Objectives

- Propensity score matching fails when there is lack of overlap between the treatment groups.
- The objective of this study was to apply a recently proposed methodology for adjusting for the lack of overlap to the estimation of healthcare expenditures.

Introduction

- Propensity score matching is a technique for removing potential selection bias present in observational studies. Since its introduction, it has been widely used in health services research.
- Propensity score matching specifies a function measuring the propensity of one case to another based on more observable characteristics.
- Cases are then grouped to minimize the distance between matched cases.
- Several matching techniques are presented in the literature. A forthcoming article compares these techniques using a real-world example.

Study Design and Methods

- Two specific methods have been proposed. The details of these methods are described elsewhere and are available from the author.
- The first method focuses on average treatment effects within a selected subpopulation defined in terms of covariate values. Conditioning on a subpopulation reduces the sample size, thereby increasing the variance of the estimated average treatment effect.
- However, if the subpopulation is chosen appropriately, it is possible to estimate the average treatment within the subpopulation more precisely than the average effect over the entire population, despite the smaller sample size.
- This trade-off is well-defined and, under some conditions, leads to choosing the subpopulation with the propensity score as an instrument. It is important that the optimal value of a study determined by the distribution of the propensity score. This estimator is referred to as optimal subpopulation average treatment effect (OSATE).

Results

- Table 1 presents summary statistics. The cancer and non-cancer groups are introduced.
- The third one is the asymptotic standard error for the optimal subpopulation average treatment effect (OSATE), in the subpopulation with observed covariates.
- The next one is the asymptotic mean standard error for the average treatment effect for the treated (ATT).
- There was a huge gain to moving from the population average treatment effect, it has been proposed to report estimates both for the population of interest and for the subpopulation, when we can make more precise inferences.

Discussion

- In practice, an important concern in matching propensity score matching is that one needs sufficient overlap between covariate distributions in the treatment and control groups.
- Limited overlap can lead to estimators for average treatment effects with poor finite sample properties. In particular, such estimators can be substantially biased, large variances, and considerable sensitivity to the exact specification of the propensity score.
- In this case, optimal subpopulation can lead to precise estimates, which can then be presented with the population average treatment effect.