Sample Sizes Based on Exact Unconditional Test for Phase II Clinical Trials with Historical Controls

Myron N. Chang\textsuperscript{1}, Jonathan J. Shuster\textsuperscript{1}, and James L. Kepner\textsuperscript{2}

\textsuperscript{1} Research Data Center, Children’s Oncology Group, Department of Statistics, University of Florida, Gainesville, FL 32611-8545
\textsuperscript{2} Department of Clinical Biostatistics, Roswell Park Cancer Institute, Buffalo, NY 14263

Abstract

Investigated in the setting of Phase II clinical trials is the two-sample binomial problem of testing $H_0 : p_e = p_c$ versus $H_1 : p_e > p_c$ where $p_e$ and $p_c$ are the unknown target population response rates for the experimental and control groups, respectively, using the usual Z-statistic with pooled variance estimator. The cornerstones that make this paper unique are as follows. First, the emphasis is on determining the sample size given that the control group information has already been collected (historical control). Second, exact unconditional inference, rather than an asymptotic method is utilized. Sample size tables, contrasting the exact and asymptotic methods are provided. Although asymptotic results were usually fairly close to the exact results, some important differences were observed.