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RESPONSE ADAPTIVE ALLOCATION AND SELECTION BIAS

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Abstract

There have been many papers on biased coin designs and their use in balancing the numbers of patients allocated to different treatments in a clinical trial, without increasing the risk of selection bias. Less attention has been given to the corresponding risk when sequential allocations depend on the previous responses and the aim is to reduce the number of patients on inferior treatments. The ethical requirements may produce a substantial imbalance in the treatment groups. This paper gives a number of examples where selection bias is a serious possibility.

1. Introduction. Selection bias can occur in an experiment designed to compare medical treatments if the experimenter knows, before deciding whether or not to admit a particular patient to the trial, which treatment will be administered next. Blackwell and Hodges (1957) introduced a measure of the bias in a design based on the maximum expected number of correct guesses that an experimenter can achieve when attempting to predict the successive treatment allocations. Their paper and later investigations by Efron (1971), Smith (1984) and many others were concerned with the need to balance the experiment while

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