Economic consequences of the progression of rheumatoid arthritis in Sweden
Kobelt G, Eberhardt K, Jonsson L, Jonsson B

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Unspecified treatments which affect the progression of rheumatoid arthritis (RA).

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
A Swedish cohort of RA patients was used to derive the basic dataset for illustration of disease progression as well as treatment costs and utilities.

Setting
The practice setting was unspecified. The economic study was carried out in Sweden.

Dates to which data relate
Effectiveness estimates were based purely on the authors’ assumptions. Resource use data were collected during the period 1985-1993. 1997 prices were used.

Source of effectiveness data
The estimates of effectiveness were not based on any studies but on opinion concerning hypothetical interventions.

Modelling
A Markov model was developed to project effectiveness and cost estimates beyond the timescale of the cohort study, using transition probabilities and effectiveness estimates for hypothetical interventions.

Methods used to derive estimates of effectiveness
Authors’ assumptions were used to derive estimates of effectiveness for the hypothetical interventions used.

Estimates of effectiveness and key assumptions
Treatments A and B have the same magnitude of effect but differ in the duration of their effect. Treatment A decreases the probabilities of transition to more severe states by 30% per year for 5 years, while treatment B decreases probabilities by 30% for 2 years. Treatments C and D have the same magnitude of effect (10%). Treatments E and F differ in the magnitude of their effect (20% and 30%, respectively).
Measure of benefits used in the economic analysis
The simulation model presented expresses the benefits of an intervention in terms of the quality-adjusted life years (QALYs) gained, compared with the base case of no intervention or compared with another intervention. Utilities were estimated in a separate study in which 100 consecutive patients were enrolled. The aim of the separate study was to estimate mean utility values for the Markov states used in the simulation model, rather than to assess the utility of a specific cohort of patients. Patients were asked to complete the Stanford Health Assessment Questionnaire and the EuroQol (EQ-5D).

Direct costs
Costs were discounted at 3%. Quantities and costs were not analysed separately. Health service costs were included and the estimation of costs was derived using a Markov model. Inpatient costs were estimated from the number of hospital days due to RA between 2 follow-up visits as observed in the cohort study. Outpatient costs were based on visits, medication and drug monitoring related to RA. Costs for one month of treatment with each drug were calculated from the public price list, and costs for standard blood and liver enzyme tests required for each drug were obtained from the accounting department of Lund University Hospital.

Indirect Costs
Costs were discounted at 3%. The estimation of the indirect costs was derived using a Markov model. Work capacity was determined in the cohort study according to 14 different work-related situations.

Currency
Swedish Kroner (SEK).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
The incremental effects of the six hypothetical interventions were 0.0579 QALYs for treatment A, 0.0337 for B, 0.0187 for C, 0.0187 for D, 0.0380 for E and 0.0579 for F.

Cost results
The mean per patient costs per year over 5 years were SEK 10,543 for inpatient care, SEK 2,888 for medical visits, and SEK 964 for drugs. The mean per patient per year direct costs were SEK 73,520. The cost per year of lost work capacity was estimated as SEK 273,000, calculated from the average labour cost for this age group in 1994 inflated to 1997 prices. The mean per patient per year indirect cost over 5 years was SEK 234,326. The mean total costs over 5 years for the entire cohort were SEK 307,845 (costs undiscounted) and SEK 285,691 (costs discounted by 3%).

Synthesis of costs and benefits
Cost-effectiveness ratios were highly sensitive to the size of the health benefit. Treatment D had 10% effectiveness, which results in a cost per QALY of SEK 602,000 while treatment F with 30% effectiveness, produced cost savings. As expected, cost-effectiveness ratios were sensitive to the intervention cost. The relatively small differences in cost between treatments C and D, at SEK 2,500 and SEK 5,000, respectively, led to a large difference in cost-effectiveness of SEK 43,000 and SEK 602,000, respectively. Results for treatments A and F illustrated that a relatively costly treatment given once, but with a long-term effect, can produce savings similar to a modestly priced, prolonged treatment, when both have similar effectiveness.
**Authors' conclusions**
Cost-effectiveness ratios were highly sensitive to the treatment costs and, to a somewhat lesser degree, to the magnitude of the treatment's effect on transition probabilities to more severe states. In the model, treatments that slowed disease by 30% or more, at a cost of approximately SEK 20,000, had the potential to save disease costs within 5 years. Treatments with an effect of 20% and a similar price were very cost-effective.

**CRD COMMENTARY - Selection of comparators**
The authors used hypothetical interventions in order to illustrate the Markov model which they had developed.

**Validity of estimate of measure of benefit**
The estimate of the measure of benefit was based in part on the authors' assumptions regarding the effectiveness of the hypothetical interventions which were used. As such, the model is illustrative in calculating incremental utility scores using the assumed effectiveness of each intervention.

**Validity of estimate of costs**
Quantities and costs were not reported separately. The methods used may have underestimated the indirect costs, since no opportunity costs were assigned to unremunerated situations.

**Other issues**
As the authors noted, with a different cohort distribution, the cost-effectiveness of treatments would increase. It should be noted that the main objective of this study was to develop the simulation model rather than to evaluate particular interventions.

**Implications of the study**
Specific interventions and their relative effectiveness in treating rheumatoid arthritis would need to be utilised in the presented model in order to undertake a full economic evaluation.

**Source of funding**
Grants from Pharmacia & Upjohn, Windsor, UK, Riksforbundet mot Reumatism, the Konung Gustaf V:s 80-ars fond, the Cocks och Osterlunds Stiftelser, and the Lunds Sjukvardsdistrikts Donationsfonder.

**Bibliographic details**

**PubMedID**
10025930

**DOI**
10.1002/1529-0131(199902)42:23.0.CO;2-P

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Arthritis, Rheumatoid /economics /physiopathology /therapy; Cohort Studies; Computer Simulation; Cost-Benefit Analysis /statistics & numerical data; Disease Progression; Female; Health Status; Humans; Male; Markov Chains; Middle Aged; Models, Economic; Surveys and Questionnaires; Sweden; Treatment Outcome; Work Capacity
Evaluation

**AccessionNumber**
21999000355

**Date bibliographic record published**
30/04/2000

**Date abstract record published**
30/04/2000