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**Xingchen Yuan** and **Don Hong**, MTSU Box 34, Murfreesboro, TN 37132, and **Changbin Guo\***, POBOX 70663, Johnson City, TN 37614. *Survival Model and Estimation for Lung Cancer Patients with Neural Network Applications*. Preliminary report.

Lung cancer is the most frequent fatal cancer in the United States. Following the notion in actuarial math analysis, we assume an exponential form for the baseline hazard function and combine Cox proportional hazard regression for the survival study of a group of lung cancer patients. The covariates in the hazard function are estimated by maximum likelihood estimation following the proportional hazards regression analysis. Although the proportional hazards model does not give an explicit baseline hazard function, the baseline hazard function can be estimated by fitting the data with a non-linear least square technique. The survival model is then examined by a neural network simulation. The neural network learns the survival pattern from available hospital data and gives survival prediction for random covariate combinations. The simulation results support the covariate estimation in the survival model. (Received August 19, 2005)