

Derivation and Comparison of Utility Scores for Economic Evaluation in Large Datasets: Modelling Patient Level EQ-5D Using The Ontario Best Practices Research Initiative

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Objectives: Quality of life scores such as the EQ-5D are essential for the economic evaluation of clinical interventions. In large databases (e.g. administrative datasets), primary data collection for EQ-5D assessments is impractical and expensive. This can be avoided by statistically modeling EQ-5D scores from demographic and clinical characteristics in existing databases that include both measures. We used a large Canadian dataset to create an EQ-5D reference index for Canadian RA patients indicating the average EQ-5D quality of life score for patients based on their demographic and clinical characteristics. We compared our Canadian index to that of an American sample (Sullivan, 2006).

Methods: Our data were obtained from the Ontario Best Practices Research Initiative (OBRI), an observational cohort of RA patients, recruited from 62/162 Ontario rheumatologists from both academic and community sites. Baseline assessments were analyzed (n=2086) with the main outcome of EQ-5D score (0-1). Covariates were categorical variables for age, sex, education, income, number of comorbid conditions (NCC) and race. A Censored Least Absolute Deviations (CLAD) regression was chosen, as it is robust to traditional regression assumptions and accounts for the right censoring of data. To obtain confidence intervals and standard error values for the CLAD regression we performed bootstrap replication of our sample with $\beta=2000$ replicates. Unadjusted EQ-5D scores and number of comorbidities were compared to American values for the 25th, median and 75th quantile.

Results: The average age of our sample was similar to US data; $\mu_{OBRI}=58$ vs. $\mu_{US}=59$ with disparate NCC quintiles OBRI: 25th=1, 50th=2, 75th=3 vs. US data: 25th=3, 50th=5, 75th=7. The unadjusted results for the EQ-5D percentile scores were 25th=0.70, 50th=0.80, 75th=0.82 compared with US sample reporting 25th=0.446, 50th=0.778, 75th=0.816 with 0 being the worst possible health and 1 being perfect health. The unadjusted EQ-5d mean $\mu_{OBRI}=0.770$ for the OBRI cohort showed better quality of life compared to the American group $\mu_{US}=0.661$. The CLAD model for the median quintile showed a bias corrected EQ-5D median of 0.799, SE=0.0174, CI:(0.763, 0.832), with significant covariates for income.

Conclusion: Our results suggest a higher quality of life score for rheumatoid arthritis patients in Ontario, Canada compared with the United States especially in the most severe patients. Our index set will allow researchers to conduct patient level economic analysis using the entire population of RA patients by providing EQ-5D scores. This index value set will be the largest and most robust ever created for rheumatoid arthritis patients.