

Title: An approximate method for constructing linear regression models for prediction of a severe bronchial asthma course

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Abstract: Diagnosis of a bronchial asthma course in children determines further preventive activities and personalized approaches to treating of a child with such a pathology. An uncontrolled type of the asthma course requires conducting a careful analysis of the factors affecting a formation of severe forms of the disease. The use of linear regression models is a widespread approach that helps to calculate the probability of severe bronchial asthma or the uncontrolled course of the disease development. During this study 90 children aged from 6 to 18 years old were examined. Of these, there were 70 children suffering from bronchial asthma with different severity and 20 healthy children. The examination included an interviewing of patients as well as a definition of clinical features and results of clinical and laboratory examination in the disease course. 142 factors were analyzed to build a three-parameter model. A correlation ratio and numerical characteristics of model regressors were calculated. Conditions of the use of approximate linear regression models were shown and the model accuracy was estimated. A technique of an approximate model of linear regression building both in dimensional and nondimensional forms was considered. The relationship among model ratios was shown.

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