



## Statistics in open replicable science, and open replicable statistical science

Anne-Laure Boulesteix  
(IBE, LMU Munich)

22.09.2021, 16.00 (c.t.)

Online via Zoom  
(Meeting-ID: 913-2473-4411; Password: StatsCol21)

The recently created interdisciplinary LMU Open Science Center (OSC) has the mission to promote and foster open science practices at LMU Munich and beyond. In the first part of my talk, I will give a very brief overview of the concept of open science with a special focus on the (potential) role of applied and methodological statisticians towards solving the so-called replication crisis in science. They include issues such as the publication of data and code for the purpose of reproducibility as well as methodological issues such as the prevention of p-hacking and related questionable research practices, the appropriate representation of uncertainties related to the data analysis strategy or the development of statistical concepts and methods supporting open replicable science.

In the second part of my talk, I will take the opposite perspective and discuss the implementation of the principles of replicable science within methodological statistical research. We statisticians are often keen to analyze the statistical aspects of the so-called “replication crisis”. We condemn fishing expeditions and publication bias across empirical scientific fields applying statistical methods. But what about good practice issues in own - methodological - research, i.e. research considering statistical methods as research objects? When developing and evaluating new statistical methods and data analysis tools, do statisticians adhere to the good practice principles they promote in fields which apply statistics? I argue that we should make substantial efforts to address what may be called the replication crisis in the context of methodological research in statistics and data science, in particular by trying to avoid bias in own comparison studies based on simulated or real data. I will discuss topics such as publication bias, the design and necessity of neutral comparison studies and the importance of appropriate reporting and research synthesis in the context of methodological (bio)statistical research by drawing an analogy with clinical research.

### **Biography:**

After studying mathematics and general engineering in Paris and Stuttgart (degree in 2001), a PhD in statistics at Ludwig-Maximilians-Universität (LMU) Munich (2005), and various postdoctoral activities in the field of medical statistics, Anne-Laure Boulesteix became an assistant professor in 2009 and has been a professor at the Institute of Medical Information Processing, Biometry and Epidemiology at LMU since 2012 and an associate member of Faculty 16 at LMU since 2013. She received her habilitation in applied mathematics from the University of Evry-Val d’Essonne near Paris in 2011. In addition to her research activities at the interface of biostatistics, bioinformatics and machine learning with a focus on prognostic modeling, she has been active in metascience for more than 10 years. She is an elected board member of the LMU Open Science Center, a member of the steering committee of the STRATOS initiative, and co-chair of the STRATOS simulation panel.