

Module 3: Applications of Multi-level Models to Profiling of Health Care Providers

1. Why do we need a multi-level model for profiling medical care providers? (check all correct answers)
 - (a) Data are clustered at multiple levels
 - (b) We need to take into account the correlation within medical providers
 - (c) We need to take into account the reliability of the different medical providers
 - (d) We need to take into account provider-specific characteristics and patients-specific characteristics
 - (e) All of above

2. What is “case-mix bias”? (check all correct answers)
 - (a) Bias arising from differences in patients characteristics across medical providers
 - (b) Bias arising from not taking into account correlation within medical providers
 - (c) Bias arising from not taking into account different sample sizes within providers
 - (d) Bias arising from not including into the model important patient-specific covariates
 - (e) Bias arising from not including into the model important provider-specific covariates

3. What is systematic variability? (check all correct answers)
 - (a) Variability across clusters of the true cluster-specific parameters
 - (b) Random noise in the residuals
 - (c) Natural variability as defined in Module II
 - (d) Statistical variance of the regression parameter estimates
 - (e) Variability of the patient-level characteristics across clusters

4. In the institutional ranking example, which of these factors affect the posterior variance of the ranks for a particular hospital? (check all correct answers)
 - (a) Numbers of surgeries
 - (b) Numbers of deaths
 - (c) Success rate of surgery
 - (d) Posterior standard errors of the success rate
 - (e) Deviations between the success rate estimates and the population average

5. What type of statistical information would you suggest adding on Table 4 of Normand et al 1997 JASA? (check all correct answers)

- (a) Estimates of the regression coefficients at the first and second stage of the hierarchical model
- (b) 95% posterior intervals of the performance measures
- (c) 95% posterior intervals of the ranks
- (d) Number of MCMC iterations
- (e) The table contains all necessary information