One of the main questions cancer patients ask themselves when diagnosed with cancer is 'How long will I live?' Health related quality of life (HRQOL) may provide added value alongside clinical data in predicting survival. One of the aims of the PROBE (Patient Reported Outcomes to Better Estimate Survival) project is its investigation into the improving cancer survival predictions including patient reported quality of life and psychosocial data in the survival estimation of cancer patients. This work is part of the Pfizer Foundation Global Health Partnerships Initiative to accelerate the pace of progress in the fight against cancer.

Patients and Data
A total of seventeen European Organisation for Research and Treatment of Cancer (EORTC) Randomized Controlled Trials (RCTs) from different cancer sites were selected for this study. Pre-treatment HRQOL data, using the EORTC QLQ-C30, was obtained from 2,140 metastatic cancer patients, diagnosed with cancer and included in the dataset. Baseline characteristics are presented in Table 1.

EORTC QLQ-C30 Questionnaire
The EORTC QLQ-C30 is a questionnaire developed to assess the quality of life of cancer patients. The questionnaire is designed to assess cancer patients' physical, psychological, and social functions. The questionnaire is comprised of multifactorial scales (physical, role, emotional, cognitive functioning); four single items (pain, global, financial impact, appetite loss, nausea/vomiting, diarrhea, constipation, sleep quality) and life satisfaction.

Objectives
HRQOL may provide added value alongside clinical data in predicting survival. The aim of this analysis was to construct a prognostic index (PI), including HRQOL and clinical data, to assess the accuracy of survival predictions and to identify any subgroups with increased risk of death in a cohort of patients with metastatic cancer.

Methods
A multivariate Cox regression model was constructed including clinical, socio-demographic, and EORTC QLQ-C30 variables, that were related to survival (p<0.05) after univariate analyses. The model selection was done in several steps. First, in the univariate model the final and HRQOL variable was independently assessed, with a criterion of p<0.05 to identify prognostic variables and to derive a final list of independent predictors. Second, the final list of significant predictors from the univariate analysis was implemented in a multivariate model and a backward selection was applied to eliminate non- significant parameters, with a criterion of p greater than 0.05. Thus, a forward selection, with a criterion of p<0.05, was used to add the non significant individual predictors from the univariate analysis in the final model obtained with backward selection. The final multivariate model was refitted 1,000 times with the bootstrapping resampling technique. Then, a quantitative PI, representing a weighted combination of the bootstrapped parameter estimates of each prognostic variable, was constructed.

Results
The final multivariate model (Table 2) included age, gender, WHO performance status (PS) and three EORTC QLQ-C30 parameters physical functioning (PF), pain (pain) and appetite loss (ap), as significant predictors.

Conclusion
The C-index was used to evaluate predictive accuracy of the PI. The C-index estimates the percentage of correctly predicted, i.e., the percentage of patient pairs in which the predicted (according to the model) and observed outcomes are in agreement (discrimination). The interpretation of the c-index is similar to the classical correlation coefficient. A log-rank test to identify significant expansion between low and high survival risk subgroups.

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