Logistic Regression

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Suppose you are interested in assessing the risk of an event as it depends on a set of covariates. For example, you may wish to assess the risk of a heart attack in the next five years for an individual from a certain population, given this individual's age, blood pressure, cholesterol level [bad and good], CRP level, and body mass index. Assessments of this kind are frequently made using the logistic regression model.

In this seminar, we'll study risk measurement using logistic regression, by reviewing the logistic regression model and associated statistical inference techniques as well as by analyzing several data sets. Different logistic regression models will be introduced and interesting features of their risk functions pointed out. [Risk function? The probability of the event as a function of the covariate values.] Models will be fit to data, the fitted risk function obtained, and relevant inference questions answered. Does the risk of an event depend on a particular covariate or set of covariates? Appropriate significance tests help to answer this question. How much does the risk of an event depend on the covariates? Confidence intervals will help here. The problem of selecting a particular model from among several models for a data set, and of assessing how well as given model fits data, will be addressed also.

The data analyses in this seminar will be done with SAS and *S*+. SAS will be used for all calculations. Complete handouts will be provided for all the data analyses, featuring the SAS code needed and the output from the code. Graphics will be obtained using *S*+.

Individuals taking this course should have a basic background knowledge of statistical models and methods and of SAS. Experience with the practical uses of regression analysis is especially helpful.