NICE Single Technology Appraisal: tocilizumab for the treatment of systemic juvenile idiopathic arthritis

Probabilistic sensitivity analysis (PSA)

7 September 2011

Introduction

Probabilistic sensitivity analyses (PSAs) were run on the revised base case using the same parameter distributions as previously specified in our manufacturer submission.

In our original base case, 'starting' (i.e. baseline) CHAQ was assumed to be a fixed average for all patients. In the PSA associated with this original base case, the 'starting CHAQ' figure was varied according to a normal distribution.

In our revised base case, baseline CHAQ scores are simulated for a hypothetical distribution of patients to allow apportionment to CHAQ categories. Our new PSA has been revised to allow this simulation to continue. That is, no additional variation is applied to the hypothetical baseline CHAQ distribution on each PSA 'run', but the distribution of 'starting' CHAQ is recalculated at each 'run'.

All other parameters in the PSA are varied as per our original base case. No variation is applied to new parameters introduced in this revised base case, namely:

- CHAQ category cut-points (which are used to define CHAQ-based health states)

- Regression coefficients (which are used to estimate a distribution of CHAQ scores post based on treatment response and baseline CHAQ)

Results

Analysis on revised base case without patient access scheme (PAS)

A PSA of 1,000 samples was carried out on the revised base case comparing the **tocilizumab→anakinra (TA)** treatment strategy with **anakinra (A)** alone. The cost-effectiveness acceptability analysis showed that 23.6% of samples were expected to be cost-effective at a willingness-to-pay (WTP) threshold of £20,000 per QALY, and 47.8% of samples were expected to be cost-effective at a threshold of £30,000 per QALY. The PSA scatterplot and cost-effectiveness acceptability curves (CEACs) are shown in Figure 1 and Figure 2.

Figure 1. PSA scatterplot - base case without PAS
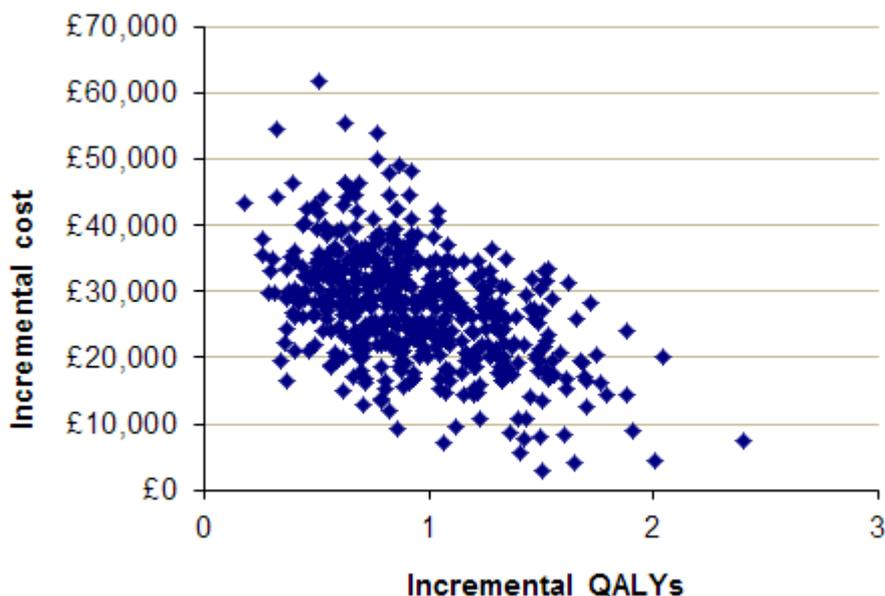
Figure 2. CEAC - base case without PAS
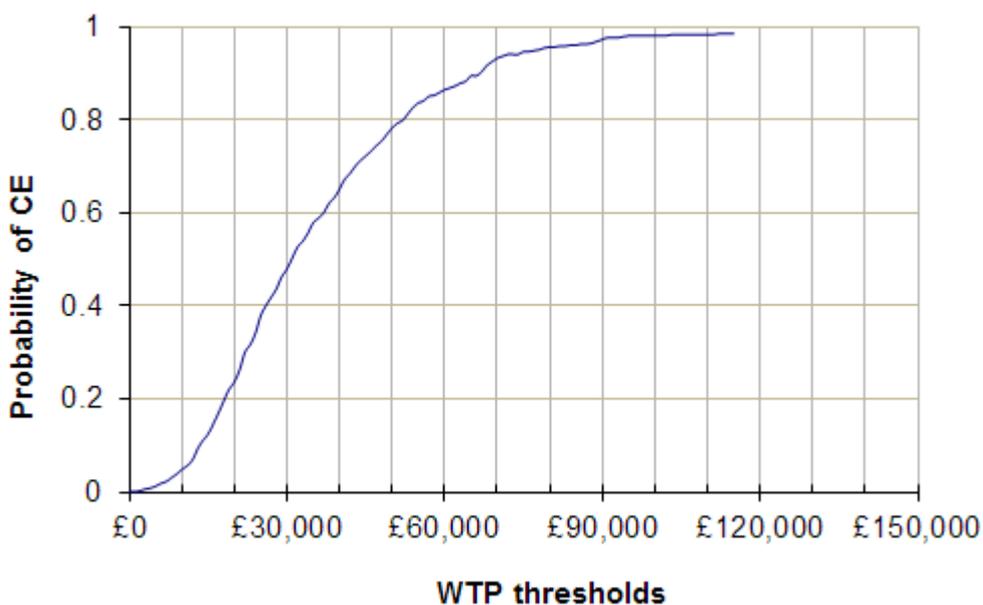
Analysis on revised base case with patient access scheme (PAS)

The PSA was repeated with the PAS applied. The probabilities of being cost-effective at £20k and £30k per QALY thresholds were 57.3% and 75.3% respectively. PSA scatterplots and CEACs are shown in Figure 3 and Figure 4.

Figure 3. PSA Scatterplot - base case with PAS
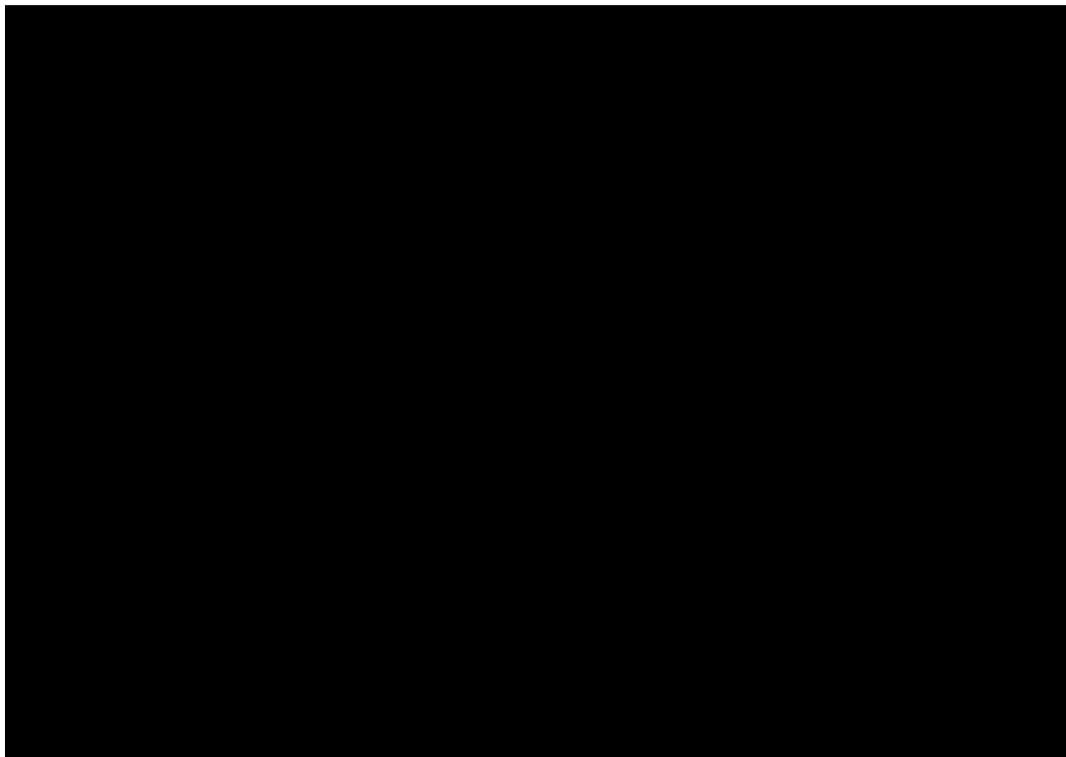
Figure 4. CEAC - base case with PAS