A time series analysis of the effect of the co-payment on pharmaceutical consumption in two Italian regions

Objective: To investigate the merits and challenges with calibrating Bayesian multiple treatment comparison meta-analysis (MTC) with cost-effectiveness (CE) analysis, in particular, construction of multiple cost-effectiveness acceptability curves and cost-effectiveness frontiers.

Methods: We calibrated a Bayesian MTC of pharmaceuticals for chronic obstructive pulmonary disease (COPD) and diabetes. CE markov model. We simulated 10000 observations and derived multiple cost-effectiveness acceptability curves for each of the treatments as well as the cost-effectiveness frontier. We separately repeated the analyses based on pair-wise meta-analysis estimates of treatment effectiveness. We compared the two approaches with respect to precision and inferred reasonable CE thresholds.

Results: The MTC approach generally yielded higher precision, and thus, had higher certainty surrounding the inferred CE thresholds. This was especially the case for comparisons with treatments in the extended dominance region, but close to the CE threshold, the CE approaches converged. Calibration of Bayesian multiple treatment comparison meta-analysis and Bayesian multiple cost-effectiveness acceptability curves appears to improve precision compared with the conventional approach.

Conclusions: The MTC approach generally yielded higher precision, and thus, had higher certainty surrounding the inferred CE thresholds. This was especially the case for comparisons with treatments in the extended dominance region, but close to the CE threshold, the CE approaches converged. Calibration of Bayesian multiple treatment comparison meta-analysis and Bayesian multiple cost-effectiveness acceptability curves appears to improve precision compared with the conventional approach.