How many microbiology consultants are needed?

G E Bignardi

Abstract
It is difficult to measure medical staff workload and medical staff requirements in microbiology departments. A review of 14 job descriptions for consultant microbiologists showed that the number of hospital beds and the number of specimens are more reliable workload indices than the population figure. Ratios between beds or specimens and medical staff numbers may help to identify understaffed or overstaffed microbiology departments.

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A report from the Royal College of Pathologists recommends that at least two microbiology consultants should be appointed in district general hospitals serving a population of about 250,000.1 This staffing recommendation is not very useful, not only because it does not define the desirable staffing levels for hospitals of different sizes or the possible contribution of junior doctors, but also because the number of beds and the number of specimens are not taken into account. Looking at the job descriptions for consultant microbiologist posts, I have been puzzled by the considerable variation of workload in different hospitals.

This report is an attempt to measure this variation of workload and to provide a norm.

Methods
Job descriptions were obtained for all consultant microbiologist posts advertised between 1 January and 31 December 1992 in either the Lancet or the British Medical Journal. Job descriptions included in this report are those for posts in England and Wales, set up in microbiology departments not directly involved in undergraduate medical teaching and for which duties other than routine medical microbiology and control of infection were not required (combined consultant in microbiology and communicable disease control posts were excluded). One post was advertised twice initially as a part-time then as a full-time post and has been included in this analysis twice.

Part-time consultant posts were counted as a fraction of 11 (x/11 where x is the number of notional half days) and the fraction was converted into a decimal value. One department had one full-time associate specialist and this was equated to one consultant post. Population, hospital beds, and laboratory specimen figures were taken from the job description to be used as possible workload indices. The number of beds included all beds: acute, long-stay, psychiatric, mental handicap. Ratios between workload indices and the number of consultant microbiologists in each department were calculated. To calculate ratios between workload indices and all medical staff, an arbitrary decision had to be taken on how to count junior doctors. A "corrected" number was achieved by counting each registrar and senior registrar as 0.4 and 0.6, respectively; these figures were then added to the number of consultants.

Results
There were 14 job descriptions which met all the above mentioned criteria. Of the 14 microbiology departments analysed here, four were Public Health Laboratory (PHL) departments, four were in NHS Trusts, and six in directly managed units. Seven of the 14 departments had single-handed consultants with no junior doctors. Junior doctors were present in four departments, including three out of four PHL departments.

Hospital beds and laboratory specimen figures could be obtained from all job descriptions. Population figures were not given in one job description but were reported in the other 13: an attempt to differentiate and report both resident and served population was made only in two job descriptions. Because population figures did not seem to have been gathered in a uniform way (resident population, or served population, or an unqualified figure were given in different job descriptions), only hospital beds and laboratory specimens were regarded as acceptable workload indices. Ratios between these workload indices and the number of consultants (or the "corrected" number of all medical staff) were calculated for each department. The table shows the range, mean, and standard deviation of these four ratios from all 14 microbiology departments.

An attempt to identify understaffed or overstaffed departments was made by comparing each department with a "normal" range defined as mean (1 standard deviation). There were five departments with at least one of these four ratios outside the "normal" range.
### Ratios between workload indices and number of consultants or all medical staff in 13 microbiology departments

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds/consultants</td>
<td>323–1479</td>
<td>748</td>
<td>332</td>
</tr>
<tr>
<td>Beds/all medical staff</td>
<td>323–1479</td>
<td>733</td>
<td>357</td>
</tr>
<tr>
<td>Specimens/consultants</td>
<td>34–127k</td>
<td>62k</td>
<td>20k</td>
</tr>
<tr>
<td>Specimens/all medical staff</td>
<td>29–127k</td>
<td>60k</td>
<td>28k</td>
</tr>
</tbody>
</table>

\( k = 1000. \)

### Discussion

There is no satisfactory and widely accepted method of measuring the medical staff workload in a microbiology department. WELCAN is the best available system to measure the workload for the technical staff but it does not really address the need to measure medical staff workload.

The Royal College of Pathologists has made staffing level recommendations that, for medical microbiology, refer to the served population. Of the three workload indices that we have considered in this report, the population is the least reliable. Hospital beds and laboratory specimens can be easily counted, but identifying and counting the served population is more difficult and arbitrary: in many areas, especially urban areas, there are no clear-cut catchment boundaries and provider units are increasingly eager to attract patients from outside their traditional catchment area. Furthermore, different medical specialties in the same hospital often have different catchment areas and the microbiology laboratory itself may serve the local units and general practitioners but also offer reference diagnostic services to a larger area. Of the 14 job descriptions examined for this report, 13 included population figures, but it was obvious that there was no uniformity in the way this information was gathered as some job descriptions referred to resident others to served population or were non-specific.

The number of specimens, rather than the population served, formed the basis of the Royal College of Pathologists' recommendation for medical staffing in histopathology. Basing medical staffing recommendations for histopathology on specimen counts may be imprecise and may not achieve universal consensus, but at least may help to identify maximum workloads beyond which good practice is definitely threatened. In microbiology many of the medical staff activities, such as clinical advice and control of infection are not necessarily related to the number of specimens; therefore, taking into account the number of hospital beds as well is certainly justified for this specialty.

In this report registrars and senior registrars were arbitrarily counted as 0·4 and 0·6, respectively, and this was added to the number of consultants who were counted as one if full-time. The rationale for counting junior doctors as a fraction is that a substantial proportion of their time (and of their trainees) should be spent in educational activities. Since 1 April 1993, junior doctors' basic salary has been charged to the employing hospital as a 0·5 fraction for all grades, but it is anticipated that at a later stage different fractional charges could be used for different grades and specialties.

Three departments had one to three ratios below the "normal" range, including two in hospitals of below average size with single-handed consultants: this situation may be related to the fact that it may not be possible to establish part-time posts, but the need to provide a year-round cover must also be taken into account. Two departments had all four ratios above the "normal" range. These two single-handed departments dealt with 1319 and 1479 beds (mainly acute beds disseminated in a number of units) and handled 100 000 and 127 000 specimens, respectively: a very good case for a second consultant microbiologist could be made.

It is difficult to make medical staffing recommendations for microbiology departments. There are limitations in the use of the number of specimens and the number of beds as workload indices, because different types of specimens and different types of beds may create a different demand for medical staff time. Not only was a detailed breakdown of the nature of specimens and beds not present in every job description, however, but also it would be impossible to quantify these differences. I suggest that both hospital beds and laboratory specimens (despite their limitations) should be used as a basis for medical staffing recommendations instead of population figures. This analysis of 14 job descriptions suggests that there is a considerable variation in the medical staff workload of different hospitals.

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4 Director of Health Care/Medical Director, NHS Management Executive. Funding of hospital medical and dental training grade posts. EL(92)65. London: Department of Health, 1992.
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