OP134 Mapping The Health Of The Nation Outcomes Scale To The EQ-5D Using The Pharmacotherapy Monitoring And Outcome Survey

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Introduction: In clinical practice, health outcomes relevant for economic evaluations, such as health-related quality of life (i.e., utilities), are not always available. However, algorithms can be developed to map available outcome measures to utilities. In the Netherlands, the Health of the Nations Outcomes Scores (HoNOS) is a physician-reported, disease-specific outcome measure frequently used for patients with severe mental illness for which no mapping algorithms for utilities currently exist. The aim of this study was to develop an algorithm to map responses on the HoNOS to EQ-5D utilities for use in economic evaluations.
Methods: A dataset was obtained from the Pharmacotherapy Monitoring and Outcome Survey cohort study containing data from patients with psychotic disorders. The dataset contains EQ-5D-3L domain and HoNOS scores, the age and sex of patients, and additional demographics. Correlation between the EQ-5D-3L and HoNOS was evaluated. To derive mapping functions, least absolute shrinkage and selection operator (LASSO) regression and random forest algorithms were applied with various predictor variables using a machine learning approach, whereby data were split into separate training and test sets. Cross-validation was then used to compare the performance of different models using R-squared and the root mean square error (RMSE).
Results: A total of 2,111 patients were included in the study. Spearman's correlation coefficients indicated a weak to moderate negative correlation of -0.31. Based on model performance metrics, LASSO models outperformed random forest models on the training set, where the model including all individual HoNOS items and the age and sex of patients showed the best overall performance with an RMSE of 0.237 and an R-squared of 0.218. When applied to the test set, this resulted in an R-squared of 0.233 and a mean absolute error of 0.177.
Conclusions: The HoNOS can be mapped onto EQ-5D-3L utilities with moderate predictive accuracy. The reported mapping algorithm may be sufficient to predict overall population utility scores for use in health economic evaluations but lacks accuracy for individual patient predictions.

OP135 Machine Learning And Cancer Registry: Evaluation Of The Effectiveness Of Case Coding

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Introduction: Machine learning (ML) algorithms are computational procedures that use pattern recognition and inference by learning from previously categorized documents to predict the category to which a new document belongs. The role of machine learning within cancer registries remains unclear given the lack of in-depth testing and guidance from health technology assessment (HTA) agencies. We evaluated the effectiveness of coding new cases through machine learning at the Integrated Cancer Registry.
Methods: The Integrated Cancer Registry covers the eastern area of Sicily in Italy, which has an annual average incidence of about 10,000 cases of malignant neoplasm. Potential new cancer cases were retrieved from pathology services and processed by pathologists who confirmed the neoplastic nature of supposed cases and specified the morphological type and location of the tumors. The current method involves identification by reading the free-text report when International Classification Diseases for Oncology information was not provided. We used the new Microsoft ML.Net Library, a framework developed in response to the challenge of facilitating machine learning pipeline utilization in large software applications. A total of 1,050,952 free-text pathology reports published from 2003 to 2018 were selected separately from all Sicilian pathology services and uploaded to machine learning software that explored eight binary classification algorithms.
Results: We evaluated each algorithm's performance by calculating metrics (the number of true positives, true negatives, false positives, and false negatives) from the classification procedure applied to the test dataset. The metrics used were accuracy, F1 score, and area under the receiver operating characteristic curve. With a test set of around 210,000 text diagnoses, each algorithm reached an F1 score of up to 95 percent.
Conclusions: Machine learning algorithms capture relevant information about tumors from free-text pathology reports, optimizing the process and reducing waste. With the help of machine learning systems, cancer registries can provide more timely data for research and evaluation of all types of new cancer technologies (drugs, devices, radiology and radiotherapy equipment, diagnostic devices, robotic surgery, and vaccines).

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