Chapter 225

Tests for Two Proportions in a Stratified Design (Cochran/Mantel-Haenszel Test)

Introduction

In a stratified design, the subjects are selected from two or more strata which are formed from important covariates such as gender, income level, or marital status. The number of subjects in each of the two groups in each strata is set (fixed) by the design. A separate 2-by-2 table is formed for each stratum. Although response rates may vary among strata, hypotheses about the overall odds ratio can be tested the Cochran-Mantel-Haenszel test. This module allows you to determine power and sample size for such a study.

Technical Details

This procedure is based on the results of Woolson, Bean, and Rojas (1986) which were extended to include a continuity correction by Nam (1992). For more details, consult those articles or chapter 4 in Lachin (2000). We will now briefly summarize these results.

Suppose you are interested in comparing the disease response rates of two groups (treatment and control). Further suppose that response rate is known to be related to another covariate (such as age, race, or gender). It is often desirable to remove the covariate's impact from the comparison of the two proportions. This is accomplished by stratifying on the covariate and forming hypotheses about a common odds ratio across all strata. Data from such a stratified design may be analyzed by the Cochran-Mantel-Haenszel test.

There are two versions of the Cochran-Mantel-Haenszel test: one that is continuity corrected and one that is not. The continuity-corrected test is more commonly used.

The computation of the test statistic is as follows. Suppose there are *J* strata. The result of each 2-by-2 table may be summarized as follows.

	Groups		
Response	Group 1 Treatment	Group 2 Control	Total
Yes	x_{1j}	x_{2j}	$x_{.j}$
No	$n_{1j} - x_{1j}$	$n_{2j} - x_{2j}$	$N_j - x_{.j}$
Total	n_{1j}	n_{2j}	N_j

where $j = 1, 2, \ldots, J$ and $N = \sum_{j=1}^{J} N_j$.

The parameters of interest are the success proportions p_{1j} and p_{2j}. These parameters are estimated by

$$\hat{p}_{1j} = \frac{x_{1j}}{n_{1j}} \text{ and } \hat{p}_{2j} = \frac{x_{2j}}{n_{2j}}$$

The odds of response in each of the two groups in each strata is given by

$$o_{1j} = \frac{p_{1j}}{1-p_{1j}} \text{ and } o_{2j} = \frac{p_{2j}}{1-p_{2j}}$$

The strata odds ratio ψ_j is calculated using the equation

$$\begin{aligned}\psi_j &= \frac{o_{1j}}{o_{2j}} \\ &= \frac{\left(\frac{p_{1j}}{1-p_{1j}}\right)}{\left(\frac{p_{2j}}{1-p_{2j}}\right)}\end{aligned}$$

In the sequel, it is assumed that the strata odds ratios are all equal. That is, it is assumed that $\psi_1 = \psi_2 = \cdots \psi_J = \psi$. Solving this relationship for p_{1j} in terms of ψ and p_{2j} gives

$$p_{1j} = \frac{\psi\, p_{2j}}{1 - p_{2j} + \psi\, p_{2j}}$$

If values for the odds ratio under the null hypothesis (ψ_0), under the alternative hypothesis (ψ_1), and p_{2j} are specified, values for p_{1j} under the null hypothesis (p_{1j0}) and the alternative hypothesis (p_{1j1}) can be calculated as follows

$$p_{1j0} = \frac{\psi_0 p_{2j}}{1 - p_{2j} + \psi_0 p_{2j}}, \quad j = 1, 2, \cdots, J$$

$$p_{1j1} = \frac{\psi_1 p_{2j}}{1 - p_{2j} + \psi_1 p_{2j}}, \quad j = 1, 2, \cdots, J$$

Assuming a common odds ratio across all strata of ψ (that is, assuming $\psi_1 = \psi_2 = \cdots \psi_J = \psi$), hypotheses of the form $H_0{:}\ \psi \le \psi_0$ versus $H_1{:}\ \psi > \psi_0$ may be tested using Cochran's U statistic (Woolson et al. 1986, page 928)

$$U_G = \sum_{j=1}^{J} w_j \left\{ \left(\hat{p}_{1j} - \hat{p}_{2j}\right) - \left(p_{1j0} - p_{2j}\right) \right\}, \quad \text{where } w_j = \frac{n_{1j} n_{2j}}{N_j}$$

Note that when $\psi_0 = 1$, U_G reduces to

$$U_0 = \sum_{j=1}^{J} w_j \left(\hat{p}_{1j} - \hat{p}_{2j} \right).$$

The value U_0 is commonly used to form the Cochran-Mantel-Haenszel statistic. U_G is an extension of this statistic which allows $\psi_0 \neq 1$.

The calculation of the asymptotically normal test statistic, z_c, may or may not include a continuity correction factor depending on whether the parameter *cc* is set to 1/2 or 0. The formula for z_{CMH} is

$$z_{CMH} = \frac{U_G - cc}{\sqrt{v_0(U_G)}}$$

where

$$v_0(U_G) = \begin{cases} \sum_{j=1}^{J} w_j^2 \left\{ \frac{\hat{p}_{1j}(1-\hat{p}_{1j})}{n_{1j}} + \frac{\hat{p}_{2j}(1-\hat{p}_{2j})}{n_{2j}} \right\} & \text{if } \psi_0 \neq 1 \\ \sum_{j=1}^{J} w_j \hat{p}_j (1-\hat{p}_j) & \text{if } \psi_0 = 1 \end{cases}$$

$$\hat{p}_j = \frac{x_{.j}}{N_j}$$

The name *Cochran-Mantel-Haenszel test* actually refers to two tests: the Cochran test and the the Mantel-Haenszel test. The difference is between these test is that Cochran's test uses $v_0(U_G)$ to estimate the unconditional variance assuming that the group sample sizes are fixed, while the Mantel-Haenszel test replaces $v_0(U_G)$ with an estimate of the conditional variance of *U* assuming that both row and column marginals are fixed. Asymptotically the two variances are equivalent, so the test is often called the Cochran-Mantel-Haenszel statistic.

Power Calculations

The asymptotic power of z_{CMH} for testing a one-sided hypothesis of the form $H_0: \psi \leq \psi_0$ versus $H_1: \psi > \psi_0$ is

$$Power = 1 - \Phi\left(\frac{z_{1-\alpha}\sqrt{V_0(U_G)} - E(U_G) + cc}{\sqrt{V_1(U_G)}} \right)$$

where

$$E(U_G) = \sum_{j=1}^{J} w_j \left\{ \left(p_{1j1} - p_{2j} \right) - \left(p_{1j0} - p_{2j} \right) \right\}$$

$$V_0(U_G) = \begin{cases} \sum_{j=1}^{J} w_j^2 \left\{ \frac{p_{1j0}(1-p_{1j0})}{n_{1j}} + \frac{p_{2j}(1-p_{2j})}{n_{2j}} \right\} & \text{if } \psi_0 \neq 1 \\ \sum_{j=1}^{J} w_j \bar{p}_j (1-\bar{p}_j) & \text{if } \psi_0 = 1 \end{cases}$$

$$\bar{p}_j = p_{1j1}\left(\frac{n_{1j}}{N_j}\right) + p_{2j}\left(\frac{n_{2j}}{N_j}\right)$$

$$V_1(U_G) = \sum_{j=1}^{J} w_j^2 \left\{ \frac{p_{1j1}(1-p_{1j1})}{n_{1j}} + \frac{p_{2j}(1-p_{2j})}{n_{2j}} \right\}$$

Note that Woolson et al. (1986) and Nam (1992) give results for the usual case when $\psi_0 = 1$. The above results are our extension to the important case when $\psi_0 \neq 1$. We could not find published results for this case, so we have made this extension. When published results become available, we will adopt those results. If you have $\psi_0 \neq 1$, you must use U_G, rather than U_0, in the calculation of the test statistic.

Similar calculations may also be made for testing the other one-sided hypothesis $H_0\!: \psi \geq \psi_0$ versus $H_1\!: \psi < \psi_0$ and the two-sided hypothesis $H_0\!: \psi = \psi_0$ versus $H_1\!: \psi \neq \psi_0$.

Procedure Options

This section describes the options that are specific to this procedure. These are located on the Design 1 and Design 2 tabs. For more information about the options of other tabs, go to the Procedure Window chapter.

Design 1 and Design 2 Tabs

The Design tabs contain most of the parameters and options of interest for this procedure.

Solve For

Solve For

This option specifies the parameter to be solved for using the other parameters. The parameters that may be selected are *OR1*, *Alpha*, *Power*, or *Sample Size*. In most cases, you will select either *Power* or *Sample Size*.

Select *Sample Size* when you want to calculate the sample size needed to achieve a given power and alpha level.

Select *Power* when you want to calculate the power.

Test

H1 (Alternative Hypothesis)

This option specifies whether a one-sided or two-sided hypothesis is analyzed.

One-Sided (H1: OR1 < OR0) refers to a one-sided test in which the alternative hypothesis is of the form H1: *OR1 < OR0*.

One-Sided (H1: OR1 > OR0) refers to a one-sided test in which the alternative hypothesis is of the form H1: *OR1 > OR0*.

Two-Sided refers to a two-sided test in which the alternative hypothesis is of the type *H1: OR1 ≠ OR0*. Here "≠" means "is not equal to" or "is less than or greater than".

Note that the alternative hypothesis enters into power calculations by specifying the rejection region of the hypothesis test. Its accuracy is critical.

Continuity Correction

Specify whether to use the Continuity Correction. When selected, a continuity correction is made that is recommend by Fleiss et al. (2003) to make the alpha and beta values achieved by the test more accurate.

Power and Alpha

Power

This option specifies one or more values for power. Power is the probability of rejecting a false null hypothesis, and is equal to one minus Beta. Beta is the probability of a type-II error, which occurs when a false null hypothesis is not rejected. In this procedure, a type-II error occurs when you fail to reject the null hypothesis of equal proportions when in fact they are different.

Values must be between zero and one. Historically, the value of 0.80 (Beta = 0.20) was used for power. Now, 0.90 (Beta = 0.10) is also commonly used.

A single value may be entered here or a range of values such as *0.8 to 0.95 by 0.05* may be entered.

Alpha

This option specifies one or more values for the probability of a type-I error. A type-I error occurs when a true null hypothesis is rejected. For this procedure, a type-I error occurs when you reject the null hypothesis of equal proportions when in fact they are equal.

Values must be between zero and one. Historically, the value of 0.05 has been used for alpha. This means that about one test in twenty will falsely reject the null hypothesis. You should pick a value for alpha that represents the risk of a type-I error you are willing to take in your experimental situation.

You may enter a range of values such as *0.01 0.05 0.10* or *0.01 to 0.10 by 0.01*.

Sample Size

M (Sample Size Multiplier)

M and the values of R1 and R2 are used to calculate the group sample sizes within each strata using the formulas N1 = M x R1 and N2 = M x R2. The total sample size, N, is found by summing N1 and N2 across all strata. Note that fractional values for N, N1, and N2 will usually result. In practice these values are rounded up to the next integer value.

One or more values, separated by blanks or commas, may be entered. A separate analysis is performed for each value.

Using M as the Group Size

To use M as the sample size in each group, the values of R1 and R2 must each be set to one.

Using M as the Strata Size

To use M as the sample size in each strata, the values of R1 and R2 must sum to one within each strata. For example, suppose M = 30 and R1 = R2 = 0.5. The values of N1 and N2, the group sample sizes within a stratum, will be 0.5 x 30 = 15. Thus, the total sample size within the strata is 15 + 15 = 30.

Using M as Total Sample Size

To use M as the total sample size across all strata, the values of R1 and R2 must sum to one across all values. Note that the resulting value of N may not exactly equal M because of rounding.

For example, suppose there are three strata with R1 = 0.1, 0.2, and 0.2 and R2 = 0.1, 0.3, and 0.1. (Note that these values sum to one.) If M were 100, then the values of N1 would be 10, 20, and 20 and the values of N2 would be 10, 30, and 10. These sum to 100, the value of M.

Effect Size

OR1 (Odds Ratio|H1)

This option specifies the odds ratio of the two proportions P1 and P2 at which the power is to be computed. This odds ratio is used to specify the size of the difference between the two proportions at which the power is calculated.

You may enter a range of values such as *0.5 0.6 0.7 0.8* or *1.25 to 2.0 by 0.25*.

Odds ratios must greater than zero.

OR0 (Odds Ratio|H0)

Specify the odds ratio under the null hypothesis, H0. For each strata, this value is used with the value of Pr(Success) to calculate the probability of obtaining a success in group one (the treatment group) assuming the null hypothesis. In the standard Cochran-Mantel-Haenszel test, this value is assumed to be (and should be entered as) one. If you enter a value other than one, your data analysis should use the more general test statistic.

Note that OR0 must be greater than zero and cannot be equal to OR1.

Strata Information

Strata

This option specifies the number of strata specified on this line. Usually, you will enter a “1” to specify a single stratum, or you will enter a “0” to ignore this line. However, this option lets you specify several strata at once.

The total number of strata is equal to the sum of these values.

R1 = N1 / M, R2 = N2 / M

R1 and R2 are used to obtain the sample sizes in groups 1 (treatment) and 2 (control) within a strata using the formulas N1 = R1 x M and N2 = R2 x M. The only limitation on R1 and R2 is that they are positive (non-zero) values. See the comments under M for more information.

Note that only a single value may be entered for this parameter—you cannot enter several values.

Pr(Success)

This is the baseline probability of a successful response. This value is used with OR1 to calculate the probability of a success in group 1 (the treatment or numerator group).

Since this value is a probability, it must be between zero and one.

Note that only one value may be entered here.

Example 1 – Finding Power

Nam (1992) discusses a case-control study investigating the possible association between chlorinated water and colon cancer among males in Iowa. Since age is known to affect colon cancer rates, the population is stratified into four age groups with weights of 10%, 40%, 35%, and 15%. An equal number of cases and controls will be selected in each age-group. Prior studies had shown the probability of chlorinated water exposure among non-cancer subjects was 0.75, 0.70, 0.65, and 0.60, respectively, among the four age groups. The significance level is set to 0.05. The investigators want to consider various total sample sizes from 50 to 500. They also want to consider odds ratios of 2 and 3.

Setup

This section presents the values of each of the parameters needed to run this example. First, from the PASS Home window, load the **Tests for Two Proportions in a Stratified Design (Cochran/Mantel-Haenszel Test)** procedure window by expanding **Proportions**, then **Two Independent Proportions**, then clicking on **Stratified**, and then clicking on **Tests for Two Proportions in a Stratified Design (Cochran/Mantel-Haenszel Test)**. You may then make the appropriate entries as listed below, or open **Example 1** by going to the **File** menu and choosing **Open Example Template**.

Option	Value
Design 1 Tab	
Solve For	**Power**
H1 (Alternative Hypothesis)	**One-Sided (H1:OR1>OR0)**
Continuity Correction	**Checked**
Alpha	**0.05**
M (Sample Size Multiplier)	**50 to 500 by 50**
OR0 (Odds Ratio | H0)	**1**
OR1 (Odds Ratio | H1)	**2 3**
Strata(1)	**1**
R1(1)	**0.05 (half of 10%)**
R2(1)	**R1**
Pr(Success)(1)	**0.75**
Strata(2)	**1**
R1(2)	**0.20 (half of 40%)**
R2(2)	**R1**
Pr(Success)(2)	**0.70**
Strata(3)	**1**
R1(3)	**0.175 (half of 35%)**
R2(3)	**R1**
Pr(Success)(3)	**0.65**
Design 2 Tab	
Strata(4)	**1**
R1(4)	**0.075 (half of 15%)**
R2(4)	**R1**
Pr(Success)(4)	**0.60**

Annotated Output

Click the Calculate button to perform the calculations and generate the following output.

Numeric Results

Numeric Results of Cochran-Mantel-Haenszel Test of an Odds Ratio
H0: OR1 = OR0.   H1: OR1 > OR0. Test: Continuity-Corrected Z-Test.

Power	Total Sample Size (N)	Sample Size Multiplier (M)	Sample Size of Group 1 (N1)	Sample Size of Group 2 (N2)	H0 Odds Ratio (OR0)	Actual Odds Ratio (OR1)	Signif. Level Alpha	Beta
0.1783	50	50.000	25	25	1.000	2.000	0.0500	0.8217
0.3505	100	100.000	50	50	1.000	2.000	0.0500	0.6495
0.4992	150	150.000	75	75	1.000	2.000	0.0500	0.5008
0.6215	200	200.000	100	100	1.000	2.000	0.0500	0.3785
0.7186	250	250.000	125	125	1.000	2.000	0.0500	0.2814
0.7937	300	300.000	150	150	1.000	2.000	0.0500	0.2063
0.8506	350	350.000	175	175	1.000	2.000	0.0500	0.1494
0.8929	400	400.000	200	200	1.000	2.000	0.0500	0.1071
0.9239	450	450.000	225	225	1.000	2.000	0.0500	0.0761
0.9464	500	500.000	250	250	1.000	2.000	0.0500	0.0536
0.3356	50	50.000	25	25	1.000	3.000	0.0500	0.6644
0.6337	100	100.000	50	50	1.000	3.000	0.0500	0.3663
0.8151	150	150.000	75	75	1.000	3.000	0.0500	0.1849
0.9121	200	200.000	100	100	1.000	3.000	0.0500	0.0879
0.9601	250	250.000	125	125	1.000	3.000	0.0500	0.0399
0.9825	300	300.000	150	150	1.000	3.000	0.0500	0.0175
0.9925	350	350.000	175	175	1.000	3.000	0.0500	0.0075
0.9969	400	400.000	200	200	1.000	3.000	0.0500	0.0031
0.9987	450	450.000	225	225	1.000	3.000	0.0500	0.0013
0.9995	500	500.000	250	250	1.000	3.000	0.0500	0.0005

Report Definitions
'Power' is the probability of rejecting a false null hypothesis. It should be close to one.
'N' is the total sample size summed across all groups and strata.
'M' is the factor by which the values of R1 and R2 are multiplied.
'N1 and N2' are the sample sizes from groups 1 and 2 summed across all strata.
'OR0' is the odds ratio [P1/(1-P1)] / [P2/(1-P2)] assuming the null hypothesis (H0).
'OR1' is the value of the odds ratio at which the power is computed.
'Alpha' is the probability of rejecting a true null hypothesis.
'Beta' is the probability of accepting a false null hypothesis.
In a treatment vs. control design, the treatment group is 1 and the control group is 2.

Summary Statements
A stratified design, which divides the sample among 4 strata, is analyzed using the one-sided, Cochran-Mantel-Haenszel test. Sample sizes, summed across all strata, of 25 in group 1 (treatment group) and 25 in group 2 (control group) achieve 18% power to reject the odds ratio set by the null hypothesis of 1.000 when the odds ratio is actually 2.000. The significance level of the test was set at 0.0500.

Sample Sizes: N, N1, and N2

The value of N is the sum of N1 and N2. The values of N1 and N2 are found by summing the individual strata-group sample sizes. These are found by multiplying R1 and R2 by M.

Note that this multiplication will usually result in fractional sample sizes across the strata. As a practical matter, we recommend rounding each fractional value up to the next integer when implementing a given design.

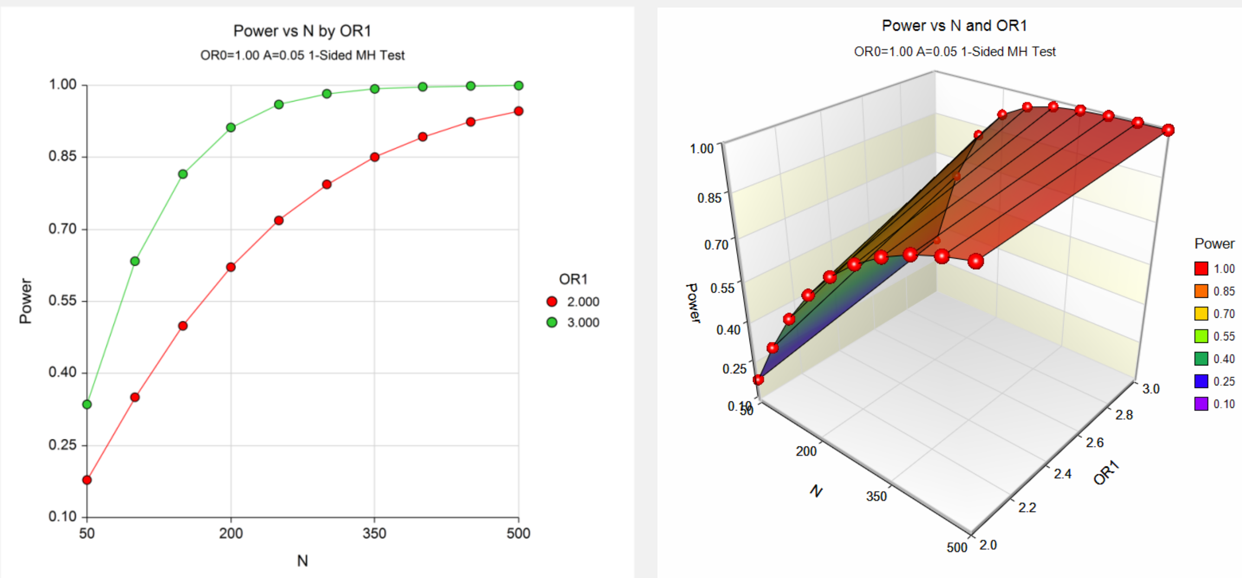
Strata-Detail Report

Strata-Detail Report

Number of Strata	Proportion of Total Sample in each Strata	Proportion of this Strata in Group 1	Proportion of this Strata in Group 2	Group 1 Multiplier (R1)	Group 2 Multiplier (R2)	Strata Probability of Success
1	0.1000	0.5000	0.5000	0.050	0.050	0.7500
1	0.4000	0.5000	0.5000	0.200	0.200	0.7000
1	0.3500	0.5000	0.5000	0.175	0.175	0.6500
1	0.1500	0.5000	0.5000	0.075	0.075	0.6000

This report shows the values of the individual, strata-level parameters that were used. These parameters are the same for all rows of the Numerical Results Report (shown above), so they are only displayed once.

Plots Section



The values from the Numerical Results report are displayed in these plots. These charts provide a quick view of the power that is achieved for various sample sizes.

Example 2 – Validation using Nam

To validate the procedure, we will compare ***PASS's*** results to those on page 392 of Nam (1992). Most of the settings in this example are the same as those of Example 1, except that the power is 90% and the odds ratio is 3. Nam (1992) found the necessary sample sizes to be 192 for the corrected test and 171 for the uncorrected test.

Setup

This section presents the values of each of the parameters needed to run this example. First, from the PASS Home window, load the **Tests for Two Proportions in a Stratified Design (Cochran/Mantel-Haenszel Test)** procedure window by expanding **Proportions**, then **Two Independent Proportions**, then clicking on **Stratified**, and then clicking on **Tests for Two Proportions in a Stratified Design (Cochran/Mantel-Haenszel Test)**. You may then make the appropriate entries as listed below, or open **Example 2a** or **Example 2b** by going to the **File** menu and choosing **Open Example Template**.

Option	Value
Design 1 Tab	
Solve For	**Sample Size**
H1 (Alternative Hypothesis)	**One-Sided (H1:OR1>OR0)**
Continuity Correction	**Checked/Unchecked**
Power	**0.90**
Alpha	**0.05**
OR0 (Odds Ratio | H0)	**1**
OR1 (Odds Ratio | H1)	**3**
Strata(1)	**1**
R1(1)	**0.05 (half of 10%)**
R2(1)	**R1**
Pr(Success)(1)	**0.75**
Strata(2)	**1**
R1(2)	**0.20 (half of 40%)**
R2(2)	**R1**
Pr(Success)(2)	**0.70**
Strata(3)	**1**
R1(3)	**0.175 (half of 35%)**
R2(3)	**R1**
Pr(Success)(3)	**0.65**
Design 2 Tab	
Strata(4)	**1**
R1(4)	**0.075 (half of 15%)**
R2(4)	**R1**
Pr(Success)(4)	**0.60**

Output

Click the Calculate button to perform the calculations and generate the following output.

Numeric Results

Numeric Results of Cochran-Mantel-Haenszel Test of an Odds Ratio
H0: OR1 = OR0. H1: OR1 > OR0. Test: Continuity-Corrected Z-Test.

Power	Total Sample Size (N)	Sample Size Multiplier (M)	Sample Size of Group 1 (N1)	Sample Size of Group 2 (N2)	H0 Odds Ratio (OR0)	Actual Odds Ratio (OR1)	Signif. Level Alpha	Beta
0.9000	192	191.538	96	96	1.000	3.000	0.0500	0.1000

The value of 192 agrees exactly with that of Nam (1992).

If you uncheck the Continuity Correction option and rerun the analysis, you will get the following results.

Numeric Results – No Continuity Correction

Numeric Results of Cochran-Mantel-Haenszel Test of an Odds Ratio
H0: OR1 = OR0. H1: OR1 > OR0. Test: Uncorrected Z-Test.

Power	Total Sample Size (N)	Sample Size Multiplier (M)	Sample Size of Group 1 (N1)	Sample Size of Group 2 (N2)	H0 Odds Ratio (OR0)	Actual Odds Ratio (OR1)	Signif. Level Alpha	Beta
0.9000	171	170.741	85	85	1.000	3.000	0.0500	0.1000

The value of 171 agrees exactly with that of Nam (1992).

Example 3 – Finding Power of a Completed Experiment

Suppose you want to find the power for a completed experiment in which the individual strata sample sizes are known. In this example there are three strata with success probabilities 0.72, 0.66, and 0.69. The sample sizes for the treatment group in each stratum are 102, 113, and 97. The sample sizes for the control group in each stratum are 98, 110, and 114. The experiment was designed to detect an odds ratio of at least 1.5 with alpha equal to 0.05 for a one-sided test.

To calculate the power in this situation, we set M to 1 and enter the sample sizes directly into R1 and R2.

Setup

This section presents the values of each of the parameters needed to run this example. First, from the PASS Home window, load the **Tests for Two Proportions in a Stratified Design (Cochran/Mantel-Haenszel Test)** procedure window by expanding **Proportions**, then **Two Independent Proportions**, then clicking on **Stratified**, and then clicking on **Tests for Two Proportions in a Stratified Design (Cochran/Mantel-Haenszel Test)**. You may then make the appropriate entries as listed below, or open **Example 3** by going to the **File** menu and choosing **Open Example Template**.

Option	Value
Design 1 Tab	
Solve For	**Power**
H1 (Alternative Hypothesis)	**One-Sided (H1:OR1>OR0)**
Continuity Correction	**Checked**
Alpha	**0.05**
M (Sample Size Multiplier)	**1**
OR0 (Odds Ratio | H0)	**1**
OR1 (Odds Ratio | H1)	**1.5**
Strata(1)	**1**
R1(1)	**102**
R2(1)	**98**
Pr(Success)(1)	**0.72**
Strata(2)	**1**
R1(2)	**113**
R2(2)	**110**
Pr(Success)(2)	**0.66**
Strata(3)	**1**
R1(3)	**97**
R2(3)	**114**
Pr(Success)(3)	**0.69**

Output

Click the Calculate button to perform the calculations and generate the following output.

Numeric Results

Numeric Results of Cochran-Mantel-Haenszel Test of an Odds Ratio
H0: OR1 = OR0. H1: OR1 > OR0. Test: Continuity-Corrected Z-Test.

Power	Total Sample Size (N)	Sample Size Multiplier (M)	Sample Size of Group 1 (N1)	Sample Size of Group 2 (N2)	H0 Odds Ratio (OR0)	Actual Odds Ratio (OR1)	Signif. Level Alpha	Beta
0.6980	634	1.000	312	322	1.000	1.500	0.0500	0.3020

The power to detect an odds ratio of 1.5 is only 0.6980 in this experiment.