

ESTIMATING THE CAUSAL EFFECT OF BREASTFEEDING ON INFANT WEIGHT GAIN

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Breastfeeding has been associated with improved health outcomes in infancy and later childhood. Observational evidence suggests that breastfeeding may reduce infant growth, which may underlie its possible protective effect against obesity. The Promotion of Breastfeeding Intervention Trial (PROBIT) randomized hospitals in Belarus to a breastfeeding promotion intervention or standard care, enrolling 17,046 mother-infant pairs. The intent-to-treat (ITT) analysis showed a small but statistically significant larger weight gain in the intervention group through nine months, in contrast to existing evidence based on observational studies. A substantial proportion of women in the intervention group stopped breastfeeding in the first month, while some women in the control group continued to breastfeed for 12 months. The decision to continue breastfeeding is associated with several maternal characteristics, suggesting confounding. We consider several ways to define the causal effect of breastfeeding in the context of PROBIT and propose a structural nested mean model to estimate these effects. We analyze the PROBIT data on infant weight gain under this model with doubly-robust G-estimating equations. We compare our results to other approaches to estimating the causal effect, to the original ITT analysis, and observational analyses and discuss the implications of the different methods and estimates.