Academic Webinar Series

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Title

Impact of model complexity on operating characteristics of adaptive dose-finding methods

Abstract

Model-based dose-finding methods, such as the continual reassessment method, have been shown to have good operating characteristics. These models are built around a fundamental assumption of parsimony, i.e., we only model the key aspects of the problem using a strict minimum number of parameters. In particular, for the simple standard situation of a single homogeneous group, it is common to appeal to a one-parameter model. Other authors suggest the use of more fully parameterized models that include many more parameters with the hope of capturing secondary effects. Such models are usually fit using standard MCMC routines. In this talk, we show that increasing the dimension of the parameter space, in the context of adaptive dose-finding studies, is counter-productive. Rather than leading to improvements in operating characteristics, the added dimensionality is likely to result in difficulties. Theory as well as extensive simulation studies demonstrate that added dimensionality leads to, in almost all cases, poorer performance in terms of correct identification of the targeted dose.

Professional Biography

Dr. Iasonos is an associate attending biostatistician at Memorial Sloan Kettering Cancer Center in New York. Her expertise is in the design and analysis of clinical trials, primarily dose finding Phase I trials that are model based, as well as predictive modeling in surgical outcomes. She has been a statistical reviewer for the institutional Data and Safety Monitoring Committee for Phase I-II trials and is currently serving as a scientific reviewer on the institution's Research Council.

Dr. Wages is an associate professor in the Division of Translational Research and Applied Statistics at University of Virginia. He is an active member of the UVA Cancer Center Biostatistics Shared Resource. His methodological research involves the design of early-phase clinical trials, with a particular focus on studies of combined immunotherapies.

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