
Title: Methods for Estimating Treatment Effects of Persons with Multiple Chronic Conditions

**Heather G Allore, PhD***(Guest Editor)*

Associate Professor
Director of Biostatistics
Yale Program on Aging
Yale School of Medicine
Department of Internal Medicine
300 George St, 7th FL
New Haven, CT 06511 USA
E-mail: heather.allore@yale.edu

Proposal

Most deaths, morbidity and healthcare costs in developed countries occur in individuals over age 65 years who have multiple chronic conditions (MCC). Prescribing decisions are typically based on guidelines using data on randomized clinical trials (RCTs) for each specific condition which results in persons with MCC taking large numbers of medications. While RCTs remain the gold standard, they have routinely excluded persons with MCC. Thus, medication effects have been extrapolated to these complex patients. The benefits of medications prescribed for a single condition, however, are difficult to determine in the presence of multiple conditions and medications. Not only are medication benefits uncertain, greater numbers of medications compound treatment burden and increase the likelihood of adverse medication effects. Strategies to determine medication effects in persons with multiple conditions are needed. Evaluating the effect of medications on cross-disease, universal health outcomes such as survival, function, and symptom burden could lay the foundation for an evidence-based approach to medication decision-making for persons with MCC.

We invite authors to submit original research, as well as review articles to this special issue in **International Journal of Statistics in Medical Research** that will allow the inclusion of more persons with multiple chronic conditions in medical research and estimate treatment effects. Potential topics include, but are not limited to:

1. Trial designs to estimate treatment effects for heterogeneous sample populations with MCC, including Bayesian and adaptive designs.
2. Estimation techniques for observational data to control for indication bias and multiple treatments.
3. Causal estimators for multiple treatments using observational data.
4. Clustering methods for MCC
5. Heterogeneity of treatment effects
6. Joint modeling of outcomes, especially patient-centered outcomes

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