Public health physicians who contribute to on-call communicable disease control duties: national comparative clinical audit by questionnaire survey*

Linda Garvican, Richard Mayon-White and Peter Littlejohns

Abstract

Background In most health authorities in the UK, general public health physicians provide out-of-hours cover for specialists in communicable disease control. Although communicable disease control was part of their specialist training, there is no current formal mechanism to enable these doctors to keep up to date. The Faculty of Public Health Medicine has an active Continuing Professional Development Programme. A new initiative aimed to assess the knowledge of general public health physicians who take part in on-call communicable disease control rotas, or may do so in the future, by means of an educational clinical audit exercise.

Methods Experts in communicable disease control developed a questionnaire containing a selection of scenarios, covering six different situations that might arise on-call. This was circulated to all members of the Faculty, but participation was voluntary. Answers were marked against model answers agreed by the experts. Results were analysed by positions held by participants.

Results Response was unacceptably low. Overall scores ranged from 15 per cent to 89 per cent with a mean of 63 per cent. There was a trend of improvement in marks from those not normally involved in on-call (mean score 56.1 per cent (95 per cent confidence interval 51.6–60.7 per cent)) through Directors of Public Health (58.4 (54.9–62.0) per cent), Consultants (62.8 (60-65.6) per cent), and specialist registrars (67.9 (65.2–70.6) per cent), to Consultants in Communicable Disease Control (70.9 (68.1–73.6) per cent).

Conclusion The public health physicians who took part in this audit appear to be competent in their knowledge of communicable disease control, and particularly good at dealing with meningitis and salmonella, which are frequently encountered out of hours.

Keywords: communicable disease control, clinical audit, on-call duties, professional competence

Introduction

The on-call duties of the public health physician are important for four reasons. Some of the problems, such as meningococcal disease, are real medical emergencies with life or death decisions. Poor handling of other problems, although not life-threatening, can create public alarm and confusion, and add to the burden of health and social services. In a small specialty, colleagues must be able to cover for one another. In common with clinical specialties, on-call commitments are expected at night and at weekends.

In most health authorities, general public health physicians serve on rotas to cover the out-of-hours duties of Consultants in Communicable Disease Control (CsCDC). Specialist registrars are trained to take part in these rotas, and their competence is tested in the membership examinations of the Faculty. Hitherto, there has been no formal mechanism to ensure that public health physicians remain competent to be on-call, although many have tried to keep up to date in their continual professional development activities. Although there was a previous survey of the responsibilities and resources of on-call public health doctors,¹ there has been no assessment of their professional competence.

The Faculty of Public Health Medicine developed this new initiative as part of the Continuing Professional Development (CPD) Programme, early in 1998. The aim was to design a clinical audit to assess the knowledge of general public health physicians who take part in on-call rotas for communicable disease control duties, or may do so in the future. The intention was to produce an exercise that was educational and interesting to do, but would attempt to create realistic scenarios, so that participants could respond as they would in real life.

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Methods

An expert panel made up of CsCDC and Regional Epidemiologists set the questions and drew up model answers. Formats comprised a mixture of multiple choice, or tick-box type answers, placing factors into priority orders and free-text with bullet points to indicate the number of one-line answers required. Several key disease areas were covered in a range of possible community situations. One situation was revisited ‘in the light of further information received’ in a subsequent question. The questionnaire also included a separate answer sheet and a simple evaluation form.

The audit was aimed primarily at consultants in public health medicine involved in on-call duties, but was thought to be also of interest to specialist registrars. As the Faculty of Public Health Medicine does not have records of the job descriptions of its members, it was necessary to send out a general mailing. It was therefore open to all members including consultants in communicable disease, academics and others not employed in health authorities. The date of mailing was outside the control of the project group, so it was difficult to include a closing date. The papers were sent out in early August 1998.

The exercise was entirely voluntary. Participants were asked to set aside a time to complete the exercise and work through a question at a time without reading through the whole paper first. Access to usual resources, such as on-call packs, was permitted, as was some discussion with colleagues, such as might occur in a real on-call situation. No time limit for completion was set.

The pack provided contained the question paper, a separate answer sheet and an evaluation form together with a covering letter. Participants were promised model answers, individual scores, and an anonymized comparison of performance across the UK. They would also be entitled to credit two CPD points.

Returned questionnaires were marked by the project manager according to a marking scheme. This gave one point for multiple choice answers and two marks for free-text, to allow some flexibility for completeness of response. Participants were classified into one of five groups, according to their employment position as given on the answer sheet. Results were analysed, both by these groups and by nature of question, using Microsoft Excel.

Results

Response

By the end of October 204 replies had been received, including 184 completed questionnaires and 20 returned papers. A further eight questionnaires were returned in the following four months. These were marked and participants informed of their score, but late returns were not included in the analysis, as the model answers were already in circulation. Completed questionnaires were received from 28 Directors of Public Health and 69 Consultants, plus 39 CsCDC and 39 specialist registrars. In addition 23 individuals employed primarily in other organizations, including academic departments or the NHS Executive, took part.

The Faculty has a total membership of 2428, including retired and honorary members; 1036 are registered for CPD in 1999, including 981 European members and fellows. Public health physicians work in a wide variety of healthcare and academic situations, but it is not known how many are ever involved in on-call communicable disease control duties. There are approximately 120 health authorities, each with a Director of Public Health, about three other general public health consultants and one CCDC, depending on population served, so potentially about 450 consultants could have replied. Only 67 members have indicated to the Faculty that they are in a CCDC.

Figure 1 Frequency distribution of individual per cent marks scored for the questionnaire (n = 183, with an outlier at 15 per cent not plotted).
null
variation, with those on meningitis and salmonella being answered very well by almost all participants, and that on parvovirus less so (Table 2).

Question 1: Meningitis in a teenager at school

This question consisted of 11 yes/no answers and two supplementary free-text points. Over 90 per cent of participants gained full marks on the first section, and 30 per cent (56/184) the maximum score of 15. The most common reason for error in the second part was to suggest that the patient’s general practitioner should be informed, but not all general practitioners in the area.

Questions 2 and 5: a family man with hepatitis A

The first requirement was to draw up the list of questions to ask the family man diagnosed with hepatitis A. The majority of replies said he should be asked whether he knew anyone else who was ill, and had any recent history of travel abroad, or consumption of seafood. Rather fewer thought to ask him about other sexual relationships, or watersports. Only a few asked whether he ever prepared food for his family, or had recently stayed in a hotel in the UK during the incubation period. The question continued by asking what actions should be taken. The majority would provide immunoglobulin to the family, and give them advice on hygiene. Wider immunization or vaccination was rarely mentioned unless enquiries had been made about other close contacts or sexual partners. Few mentioned checking for cases at the school or nursery. The mean score for question 2 was 62 per cent (9.3/15).

When this scenario was revisited it was revealed that the index case was bisexual and had recently had relations with two men, one of whom was a chef. When asked who should now be tested for hepatitis A infection the most common errors were to suggest only the chef, or the sexual partners, omitting the children. Only four participants suggested that hepatitis B vaccination might also be appropriate for those in homosexual relationships. No one suggested testing any other close contacts with symptoms, or immunizing or vaccinating anyone who had eaten food prepared by the index case.

All but two participants had apparently forgotten that the 14-month-old child could have had a subclinical infection, possibly acquired at the nursery. These omissions led to inadequate recommendations for vaccination and for action to be taken at the nursery. There was a reluctance to inform staff or parents because of confidentiality, and frequently only stricter hygiene precautions were suggested.

As a result the mean group scores for question 5 ranged between 5.6 and 8.8 with an overall mean of 7.1 out of 18 marks, or only 39 per cent.

Question 3: legionella in a factory

The first part of this question was multiple-choice, and yielded a mixed response. Some participants said that legionnaire’s disease was notifiable (but it is not). The majority had a good idea of the incubation period and distribution of the causative agent. In the second part of the question the aim was to outline actions to be taken in the next 12 hours, given that the two suspected cases worked in the same factory. Again, the quality of responses was very varied, but low scorers tended to want to take responsibility for managing the situation alone, rather than contacting the various other statutory agencies for advice and practical assistance, and creating a team and developing a co-ordinated and systematic approach to the outbreak.

Question 4: salmonella in an old peoples’ home

This question involved putting possible actions in priority order, and was generally very well answered, with 14 per cent (25/184) of individuals scoring full marks. In the marking scheme there was some flexibility, with the three points considered essential scoring higher. Marks were to be deducted for certain inappropriate actions, but it was rarely necessary to do this. Only one participant wanted to take eggs off the menu, and indeed chose to make this the top priority action. Several would have closed the home to new admissions, but only two would close it completely.

Question 6: Section 47, National Assistance Act (1948)

This question was answered well, with 13 per cent (23/184) of participants gaining full marks. The majority knew the correct source of information, and the name of the designated Proper

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**Table 2: Mean communicable disease marks by question (n = 184)**

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean score</th>
<th>95% CI</th>
<th>No. with full marks</th>
<th>% with full marks</th>
<th>Range</th>
<th>Max. possible score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13.3</td>
<td>13–13.5</td>
<td>56</td>
<td>30.4</td>
<td>8–15</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>9.3</td>
<td>8.9–9.7</td>
<td>13</td>
<td>7.1</td>
<td>0–13</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>10.6–11.4</td>
<td>5</td>
<td>2.7</td>
<td>3–16</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>8.7</td>
<td>8.5–8.9</td>
<td>25</td>
<td>13.6</td>
<td>0–11</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>7.1</td>
<td>6.6–7.6</td>
<td>1</td>
<td>0.5</td>
<td>0–18</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>5.6</td>
<td>5.3–5.8</td>
<td>23</td>
<td>12.5</td>
<td>0–8</td>
<td>8</td>
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<tr>
<td>7</td>
<td>8.9</td>
<td>8.4–9.5</td>
<td>0</td>
<td>0</td>
<td>0–18</td>
<td>19</td>
</tr>
</tbody>
</table>
Officer in their area. Problems with the interpretation of the Act were recognized by several: to quote one response ‘it’s not the weekend that’s wrong with the Act’. In this case, unlike all the other questions, the mean score for both consultants and Directors of Public Health was significantly higher than that for their specialist registrars.

**Question 7: parvovirus at a playgroup**

Most respondents recognized that the children had parvovirus, although few knew all the appropriate tests for confirmation. Most of those who knew of the risks to a foetus correctly identified anaemia, hydrops foetalis and death, thus gaining a six-mark advantage. No one mentioned arthritis or aplastic crisis.

This question was not well answered overall, with a mean of only 47 per cent (8.9/19), and no one gaining full marks. However, the marks showed a bipolar distribution, as participants tended to do well if they correctly identified parvovirus and foetal risks, and otherwise rather badly. There was the possibility of some follow-through marks for those who opted for other diagnoses, if they went on to recommend appropriate actions at the playgroup. Marks were to be deducted for those who recommended closing the playgroup (no-one) or excluding children. Most correctly pointed out that there was little point in excluding children with a rash, but febrile children should be excluded, until the diagnosis was confirmed.

**Discussion**

**Response**

The overall response to this exercise was disappointing, given the aim of an assessment of the competence of general public health physicians on-call. Future audits may be compulsory. The response from academics and other groups was welcome. Those specialist registrars who responded welcomed the exercise as a teaching initiative. All respondents thought the initiative was a good idea and would welcome similar exercises in the future.

A return date deadline was not included in the covering letter, as the date of mailing was outside the control of the project team. It was eventually circulated early in August, perhaps not the best time of year to achieve a good response rate. Few questionnaires were returned before September. Similar exercises in the future should include a clear cut-off for marking, and be timed to avoid the holiday season.

In all those six health authorities with the best response, the Director of Public Health also took part. This may indicate encouragement to participate from the Director or a more positive attitude to continual professional development in those organizations. However, it did not affect the mean score of those who took part.

Most respondents considered a time commitment of 45–60 min to be reasonable. There did appear to be some correlation between mark and time commitment, with those spending less than 30 min scoring badly. Most respondents found the questions challenging, and liked the format of a mixture of question types. They would be willing to repeat the exercise both with other communicable disease questions and different topic areas, and the initiative was warmly welcomed as an excellent idea. Suggestions for future topics including basic skills and competencies, as examined for Faculty Membership, political issues and further on-call areas, including chemical incidents.

**Answers to specific questions**

Question 1 on meningitis was answered very well. This indicates that these general public health physicians would be likely to handle such an on-call situation well, although specialist registrars performed significantly better than their consultant and director colleagues. This is important because of the fear engendered by this disease in the community. On the evaluation forms this question was most frequently identified as the least interesting, together with that on salmonella, although a small number did comment that these topics were actually the most relevant to out-of-hours duty.

In contrast, the parvovirus question was not well answered, but is rather less likely to be encountered on-call. It can also be argued that this question was not as well constructed, with a disproportionate amount of the total marks for the exercise being allocated to this question, and undue weighting on the rare consequences of foetal transmission of parvovirus infection.

The majority of participants considered questions 2 and 5 on hepatitis to be the most interesting in the paper. No one admitted that they had looked ahead, and spoiled the surprise for themselves, and there was no evidence of this from the answers received.

**Format and quality of the questions**

As this was a new exercise it was likely that question-setting quality would also be variable. Question 6, on the National Assistance Act, was somewhat ambiguously worded, and criticized accordingly by several doctors. True/false answer options were considered preferable to yes/no alternatives. Similarly, the yes/no sequence in question 1 was considered less interesting by participants than questions requiring free-text answers, but was much simpler to mark. Free-text answers were considered more representative of real-life situations, and one participant even suggested an essay format.

The response rate was low, yet the time taken to mark the returns was considerable. For a future exercise it may be worth investigating the possibility of running the project in cooperation with a medical school, so that multiple choice questions can be optically marked.

**Model answers**

The model answers were produced by a panel of experts from
around the country, but it was recognized that in some situations there is no single right answer, and practices do vary, and therefore some flexibility was built into the marking scheme. One CCDC suggested a system of consensus marking, based on the answers of all the ‘experts’, but this would be extremely difficult to administer.

Feedback from some public health doctors indicated that they believed many actions in the model answers would not have to be taken on-call. However, an on-call doctor does have to know which decisions can wait until normal working hours. Adequate communicable disease cover is essential at all times, and minimal intervention is not acceptable, especially when the CCDC is on leave.

Performance of the different groups

Classification of respondents into the five groups was conducted on the basis of brief description of employment on the answer form, yet the true situation is more complex. The ‘Academic’ group contained all those who are apparently unlikely to be involved in on-call duties, but may include some who have sessional commitments to health authorities, or are involved in teaching communicable disease at undergraduate or postgraduate levels. Similarly, the specialist registrars will include both those who have recently taken Part 1 and those who have already achieved specialist registration in public health, and are about to take up consultant posts.

The wide range of performance in all groups may be a cause for concern, especially when considered with the results of the previous study, where a wide variation in standard of available resources was also observed.

Health authorities, the Department of Health and the NHS Executive rely on general public health physicians and specialist registrars to give 24-hour cover for communicable disease control and other public health functions. It may be debated whether this system is ideal, but it is at present the only way to prevent a few specialists (e.g. CsCDC) being on duty all the time and working many more hours than their colleagues. As this system of all taking part in the rota is the usual arrangement, it is essential that the quality of the out-of-hours service be assessed.

The findings for those who took part are broadly reassuring, because most answered the important questions correctly. There can be no such reassurance for those who did not take part. The non-participants have more to do to demonstrate to their peers (and themselves) that they are safe on-call. We hope that they will use the questionnaire and this report for self-assessment, so that they have more confidence to take part in the next exercise.

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Reference


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