PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 1 EARLY STAGE GRANT LASTING 12 MONTHS FOR CONDUCTING RESEARCH PURSUANT TO ART. 22 OF LAW NO. 240/2010 AT THE DEPARTMENT OF MANAGEMENT, ECONOMICS AND QUANTITATIVE METHODS (A.R.F. 13/D1 - STATISTICS - A.D. SECS-S/01 - STATISTICS (CUP: F12F16000350001) - TYPE B

announced with decree of the Chancellor Rep. no. 688/2018 of 24.10.2018 and posted on the official registry of the University on 25.10.2018

RESEARCH PROJECT
"Air pollution effects on human health and well-being: a statistical approach with open-source and big data"

Research structure: Department of Management, economics and quantitative methods
Duration of the grant: 12 months
Scientific Area: 13 – Economics and statistics
Academic recruitment field: 13/D1 - Statistics
Academic discipline: SECS-S/01 - Statistics
Scientific Director: Prof.ssa Michela Cameletti

Air pollution represents the single largest environmental health risk in Europe today, especially for people living in urban areas. It has an impact on mortality, with a reduction in life expectancy as a result of air pollution exposure, and morbidity, with the occurrence of chronic diseases that may require hospitalisation and/or the use of drugs and, in general, reduce well-being and quality of life.
The goal of the research project consists in the assessment, for the Italian case study, of the effects of air pollution exposure on human health and well-being. This aim will be achieved by integrating several data which are freely available through open-data of the Italian Public Administrations, specific research projects or social networks. As regards pollutant concentration, for example, we will consider the geo-referenced data available through the Calicantus web-database (https://sdati.arpae.it/calicantus-intro/) or the *European air quality database managed* by the European Environmental Agency, or the Italian EPISAT data provided by the Department of Epidemiology of the Lazio Regional Health Service (http://www.deplazio.net/it/dati-episat). For the health information we will consider the individual hospitalisation data for cardio-respiratory causes provided by the Italian Ministry of Health and the provincial mortality data provided by the Italian National Institute of Statistics (ISTAT). Finally, as regards well-being, a monitoring system will be implemented based on the collection and automatic analysis of text data downloaded from Twitter (both at the national and regional level) with the aim of monitoring the spatio-temporal variations and causes of well-being.
The joint statistical analysis of all the available data will be carried by means of hierarchical mixed effects models with spatial and temporal components. The methodological challenges to be faced regard: the integration in statistical models of heterogeneous data characterized by several spatial and temporal supports and by different uncertainty sources; the management of big amount of data (especially with regard to the Twitter data), potentially characterized by sampling bias, representativeness issues and spatio-temporal misalignment.
For the research project the candidate will be working on the creation of the database by merging and integrating all the data collected also by means of automatic web-scraping procedures. The candidate will be also responsible for the preliminary analysis of the data and for the implementation of the statistical methods and models, programming with R software, for assessing the effects of air pollution on human health and well-being.
This is a position for young researchers who know the key literature of the project topics and have some previous experience in conducting research using the specific methods required for this project. A full-time commitment to the project is required with the final aim of publishing the project results on statistical journals.
During the research project the candidate will collaborate with the other Italian research units of the PRIN Ephastat project (https://sites.google.com/site/ephastat/people) and with Marta Blangiardo of the Department of Epidemiology and Biostatistics, Imperial College London (https://www.imperial.ac.uk/people/m.blangiardo).