Course: "Statistical methods for policy evaluation and causal inference in observational studies"

Instructor: **Dr. Bruno Arpino,** Professor at Universitat Pompeu Fabra and member of the Research and Expertise Centre for Survey Methodology.

Date: March 28-29, 2012, from 10h00-13h00 and 14h00-17h00.

Place: Universitat Pompeu Fabra, Ciutadella Campus. Barcelona, Spain.

Short description of the course:

What is the effect of smoking on health? Does having an additional child increase the risk of poverty? Are the development policies targeted on small firms effective in increasing investments?

Most studies in the social sciences are motivated by questions that are causal in nature. However, in these areas experiments are very rare because of ethical or practical reasons and the estimation of causal effects has to rely on observational studies. The validity of inference will then strictly depend on the plausibility of the assumptions underlying the employed statistical techniques.

Several approaches to causal inference have been developed. This course will define causal effects, discuss assumptions and estimation methods using the Potential Outcome approach (also known as Rubin Causal Model). Both theoretical and applied perspectives on the covered topics will be offered to participants. Examples will be drawn from economics, political science, sociology, public health and policy evaluation. A lab session will be organized during the second day of the course to demonstrate the implementation of some of the covered techniques in Stata.

In particular, the course will address the following questions:

- Why do we need causal inference? (Introduction to the Potential Outcome approach to causal inference)

- What assumptions do we need to identify causal effects? (Assignment mechanisms; randomized experiments versus observational studies)

- How can we estimate causal effects? (Propensity score techniques; Alternative matching strategies; Instrumental variables; Regression Discontinuity Design)

- Are our conclusions robust to violation of assumptions? (Sensitivity analysis)

This course is complemented by the seminar "Causal inference for policy evaluation: case studies and statistical complications", where applications of real policy evaluation studies will be presented and some complications (spill-over effects, continuous treatments) will be discussed. The seminar will take place on March 30, 2012 at Universitat Pompeu Fabra. It is advised that all course participants attend the seminar as well. For more information on the seminar, please see www.upf.edu/survey

Prerequisites for the course are basic knowledge of linear and logistic regression.

References

While not required, the following papers are useful background readings for the course:

Holland, P. (1986) "Statistics and Causal Inference", with discussion and rejoinder. *Journal of the American Statistical Association*, 81, 945-970.

Reiter, J. P. (2000) "Using statistics to determine causal relationships." *The American Mathematical Monthly*, 107, pp. 24-32.

About the Instructor:

Dr. Bruno Arpino currently works at the Department of Political and Social Sciences, Universitat Pompeu Fabra. Previously, he has been working as post-doc research fellow at Bocconi University in Milan (Italy). He obtained a PhD in Applied Statistics from the University of Florence (Italy) in 2008 with a thesis titled "Causal inference for observational studies extended to a multilevel setting. The impact of fertility on poverty in Vietnam". The thesis was awarded by the Italian Statistical Society the price as the best thesis in Applied Statistics 2007/2008. His main research interests are in the areas of causal inference and multilevel models and their application in the socio-demographic field. He has published articles in international peer-reviewed journals such as Computational Statistics and Data Analysis and Empirical Economics.

Participation:

The course is directed to anyone involved and/or interested in causal inference and modeling, policy evaluation, or statistics, especially experts coming from survey research commercial organizations, and students of statistics, political science and sociology. A maximum of 30 people can participate. Participants will be admitted on a first-come first-serve basis: the first 30 people who sign up and pay the registration fee will be accepted.

Registration procedure:

Please send an email to recsm@upf.edu, indicating your interest in registering for the course and including your name, institution, address, telephone and email address. As soon as we receive this email, we will send you information on how to proceed with the payment. Registration will only be considered complete when payment for the course has been received by RECSM.

Costs:

Participants from commercial organizations: € 400
Participants working at Universities: € 200
Students (PhD, Master): € 50

Deadline for registration: March 16th, 2012.

Further information: If you have any questions about the course, its program or its registration procedure, please contact us at recsm@upf.edu.