

BIOS 8500: Monte Carlo and Bootstrapping

Bias

Bootstrap estimator

Better bootstrap estimator

Jackknife estimator

Bootstrap wrap-up

Bioequivalence Example: Raw Data

Point of study was to show bioequivalence, so you want minimal differences between old and new.

Data are blood levels of hormone under each condition

sub	placebo	old	new
1	9243	17649	16449
2	9671	12013	14614
3	11792	19979	17274
4	13357	21816	23798
5	9055	13850	12560
6	6290	9806	10157
7	12412	17208	16570
8	18806	29044	26325

Bootstrap Estimates of Bias

Bioequivalence Example: (from Efron)

Eight subjects wearing each of 3 hormone patches: placebo, old, new (not all at the same time!). Blood levels of hormone measured under each condition.

Research question: Are the new patches bioequivalent to the old patches?

FDA standards $\frac{|E(\text{new}) - E(\text{old})|}{E(\text{old}) - E(\text{placebo})} \leq 0.20$