Public health physicians’ knowledge of core skills and current policy: clinical audit by questionnaire

Linda Garvican and Yvonne Doyle

Abstract

Background The aim of this study was to facilitate the assessment of the knowledge of general public health physicians on a range of topics relating to everyday areas of work and core skills, and to encourage learning in the process, by means of an educational clinical audit exercise.

Methods A group of experts in different aspects of public health were asked to contribute multiple-choice questions. These were developed into a questionnaire that could be marked by computer. The questionnaire was circulated to all members of the Faculty registered for Continuing Professional Development (CPD) and to specialist registrar members, but participation was voluntary. The experts marked answers according to a marking scheme against model answers agreed.

Results A total of 499 public health doctors returned answer sheets. There was no ‘pass mark’ as this was a learning exercise, not an examination. However, although the negative marking system meant that the possible range of scores was −100 per cent to 100 per cent, no one had a negative score. The median uncorrected result was 44 out of 80. Questions on communicable disease and critical appraisal had the highest scores, and one on Primary Care Trusts the lowest. Participants thought the most interesting questions were those on epidemiology and evidence-based medicine, whereas the most unpopular was on Personal Medical Services pilots. Most comments were favourable to the approach but several commented that the whole exercise was too general and questions outside their current area of specialization were irrelevant.

Conclusion The general public health physicians who took part in this audit appeared to be mainly competent in their knowledge of core skills and up to date with current health policy issues. However, the audit raises a debate about what ‘core’ knowledge is required in the post-training period. The place of UK-wide CPD initiatives over national or regional, or local approaches needs consideration, as do potential regional or national variations in CPD. This will receive further impetus because of revalidation and the need to demonstrate valid CPD activities in public health medicine.

Keywords: clinical audit, continuing professional development, core skills

Introduction

In 1998 the Faculty of Public Health Medicine Continuing Professional Development (CPD) Programme developed a new initiative of comparative clinical audit by questionnaire survey. The first exercise was aimed at public health physicians involved in on-call communicable disease control duties and consisted of a series of scenarios for different infectious diseases.1 Questions required a mixture of multiple-choice and free-text answers. Although the audit was appreciated by all who took part, the response to this exercise was not good and fewer than 200 questionnaires were returned. Nevertheless, the marking proved onerous for one individual, and it was decided that if a similar exercise were to be carried out in future it would be necessary to use a multiple-choice questionnaire (MCQ) that could be marked electronically.

This paper describes the development and analysis of a second audit exercise conducted in 2000, directed at all Faculty members registered for CPD and specialist registrars. The audit aimed to extend a central audit, as tested in communicable disease, to the mainstream of public health practice, linking questions where feasible with the core competencies in public health being developed by the Faculty. It was primarily educational and intended to test knowledge of everyday areas of work.

Methods

A group of experts in a range of relevant fields were asked to submit questions on specific topics in one of two multiple-choice formats. In practice, all elected the true-or-false approach with the questions grouped into five-stem sections. Questions covered topics including epidemiology, communicable disease,

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primary care and policy issues, plus health service evaluation and critical appraisal. The wide range was aimed to produce a complete questionnaire where all participants should find some topics relevant to their own work situation, plus some of general interest in less familiar areas. The questionnaire was piloted on the members of the Faculty’s CPD Committee, and modified to take some account of devolution of the Celtic nations. Two alternative primary care questions, leading to the same answers, were produced for Scottish participants, and some policy questions relating specifically to England were deleted.

The questions were produced in a booklet and distributed to all those members registered for CPD along with a covering letter, the special MCQ answer sheet, an evaluation form and full instructions. Specialist registrar members were also invited to take part. If stimulated to seek further information about questions where they realized their knowledge to be deficient, participants could consult those resources that would normally be available at work. There was no time limit for the exercise but a deadline was set for return of completed answer sheets, so that a single marking run could be set up. Participants were assured the audit results would be aggregated and responses kept confidential, and they were entitled to claim five CPD points. Model answers, individual scores and an anonymous comparison of performance across the United Kingdom would be sent to those who submitted answers.

For identification purposes members used their CPD registration number, and registrars were supplied with a candidate number of the form 2XXX, so they could be distinguished. The University of London Management Systems Division provided the marking service. The system generated an analysis of performance by individual candidate, by question and by topic area. Unlike the previous audit, it was not possible to analyse performance in relation to participants’ positions.

Results

Response

Questionnaires were sent out to the members registered for CPD plus specialist registrars: 1424 in all. A total of 517 replied (a 36 per cent response rate) but only 499 of these returns included the completed answer sheet. Three respondents wrote their answers on the question sheet, and 15 sent back the evaluation form only. A total of 492 were marked and analysed by the computer system. One was marked manually. These included 98 specialist registrars and 10 anonymous returns. This is equivalent to an overall return rate of 35 per cent, with 40 per cent of full members and 25 per cent of specialist registrars taking part. It is not known how many others did the exercise privately without making any return.

Completion of MCQ answer sheets

Several participants had difficulties with the answer sheet, and the central university computer was unable to cope with some of their mistakes. Three pairs of non-identical answer sheets with duplicate candidate numbers were returned. The computer, which is set up for formal university examinations, could mark neither of each pair. Two participants included the wrong centre number; despite this their returns were marked and included in the analysis. Ten responses were anonymous, and one sheet was returned completely empty.

In view of the negative marking candidates were advised to leave answers blank when unsure and not to guess, and most seemed to have followed this advice, with the majority not answering up to 20 questions (range 0–69). The form has a mechanism for the candidate to cancel and amend an incorrect answer, to avoid negative marking. Eight participants altered over 20 answers in this way.

Analysis of marks

The negative marking meant that the possible range of scores was –100 to 100 per cent. No one had a negative score. Participants’ corrected scores ranged from 2.5 to 83.75 per cent, with a mean of 51.4 per cent (SD 14.7). The median uncorrected result was 44 out of 80. Figure 1 shows the frequency distribution. The specialist registrars performed slightly worse than the total sample, with a mean of 50.0 per cent. This was not statistically significant, but contrasted with their better performance in the previous communicable disease exercise.

The analysis of the marks by question is shown in Table 1 and by topic in Table 2. The possible range of marks for each five-stem question was –5 to +5. Mean scores for individual questions ranged from 1.08 to 4.33 [mean 2.57, 95 per cent confidence interval (CI) 1.13–4.01]. Standard deviations were again large. The most successfully answered questions were on communicable disease and question 11 on critical appraisal, and the least successful on Primary Care Trusts. The health care evaluation question, which provided data on reconfiguration of A&E services, also scored surprisingly badly.

Evaluation by participants

A total of 469 evaluation forms were returned. Most were complimentary about the exercise, finding it reasonable and challenging, and would be willing to repeat it next year. The range of responses ranged from ‘Interesting and challenging exercise – I enjoyed doing it. Thank you’ to ‘This is a waste of a busy DPH’s time’.

About two-thirds of respondents were willing to have a central marking and analysis process if individual scores were anonymous or kept confidential, but the remainder would have preferred to mark their own efforts from circulated model answers. It is likely that any members who did the exercise but did not make a return also shared this latter opinion.

The most interesting questions were those on epidemiology and evidence-based medicine. The question on health service evaluation was considered to be the best or worst by approximately equal numbers of respondents; it was the most practical, but was considered ambiguous. The least interesting and most
unpopular question was that on Personal Medical Services pilots, which was deemed ‘too fashionable’ and not relevant to most public health physicians’ work. Indeed, several commented that the whole exercise was too general, and as they specialized in a limited area such questions were irrelevant.

Policy and primary care questions had been included because of the importance of public health physicians keeping up to date and the large numbers of changes in recent years. However, these caused the most contention, especially in Wales. Other criticisms were that some questions were ambiguous and that the negative marking was unfair or inappropriate. Several participants pointed out that there is often no simple distinction between true and false in public health but the MCQ format forbids qualification of answers.

![Figure 1](image_url)  
Figure 1 Frequency distribution of overall raw scores from comparative audit questionnaire (n = 491).

<table>
<thead>
<tr>
<th>Question number</th>
<th>Range</th>
<th>Number with negative score</th>
<th>Median score</th>
<th>Number scoring</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>median</td>
<td>Mean</td>
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<tr>
<td>1</td>
<td>–3 to +5</td>
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<td>18</td>
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<td>202</td>
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<td>197</td>
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<td>0 and +1</td>
<td>106</td>
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<td>+3</td>
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<td>97</td>
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<td>141</td>
</tr>
<tr>
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<td>–3 to +5</td>
<td>6</td>
<td>+5</td>
<td>366</td>
</tr>
<tr>
<td>12</td>
<td>–5 to +5</td>
<td>18</td>
<td>+5</td>
<td>186</td>
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<td>–1 to +5</td>
<td>2</td>
<td>+3</td>
<td>183</td>
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<td>121</td>
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<td>51</td>
<td>+3</td>
<td>94</td>
</tr>
<tr>
<td>16</td>
<td>–2 to +5</td>
<td>19</td>
<td>+3</td>
<td>140</td>
</tr>
</tbody>
</table>

The possible range of marks for each five-stem question was –5 to +5.
Table 2  Analysis of results by question topic (n = 491)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Questions</th>
<th>Mean score per question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidemiology</td>
<td>1–3</td>
<td>2.60</td>
</tr>
<tr>
<td>Communicable disease</td>
<td>4</td>
<td>4.31</td>
</tr>
<tr>
<td>Primary care</td>
<td>5–7</td>
<td>2.09</td>
</tr>
<tr>
<td>National policies</td>
<td>8–10</td>
<td>2.05</td>
</tr>
<tr>
<td>Critical appraisal</td>
<td>11–13</td>
<td>3.66</td>
</tr>
<tr>
<td>Health service evaluation</td>
<td>14</td>
<td>1.58</td>
</tr>
<tr>
<td>Evidence-based medicine</td>
<td>15</td>
<td>1.90</td>
</tr>
<tr>
<td>Environmental health</td>
<td>16</td>
<td>2.28</td>
</tr>
</tbody>
</table>

Time to complete the questionnaire

Most participants took 2 or 3 h to complete the test (range 15 min to several days, but presumably not continuously). Most felt this was reasonable but some felt it was too long. Those who looked up answers took longer, but commented that this was a beneficial learning exercise. Those who spent less than 30 min tended to score badly and were less complimentary about the audit.

Discussion

Response

The response was still disappointing, although answer sheets were returned by two and a half times the number of public health physicians who took part in the previous communicable disease audit. It is impossible to know how many others used the questionnaire privately but did not submit a return, because they either disapproved of the central marking and comparison of performance, or were put off from filling in the answer sheet. There is anecdotal evidence that in some health authorities the questionnaire was circulated round the department, and shared with colleagues who are not Faculty members, as a general audit and educational tool, and this is to be welcomed.

However, this audit was not a survey in the usual sense where the results from a sample of responses would be used to estimate the characteristics of a more general population. We have made no inferences about the competence of those who did not take part. The scores of the members who took part stood in their own right, and we believe they could be legitimately analysed, especially as there was no pass mark. Indeed, participants were understandably anxious to know how they had scored in comparison with their peers, and to see the model answers, to understand how they had scored in comparison with their peers. They have been encouraged to learn in multi-disciplinary teams to meet the challenges of modern health care.

Some publicity has been given to distance learning recently. Current developments in that field are still focused in public health on factual subjects such as statistics and epidemiology. This reinforces the knowledge-based, examination-oriented aspects of the specialty, which are proving unpopular with the wider membership.

The repeated experience of poor responses poses a challenge to the Faculty as follows. This type of exercise is an efficient way of conducting a standardized central CPD-audit initiative. The audit was achieved within budget by employing a project manager with dedicated time, and using volunteer question setters and computerized marking. Within the limits of MCQs it was successful, and appreciated by the majority who took part. Efficiency is important in an environment where Royal Colleges are meeting widening agendas, and in the case of CPD, with changing central demands. In England, the National Institute of Clinical Excellence, as lead central agency there for clinical audit, has made it clear that Royal Colleges should support its evolving agenda, and revalidation is making major demands for the development of systems to demonstrate meaningful CPD.

Although efficient, a central audit initiative for learning in public health is not likely to be recommended again, because of the response rate. Considerable thought will be needed as to what kind of UK-wide initiative is desirable or indeed relevant in future CPD in the field of public health. Before pursuing such approaches, the question is: what can or should a UK-wide CPD initiative achieve over a national or regional, or local approach? Would regional or national variations in CPD matter? With the increasing importance of clinical governance and the forthcoming necessity for revalidation, the Faculty needs to address this problem in the near future.

What is ‘core’ public health practice in the period after formal training?

That this is likely to be a vexed question can be ascertained from the responses to the audit at meetings subsequent to its circulation and in correspondence with the Director of CPD. Many service-based respondents commented that it was surely not important for them to know epidemiological definitions; equally, academics did not see the relevance of researching health policy matters. These comments constituted a criticism of the audit itself, in that at least a body of respondents do not consider a comprehensive knowledge of public health to be necessary or relevant to every public health practitioner. This surprised the current authors, particularly in the light of developments on core competencies in public health training. The assumption by the Director of CPD, and indeed the Board of the Faculty, is that there is a logical connection between the competencies and CPD, but the consequences of this may not be shared by the
membership. A debate is needed as to what ‘core’ means in the post-training period; whether a baseline competence in all areas is needed with more detailed competence in areas of current practice; and what is defined as a baseline.

This matter is one of the most pressing in public health practice and has been evolving for some time. Although the formal assumption is that everyone will subscribe to the core, in fact, the development of special interests and sub-groups in the medical part of the specialty already may have rendered this assumption obsolete. This comes even before the addition of many other specialists to the Faculty’s CPD membership. The resolution of this in measurable terms is fundamental to authoritative advice from the Faculty about, for example, the CPD component of revalidation.

There are other practical issues arising from this debate. Those who no longer consider themselves general public health physicians may appreciate special interest group audits or CPD itself but the Faculty does not keep records of members’ current job descriptions, and would find it impossible to organize such a process. Therefore those planning computer systems centrally might need to take account of this in future. If more emphasis was given to defining the varieties of public health practice, CPD provision might reside not only in regions or nations of the United Kingdom, but also in special interest groups building on the current example set by the communicable disease networks. Some of these interest groups are integral to the Faculty itself, but potential CPD leaders would need similar training to that of regional coordinators.

**Question-setting**

*Constraints of MCQ format*

The MCQ format simplified the marking and analysis process considerably, and was very cost-effective. It would have been impractical to have 500 returns marked individually. For example, to handle the large numbers without resorting to MCQs and optical marking it would be necessary to break down the membership into more manageable groups, but this is not an easy task given the nature of the membership database. However, there are several limitations to the system, which is operated for the benefit of university examinations and therefore abides by certain rules and regulations:

1. Answers cannot be qualified, and so much in public health is not black or white.
2. All the returns must be marked in one batch, with no allowance for late returns.
3. Negative marking is a standard part of the process. Although this is not inherently unfair, as all participants were clearly warned that it would apply, it is not what many are used to.
4. The answer sheet must be completed correctly. University students soon learn to do this, but it is difficult and time-consuming for those who have not done such an examination for several years.
5. Candidates must use their correct number. Although individual’s CPD numbers were used, errors still occurred.
6. NHS policy changes rapidly, and there was potential for some answers to be out of date before marking.

Many of the question setters, although acknowledged experts in their respective fields, were not academics used to setting MCQ-type questions. None were experienced in setting MCQs for their peers, as this was a new venture and has not been common practice. They therefore found it extremely difficult to produce unambiguous and suitably challenging questions, and this may have been reflected in some of the responses.

**Devolution and policy differences across the United Kingdom**

The organizers thought it was appropriate to have sections on primary care and recent policy for the NHS. Unfortunately, this proved very difficult to achieve, even with the assistance of the CPD co-ordinators for the Celtic nations, because there is now wide diversity across the United Kingdom in policy and practice. The two alternative primary care questions for Scottish participants did not entirely solve the problem, and may even have made matters worse for the Welsh. One respondent declared that the interests of three-quarters of the United Kingdom had been forgotten, failing to recognize that more than 80 per cent of the membership work in England. There is no easy solution to this problem, other than to run separate exercises for the Celtic nations, but in this case the funding had been obtained for a UK-wide audit.

**Lessons learned**

*Evaluation forms*

The organizers did not consider the possibility of a separate MCQ sheet for the evaluation and thus the hand-written forms had to be analysed manually. This was not done in great detail, which would have been an inappropriate use of time, but a broad picture soon emerged when the forms were scanned.

*Audit in public health*

This initiative was a second attempt to link audit to CPD, but in a broader context than communicable disease. The aim of audit in public health is to reflect on performance in everyday practice using standards where available. By linking this to a regular learning plan, it is possible to develop professionally by improving or reinforcing effective public health practice. This audit removed the experience from everyday practice into the abstract, but the inference was that the knowledge gleaned in the audit would sharpen practice. It is not an ideal method, but it is a way of encouraging audit where none may be occurring locally – and there is evidence that regular audit does not occur in many locations in public health practice. From the response rate and the reactions to the audit ranging from enjoyment to anxiety, the state of audit at grassroots level of public health is probably at best variable. There are many...
excuses proffered as to why audit in public health is difficult, but
an important reason is that it is not universally integral to prac-
tice in the specialty. This is a cultural and leadership matter and
will become pressing as requirements for revalidation state that
doctors who wish to remain registered must demonstrate evi-
dence of routine audit of their work. The methods are left to the
individual. An occasional UK-wide audit can only complement
local approaches to audit. However, that event presents individ-
uals with a challenge that, if they do not respond, they must
question whether they are engaged in any local alternatives.
Heads of service and academic departments need to understand
that their medical staff will be required to demonstrate current
audit. Public health governance, as outlined by the Faculty,
outlines this as part of good public health practice.8

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