Time Series Models on Medical Research

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Time series analysis has been a well-known method for many years. This method can be applying on medical research as well. The paper demonstrated applications the autoregressive integrated moving average models and application the seasonal decomposition method. The mortality data may be analysed by time series methods such as autoregressive and integrated moving average (ARIMA) modelling. This method is demonstrated by two examples: analysis of the mortality data of isemic heart diseases and analysis of the mortality data of cancer of digestive system. The relationships between time series of mortality rates were studied with ARIMA models. The author with ARIMA models studied the substantial role an exogenous environmental factor of the incidence for the causes of death autocorrelation functions and cross-correlation functions. Mathematical expressions are given for the results of analysis.

We examined the periodicity of the childhood leukaemia in Hungary using seasonal decomposition time series. The analysis of the periodicity of childhood leukaemia was performed on the basis of the date of the diagnosis of the disease. From the time series the cyclic trends, the seasonally adjusted series, the moving averages and the data series of random components. Our results prove the seasonal occurrence of the childhood lymphoid leukaemia in Hungary. These data seem to highlight the role of the environmental effects (viral infections, epidemics, ect) on the onset of the disease. Due to the controversial nature of the available international data, further studies should be carried out.

The analysis of the mortality rates of the examined diseases and the seasonal periodicity of the childhood leukaemia was done with the SPSS statistical program package.