Abstract

Weighted Estimation for Confounded Binary Outcomes Subject to Misclassification: Post-Myocardial Infarction Statin Use and the One Year Risk of Stroke

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Inverse probability of treatment (propensity score) weights can be used to address measured confounding in the analysis of real world data under the assumption of accurate measurement of the outcome variable; however, many of these datasets suffer from outcome misclassification. These types of errors can present for systematic reasons, such as inconsistent coding of clinical events between health care facilities, or due to study design decisions, such as the use of event definitions with lower reliability than desired. We introduce a modification to these weights that can be used to produce consistent estimation in binary confounded data with outcome misclassification.

This discussion will begin by an overview of the motivation and application of inverse probability of treatment weights followed by a characterization of the biasing influence of outcome misclassification. Then, we will review some examples from the literature in which the presence of outcome misclassification is described in real world datasets. Finally, we will introduce the proposed methodology and apply it to an example investigating post myocardial infarction statin use and the 1 year risk of stroke using the Clinical Practice Research Datalink - a real world repository of patient data drawn from general practices in the United Kingdom.