

*Education for Statistics in Practice at CEN2023*

Organizer: Willi Sauerbrei, Institute of Medical Biometry and Statistics, Medical Center – University of Freiburg, Freiburg, Germany

Speakers: Tim P Morris and Brennan C Kahan, MRC Clinical Trials Unit at UCL, London, UK

Title: Simulation studies as a tool to evaluate and compare the properties of statistical methods – an overview

As part of its educational work, the German Region of the International Biometric Society began a series of lectures called ‘Education for Statistics in Practice’ at their regular meetings. Since 2010, the series has been a regular part of the annual meetings of the society. This series is aimed at researchers who are interested in the application of sophisticated statistical techniques to real data. State of the art statistical techniques and software will be discussed; issues that arise when using these in practice will be addressed.

Simulation studies are a key tool for learning about the properties of statistical methods and are used extensively in statistical research. As such, they form an important part of the evidence base that is used to choose appropriate statistical methods. In this session, you will learn about some concepts of simulation studies and how to identify the structure of a given simulation study using ‘ADEMP’ (Aims, Data-generating mechanisms, Estimands, Methods and Performance measures). The focus will be more on concepts than on code, with two aims:

1. To help you understand and critique the contribution of published simulation studies;
2. To give you the understanding and confidence to go about planning and executing your own simulation study.

We will consider how simulation studies are reported and suggest how tabular and graphical displays be structured. Throughout, we will touch on some advanced issues such as the ‘phase’ of evaluation, ‘neutrality’, and the precise question being addressed by a simulation study.

By the end of June, we will provide an extended version of this abstract.