Poisson Regression Power Analysis

Numeric Results when X1 is Binomial with Proportion = 0.5
And Phi (Over-Dispersion Parameter) = 1.0000

Power	Sample Size (N)	Response Rate Ratio	Baseline Rate Exp(B0)	Mean Exposure Time (MuT)	R-Squared X1 vs Other X's (R2)	Two-Sided Alpha	Beta
0.80000	909	1.1000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	246	1.2000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	118	1.3000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	71	1.4000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	49	1.5000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	36	1.6000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	28	1.7000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	23	1.8000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	19	1.9000	5.0000	1.0000	0.2500	0.05000	0.20000
0.80000	17	2.0000	5.0000	1.0000	0.2500	0.05000	0.20000

References

Signorini, David. 1991. 'Sample size for Poisson regression', Biometrika, Volume 78, 2, pages 446-450.

Report Definitions

Power is the probability of rejecting a false null hypothesis. It should be close to one.
N is the size of the sample drawn from the population.
Exp(B1)/Exp(B0) is the response rate ratio due to a one-unit change in X1.
Exp(B0) is the response rate when all covariates have a value of zero.
Phi is the over-dispersion parameter used when the Poisson model does not fit.
R2 is the R-squared achieved when X1 is regressed on the other covariates.
Alpha is the probability of rejecting Exp(B1)/Exp(B0) is one.
Beta is the probability of accepting a false null hypothesis.

Summary Statements

A Poisson regression of a dependent variable of counts on a binary independent variable with proportion = 0.5 using a sample of 909 observations achieves 80% power at a 0.05000 significance level to detect a response rate ratio of at least 1.1000 due to a one-unit change in the IV. The baseline rate is 5.0000 and the mean exposure time is 1.0000. The sample size was adjusted since a multiple regression of the covariate of interest on the other covariates in the Poisson regression is expected to have an R-Squared of 0.2500.

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Chart Section