Model Based Network Meta-Analysis for Pharmacometrics and Drug-Development: A 3 year Research Collaboration between Pfizer and the University of Bristol

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Objectives: Network Meta-Analysis (NMA) allows simultaneous comparison of multiple treatments [1], and provides a framework for model comparison and assessment of evidence consistency. Model based meta-analysis MBMA [2] has been used to assess multiple treatment comparisons, however little attention has been given to assessment of consistency [3]. This project aims to integrate the two approaches to allow formal assessment of consistency for MBMA models.

Methods: We illustrate the importance of assessing model fit using a MBMA comparing Naproxen vs placebo for treating pain. The fit and model predictions are compared for different time-course models. We indicate how the methods can be extended to multiple treatments, using a network of trials of multiple treatments, doses and time-points for osteoarthritis.

Results: We show that parameter estimates are sensitive to choice of model and that ignoring time/dose in a NMA can lead to inconsistent treatment effects, motivating a model-based analysis.

Conclusions: This collaboration offers the potential to combine all the available dose-response and time-course evidence in a model-based network meta-analysis (MBNMA) to compare the relative efficacy of multiple treatments, while allowing model fit and evidence consistency of the whole network to be assessed.

References: