

Economic Evaluation of DARBEPOETIN ALFA (ARANESP®) Compared to EPOETIN ALFA (ERYPO®) and EPOETIN BETA (NEORECORMON®) in the Treatment of Chemotherapy-induced Anemia (CIA) in Austria

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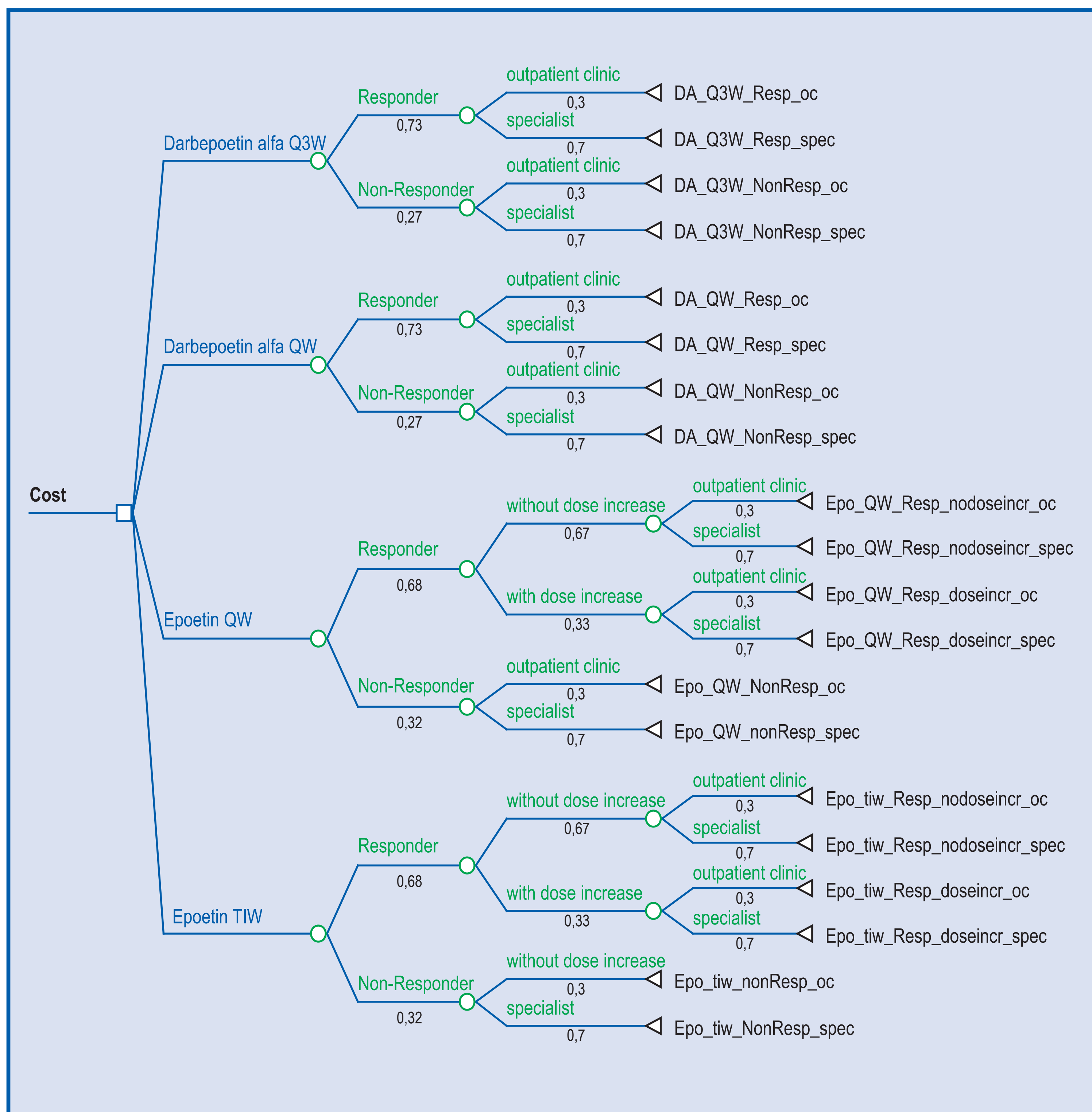
OBJECTIVE

Anemia is a common side effect observed in patients receiving myelosuppressive chemotherapy. In Austria this concerns approximately 22,290 cancer patients. Erythropoiesis-stimulating agents (ESAs) have become the standard of care for the treatment of CIA and for decreasing the need for blood transfusions. The purpose of this pharmacoeconomic analysis was to evaluate the cost-effectiveness of the long-acting erythropoiesis-stimulating agent (ESA) darbepoetin alfa (DA) 500 mcg once every 3 weeks (Q3W) and 150 mcg weekly (QW), and short-acting ESAs epoetin-alfa (EA) 40,000 IU QW, epoetin-beta (EB) 30,000 IU QW and 3-times weekly (TIW) for the treatment of CIA.

METHODS

A cost-consequence model was constructed using a decision-tree analysis. The treatment period considered was based on 12 weeks and was aligned with routine chemotherapy regimen administration. Model inputs included: medical treatment, outcomes, and healthcare service utilization from published clinical trials and summary of product characteristics recommendation. Effectiveness of therapeutic alternatives was determined by comparing haemoglobin response rates, defined as Hb \geq 12 g/dL or an increase of \geq 2 g/dL. Costs included direct medical costs (interventional drug, inpatient and outpatient consultations) and transportation costs. Direct medical costs are derived from a number of publicly available sources like tariff-catalogues of Austrian health insurance funds, official price list for pharmaceuticals (Warenverzeichnis) etc. Costs presented reflect 2010 data. The analysis was performed from the perspective of the Austrian health care system.

Figure 1: Model Design



Source: developed by IPF

The overall response rate is 73% for darbepoetin alfa (Lerchenmüller 2008, Glaspy 2005) QW and Q3W. No dose increase is intended. Non-Responders were identified after 9 weeks (Product Information). For epoetin alfa and beta the overall response rate amounts to 68% (Gabrilove 2001). Non-Responders were identified after 8 weeks (Product Information). Dose increase is intended after 8 weeks of therapy if hemoglobin did not increase by at least 1.0 g/dL (epoetin alfa: 40,000 IU to 60,000 IU and epoetin beta: 30,000 IU to 60,000 IU once weekly). 33.4% of patients received an increased dosage (Gabrilove 2001). Clinical Trials were selected on the basis of comparable patients groups according to age (60 yrs), baseline Hb level (9.5 g/dL) and treatment path. All patients suffered from nonmyeloid malignancies.

RESULTS

The average expected direct costs per patient were 3,675.43 € for darbepoetin alfa Q3W, 3,830.47 € for darbepoetin alfa QW, 4,209.03 € for epoetin-alfa QW, 4,239.72 € for epoetin-beta QW and 4,744.65 € for epoetin-beta TIW. Cost-savings associated with darbepoetin alfa Q3W were 4.05% relative to darbepoetin alfa QW, 14.33% to epoetin-alfa QW, 13.31% to epoetin-beta QW and 22.54% to epoetin-beta tiw. The cost per response amounts to 5,034.84 € per patient for darbepoetin alfa Q3W, 5,247.22 € for darbepoetin alfa QW, 6,308.87 € for epoetin-alfa QW, 6,234.89 € for epoetin-beta QW and 6,977.43 € for epoetin-beta TIW.

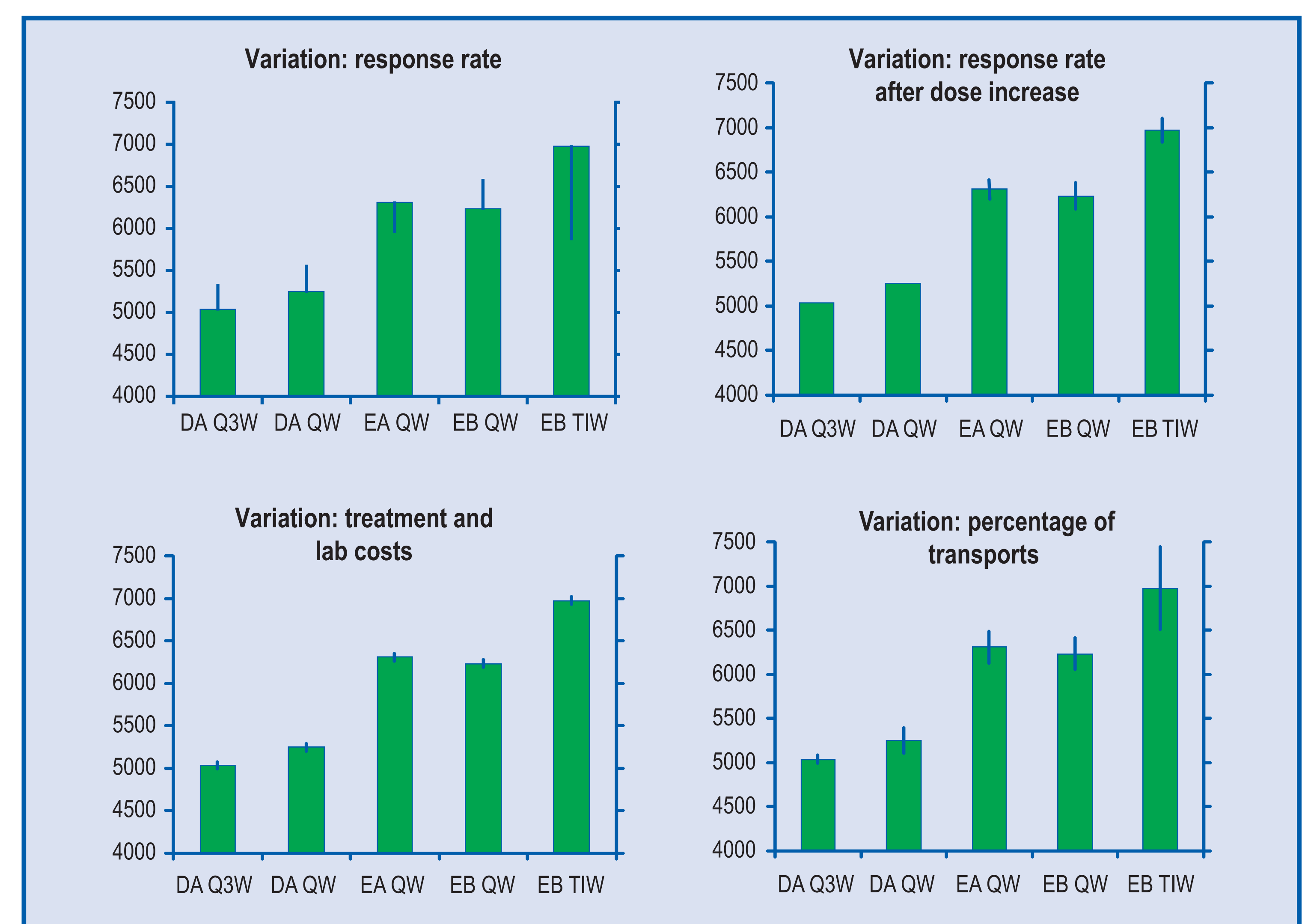
Table 1: Results

Comparator	Cost* (C) in €	Cost Difference (Δ C) in €	Response Rate (E)	Cost Per Response (C/E)
Darbepoetin alfa Q3W	3,675.43		73%	5,034.84
Darbepoetin alfa QW	3,830.47	155.04	73%	5,247.22
Epoetin-alfa QW 40,000 IU	4,209.03	614.60	68%	6,308.87
Epoetin-beta QW 30,000 IU	4,239.72	564.29	68%	6,234.89
Epoetin-beta TIW	4,744.65	1,069.22	68%	6,977.43

Source: IPF own calculations; * per patient

Figure 2 displays the deterministic sensitivity analysis. Results show that the model is not sensitive. Variations of the response rate, response rate after dose increase and costs have no influence on the results. Generally the deterministic sensitivity analyses show the robustness of the model.

Figure 2: Deterministic Sensitivity Analysis (costs per response)



CONCLUSION

In the treatment of CIA among cancer patients in Austria, darbepoetin alfa Q3W and QW can be expected to provide a more efficient use of healthcare resources compared to alternative treatment strategies such as epoetin-alfa and epoetin-beta.

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