

Kolloquium „Statistische Methoden in der empirischen Forschung“

Wann: 31. Januar 2023, 17:00 – 18:30 Uhr

Wo: FU Berlin | FB Wirtschaftswissenschaft | Hörsaal 104a | Garystr. 21, 14195
Berlin | U3, Freie Universität (Thielplatz) | S1, Lichterfelde West

Online-Übertragung: der Link wird auf der [Website](#) zur Verfügung gestellt

Werner Brannath (Universität Bremen)

Towards a concept of essential type I error rates

This talk is about alternatives to the control of the familywise error rate for clinical trials with multiple hypotheses. I thereby focus on concepts that control type I error rates and losses only so far, as they are relevant to the patients outside and after the trial. Focusing on studies with multiple populations, I will introduce the familywise expected loss (FWEL; Maurer et al., 2022) and the population-wise error rate (PWER; Brannath et al., 2022) as examples for such concepts. By representing the PWER as FWEL, I will illustrate how the FWEL framework (which was applied yet only to disjoint subpopulations) can be extended to clinical trials with overlapping populations. I will also show how the PWER can be generalized to more general losses. Furthermore, focusing on multi-arm and platform trials with the possibility of dropping treatments mid-trial, I will discuss how one could account for the mid-trial reduction of the post-trials risks when dropping a treatment. As a potential solution, I will suggest to switch from control of the unconditional expected loss to control of the conditional expected loss whereby the latter concerns only the remaining risks and is conditional on the sample event that causes the change in the risks. I will motivate this solution with a sequence of clinical trials for an untreatable disease, which ends when an efficient treatment is found. No multiplicity adjustment is applied in this case and I show how this can be justified by the consideration of the changing out-trial risks and with control of conditional type I error rates. I will give additional justifications for the switch from unconditional to conditional control after dropping a treatment in multi-arm or platform trials. The talk will end with a discussion and outlook on further questions and future research concerning the control of essential type I error rates and related losses.

Literatur

Brannath, W., Hillner, C., Kornelius, R. (2022). The population-wise error rate for clinical trials with overlapping populations. *Statistical Methods in Medical Research*, online ahead of print.

Maurer, W., Bretz, F., and Xun, X. (2022). Optimal test procedures for multiple hypotheses controlling the familywise expected loss. *Biometrics*, to appear.

Brannath, W. (2022). Discussion on "Optimal test procedures for multiple hypotheses controlling the familywise expected loss" by Willi Maurer, Frank Bretz, and Xiaolei Xun. Submitted to *Biometrics*.