

Methods for the Control of Measured Confounders in Outcomes Research

Introduction

Outcomes research seeks to understand the end results of particular health care practices and interventions in the real world. In observational outcomes research, confounding occurs when the apparent association between an exposure and an outcome is affected by the relationship of a third variable to the exposure and the outcome. Thus, it is very important to apply the appropriate analytical method for outcomes ascertainment and risk adjustment.

Objective

The purpose of this manual is to summarize available methods for the control of measured confounders in outcomes research and provide a practical guidance for the implementation.

Contents of manual

This manual consists of three parts. In first part, we describe concepts of confounder and effect modifier and provide examples for identifying confounder and effect modifier. In second part, we review the method to control measured confounders in design phase: restriction and matching. In third part, we review the analytical methods for the control of measured confounders including multiple linear regression, generalized linear model such as logistic regression and poisson regression, Cox proportional hazard model for time-dependent variable,

generalized estimating equations method for repeated data or matched data, and conditional logistic regression for the matched data. In addition, stratified analysis and propensity score method are reviewed intensively. We provide how to apply methods using several computing tools including SAS, R, Stata, as well as examples using data(Figure 3).

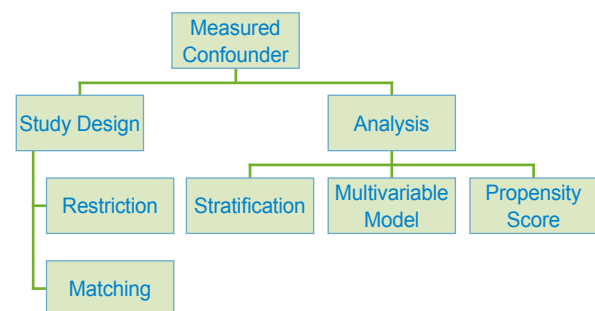


Figure 3. Methods for the control of measured confounders

Conclusions

Well-designed study and application of appropriate analysis techniques can yield valid findings, and improve causal inference of treatment effects from observational outcomes research. As results, this manual should be beneficial to researchers who perform outcomes research and decision-making.