If the NHS introduced a ‘50 procedures a year’ policy, what proportion of consultant firms would be affected?

Andrew Rouse, Richard Wilson and Andrew Stevens

Abstract

Background Governments, insurers, quality assurance agencies and others have used the higher volume = better quality relationship as a basis for health policy. This relationship is probably real enough to justify these policies. However, even if it were not real, there are other reasons why these and other organizations such as the National Health Service (NHS) may favour high-volume providers. This paper attempts to answer the question: ‘If, for common elective procedures, the NHS instituted a high-volume purchasing policy that requires consultant firms to perform a minimum of “50 procedures a year”, what proportion of consultant firms would be affected?’ The aims of this study were to estimate the proportion of NHS consultant firms that perform common elective procedures less than 50 times a year and to estimate the proportion of firms that would have to stop providing these procedures if a ‘50 procedures a year’ purchasing policy were introduced.

Method A descriptive analysis was carried out and modeling was performed on data stored in an NHS health episode statistics database of patients treated in West Midlands NHS facilities. For each of 12 common elective procedures we assumed that a volume threshold of at least 50 a year were set, and calculated the proportion of NHS consultant firms undertaking each procedure who performed less than 50 of those procedures each year and the proportion of firms who would have had to stop providing each procedure.

Results All firms performing some procedures, e.g. cataract extraction, did so at least 50 times a year. By contrast, no firm repaired more than 50 recurrent inguinal hernias a year. If a volume threshold of at least 50 procedures a year were set for a basket of 12 common elective procedures, then about 40 per cent of firms would no longer be eligible to provide a procedure. Even if a lower ‘one a month’ threshold were set, about 20 per cent of firms would still not be eligible to provide that procedure.

Conclusion Introduction of a high-volume policy would affect a considerable number of firms, as many NHS consultant firms perform some common elective procedures infrequently. Some consultants would see the introduction of a high-volume policy as an opportunity to further specialize and super-specialize. Others would see it as a policy that restricts them to providing a narrower range of procedures, makes their professional practice less interesting, and reduces their professional autonomy. Postgraduate training institutions need to consider the possibility and implications of high-volume policies, as many junior doctors would probably need to learn to provide a narrower range of skills than at present.

Keywords: high volume, NHS reorganizations, surgical specialization

Background ‘I would like my thyroid taken out by someone who does 50 operations a year rather than five’ (Maran, quoted in Ref. 1).

For over 20 years it has been suggested that hospitals performing higher volumes of specific surgical procedures have lower mortality rates. Since then insurers, quality assurance agencies and others have used the ‘higher volume = better quality’ relationship as a basis for policy making. Organizations representing clinical specialists have begun to set minimum volume thresholds for their members, and quality assurance organizations often stipulate that providers reach certain volume requirements. Patient advocacy groups advocate the relationship, and governments have started to pass statutes imposing volume thresholds. In 1995 the UK Government implemented the Calman–Hine initiative in accord with the belief that the higher volume = better quality relationship applies to cancer services. The higher volume = better quality relationship is probably real enough to justify these policies. Surprisingly, however, the validity of the relationship is supported by only a modest amount of research evidence. Nevertheless, even if convincing evidence never emerges there are other reasons why purchasers of health services may favour high-volume providers:

1. In other walks of life, e.g. banking, air transport, CD manufacturing, the high volume = better quality relationship is clearly true;

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threshold, how many consultant firms would have been ineligible providers of certain procedures?

Table 2 provides data that answer the question: ‘If purchasers had adopted a high-volume policy based on a “50 a year” threshold, how many consultant firms would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) performing thyroid operations would have been ineligible to provide this service. Eighty-two per cent of firms (95/116) perfo

Discussion

If purchasers and quality assurance agencies introduced a high-volume policy, there is no reason to believe that the total number of consultant firms needed by a health service would alter. However, the findings of this study suggest that the case mix and work patterns of many firms would have to alter sig-

Results

What proportion of NHS consultant firms performed specific procedures less than 50 times a year?

The data in Table 1 show that, at one extreme, no firm removed cataracts less frequently than 50 times a year. At the other extreme, we find that no firm repaired more than 50 recurrent inguinal hernias a year. Only 2 per cent of consultant firms (two) performed more than 50 thyroid procedures a year. Even if a lower threshold of one a month were set, our data show that just 28 per cent of these firms (32/116) undertaking thyroid procedures would have been considered high-volume providers.

What proportion of consultant firms would have been ineligible providers of certain procedures?

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Method

Sample

We obtained data derived from the 5.1 million residents of the West Midlands Region of the NHS. This population comprises more than 9 per cent of the UK population. Its demographic composition and health service provision is typical of that in the United Kingdom. It is therefore likely that the findings of this study will reflect those that would be found elsewhere in the United Kingdom.15 17

Thresholds

What is high volume? We were unable to identify research-derived thresholds for common elective procedures. We therefore discussed the high-volume concept with lay informants and clinical colleagues. They shared the view that they would not elect to be treated by a doctor performing a specified procedure less than 50 times a year. Therefore, although we have investigated the consequence of using other thresholds, for this paper we use a ‘50 procedures a year’ threshold to define high volume. A reference in the literature suggests that 50 a year is credible, at least for thyroid procedures.1

Data – the NHS hospital episode dataset (HES)

Details on 1.5 million procedures performed in West Midlands NHS facilities between April 1994 and March 1997 were extracted from the HES dataset. These data include the consultant identification code, operation date and Office of Population Censuses and Surveys (OPCS; now the Office for National Statistics) procedure code. We combined OPCS code groups into clinically meaningful procedure groups. For each procedure, we calculated the annual average number of procedures performed by consultant firms undertaking that procedure. We report results for 12 common elective procedure groupings: cataract removal; excision of gall bladder; fibre-optic procedures of the upper gastrointestinal (GI) tract; ligation or stripping of varicose veins; primary inguinal hernia repair; prosthetic replacement of knee; repair recurrent inguinal hernia; thyroid procedures; tonsillectomy; total prosthetic replacement of hip; transurethral resection of prostate; vaginal hysterectomy.

We felt we could not calculate meaningful annualized volumes for consultant firms that had performed for less than 1 year so we excluded the 4 per cent of procedures undertaken by these firms from our analysis. We also had to exclude 1 per cent of procedures because data were incomplete. HES protocols can only attribute data to consultant firms. Therefore this study is only able to report at the level of the consultant firms, not at the level of individual doctors. (Consultant firms consist of a single consultant and several non-consultant doctors.) The HES database does not capture procedures carried out in non-NHS facilities. However, as less than 2 per cent of all medical procedures performed in the West Midlands take place in non-NHS facilities errors associated with not including these will be small.
INTRODUCTION OF A HIGH-VOLUME POLICY

significantly. Least affected would be above-threshold firms, as it is unlikely that anyone would ask them to perform fewer specified procedures (although some may assume the workload of below-threshold firms). In contrast, sub-threshold firms would be affected greatly; some more than others. Some sub-threshold firms would become high-volume providers but the remainder would become ineligible to provide the procedure. For the sub-threshold firms to become high-volume providers they would have to transfer some general-service workload to other firms – presumably to sub-threshold firms no longer eligible to provide the procedure.

Table 2 shows the minimum number of firms who would become ineligible providers of a procedure. It assumes that some sub-threshold firms will increase their activity to 50 a year and carry out the procedures previously undertaken by all sub-threshold firms. Data from the table suggest that if a ‘50 a year’ threshold were adopted for the basket of 12 procedures, at least 40 per cent of consultant firms would become ineligible providers of at least one procedure. Even if the threshold were lower – one a month – this figure is likely to be 20 per cent.

Redistributing the workloads of so many firms would be a considerable task for health service managers and would meet resistance from some consultants, especially those who would have to change their working practices. Many will fear that providing a narrow range of procedures will reduce their job satisfaction. Some may even feel that because they are to offer

Table 1 Percentage of low-volume consultant firms (firms undertaking less than 50 procedures a year), and percentage of all procedures undertaken by these low-volume firms

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Total no. procedures undertaken annually*</th>
<th>% of low-volume firms (firms performing &lt;50 procedures a year)</th>
<th>% of all procedures performed by low-volume firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair recurrent inguinal hernia</td>
<td>1919 (124)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Procedures on thyroid gland</td>
<td>2248 (116)</td>
<td>98</td>
<td>84</td>
</tr>
<tr>
<td>Vaginal hysterectomy</td>
<td>6508 (100)</td>
<td>91</td>
<td>73</td>
</tr>
<tr>
<td>Prosthetic replacement of knee</td>
<td>8627 (109)</td>
<td>89</td>
<td>71</td>
</tr>
<tr>
<td>Excision of gall bladder</td>
<td>12811 (136)</td>
<td>82</td>
<td>62</td>
</tr>
<tr>
<td>Fibre-optic procedures of the upper GI tract</td>
<td>138976 (582)</td>
<td>76</td>
<td>13</td>
</tr>
<tr>
<td>Total prosthetic replacement of hip</td>
<td>14493 (122)</td>
<td>70</td>
<td>45</td>
</tr>
<tr>
<td>Primary inguinal hernia repair</td>
<td>22974 (169)</td>
<td>50</td>
<td>21</td>
</tr>
<tr>
<td>Transurethral resection of prostate</td>
<td>6071 (30)</td>
<td>37</td>
<td>5</td>
</tr>
<tr>
<td>Ligation or stripping of varicose veins</td>
<td>42985 (133)</td>
<td>35</td>
<td>8</td>
</tr>
<tr>
<td>Tonsillectomy</td>
<td>27706 (452)</td>
<td>9</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Cataract removal</td>
<td>93803 (58)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Number of firms given in parentheses.

Table 2 Percentage of firms who would be ineligible to perform a procedure if a ‘50 a year’ threshold were introduced

<table>
<thead>
<tr>
<th>Procedure</th>
<th>No. of procedures undertaken annually by sub-threshold firms*</th>
<th>Minimum no. of firms who would be ineligible to provide procedure†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair recurrent inguinal hernia</td>
<td>807 (124)</td>
<td>108 (87)</td>
</tr>
<tr>
<td>Procedures on thyroid gland</td>
<td>957 (114)</td>
<td>95 (82)</td>
</tr>
<tr>
<td>Vaginal hysterectomy</td>
<td>1747 (91)</td>
<td>56 (67)</td>
</tr>
<tr>
<td>Fibre-optic procedures of the upper GI tract</td>
<td>6445 (445)</td>
<td>316 (54)</td>
</tr>
<tr>
<td>Prosthetic replacement of knee</td>
<td>2353 (97)</td>
<td>50 (46)</td>
</tr>
<tr>
<td>Excision of gall bladder</td>
<td>2921 (112)</td>
<td>54 (40)</td>
</tr>
<tr>
<td>Total prosthetic replacement of hip</td>
<td>2453 (87)</td>
<td>38 (30)</td>
</tr>
<tr>
<td>Transurethral resection of prostate</td>
<td>120 (11)</td>
<td>9 (30)</td>
</tr>
<tr>
<td>Primary inguinal hernia repair</td>
<td>1755 (84)</td>
<td>49 (29)</td>
</tr>
<tr>
<td>Ligation or stripping of varicose veins</td>
<td>1232 (46)</td>
<td>21 (16)</td>
</tr>
<tr>
<td>Tonsillectomy</td>
<td>41 (5)</td>
<td>4 (8)</td>
</tr>
<tr>
<td>Cataract removal</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

*Number of firms performing <50 a year given in parentheses.
†Percentage of all firms performing becoming ineligible given in parentheses.

Values in column 2 are calculated as follows: for example, for fibre-optic procedures of the upper GI tract, column 1 shows that 445 sub-threshold firms undertook 6445 procedures annually. If the 6445 procedures being performed by sub-threshold firms were reallocated to firms working at or above the threshold of 50 a year, then a maximum of 129 (6445/50) firms would be needed, i.e. 316 fewer. As Table 1 shows that 582 firms performed this procedure if a threshold of 50 a year were set, at a minimum, 54 per cent (316/582) fewer firms would be needed.
so limited a range of services their role has been reduced to that of a technician or assembly-line worker. On the other hand, a few consultants will see a high-volume policy as an opportunity to super-specialize, experiment and develop new methods of delivering services. Many special interest groups and non-consultant staff would also oppose the numerous changes that the NHS would have to make to implement a high-volume policy – especially if these changes extend to the closure of a hospital department or hospital.

After the introduction of a high-volume policy, many consultants will perform a narrower range of procedures than at present. For instance, if a ‘50 a year’ threshold had applied to surgeons performing thyroid operations then about 82 per cent would not have been eligible to perform this procedure. It could therefore be argued that fewer junior doctors – possibly 82 per cent fewer – would need to learn how to operate on the thyroid. Postgraduate training institutions need to consider this finding. After all, why teach junior doctors a skill that they will not use as consultants?

**Key messages**

- There are many and varied reasons why health services purchasers may consider purchasing services only from high-volume providers.
- If a high-volume policy were introduced the case mix of services provided by low-volume firms would change. Some would become high-volume providers; others would have to stop providing specific services. There is no reason to believe that the number of consultant firms needed by a health service would change.
- The number of consultant firms affected by the introduction of a high-volume policy would depend on the volume threshold set. If a ‘50 a year’ threshold were set for a basket of common elective procedures as many as 40 per cent of present consultant firms may become ineligible providers. Even if a lower threshold of one a month were set, about 20 per cent consultant firms may become ineligible providers.
- If a high-volume policy were introduced, many consultant firms would provide a narrower range of services than at present. Postgraduate institutions providing specialist training to doctors would need to revise training programmes to recognize this, and consider reducing the range of procedures that many trainees are taught.

**Conclusion**

Many consultant firms performing common elective procedures undertake those procedures less frequently than 50 times a year. If the purchasing authorities and quality assurance agencies set a ‘50 a year’ threshold for a basket of common procedures it is likely that about 40 per cent of consultants would have to cease providing some of those procedures.

**Acknowledgements**

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