

Counter Matching and Genetic Susceptibility to Radiation-induced Breast Cancer

Larry GOLDSTEIN, *Department of Mathematics, University of Southern California, Los Angeles, CA, USA*, E-mail: larry@math.usc.edu

Abstract: The goal of the ongoing WECARE study is to assess genetic susceptibility to radiation-induced breast cancer. For some years, the counter matching design has proved to be of value in cohort studies such as these which seek to determine the effect of covariate variables on disease outcome. The counter matching study design increases estimation efficiency over simple random sampling by taking into account easily obtainable covariate information when comparing cases to controls. Under tenable assumptions, calculations in anticipation of data collection show significant power increases can be expected when applying this design to determine the impact of mutations in the DNA repair genes ATM, BRCA1, BRCA2 on radiation-induced breast cancer.