# FOREWORD

This special issue of REVSTAT – *Statistical Journal* contains a selection of invited papers presented at the *Workshop StaM2010 — Statistical Modelling: Challenges in Health* that took place in Parque das Nações — Lisbon, Portugal, from 9 to 12 May 2010.

The workshop was organized under the auspices of the Center of Statistics and Applications, University of Lisbon (CEAUL, `http://www.ceaul.fc.ul.pt`), and the FCT/MCTES research projects: "Statistical Methods in Genetics and Environment" (PTDC/MAT/64353/2006), "Latent Class Models in Tropical Health" (PTDC/SAU-ESA/81240/2006). It brought together researchers interested in advanced statistical applications in Health challenging problems, to promote knowledge and experience exchange and also to encourage cooperation between the participants. A fruitful discussion on the role of statistical modelling in Health with maximum participation in non-parallel sessions included the following areas: health spatial problems; survival analysis; genetics; molecular biology; bioinformatics; latent class models in health.

The six papers in this volume illustrate some of the statistical problems currently of interest in Health. Jow et al. develop a method for estimating the density of BLAST hits across chromosomes on a target genome, which is used to identify genes associated with QTLs from Bovine Hemoglobine Genome by using the Human genome. Anticoagulants are one of the most prescribed groups of drugs. This is the motivation for Henderson et al. to review and develop methods to optimal dynamic treatment regime determination. Teixeira-Pinto and Normand develop likelihood and quasi-likelihood methods to analyse multiple non-commensurate outcomes in the presence of missing data in biomedical researches. Sousa reviews different methods for joint modelling of longitudinal and time to event data, based on the full likelihood of the joint distribution of the two processes. This special issue also includes a review of several nonparametric approaches for non-Markov multi-state survival models. Meira-Machado illustrates his contributions on that topic with well-known real data sets using three-state models. Bailey and Hewson suggest an addition to the multivariate modelling of the geographical distribution of different but potentially related diseases, which incorporates a discrete mixture of latent factors. This is illustrated on data on four carcinomas in some UK geographical areas.

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