

NONRANDOM SELECTION AND THE ATTRIBUTABLE COST OF SURGICAL-SITE INFECTIONS

Christopher S. Hollenbeak, PhD; Denise Murphy, RN, MPH; William C. Dunagan, MD; Victoria J. Fraser, MD

ABSTRACT

OBJECTIVE: To study the extent to which selection bias poses problems for estimating the attributable cost of deep chest surgical-site infection (SSI) following coronary artery bypass graft (CABG) surgery.

DESIGN: Reanalysis of a prospective case-control study.

SETTING: A large, Midwestern community medical center.

PATIENTS: Cases were all patients who had an SSI (N = 41) following CABG and CABG and valve surgery between April 1996 and March 1998. Controls were every tenth uninfected patient (N = 160).

METHODS: Estimates of the attributable cost of deep chest SSI were computed using unmatched comparison, matched comparison, linear regression, and Heckman's two-stage approach.

RESULTS: The attributable cost of deep chest SSI was estimated to be \$20,012 by unmatched comparison, \$19,579 by matched comparison, \$20,103 by linear regression, and \$14,211 by

Heckman's two-stage method. Controlling for selection bias substantially reduced the cost estimate, but the coefficient capturing selection bias was not statistically significant.

CONCLUSIONS: Deep chest SSI significantly increases the cost of care for patients who undergo CABG surgery. Unmatched comparison, matched comparison, and linear regression estimated the attributable cost to be approximately \$20,000. Although controlling for selection bias with Heckman's two-stage method resulted in a substantially smaller estimate, the coefficient for selection bias was not statistically significant, suggesting that the estimates derived from the other models should be acceptable. However, the magnitude of the difference between the models shows that the effect of selection bias can be substantial. Some exploration for selection bias is recommended when estimating the attributable cost of SSIs (*Infect Control Hosp Epidemiol* 2002;23:177-182).