Technology Assessment Report commissioned by the NHS R&D HTA Programme on behalf of the National Institute for Health and Clinical Excellence

The use of bevacizumab and cetuximab for the treatment of metastatic colorectal cancer (Project 04/46).

Response to manufacture comments modelling the impact of the proposed Roche Registry Programme on the cost-effectiveness of Avastin in the first-line treatment of metastatic colorectal cancer

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MODELLING THE IMPACT OF THE ROCHE REGISTRY PROGRAMME ON THE COST-EFFECTIVENESS OF AVASTIN

1.1 Overview

This document has been prepared at the request of Roche and NICE to provide additional input into the current appraisal of bevacizumab (Avastin) in the first-line treatment of metastatic colorectal cancer in England and Wales. The document presents a revised analysis of the ScHARR bevacizumab model developed to support the NICE technology appraisal,[1] incorporating the expected cost reduction for the NHS resulting from the introduction of Roche's proposed Avastin Registry Programme (ARP). This registry programme includes arrangements for making payments to NHS trusts to cover the administration costs of bevacizumab and other associated infusional drugs given alongside bevacizumab-including regimens.

The methods used to evaluate the impact of the ARP on the cost-effectiveness and cost-utility of bevacizumab are described in Section 1.2. The base case cost-effectiveness results based upon the original ScHARR bevacizumab model are presented in Section 1.3. The results of the revised ARP analysis are presented in Section 1.4. The impact of the ARP on decision uncertainty is presented in Section 1.5.

1.2 Methods

In line with the revisions to the ScHARR model proposed by Roche,[2] the ARP analysis presented here assumes that the costs to the NHS relating to the administration of bevacizumab and other chemotherapies given alongside bevacizumab is zero. In addition, the costs of pharmacy preparation and dispensing for bevacizumab-including regimens are assumed to be zero. The chemotherapy administration and pharmacy costs for non-bevacizumab including regimens remain at their estimated values. All other assumptions are as reported by Tappenden et al.[1]

1.3 Cost-effectiveness results presented in the ScHARR Technology Assessment Report

Table 1 presents the central estimates of marginal cost-effectiveness and cost-utility for bevacizumab as presented within the Technology Assessment Report.[1]

Table 1 Central estimates of cost-effectiveness for bevacizumab

Treatment arm	Mean LYG	Mean QALYs gained	Mean total cost	Marginal cost per LYG	Marginal cost per QALY gained
Study AVF2107g					
Bevacizumab+IFL	1.98	1.44	£43,140.09	**£46,853.48**	**£62,857.10**
IFL+placebo	1.57	1.13	£23,779.36		
Difference	0.41	0.31	£19,360.73		
Study AVF2192g					
Bevacizumab+5-FU/FA	1.59	1.19	£37,074.28	**£84,395.74**	**£88,435.85**
5-FU/FA	1.41	1.01	£21,459.35		
Difference	0.19	0.18	£15,614.94		

The model suggests that treatment with bevacizumab plus IFL costs approximately £19,361 more than treatment with IFL over the lifetime of the average patient, and results in an estimated 0.41 additional LYGs. The model suggests that bevacizumab in combination with IFL costs an estimated £46,854 for each additional LYG when compared to IFL alone. The addition of bevacizumab to IFL is estimated to produce an additional 0.31 QALYs. The model suggests that bevacizumab in combination with IFL costs an estimated £62,857 per QALY gained when compared to IFL alone.

The health economic model suggests that treatment with bevacizumab plus 5-FU/FA costs approximately £15,615 more than treatment with 5-FU/FA alone over the lifetime of the patient, and results in an estimated 0.19 additional LYGs. The model suggests that bevacizumab in combination with 5-FU/FA costs an estimated £84,396 per LYG when compared to 5-FU/FA alone. When survival is adjusted to account for differences in HRQoL between disease states, the addition of bevacizumab to 5-FU/FA is estimated to produce an additional 0.18 QALYs. The model suggests that bevacizumab in combination with 5-FU/FA costs an estimated £88,436 per QALY gained when compared to 5-FU/FA alone.

1.4 Central estimates of cost-effectiveness based on the proposed ARP arrangements

Table 2 presents estimates of the marginal cost-effectiveness and cost-utility of bevacizumab assuming that all chemotherapy administration and pharmacy costs for bevacizumab-including regimens are borne by Roche.

Table 2 Central estimates of cost-effectiveness based on the proposed ARP arrangements

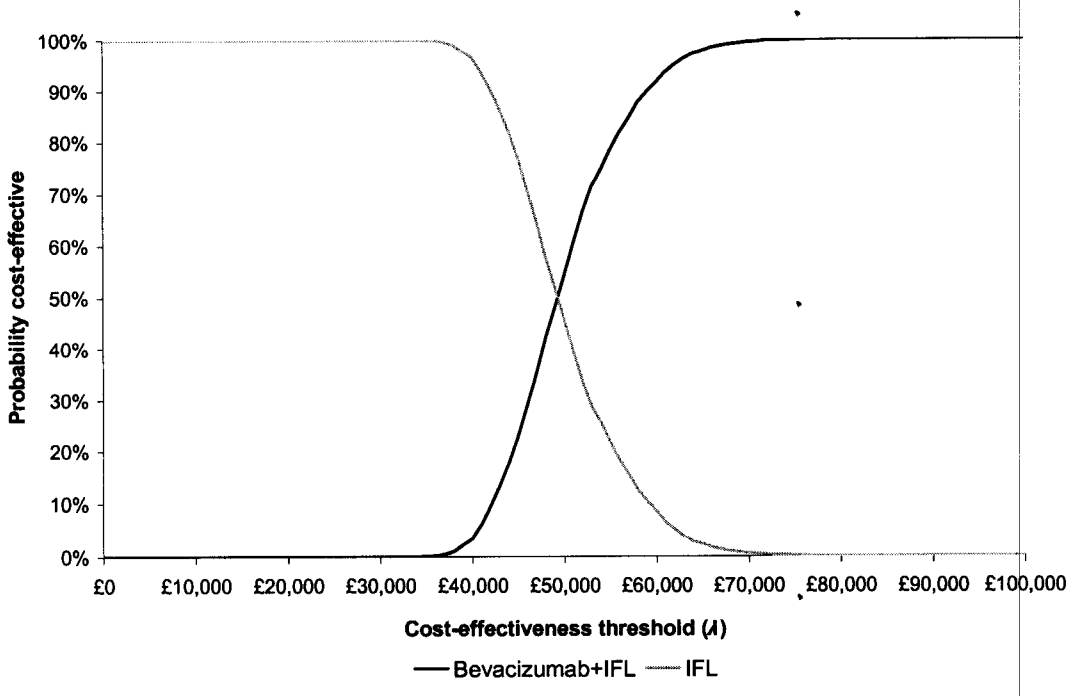
Treatment arm	Mean LYG	Mean QALYs gained	Mean total cost	Marginal cost per LYG	Marginal cost per QALY gained
Study AVF2107g					
Bevacizumab+IFL	1.98	1.44	£38,932.67	**£36,671.42**	**£49,197.18**
IFL+placebo	1.57	1.13	£23,779.36		
Difference	0.41	0.31	£15,153.31		
Study AVF2192g					
Bevacizumab+5-FU/FA	1.59	1.19	£33,650.56	**£65,891.16**	**£69,045.43**
5-FU/FA	1.41	1.01	£21,459.35		
Difference	0.19	0.18	£12,191.21		

Clearly the adoption of the ARP will reduce the costs of treating patients with bevacizumab-including therapy in the first-line setting. Based upon the results of the ScHARR model, the ARP is expected to reduce the marginal cost of bevacizumab plus IFL by around £4,207, resulting in a marginal cost-effectiveness of **£36,671 per LYG** and a marginal cost-utility of **£49,197 per QALY gained** when compared to IFL alone. The ARP is expected to reduce the marginal cost of bevacizumab plus 5-FU/FA by around £3,424. This results in a marginal cost-effectiveness for bevacizumab plus 5-FU/FA of **£65,891 per LYG** and a marginal cost-utility of **£69,045 per QALY gained** when compared to 5-FU/FA alone.

1.5 Impact of the ARP arrangements on decision uncertainty

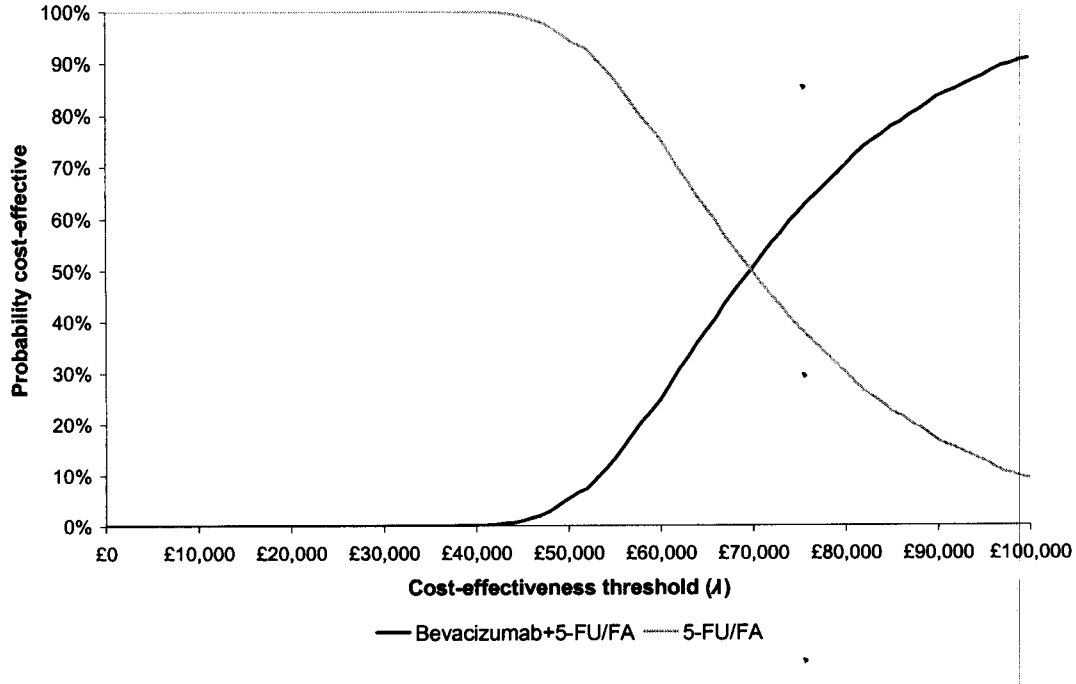
Figure 1 presents cost-effectiveness acceptability curves (CEAccs) for bevacizumab plus IFL versus IFL alone, incorporating the cost reductions resulting from the proposed ARP arrangements.

Figure 1 Marginal CEAccs for bevacizumab plus IFL versus IFL including ARP arrangements



The CEAccs suggest that the probability that bevacizumab plus IFL has a marginal cost-effectiveness that is better than £30,000 is close to zero. Figure 2 presents CEAccs for bevacizumab plus 5-FU/FA versus 5-FU/FA alone, incorporating the cost reductions resulting from the proposed ARP arrangements.

Figure 2 Marginal CEAccs for bevacizumab plus 5-FU/FA versus 5-FU/FA including ARP arrangements



The CEAccs suggest that the probability that bevacizumab plus 5-FU/FA has a marginal cost-effectiveness that is better than £30,000 is close to zero.

1.6 Additional considerations

Within the ScHARR bevacizumab model, the cost of an outpatient attendance for chemotherapy administrated was sourced from PSSRU (cost=£114 per visit).[3] ***(CIC information removed).*** The greater the cost of an outpatient attendance, the greater the potential reduction afforded by the ARP. Consequently, higher cost estimates result in more favourable cost-effectiveness and cost-utility estimates for bevacizumab. ***(CIC information removed).***

(CIC information removed)

1.7 References

1. Tappenden P, Jones R, Paisley S, Carroll C. The use of bevacizumab and cetuximab for the treatment of metastatic colorectal cancer: Assessment Report submitted to the National Institute for Health and Clinical Excellence. 2006.
2. Catchpole P. Roche Avastin Registry Programme: Letter to Carole Longson. 7th April 2006.
3. Netten, A, Dennett, J, and Knight, J. Unit costs of health and social care. PSSRU: Kent. 1999.
4. Roche. Roche Avastin Registry Programme for patients treated with bevacizumab (Avastin®) for the treatment of metastatic colorectal cancer. Received 12th April 2006.
5. ***(CIC information removed)***