for many reasons. Among these are the population-based orientation of public health, the broad and complex nature of the subject, the separate career paths and training of clinicians and public health practitioners, the compartmentalization of traditional public health teaching and, as
previously mentioned, the apparent lack of a clearly defined component of public health that is distinctly medical as opposed to generic. Above all, the attitudes of students tend to be negative. Historically, medical students have been overwhelmed by the huge volume of factual material they are required to learn. It is, therefore, hardly surprising that a largely non-clinical subject is often regarded as an irritating distraction from the real business of medical training.

The perception of many students, that much of public health is irrelevant to clinical practice, has an important corollary. A number of aspects of public health lend themselves to a mode of teaching that demonstrates their centrality to clinical decision making. The processes of clinical diagnosis, treatment and follow-up each contain implicit algorithms that are dependent on insights generated by epidemiology and related disciplines. These have been described in detail by medical educationalists such as Sackett et al. (1997) who have extended the boundaries of traditional clinical epidemiology into the newer field of evidence-based medicine. Diagnosis, for example, requires the integration of data drawn from clinical assessment and epidemiological surveys to enable the formulation of a sensible differential diagnosis. Choosing an appropriate treatment involves, to an extent, a critical appraisal of the relevant published literature describing the efficacy and safety of therapeutic interventions. Follow-up, including both the evaluation of the clinical course of the disorder and an attempt to prevent recurrence of symptoms, demands the interpretation of outcome data and the implementation of preventive measures of established efficacy. By placing a strong emphasis on these clinical skills and the way that public health can enhance them, students are more likely to embrace the notion that a population perspective has a legitimate place in the clinical armamentarium.

Teachers, however, may be equally antipathetic to the notion that public health should occupy a central role in the curriculum. The tension between population-based and individual health care has been characterized vividly in a deliberately provocative statement by Woodward (1994):

“...To teach public health subjects in medical schools is frequently a tiresome and unproductive task. The reason for this is that public health is marginal in the eyes of medical students, and also in the eyes of most of the staff of medical schools. There is little support within medical schools for a strong public health role for clinical doctors. Instead, public health is commonly seen to be irrelevant to the essential function of medicine – the diagnosis and treatment of patients.

In other words, the case for a prominent role for public health in the undergraduate curriculum cannot be taken for granted. And the numerous points of convergence between public health and clinical practice should not be regarded as self-evident even if they are intuitively plausible. The attitudes of both students and teachers are moulded by past experiences, some of which may have reinforced historically rooted prejudices about the alleged separateness of the two spheres of activity. An explicit practical demonstration of the application of public health principles to clinical problem solving may be the most effective means of overcoming this type of resistance. Where and how should such demonstrations take place?

**Settings for integrated public health teaching**

Almost anywhere, either in the community or in hospital, that clinical services are provided is suitable for this purpose. Community clinics, health centres or general practices have obvious appeal because of the large number of patients seen, the common conditions with which they present and the preventive nature of much of the clinical activity. The theoretical advantages of teaching of public health in the community seems to be reflected by practice. In the survey of 38 public health courses in the UK performed by Edwards et al. (1999), public health teaching was most commonly integrated with general practice, occupational and environmental medicine, child health (including community clinics) and NHS public health departments. Some medical schools have introduced project work whereby students...
follow up a patient discharged from hospital and document their progress at home (Elwood 1985). This enables the student to observe the sometimes difficult transition between hospital and home care, and to explore the interaction of biological, clinical, familial, social and environmental influences on the natural history of the disorder.

An acute hospital may seem an unlikely setting for teaching public health but it has important advantages mostly arising from the students’ preoccupation with the excitement and glamour of clinical medicine. Either the bedside or the outpatient department can be used for this purpose. The teaching may be performed either by public health specialists with clinical experience or by clinicians with a sound understanding of epidemiological principles and a detailed knowledge of the epidemiology of the diseases in their specialty. In Glasgow, an acute paediatric ward of a children’s hospital was used to conduct ‘clinical epidemiology ward rounds’ in which small groups of students were introduced to the principles and practice of clinical epidemiology and paediatric public health including nosocomial infection control (Stone 1998). The success of that scheme was attributable in part to the availability of teachers who felt equally comfortable in both clinical and public health settings.

**Aim, objectives and content of integrated public health teaching**

The educational objectives of medical schools in their teaching of public health are extremely wide-ranging. Most are concerned with increasing knowledge although some emphasize that public health knowledge and skills can contribute to improving clinical decision making and practice (Edwards *et al.* 1999).

The theoretical basis of public health and its component disciplines can be acquired by students in a variety of ways such as lectures, tutorials, seminars and projects. By contrast, the main aim of integrated public health teaching is to facilitate the students’ acquisition of knowledge, skills and attitudes that promote the effective application of public health (including epidemiological) approaches to clinical practice.

Its specific objectives may be described as:

1. to reinforce and expand the students’ knowledge and understanding of the contrasting but complementary approaches of public health and clinical practice, and of the differing patterns of illness in the population and the health care setting;
2. to enhance the students’ clinical skills by enabling them to apply explicit epidemiological and public health principles and insights to the processes of (a) disease management (diagnosis, treatment and follow-up, including the prevention of recurrent illness), and (b) clinical (one-to-one) health promotion and disease prevention;
3. to promote a positive attitude in the students towards the need to incorporate an epidemiological, social, environmental and political perspective into clinical practice to optimize their clinical effectiveness in managing disease and promoting health.

**Theoretical framework for integrating public health with clinical teaching**

The interrelationships between clinical practice and public health may be represented in the form of a grid (Table 1). The vertical headings are the clinical skills that relate to the different stages of the natural history of disease – from the pre-disease state through diagnosis, treatment and follow up. The horizontal headings describe four key public health dimensions: epidemiology, behaviour, environment and services. These four dimensions are not mutually exclusive and are, to an extent, arbitrary in that they are not intended to encompass the entire field of public health. The text in the columns suggests appropriate topics related to each interface that might form the basis for discussion. Both teacher and student can use the grid to locate the content of the teaching within the framework, to stimulate thinking about interdisciplinary boundaries and to identify gaps in teaching. The grid is also potentially useful for course documentation and content evaluation.

**The future**

Both medical education (GMC 1993) and public health (Beaglehole & Bonita 1997) are at a crossroads. Moreover, their destinies are intertwined. In many countries, the once lowly status of public health within the undergraduate medical curriculum has been consigned to history. The opportunity for a
radical redefining of the relationship between public health and the rest of medicine has never been greater. The benefits should be mutual: medical education will be revitalized and public health will win new allies. A bonus for the latter may be a renewed recognition and articulation of the specifically medical as opposed to generic or multidisciplinary aspects of public health.

How will we win over the hearts and minds of the remaining sceptics? We could do worse than to quote Woodward (1994) whose arguments are as cogent as they are eloquent.

There are two simple, symmetrical and unassailable arguments in favour of public health within the medical curriculum: medicine needs public health, and public health cannot function without clinical medicine.

Woodward goes on to argue that public health is as essential to good clinical practice as biochemistry and physiology.

The assessment of illness and provision of good care, which are the core of medical work, inevitably require a population perspective, whether it is appreciated or not. . . . One objective of medical education is to produce graduates who can think in multiples of individuals as well as fractions.

The challenge for medical educators is to develop curricula that will fulfil that central objective – the integration of population and clinical perspectives – in ways that will demonstrably benefit students, teachers, patients and the population as a whole.

References


