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Quantile Regression Coefficient Models to Estimate Continuous Outcomes in Epidemiologic Studies

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Abstract

This thesis describes quantile regression coefficient models (QRCM), a method recently developed by Frumento and Bottai [3]. This method is an extension of quantile regression, which can estimate conditional quantiles of a continuous outcome variable given covariates. QRCM specifies the coefficients of a quantile regression model as parametric functions of the order of the quantile. This thesis illustrates the use of QRCM in a study of the distribution of body mass index (BMI), defined as weight divided by height squared (kg/m^2). The data were collected by the National Health and Nutrition Examination Survey (NHANES) between the years $2015 - 2016$. The sample consisted of 8419 individuals living in the United States. QRCM were used to estimate conditional quantiles of BMI given four explanatory variables: age, race, height and gender. All these predictors appeared to be important for accurate estimations of BMI quantiles. QRCM enabled estimating reference values that could be used when assessing the BMI value of any given individual in an epidemiological or a clinical setting.

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