adequate patient preparation in terms of dietary restrictions which could impede test accuracy. There were inconsistencies among physicians regarding when in a patient’s life to initiate screening, and at what age to discontinue screening. CONCLUSIONS: This systematic review of ten included studies reflected considerable knowledge gaps among physicians, which could contribute to reasons for inadequate screening rates. Provider education about CRC screening should emphasize guidelines regarding when to start screening, frequency rates for screening with given modalities, and particular techniques and precautions that should be used to perform screening.

PCN21
RETRANSFORMATION OF ESTIMATED LOG-TRANSFORMED COSTS WHEN THE ERRORS PRESENT HETEROSKEDASTICITY
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OBJECTIVE: Log transformation reduces robustness by focusing on symmetry. It improves precision and it diminishes the outlier effect. One big disadvantage of log models is retransformation problems. Although smearing methods provide non-parametric way to transform estimated costs, it fails to adjust heteroskedasticity especially if the form of heteroskedasticity is not known. In this paper, we propose a method where we can apply transformation accounting for heteroskedasticity. We compare our results with smoothing estimators and generalized linear model (GLM) estimators. METHODS: Two form of heteroskedasticity is considered: 1) The heteroskedasticity is known up to a multiple constant. We used generalized least squares (GLS) estimator for correcting heteroskedasticity; and 2) The form of heteroskedasticity is unknown. If this is the case, feasible GLS method is used. After correcting for heteroskedasticity, smearing estimates is applied for the transformed equations to do the retransformation. Medstat Market Scan data is used to show the application. Cost level estimators are compared: OLS estimation, smearing transformation assumed no heteroskedasticity, smearing transformation with heteroskedasticity, GLM estimators where the family is gaussian with logarithmic link function. RESULTS: Estimation methods yield that log scale residuals were heavy tailed. White Test suggested the presence of heteroskedasticity. The graph of squared residuals on disease stage levels show that variance is increasing with an increased level of stage levels. Park test suggested that if GLM is chosen, gaussian family should be chosen. Comparisons of the retransformed costs yield that smearing transformation after accounting for least deviation yielded least minimum square errors. CONCLUSION: We attempted to solve the biggest disadvantage of log transformed cost estimation by proposing two stage estimation procedure where at the first stage GLS or feasible GLS is used to correct for possible heteroskedasticity (depending on the form of heteroskedasticity), at the second stage smearing method is applied to transformed equation.

PCN22
ESTIMATION OF CENSORED MEDICAL COUNT DATA
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OBJECTIVE: Censoring is common problem with medical count data. Estimation over only uncensored patients yields bias toward the patients who have shorter survival time since patients who have longer survival times are high likely to be censored. Standard survival analysis is not applicable since the number of visits during the study time and after censoring time is not independent. The objective of this paper is to propose a method, which can be applied to censored count data. METHOD: The proposed method first estimates the probability of censoring by using logit model. Then, second stage involves estimating weighted Poisson regression where weights are calculated as inverse of estimated probability of censoring. We show that the resulting estimators are consistent. Standard errors from second stage are not valid and should be adjusted for first stage estimation. We estimate the errors by using bootstrapping techniques. RESULTS: Medstat Market Scan data is used as an application of the method. Total hospitalization days after a year of initial diagnoses is estimated. Patients who are diagnosed less than a year before the end of study period are considered as censored. After using inverse probability weighted poisson regression, we also estimate the total hospitalization days by dropping the patients whose visits are censored. A test is proposed to compare the coefficients. We found that the difference in coefficients are significant (p < 0.0004). CONCLUSION: This paper presents a method for testing and correcting for possible sample selection bias for cross sectional data. In our application we assessed the influence of explanatory variables, such as patient and clinical characteristics, on inpatient visits of asthma two years following diagnosis after accounting for possible selection bias due to censoring. We applied poisson and our proposed method and to show that failing to do the adjustments yield different estimators.

PCN23
RELIABILITY OF SPANISH-LANGUAGE HUI MEASUREMENTS IN SURVIVORS OF CANCER IN CHILDHOOD: AGREEMENT BETWEEN PATIENTS, PARENTS, AND PHYSICIANS
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OBJECTIVES: To assess inter-rater agreement of Health Utilities Index (HUI) measurements in survivors of cancer during childhood in Honduras, El Salvador, Nicaragua and Panama. METHODS: Patients and their parents completed a Spanish-language interviewer-administered HUI questionnaire. Physicians answered the Spanish-language self-complete questionnaire version. Primary analyses of agreement between patients and parents, and parents and physicians, for HUI3 single-attribue and overall health-related quality of life (HRQL) utility scores was measured using single-measure one-way intra-class correlation coefficient (ICC). Secondary analyses used the two-way mixed model ICC, Pearson’s r and concordance correlation coefficient. Differences in mean scores > 0.05 are considered clinically important. RESULTS: Of 211 patients surveyed (aged 3.4 to 25.8 years at time of study, 56% male), there were 191 patient/parent pairs of complete HUI assessments and 192 patient/physician pairs. There was moderate or better agreement (ICC > 0.41, p < 0.0001) between both pairs of raters for vision, hearing, speech and ambulation. Agreement was less than moderate (ICC < 0.41) for pain (p < 0.01), cognition (p < 0.01) and emotion (p < 0.05). Statistically significant (p < 0.001) and clinically important differences were observed within both sets of paired groups for cognition and emotion, with lower mean scores for patients. For overall HRQL, agreement was moderate between patients and parents but less than moderate between patients and physicians. The mean overall HRQL score was significantly lower statistically (p < 0.01) and clinically for patients than both parents (diff = 0.094), and physicians (diff = 0.159). Secondary analyses yielded similar results. CONCLUSIONS: Parent and physician reports should not be considered interchangeable with patient assessments, especially for aspects of health not readily observable. There were important differences between patients and parents and physicians in emotion, cogni-
tion, pain and overall HRQL with patients reporting more morbidity. The results are consistent with the published literature. Future research should focus on intra-rater reliability, responsiveness and validity.

PCN24

HANDLING MISSING PATIENT REPORTED OUTCOMES (PRO) DATA FOR PREMATURE WITHDRAWALS FROM CLINICAL TRIALS OF SEVERE DISEASES

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PRO data have now become an integral part of clinical trials to evaluate the efficacy of treatment for severe and terminal illness. However, it is often fraught with missing data due to illness, death and early termination of a trial (time to event study or superior efficacy). OBJECTIVES: To evaluate different methods of data imputation when trials are terminated early and there is missing data due to deteriorating health. METHODS: Using data from a large cancer (multiple myeloma) trial which included both missing data due to illness and early termination due to study termination or non-illness-related reasons, several statistical methods were evaluated. A total of 598 subjects completed study termination or non-illness-related reasons, several statistical methods were evaluated. A total of 598 subjects completed the EORTC QLQ-C30 at least one post-baseline timepoint and all PRO scores of all sub-scales adjusted for multiplicity using the Hochberg method. Other scales adjusted for multiplicity using the Benjamini method. RESULTS: All methods found similar results, although the multiple imputation method found the most number of scales/symptoms significant (N = 10). Sun and Song and the Pattern-Mixture model each found the same four scales/symptoms significantly different between groups—Global Health, Cognitive Functioning, Emotional Functioning and Dyspnea. CONCLUSIONS: All methods are useful approaches to handle missing data imputation and analysis. The multiple imputation method appears to be less conservative, finding ten significant differences versus four with the other methods. The Sun and Song approach provides an insight into what the treatment differences would have been had all the subjects stayed in the study. The Pattern-Mixture model was the most complex method and did not provide any additional information over the other methods.

PCN25

RELIABILITY AND VALIDITY OF BRAZILIAN PORTUGUESE HEALTH UTILITIES INDEX (HUI) QUESTIONNAIRES FOR ASSESSING THE HEALTH STATUS OF SURVIVORS OF CHILDDHOOD CANCER

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OBJECTIVES: To assess inter-rater reliability and discriminative validity of Brazilian Portuguese HUI questionnaires for a sample of survivors of childhood cancer. METHODS: A sample of consecutive patients attending the long-term follow-up clinic at Centro de Tratamento e Pesquisa Hospital do Câncer in São Paulo was recruited. Self- and proxy-assessment versions of self-complete, one-week health-status recall HUI questionnaires were used. A questionnaire was completed independently by each patient (self-assessment), and nurse and physician (proxy-assessments). HUI single-attribute utility scores (n = 14) and health-related quality of life (HRQL) scores (n = 2) were derived using standard coding algorithms and published utility functions. Single measure, one-way random effects models were used to calculate intra-class correlations (ICC) of inter-rater agreement. Analysis of variance (ANOVA) assessed the statistical significance (p < 0.05) of differences in mean utility scores for patients in various diagnostic groups (n = 15). RESULTS: HUI data for 138 cancer survivors (45.7% female) were collected from the three types of assessors. Patient mean age at diagnosis was 6.3 (min = 0.2, max = 17.4) years and 22.8 (13.4, 40.2) years at survey. There was substantial to almost perfect agreement (ICC > 0.85, p < 0.001) between all pairs of raters for all types of utility scores. ANOVA detected statistically significant (p < 0.013) differences among the diagnostic groups, in means of HUI2 and HUI3 HRQL utility scores, HUI3 vision (p < 0.0005), HUI3 ambulation (p = 0.002), HUI2 mobility (p = 0.001) and HUI2 self-care (p < 0.045). CONCLUSIONS: There was substantial or better agreement in all single-attribute and HRQL utility scores between pairs of patient, nurse and physician assessors. Differences in mean HRQL among diagnostic groups was evidence of discriminative validity. The Brazilian Portuguese HUI questionnaires should be considered for future PRO-studies of morbidity and HRQL in survivors of cancer in childhood in Brazil. Future research on the measurement properties of the Brazilian Portuguese HUI questionnaires should focus on concurrent validity and other health problems.

PCN26

DERIVING A PREFERENCE-BASED INDEX FROM THE MD ANDERSON SYMPTOM INVENTORY IN CANCER PATIENTS

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OBJECTIVES: The importance of postmarketing surveillance was again publicized by the recent recall of Vioxx; similar concerns should be addressed in trial-based cost-effectiveness analyses (CEA). The net benefit regression approach applies econometric methods; thus, offers a power tool to assess CEA of a new intervention in a non-randomized environment (e.g., claims data). Our study proposed a Bayesian approach to synthesize clinical trial data with secondary data collected in postmarketing setting. METHODS: We first compared the treatment effect estimated from least squares (LS) and Bayesian regressions using a simulated data of 200 pairs of case-control patients. The data contained information on cost (C), effectiveness (E), and demographics for each patient, with 85% of data in the quadrant of positive incremental cost and incremental effectiveness. The dependent variable was the net benefit (NB), calculated as: $\lambda E - C$, where $\lambda$ denoted the maximum willingness to pay; covariates included demographics and a binary variable indicating treatment. By incorporating trial data in the prior distribution, we demonstrated use of the Bayesian regression to update the net benefit estimates with observed data, exemplified by the simulated data. RESULTS: NB estimated from LS and Bayesian approaches were very similar when non-informative prior was used, representing the scenario where the trial data was neglected. However, using the posterior distribution of the regression coefficients, the Bayesian approach can infer the probability that the new treatment was cost-effective. At $\lambda = 15,000$, the estimated NB was $679.3$ (P = 0.766) in OLS and $677.5$ in Bayesian, with 0.61 probability of cost-effective. When a strong prior favoring the new treatment was employed, the estimated NB increased to $3,414$ at $\lambda = 15,000$ and the probability of