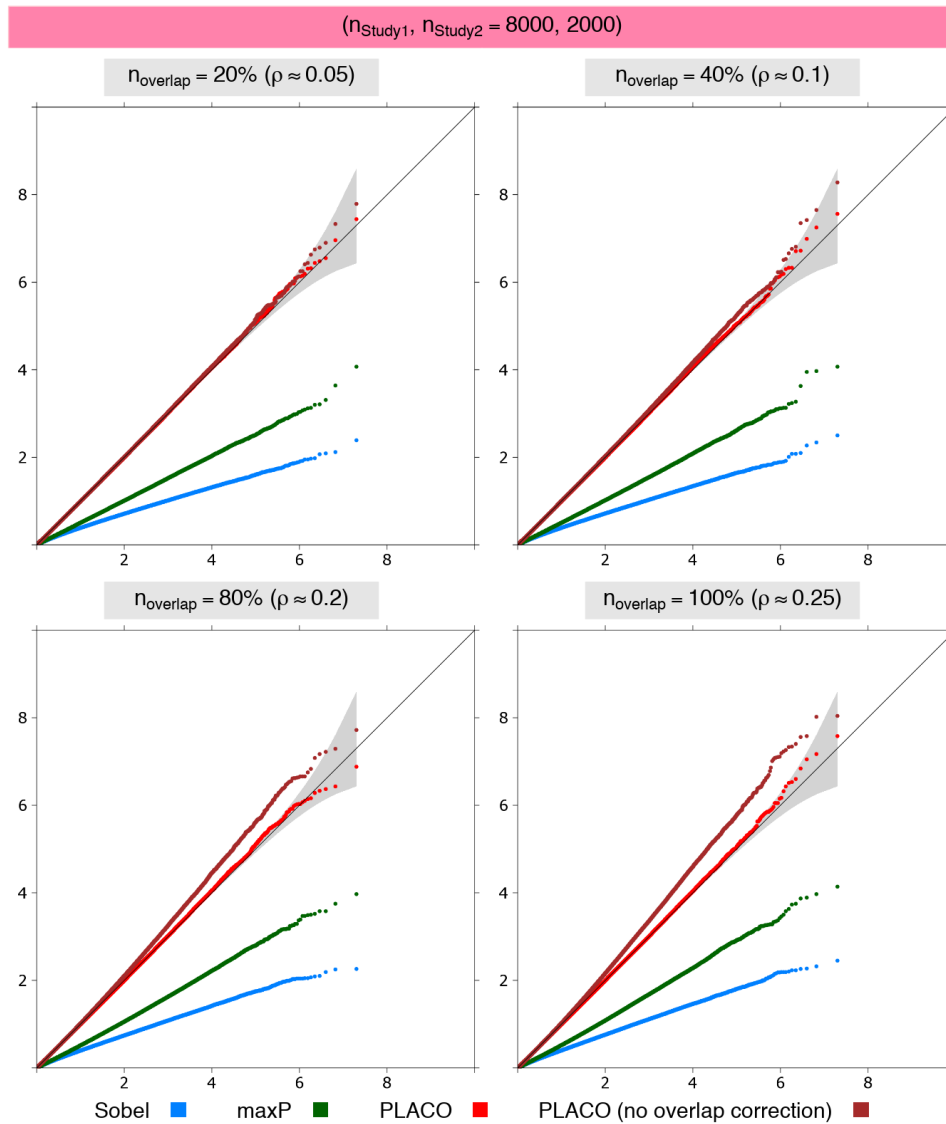


Scenario II: Traits from 2 case-control studies with shared controls



S1 Fig: Scenario II: QQ plots for the pleiotropic analysis of null data on traits from 2 case-control studies with different proportions of overlapping controls. Observed $(-\log_{10} p\text{-values})$ are plotted on the y-axis and Expected $(-\log_{10} p\text{-values})$ on the x-axis. Unequal study sample size, and equal case-control size assumed in each study. Study 1 has 4,000 unrelated cases and 4,000 unrelated controls. Study 2 has 1,000 unrelated cases and 1,000 unrelated controls, of which either 20%, 40%, 80% or 100% of the controls are shared between the two studies. Type I error performance of tests of pleiotropic effect of a genetic variant on the 2 traits is based on 9.99 million null variants with genetic effects that are either $\{\beta_1 = 0, \beta_2 = \log(1.15)\}$ or $\{\beta_1 = \log(1.15), \beta_2 = 0\}$. The gray shaded region represents a conservative 95% confidence interval for the expected distribution of p-values.