**Report Supplementary Materials 16**

**SCENARIO ANALYSIS EVALUATING THE 100-THRESHOLD RECONFIGURATION OF SERVICES**

Based on our analysis of HES data, there was greater benefit from increasing the recommended AAA volume threshold from 60 cases per year to 100 cases per year. Those with AAA volumes above 100 cases per year performed significantly better than the lower volumes whereas there was still considerable variation amongst those centres having AAA volume between 60 and 100 cases per year. Thus, a further scenario analysis was undertaken to consider the effect of reconfiguring vascular services to meet a threshold of 100 AAA repairs per year. Using the same methods described earlier, three decision options were specified: (1) the baseline configuration with 72 active sites in 2017/18; (2) the new configuration to meet the 60 AAA repairs threshold (move major vascular interventions from 23 sites to the remaining 49 sites compared to the baseline); and (3) the new configuration to meet the 100 AAA repairs threshold (move major vascular interventions at 34 sites to the remaining 38 sites compared to the baseline). Figure 1 illustrates the AAA volume distribution in the baseline configuration, the new 60-threshold configuration and the new 100-threshold configuration. Table 1 describes the changes with each region moving from the baseline configuration to the 60-threshold reconfiguration and the 100-threshold reconfiguration.

Figure 1: AAA volume distribution in the baseline and the new configuration



Table 1: Changes in each region from the reconfiguration

|  |  |
| --- | --- |
|  | **Active centres** |
| **Region** | **Baseline** | **New 60-threshold** | **New 100\_threshold** |
| East Midlands | 6 | 4 | 3 |
| East of England | 11 | 7 | 6 |
| London | 11 | 5 | 5 |
| North East | 4 | 3 | 2 |
| North West | 10 | 7 | 5 |
| South East | 7 | 6 | 5 |
| South West | 9 | 6 | 5 |
| West Midlands | 7 | 6 | 4 |
| Yorkshire Humber | 7 | 5 | 3 |
| **Total** | **72** | **49** | **38** |

Table 2 shows the results of the deterministic model comparing the three decision options when the whole combined cohort of AAA, PAD, and CAD was considered. Compared to the 60-threshold reconfiguration, the 100-threshold reconfiguration slightly increased the length of stay (+0.2 day per patient); it reduced in-hospital death (-0.21%) and had positive impact on long-term survival of those who survived the index repairs leading to an increase in the total of QALYs (+0.0177 additional discounted QALYs gained per patient). The 100-threshold reconfiguration (compared to the 60-threshold reconfiguration) increased to the costs of index admission (+£615 per patient) but saved resources on other longer-term costs. This led to a reduction in the total costs when discounting was not included (-£310 per patient) but an increase in the total costs when discounting was included (+ £165 per patient). The 100-threshold reconfiguration (compared to the 60-threshold reconfiguration) increased the total travel distance of patients by 5.6 miles per patient.

Table 2: Comparing 100-threshold configuration vs 60-threshold configuration vs baseline

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Results (All cohort)** | **Baseline** | **New 60** | **New 100** | **60 vs base** | **100 vs base** | **100 vs 60** |
| Number of patients | 34712 | 34712 | 34712 | 0 | 0 | 0 |
| AAA volume per site | 92 | 135 | 174 | 43 | 82 | 39 |
| Mean age | 70 | 70 | 70 | 0 | 0 | 0 |
| % Male | 68% | 68% | 68% | 0% | 0% | 0% |
| Length of Stay | 8.5 | 8.8 | 9.0 | 0.3 | 0.5 | 0.2 |
| % Hospital Death | 6.85% | 6.60% | 6.40% | -0.25% | -0.46% | -0.21% |
| Travel Distance (miles) | 44.0 | 53.6 | 59.0 | 9.6 | 15.0 | 5.4 |
| Life Years (undiscounted) | 16.728 | 16.784 | 16.830 | 0.056 | 0.102 | 0.046 |
| QALYs (undiscounted) | 10.670 | 10.714 | 10.750 | 0.044 | 0.080 | 0.036 |
| Life Years (discounted) | 11.092 | 11.122 | 11.146 | 0.030 | 0.054 | 0.024 |
| QALYs (discounted) | 7.0631 | 7.085 | 7.1027 | 0.0219 | 0.0396 | 0.0177 |
| Costs of index admission | £10,987 | £11,687 | £12,302 | £700 | £1,315 | £615 |
| Total Costs (undiscounted) | £66,864 | £66,440 | £66,131 | -£424 | -£734 | -£310 |
| Total Costs (discounted) | £43,964 | £44,124 | £44,289 | £160 | £325 | £165 |
| Incremental Costs per QALYs (ICER) | **£7,312.9** | **£8,218.0** | **£9,337.8** |

The 100-threshold reconfiguration was associated with an incremental cost per QALY of £9,338 per QALY compared to the 60-threshold reconfiguration. The results suggest that when comparing the three strategies, the 100-threshold reconfiguration is the most cost-effective option. However, it should be noted that we have not considered the feasibility of such reconfigurations of services (i.e. no consideration of capacity constraints) and the model’s results are sensitive to several important assumptions such as whether reconfiguration affecting the proportion of no-operation deaths.