

The Use of Censored Medical Survival Data to Evaluate Efficiency of Different Surgery Techniques

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Medical survival censored data of about 500 patients will be evaluated to comparison of two basic surgery techniques. Data comes from patients who underwent colectomy in the University Hospital in Ostrava. The data has been screened into three general groups: A... all patients, B... data from successful operations, i.e. the tumour is completely removed, C ... data from less successful operations, i.e. the tumour is partially removed or not removed. Two basic surgery techniques are used for the colectomy: either classical (open) operation or laparoscopic operation. Basic question which arises at the colectomy operation is which type of operation is to choose to guarantee longer overall survival time.

Two methodological approaches have been used to answer this relevant question. Parametric approach results from modelling of survival time. It is based on Maximum Likelihood Estimation method used to estimate parameters of probability distribution of overall survival time. The technique results in comparison of MTTF characteristics assigned to particular types of operation, within all 3 screened groups of data.

Second approach is nonparametric when the survival analysis is performed by the use of Kaplan-Meier estimate of reliability function. For each data group two survival curves are designed, i.e. for both classical and laparoscopic type of operation. Resulting survival curves are compared and evaluated using advanced methods of statistical inference, as is hypothesis testing (e.g. log rank test), etc.