Meta-Analysis: Statistical Methods for Combining the Results of Independent Studies

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ABSTRACT:

Meta-analysis enables researchers to synthesize the results of a number of independent studies designed to determine the effect of an experimental protocol such as an intervention, so that the combined weight of evidence can be considered and applied. Increasingly meta-analysis is being used in the health sciences, education and economics to augment traditional methods of narrative research by systematically aggregating and quantifying research literature.

Two meta-analytic examples are the effectiveness of mammography in the detection of breast cancer, and an evaluation of gender differences in mathematics education. The information explosion in almost every field coupled with the movement towards evidence-based decision making and cost-effective analysis has served as a catalyst for the development of procedures to synthesize the results of independent studies.

In this talk we provide an historical perspective of meta-analysis, and discuss some issues, such as bias. We also give a brief review of the statistical methods used in combining results. Several multivariate models will be presented.