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## Teaching public health in UK medical schools:

**“Things have improved. Teaching no longer feels like an expensive hobby.”**

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## **Abstract**

### **Background**

Recent policy initiatives in the UK have underlined the importance of public health education for health care professionals. We aimed to describe teaching inputs to medical undergraduate curricula, to identify perceived challenges in the delivery of public health teaching and make recommendations that may overcome them.

### **Methods**

We undertook a cross-sectional survey; questionnaires were sent electronically to 32 teaching leads in academic departments of public health in UK medical schools and followed up by telephone interviews.

### **Results**

We obtained a 75% response rate; 13 public health teaching leads were interviewed. We found much variability between schools in teaching methods, curricular content and resources used. Concerns regarding the long term sustainability of teaching focus on: staffing levels and availability, funding and the prioritisation of research over teaching. We give examples of integration of public health with clinical teaching, innovative projects in public health and ways of enabling students to witness public health in action.

### **Conclusions**

There is a need to increase the supply of well-trained and motivated teachers and combine the best traditional teaching methods with more innovative approaches. Suggestions are made as to how undergraduate public health teaching can be strengthened.

## Introduction

Public health competencies, especially as they relate to the management of chronic disease, will be of increasing importance to the 21st century global health care workforce.<sup>1</sup> Successive iterations of the General Medical Council's blueprint for medical training, *Tomorrow's Doctors*, have helped to entrench the position of public health and related disciplines in undergraduate curricula.<sup>2-4</sup> The most recent white paper on public health further emphasised the importance of training in this area.<sup>5</sup>

The teaching of undergraduate public health reflects a number of tensions. The separation of population health from mainstream medical training dates back to the early nineteenth century.<sup>6</sup> There remain those who regard it as an entirely postgraduate discipline.<sup>7</sup> As a small "shortage speciality", teachers have always been in short supply. Successive structural reforms within the NHS have further strained teaching resources. There has been a major expansion in medical student numbers in an attempt to meet the national shortfall in doctor numbers. The fate of undergraduate public health is also an international concern,<sup>8,9</sup> with students struggling to embrace the subject in some schools.<sup>10,11</sup>

The last major review of UK undergraduate public health teaching took place in 2005.<sup>12</sup> This in turn built on an earlier survey.<sup>13</sup> The overall picture was one of great diversity in the amount of public health teaching, content and methods used, and the authors noted increasing use of more innovative teaching and assessment methods. There was considerable evidence of dynamism in the departments responding.<sup>12,14</sup>

With public health rising up the policy agenda, there is widespread agreement that teaching in this area is of increasing importance. This is therefore an apposite time to be reviewing the state of teaching in public health and related disciplines.

The aim of this study was to examine public health teaching in UK medical schools. Specific objectives were to: describe teaching inputs to medical undergraduate curricula, describe resources available to support teaching, identify challenges in the delivery of public health teaching, and to make recommendations that may overcome them.

## Methods

A cross-sectional survey was performed using a questionnaire and interview. The questionnaire was based on a previous survey carried out in 2005 to enable direct comparisons between surveys.<sup>12</sup> The updated questionnaire covered the same areas as the 2005 questionnaire: the public health curriculum, methods of teaching, assessment, teaching staff and resources and quality assurance of teaching. It consisted of a mixture of open and closed questions. The questionnaire was piloted among academic colleagues. The questionnaire was distributed via email in September 2013 to the public health teaching leads of the 32 UK medical schools. Non-respondents were encouraged to participate through personal contact and reminder emails. The final questionnaire was received in May 2014. Public health teaching leads were then interviewed between July and October 2014. Interview topics covered included the quality of teaching and the challenges in delivering curricular innovation. Telephone interviews were conducted by AL, SG and EH; notes were taken during the interview. The quantitative data was analysed descriptively using Excel 2007. Themes and unique approaches were sought from both the survey and interview data. The findings from the interviews were used to supplement and enhance the findings from the questionnaires; the findings are presented together. Quotes are reported by respondent number (R#).

## Results

Questionnaires were received from 24 (75.0%) medical schools; interviews were conducted with 13 public health teaching leads. Of the responding schools: 19 (79.2%) have a 5-year course; mean student intake is 235 with school size varying from 130 to 600 students per year and 17 (70.2%) schools have an integrated curriculum, where the basic sciences are taught concurrently with the clinical. Many public health tutors are responsible for a longitudinal theme within a "spiral curriculum", revisited and reinforced over years, rather than taught as a single block.<sup>15,16</sup> As one respondent put it: *"Public health is not a single course and then it's done."* (R12).

### **Teaching content**

Teaching leads were asked which aspects of Tomorrow's Doctors 2009 (paragraphs 9-12; 19)<sup>4</sup> formed part of core teaching, and which were optional. The outcomes least frequently offered as part of core teaching are listed in Table I; only 14 (58.3%) schools provide 19e as part of their core curriculum. The other outcomes are offered as core by 16 (66.7%) or 17 (70.8%) schools.

When asked what other outcomes should be delivered by public health, the responses varied from the specific *"leadership"* (R7) to the general *"Almost all of [the] Doctor as a Professional"* (R5). The

outcomes that were mentioned by two or three respondents include 14g, 22d, 23c, 23g and 23h (see Box I). Additional topics that it was suggested should come under the remit of public health, but that are not detailed in Tomorrow's Doctors include: sustainability and climate change, global health, politics and health, mental wellbeing and its impact on health, risk communication, the ethical elective, law and ethics.

### ***When and how is public health taught?***

Public health is taught universally in the first year; one school stops teaching public health after year 2, two schools after year 3; and 9 (39.1%) schools teach public health in the final year (year 5 or 6). The majority of public health leads consider the amount of time in the undergraduate curriculum available for public health teaching "about right" (15; 62.5%).

In most schools public health teaching is integrated with clinical teaching. However, the degree to which this takes place varies greatly: in some schools the only integration is through the use of clinical examples in lectures; in other schools public health learning outcomes are included in problem-based learning (PBL) and case-based learning scenarios. In some schools, public health teaching is integrated with general practice. Interesting examples of integration are given in Box II.

The majority of schools teach public health through lectures (93.3%), small group tutorials (86.7%), project work (86.7%) and e-learning (66.7%). The definition of a "small group" session varies widely, with a mean of 16 students, but a range of 8-60.

Almost all students (22 Schools) have the opportunity to undertake a project in public health, either as part of the core curriculum or a student selected component. The project may take place in the public health department or hospital, general practice, community organisations or elective placements. The most commonly cited project (6 schools) involved applying an evidence based medicine skill set. Other students have the opportunity to get actively involved in research, undertake a quality improvement project, carry out a health promotion audit, develop community health profiles, examine the epidemiological/public health aspects of a single clinical case, or learn about health communication. Examples of projects are given in Box II.

Thirteen medical schools (54.2%) provide students with the opportunity to witness public health in action, through projects involving voluntary health organisations, engagement with other professional groups (such as the police, school nurses and health visitors), or field trips. Schools also

try to bring public health to life in the lecture theatre through the involvement of practising public health professionals; examples include: Public Health England staff; a trust strategy director; speakers from the National Institute for Clinical and Healthcare Excellence, the World Health Organisation and non-governmental organisations. Some schools use alternative methods to capture their students' imaginations: role plays covering topics such as pandemic influenza planning, prioritisation of health care services and patient safety; student-created podcasts about screening; a panel of homeless people.

Some students are required to undertake personal reflection in relation to public health. Examples include reflection on the application of public health concepts to future clinical practice and on the public health aspects of clinical cases.

### **Assessment**

Nearly all students are assessed in public health using multiple choice questions (MCQs: 23 schools (95.8%)); other common forms of assessment are: short answer questions in exams (SAQs: 18 schools), coursework essays (17 schools) and oral presentations (15 schools). Less than half of schools assess students through poster presentations (11 schools), objective structured clinical examinations (OSCEs) (10 schools) and project work (9 schools). Only seven schools assess students using exam based essays. No relationship was observed between number of students and use of exam based essays, coursework essays or project work. Public health contributes to summative assessment in particular years and/or finals in all schools.

### **Teaching staff**

Almost all schools involve public health consultants, non-medical public health academics, medical public health academics and epidemiologists in teaching (see Fig 1). Many schools depend heavily on public health speciality registrars. The mean number of specialists from different disciplinary areas involved in teaching is 9.3 (range: 4-13), a reflection of the breadth of public health. The long standing difficulty of getting some academic staff to teach persists: *"We've got a few dinosaurs with a research agenda and need to find the right carrots and sticks to help the epi-stats folk become teachers."* (R4) and *"We now have very few academics to help with teaching."* (R9).

The majority of the schools (12; 60.0%) pay external staff to deliver some teaching e.g. using the service increment for teaching (SIFT).

### **Assessment of teaching quality**

The quality of teaching is most frequently assessed through student evaluation forms (23; 100%) and discussion with students (22; 96%). External examiner feedback, analysis of exam results and peer review are also common methods of assessment (87%, 83% and 78% respectively).

The quality of teaching is maintained through regular teacher training opportunities (17 schools; 77.3%), and a requirement to complete a post-graduate certificate in medical education or equivalent qualification (12 schools; 54.5%) for academic staff. Teacher induction takes place in only five schools. Eight schools employ three or more methods to maintain teaching quality; four schools use only one method.

When asked what is needed to improve the quality of public health teaching, most frequently mentioned was the need for more trained teachers who understand different teaching methodologies (e.g. problem-oriented approaches). The importance of a good team with strong leadership was frequently cited: *"Of course you need experienced people trained in teaching but they need time to reflect on their teaching and improve it."* (R24)

### **Support for teaching**

One school does not have a designated member of staff to lead and coordinate public health teaching. The number of clinical sessions (or half day equivalents) allocated to the role ranged from 0-20, with a mean of 3.3 (i.e. 0.33 whole time equivalent). Since 2005, staffing levels have remained constant in 30.4% of schools and risen in 43.5% of schools. All schools are able to find suitably qualified staff to teach public health, but 66.7% do so "with difficulty".

Most public health leads feel that they have adequate administrative support for teaching activities. However in three schools there is no support at all (13.6%), and in two schools sufficient university administrative support is lacking: *"Very little support specifically, but I manage to "steal" it from elsewhere!"* (R5)

18 (78.3%) of public health leads consider there to be sufficient support for public health from senior management: *"I feel well supported and have strong leadership from the head of department."* (R9); However, one lead qualified this with the comment *"The difficulty is that people are continually being asked to do more - teaching, research, admin/management."* (R24) and another stated *"No, public health is not prioritised, and is seen as an optional extra for the students, not a core subject."*



(R23). In some schools the status of teaching has improved: *“Teaching is rewarded and no longer feels like an expensive hobby.”*(R13) but in other schools this is not the case: *“Career progression is still largely dependent on excellence in research.”*(R2) and *‘I don’t feel isolated but teaching will always play second fiddle to research.’* (R12)

### **Funding**

In response to the question “How much funding is available for the support of public health teaching?” 13 public health leads either did not answer, stated that they did not know, or responded with answers like *“Resources are not explicit in that way.”* (R11) or *“There is no discreet budget for PH teaching.”* (R19).

### **The future**

When asked “What factors affect the long term sustainability of teaching delivery in your medical school?” 14 (60.9%) public health leads specified staffing levels and availability as an issue, five (21.7%) identified adequate funding as a problem, three were concerned about the need for research productivity on teaching commitments, and two expressed concern about the possibility of NHS changes to public health impacting on the delivery of their courses.

Most interviewees referred to the pressure of time and resource constraints; they were often working alone. Other hindering factors included the lack of integration of teaching with other disciplines which can leave public health marginalised and feeling the absence of dedicated funding (e.g. from SIFT) to expand faculty: *“Organisational turbulence in the NHS has sometimes limited the availability of trainees and consultant teachers.”* (R1). The support of clinical colleagues, notably Deans, is pivotal: *“I badly need more support. You need time to be creative and implement new ideas.”*(R19)

Future development of the course often centred on making public health more clinically relevant and increasing the amount of self-directed learning: *“We need to get public health ‘mainstreamed’ and being taught by non-public health doctors. Students probably respond best to clinical role models.”* (R5)

## **Discussion**

### ***Main findings of this study***

Our survey shows a rich and varied picture of public health teaching across the UK. The overall impression gained is that medical school curricula have been strengthened since the inclusion of public health learning outcomes in Tomorrow's Doctors.<sup>4</sup> However, the delivery of teaching is often hampered by lack of resources.

### ***What is already known on this topic***

The last survey of this topic in the UK<sup>12</sup> highlighted many of the same difficulties facing teachers of public health-related disciplines. Generally, respondents are more confident in their place in medical school curricula and the quality of their teaching programmes. However, while many challenges are being successfully addressed, there is much still to do.

While the majority of respondents felt there was insufficient time for public health teaching in 2005 (52%),<sup>12</sup> this is no longer the case. However, this increase in curriculum time requires extra teaching input. Although medical schools provide most of the teaching staff required, there has been an increase in those who say they can do so "with difficulty" (56% in 2005; 67% now). The number of schools using public health speciality registrars has increased (from 60% to 78%).<sup>12</sup> Involvement in teaching allows registrars to achieve several training competencies;<sup>17</sup> it also benefits schools facing rising student numbers and staffing constraints. In many schools teacher shortages are aggravated by the challenge of involving academic staff for whom research goals are a more compelling incentive, particularly as their careers may depend on it.<sup>18</sup> This teaching/research divide has been a recurrent feature of previous surveys.<sup>8,9</sup>

### ***What this study adds***

The availability of a dedicated teaching budget provides both clarity and leverage in negotiating with agencies outside the medical school. This should be available for all teaching co-ordinators.

Unsurprisingly, the use of eLearning resources has increased since the last survey. The use of projects in public health teaching is now almost universal while for assessment there seems to have been a shift away from essays and project work towards more easily standardised methods such as MCQs and SAQs. This reflects a general shift in medical school preference in favour of these formats. The lack of any association between the size of medical school and the form of assessment suggests that the workload implications of essay marking are not the main barrier to its use in assessment.

While curricular coverage is broadly in line with the recommendations of Tomorrow's Doctors, certain subject areas continue to be under-represented. These include environmental and occupational health, nutrition and health informatics. Given the difficulties in finding suitably qualified staff, involvement in these areas seem likely to progress in a piecemeal fashion.

Given the political commitment to focus on prevention and anticipatory care<sup>19</sup>, public health as a discipline will have increasing relevance to the medical workforce in future.<sup>20</sup> The challenge is thus to ensure that public health is integrated into the undergraduate curriculum in ways which will demonstrate its relevance and applicability while retaining its visibility as a speciality in its own right. In this context, public health must be seen as a core component, rather than an "optional extra", with direct relevance to clinical practice. Though difficult<sup>21,22</sup>, this can be achieved through closer collaboration with clinical colleagues, and developing joint or mutually reinforcing teaching sessions and assessments (e.g. integrating public health questions into clinical OSCEs).<sup>23</sup> Greater sharing of resources between schools could usefully contribute to inter-university standard setting.

There is currently a dearth of evidence in the literature about how to engage clinically-orientated students in the public health paradigm, with some notable exceptions.<sup>24,25</sup> Formal evaluation and publication of innovative teaching methods are essential to raise the profile of the subject, and to share what works for the benefit of our students.

Ensuring visibility of the subject is a particular challenge in courses using a problem-based learning format as these tend to focus on individuals and can be difficult to broaden into population issues. However, some medical schools have created suitable resources which should be shared across schools. E-learning should similarly be shared across schools, and can be as effective as face-to-face teaching.<sup>26</sup> Finally, faculty development could be undertaken collaboratively.

Maintaining the profile of public health among undergraduates is crucial if medical recruits are to be attracted to the specialty. To this end, the public health educators in medical schools group (PHEMS), in collaboration with the Faculty of Public Health, have produced a consensus document mapping the outcomes of Tomorrow's Doctors 2009 to the priorities of public health teaching.<sup>27</sup> It highlights how public health helps to deliver key learning outcomes and should enable public health teachers to demonstrate their continuing relevance in ever more crowded curricula.

***Limitations of this study***

This was a descriptive study that relied on reportage from teaching leads alone. While the response rate was comparable with previous surveys, non-responders may have included less well supported teachers. The findings may therefore be more positive than the reality.

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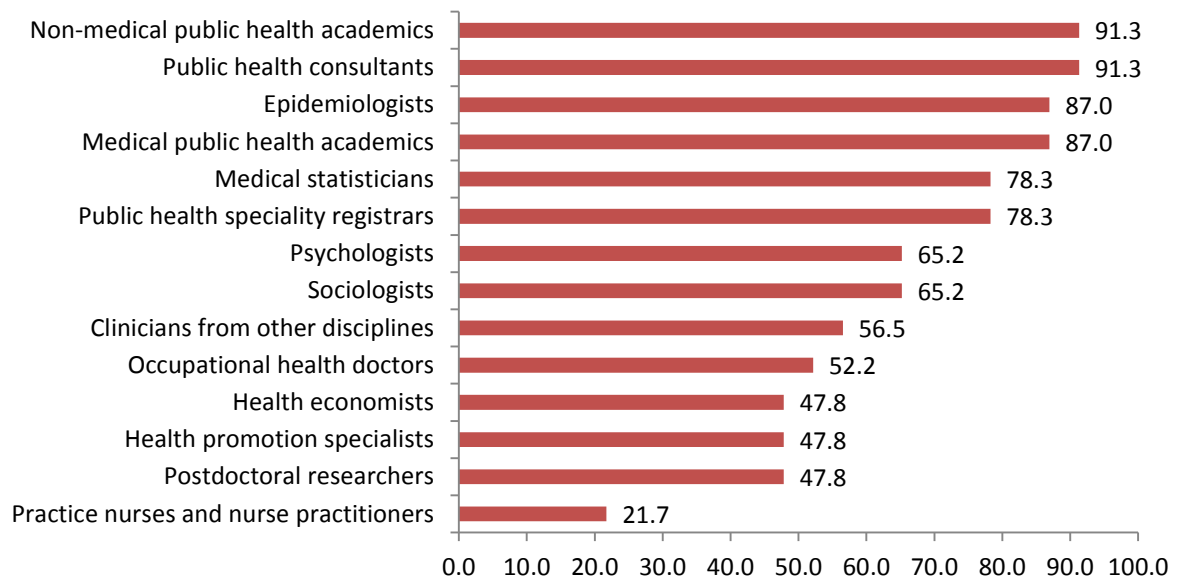
Thank you to all the public health teaching leads who found the time to complete the questionnaire, and to those who made themselves available for interview.

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**Figure I: Percentage of schools involving specified disciplines in undergraduate public health teaching.**



**Box 1: Outcomes from Tomorrow's Doctors<sup>4</sup> that respondents felt Public Health teachers should lead on:**

14g: 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. Respond to patients' concerns and preferences, obtain informed consent, and respect the rights of patients to reach decisions with their doctor about their treatment and care and to refuse or limit treatment.

22d: Demonstrate ability to build team capacity and positive working relationships and undertake various team roles including leadership and the ability to accept leadership by others.

23c: 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.

23g: Demonstrate awareness of the role of doctors as managers, including seeking ways to continually improve the use and prioritisation of resources.

23h: Understand the importance of, and the need to keep to, measures to prevent the spread of infection, and apply the principles of infection prevention and control.



## **Box II: Exciting ways to teach public health**

### **Integration of public health teaching with clinical teaching**

“Case analysis project: students need to select a patient seen during clinical attachment, and consider the associated epidemiological and public health issues.” (R20)

“A Clinical Skills session ... promoting behaviour change with patients...is being integrated with: information on the NHS’s Making Every Contact Count initiative; history taking about lifestyle from clinical skills perspective; lecture and group work from health psychology on models of behaviour change ..; students’ project work on knowledge of risks and approaches to tackle 10 health-related behaviours from individual approaches to policy, and the impact on health inequalities.” (R22)

“New 2nd year project involving choosing a drug company advert (mostly BMJ), identifying one of the papers the advert cites... critically appraising it and presenting back the relationship between the paper and the advert.” (R5)

### **Public health projects**

“Public Health Dragon’s Den- Presentation based on key public health intervention in proposed elective destination or home area of the student.” (R20)

“Project work involving attendance at a voluntary sector organisation and a review of what they do to improve population health” (R21)

“Students undertake a project using critical appraisal and literature searching skills....They must define a research question and develop a research proposal.” (R24)

**Table I: Number (percentage) of schools offering listed outcomes as part of the core curriculum**

<b>Tomorrow's Doctors 2009 objectives <sup>4</sup></b>	<b>Core</b>
(9d) Explain psychological factors that contribute to illness, the course of the disease and the success of treatment	17 (70.8%)
(11g) Recognise the role of environmental and occupational hazards in ill-health and discuss ways to mitigate their effects.	16 (66.7%)
(11h) Discuss the role of nutrition in health.	16 (66.7%)
(11j) Discuss from a global perspective the determinants of health and disease and variations in healthcare delivery and medical practice.	17 (70.8%)
(19e) Apply the principles, method and knowledge of health informatics to medical practice.	14 (58.3%)