METHODS FOR COMBINING INDIVIDUAL PATIENT DATA AND AGGREGATE DATA IN EVIDENCE SYNTHESIS

R.D. Riley[1], M.P. Look[2], M.C. Simmonds[3]

[1]*Centre for Biostatistics and Genetic Epidemiology, Department of Health Sciences, University of Leicester, England, UK.*
[2]*Department of Medical Oncology, Erasmus MC Rotterdam, Rotterdam, The Netherlands*
[3] *Medical and Pharmaceutical Statistics Research Unit, The University of Reading, UK*

Email: *rdr3@le.ac.uk*

Methods for research synthesis play an important role in evidence-based medicine, facilitating clinical practice and health policies based on the overall evidence. Meta-analysis of *individual patient data* (IPD) is the 'gold-standard' for synthesizing evidence across several studies. This approach is increasingly used, but often only *aggregate data* (AD), such as a treatment effect estimate and standard error, are available for some studies. In this situation researchers need to *combine* IPD studies with AD studies to utilize *all* the evidence, but little advice exists for doing this and so AD are often ignored. To address this, we performed a systematic review to identify methods for *combining* IPD and AD in evidence synthesis. We identified 30 articles which either proposed (8 articles) or applied (22 articles) one of four methods: (1) reducing the IPD to AD and employing standard AD meta-analysis techniques; (2) reconstructing IPD from tabulated data and employing IPD meta-analysis techniques; (3) direct synthesis using a multi-level model, and (4) Bayesian simultaneous analysis of IPD-only and AD-only hierarchical related models. In this talk we describe Approaches (1) to (4) in detail, and apply them to oncology datasets. We show that Approaches (1) and (2) are simple, but that Approaches (3) and (4) are more appropriate for making patient-level clinical assessments. We also consider how to extend these methods to where evidence synthesis of multiple outcomes is required.