

MULTIVARIABLE MODELING TO PREDICT LONG-TERM SURVIVAL PROBABILITY OF INDIVIDUAL THYROID CANCER PATIENTS

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Background/Purpose: The purpose of this study was to test the utility of web based multivariable modeling in prediction of the long-term survival probabilities of individual patients, depending on their risk factors.

Methods: A total of 2306 cancers were diagnosed between 1970 and 2010 in a population cohort were included in the study to develop a Cox's proportional hazard model. A random sample was drawn from the study population to be used in developing the multivariate model (N=1168) and the rest were used to evaluate of the validity of the model (N=1138). Kaplan-Meier product-limit survival analyses were used to explore variables to be included in the multivariable analyses. The Receiver Operating Characteristics (ROC) curves were used to evaluate the developed multivariate model in predicting long-term disease-specific survival, beyond the first year, for both samples.

Results: The analysis of ROC curves revealed that the model developed using 1168 patients in the development sample had similar prediction ability of the long-term survival 1138 patients in the testing sample. In both samples, the curve had large area under the curve (0.81) indicating good validity (accuracy). The 95% confidence Intervals (CI) were relatively narrow and did not include the chance probability of 0.50 (0.77-0.85, and 0.76-0.85, for both the development and testing samples, respectively), which indicates good reliability (precision) in addition to the good validity.

Discussion & Conclusion: This study demonstrates good validity and reliability of the multivariable web based dynamic survival model for thyroid cancer.