Eliciting and using expert opinions about informatively missing outcome data in clinical trials

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When some outcomes in a clinical trial are missing, it is sensible to perform an analysis that assumes the data are missing at random (MAR). However, it is also important to consider the possibilities of departures from MAR. Such informative missingness (IM) may be detected in some situations by using supplementary data or by appropriate model assumptions. By contrast, I will explore an approach based on experts' subjective prior opinions about IM. Prior beliefs have been elicited by questionnaire in two trials. These beliefs may be summarised as the prior mean and standard deviation of an IM parameter in each trial arm, together with the prior correlation between the IM parameters in different arms. The prior correlation proves to be most important and hardest to elicit. I will then show that a simple Bayesian analysis agrees closely with an MCMC analysis. Finally, I will discuss how realistic this approach is both in clinical trials and in meta-analysis.

References:

D. B. Rubin:
Formalizing subjective notions about the effect of nonrespondents in sample surveys.
Journal of the American Statistical Association 1977; 72: 538–543.

J. J. Forster, P. W. F. Smith:
Model-based inference for categorical survey data subject to non-ignorable non-response.
Journal of the Royal Statistical Society (B) 1998; 60: 57–70.

T. E. Raghunathan:
Nonparametric analysis of randomized experiments with missing covariate and outcome data – comment.
Journal of the American Statistical Association 2000; 95: 85–87.