**Tests for the Odds Ratio in a Matched Case-Control Design with a Quantitative X**

**Numeric Results**
Hypothesis Type: Two-Sided

| Power | Number of Matched Sets N | Cases per Set $M_D$ | Controls per Set $M_H$ | Odds Ratio OR | Standard Deviation of the Covariate X $\sigma_x$ | Regression of X on other Covariates $R^2$ | Alpha |
|---|---|---|---|---|---|---|---|
| 0.8000 | 24 | 1 | 3 | 1.0050 | 137.1000 | 0.0670 | 0.0500 |
| 0.8000 | 24 | 1 | 4 | 1.0048 | 137.1000 | 0.0670 | 0.0500 |

**References**
Lachin, John M. 2008. 'Sample size evaluaion for a multiply matched case-control study using the score test from a conditional logistic (discrete Cox PH) regression model.' Statistics in Medicine, Volume 27, Pages 2509-2523.
Lachin, John M. 2011. Biostatistical Methods: The Assessment of Relative Risks, Second Edition. John Wiley & Sons. New York.
Tang, Yongqiang. 2009. 'Comments on 'Sample size evaluation for multiply matched case-control study using the score test from a conditional logistic (discrete Cox PH) regression model.'' Statistics in Medicine, Volume 28, Pages 175-177.

**Report Definitions**
Power is the probability of rejecting a false null hypothesis.
Number of Matched Sets, N, is the number of sets (strata) in the study. Each set consists in a fixed number of cases and controls.
Cases per Set, $M_D$, is the number cases in each matched set.
Controls per Set, $M_H$, is the number of controls in each matched set.
Odds Ratio, OR, is the ratio of the odds of a positive outcome when the covariate is X+1 to the odds of a positive outcome when the covariate is X.
Standard Deviation of the Covariate X, $\sigma_x$, is the average SD of X across all subjects in the study.
Regression of X on other Covariates, $R^2$, is the $R^2$ that occurs when the covariate variable of interest X is regressed on any other covariates. This adjustment assumes that covariates that have a large correlation with the outcome are used in the matching process and are not included here.
Alpha is the probability of rejecting a true null hypothesis of no association between disease and the exposure variable.

**Summary Statements**
In a matched case-control study, a sample of 24 matched sets (or strata) is obtained. Each matched set consists of 1 case and 3 controls. The standard deviation of X is 137.1000. This sample achieves 80% power to detect an odds ratio of 1.0050 calculated using conditional logistic regression with a 0.0500 significance level.

**Dropout-Inflated Sample Size**

| Dropout Rate | Sample Size N | Dropout-Inflated Enrollment Sample Size N' | Expected Number of Dropouts D |
|---|---|---|---|
| 20% | 24 | 30 | 6 |

**Tests for the Odds Ratio in a Matched Case-Control Design with a Quantitative X**

**Definitions**

Dropout Rate (DR) is the percentage of subjects (or items) that are expected to be lost at random during the course of the study and for whom no response data will be collected (i.e. will be treated as "missing").

N is the evaluable sample size at which power is computed (as entered by the user). If N subjects are evaluated out of the N' subjects that are enrolled in the study, the design will achieve the stated power.

N' is the total number of subjects that should be enrolled in the study in order to end up with N evaluable subjects, based on the assumed dropout rate. N' is calculated by inflating N using the formula N' = N / (1 - DR), with N' always rounded up. (See Julious, S.A. (2010) pages 52-53, or Chow, S.C., Shao, J., and Wang, H. (2008) pages 39-40.)

D is the expected number of dropouts. D = N' - N.

**Chart Section**



OR vs $M_H$

Power=0.80 N=24 $M_D$=1 Alpha=0.05 $P_E$=137.10 $R^2$=0.07 M.C.C. Test
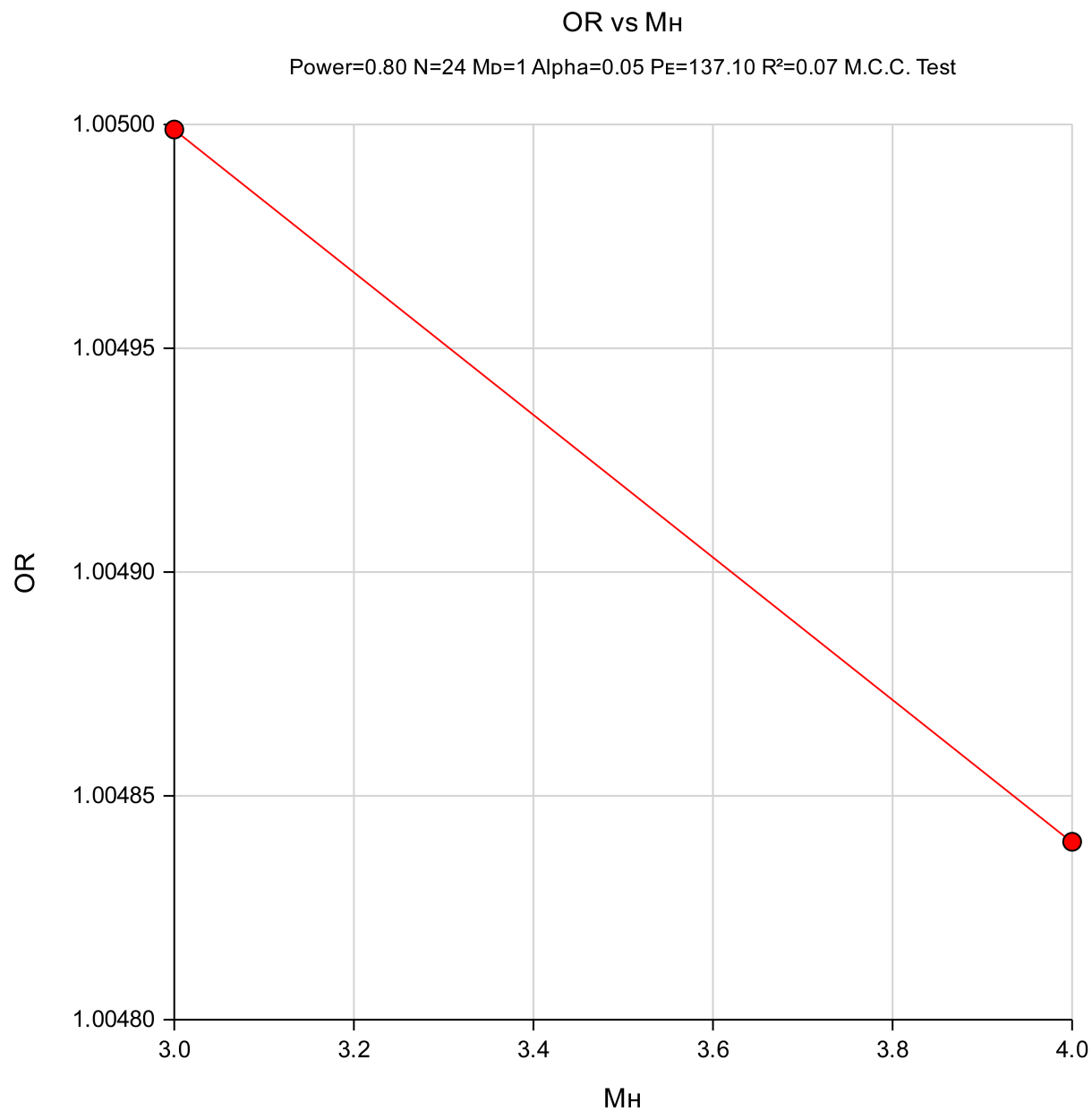
**Tests for the Odds Ratio in a Matched Case-Control Design with a Quantitative X**

**Procedure Input Settings**
Autosave Inactive

**Design Tab**

| | |
|---|---|
| Solve For: | Odds Ratio |
| Alternative Hypothesis: | Two-Sided |
| Power: | 0.8 |
| Alpha: | 0.05 |
| N (Number of Sets or Strata): | 24 |
| $M_D$ (Number of Cases per Set): | 1 |
| $M_H$ (Number of Controls per Set): | 3 4 |
| $\sigma_X$ (Standard Deviation of X): | 137.1 |
| $R^2$ (X vs. Covariates): | 0.067 |