



HAL
open science

Model selection via the lasso in conditional logistic regression

Marta Avalos

► **To cite this version:**

Marta Avalos. Model selection via the lasso in conditional logistic regression. Second International Biometric Society Channel Network Conference, Apr 2009, Ghent, Belgium. pp.Model selection and clustering session. inserm-00402434

HAL Id: inserm-00402434

<https://inserm.hal.science/inserm-00402434>

Submitted on 7 Jul 2009

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Model selection via the lasso in conditional logistic regression

Marta Avalos

Biostatistics team of INSERM U897 and University of Bordeaux 2, France
marta.avalos@isped.u-bordeaux2.fr

We propose a model selection procedure in the context of matched case-control studies and, more specifically, for the conditional logistic regression. The method is based on penalized conditional likelihood with an L_1 -type penalty of the regression coefficients, the so-called lasso. This penalty, which shrinks coefficients to improve the accuracy of prediction, is particularly adapted when the number of covariates is large (with respect to the number of events) or in case of collinearity between them. An attractive property of the lasso is that it performs parameter estimation and variable selection simultaneously. The implementation of the method is based on a simple modification of the R-package *penalized* for fitting generalized linear and Cox proportional hazard models with L_1 or L_2 penalties, developed by J. Goeman. The effectiveness of the algorithms allows the use of resampling methods for choosing the regularization term and for evaluating the stability of the selected model. Thus, K-fold likelihood cross-validation and bootstrap are applied, both taking into account the dependent nature of data. The methodology is illustrated with some examples.