Propensity scores, an introduction

Saskia le Cessie

Using propensity scores to deal with confounding has become very popular in recent years. By estimating the probability to receive a certain treatment (the propensity), one can adjust for observed imbalance between treatment groups. In this talk, the basis concepts of propensity scores are considered. We discussed in which situations propensity scores are useful. We also consider how propensity scores can be constructed; answering questions like whether all possible variables related to the treatment should be included in the score. Finally we compare different ways of using propensity scores: propensity matching, stratification, inverse probability weighting, and using the propensity score as covariate. We show that the different approaches can yield quite different results.

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Het gebruik van respons propensities in survey onderzoek

Fannie Cobben

Door de introductie van de propensity score method (Rosenbaum en Rubin, 1983) heeft het idee van het gebruiken van geschatte responskansen de laatste tijd veel aandacht gekregen in de survey literatuur. Rosenbaum en Rubin (1983) hebben deze methode geintroduceerd voor het schatten van het effect van medische behandelingen. Harris Interactive gebruikt de propensity score method met geschatte responskansen voor het oplossen van problemen in vrijwillige internetpanels veroorzaakt door onderdekking en zelf-selectie. Hierbij worden de geschatte responskansen beschouwd als zg. respons propensities.

Het gebruik van (inverse) responskansen voor de correctie van nonrespons is al in 1952 geopperd door Horvitz en Thompson. Zij stellen voor om de insluitkansen in hun bekende Horvitz-Thompson schatter aan te passen voor het optreden van (selectieve) nonrespons. Onder andere Bethlehem (1988) en Särndal et al. (1992) beschrijven hoe de Horvitz-Thompson schatter aangepast kan worden aan de situatie van nonrespons met het gebruik van geschatte responskansen.

In mijn presentatie beschrijf ik een aantal methoden voor het gebruik van respons propensities in de correctie voor nonrespons bias. Vervolgens beschrijf ik de toepassing van deze methoden op het Permanent Onderzoek Leefsituatie uit 2002. In mijn presentatie zal ik ingaan op de verschillen tussen de methoden onderling, en het verschil met de traditionele nonrespons correctie methode van linear wegen.

Fannie Cobben heeft econometrie gestudeerd aan de Vrije Universiteit (VU) in Amsterdam. Haar afstudeerrichting was Statistische Econometrie, of econometrie in enge zin. Na het behalen van haar bul, is zij in 2004 gaan werken bij de Divisie Methodologie en Kwaliteit van het Centraal Bureau voor de Statistiek. Zij werkt momenteel aan haar PhD-thesis over analyse en correctie van nonrespons in persoonsenquêtes, onder begeleiding van Jelke Bethlehem.

The (collateral) effects of imprisonment

Arjan Blokland

At the outset of the new millennium 2.5 million individuals are confined in prisons or jails across North America and Western Europe and in most countries rates are at or near all time highs.

A growing international literature has been attentive to the collateral consequences of the increased use of imprisonment. The potential irony of mass imprisonment is that, to the extent it has unintended adverse effects on life outcomes that are correlated with criminal offending, large-scale growth in the incarceration rate may actually exacerbate the crime problem over the long run by stigmatizing an ever larger class of individuals. Using data from the Netherlands-Based Criminal Career and Life-course Study the effect of first-time adult imprisonment on criminal recidivism and life circumstances in the years following the imprisonment was examined. Unadjusted comparisons of those imprisoned and those not imprisoned will be biased because imprisonment is not meted out randomly. Selection processes will tend to make the imprisoned group disproportionately crime prone compared to the not imprisoned group. In this study group-based trajectory modeling was combined with risk set matching to balance a variety of measurable indicators of criminal propensity.

Arjan Blokland (PhD) is researcher at the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR) in Leiden and senior-researcher at Parnassia Addiction Research Centre (PARC) in The Hague. In 2006 he received a VENI-grant for his work on specialization in offending. He currently chairs the European Developmental and Life-course Criminology working group. His main area of research is life course criminology and focuses on the development of criminal careers, the influences of life course transitions on criminal behavior, drug use and crime and the (un)intended consequences of interventions.

Preference for propensity scores when estimating an average treatment effect in case of a dichotomous outcome

Edwin Martens

In observational studies with a dichotmous outcome, a multivariable logistic regression analysis is often used to adjust for confounding and estimate an adjusted treatment effect. This treatment effect is in general an overestimation of the treatment effect that is in most circumstances the intended one. The method of propensity scores on the other hand, will result in a treatment effect that is in general closer to the treatment effect that would have been found when the study was a randomized one. The larger the number of confounders or the larger the treatment effect, the more preferred is the method propensity scores over a multivariable logistic regression analysis.

After 12 years of sociologic-economic research at the Erasmus University of Rotterdam, Edwin Martens worked from 2000 as a biostatistiian at Utrecht University. In 2007 he finished his PhD on the methods of propensity scores and instrumental variables.

Pooling outcomes after quintile stratification

Stef van Buuren

Propensity score methods offer both theoretical and practical advantages over conventional regression techniques to control for bias in observational studies. Quintile stratification is a popular technique in which exposed and non-exposed subjects are divided into five homogeneous strata. Exposed and non-exposed are compared within each stratum, which leads to five results instead of one. The relevant literature pays surprising little attention to the problem how to aggregate these results into one overall estimate. I will outline pooling methods for differences in means and proportions and for the odds ratio, and illustrate these methods on real data.