Tests for Two Proportions

Numeric Results for Testing Two Proportions using the Z-Test with Unpooled Variance

H0: P1 - P2 = 0. H1: P1 - P2 = D1 ≠ 0.

Power*	N1	N2	N	P1	P2	Diff D1	Alpha
0.80000	24	72	96	0.2134	0.5000	-0.2866	0.0500
0.80000	24	96	120	0.2225	0.5000	-0.2775	0.0500

* Power was computed using the normal approximation method.

References

Chow, S.C., Shao, J., and Wang, H. 2008. Sample Size Calculations in Clinical Research, Second Edition. Chapman & Hall/CRC. Boca Raton, Florida.

D'Agostino, R.B., Chase, W., and Belanger, A. 1988. 'The Appropriateness of Some Common Procedures for Testing the Equality of Two Independent Binomial Populations', The American Statistician, August 1988, Volume 42 Number 3, pages 198-202.

Fleiss, J. L., Levin, B., and Paik, M.C. 2003. Statistical Methods for Rates and Proportions. Third Edition. John Wiley & Sons. New York.

Lachin, John M. 2000. Biostatistical Methods. John Wiley & Sons. New York.

Machin, D., Campbell, M., Fayers, P., and Pinol, A. 1997. Sample Size Tables for Clinical Studies, 2nd Edition. Blackwell Science. Malden, Mass.

Ryan, Thomas P. 2013. Sample Size Determination and Power. John Wiley & Sons. Hoboken, New Jersey.

Report Definitions

Power is the probability of rejecting a false null hypothesis.
N1 and N2 are the number of items sampled from each population.
N is the total sample size, N1 + N2.
P1 is the proportion for Group 1 at which power and sample size calculations are made. This is the treatment or experimental group.
P2 is the proportion for Group 2. This is the standard, reference, or control group.
D1 is the difference P1 - P2 assumed for power and sample size calculations.
Alpha is the probability of rejecting a true null hypothesis.

Summary Statements

Group sample sizes of 24 in group 1 and 72 in group 2 achieve 80.000% power to detect a difference between the group proportions of -0.2866. The proportion in group 1 (the treatment group) is assumed to be 0.5000 under the null hypothesis and 0.2134 under the alternative hypothesis. The proportion in group 2 (the control group) is 0.5000. The test statistic used is the two-sided Z-Test with unpooled variance. The significance level of the test is 0.0500.

Dropout-Inflated Sample Size

	Sample Size			Dropout-Inflated Enrollment Sample Size			Expected Number of Dropouts		
Dropout Rate	N1	N2	N	N1'	N2'	N'	D1	D2	D
20%	24	72	96	30	90	120	6	18	24
20%	24	96	120	30	120	150	6	24	30

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Definitions

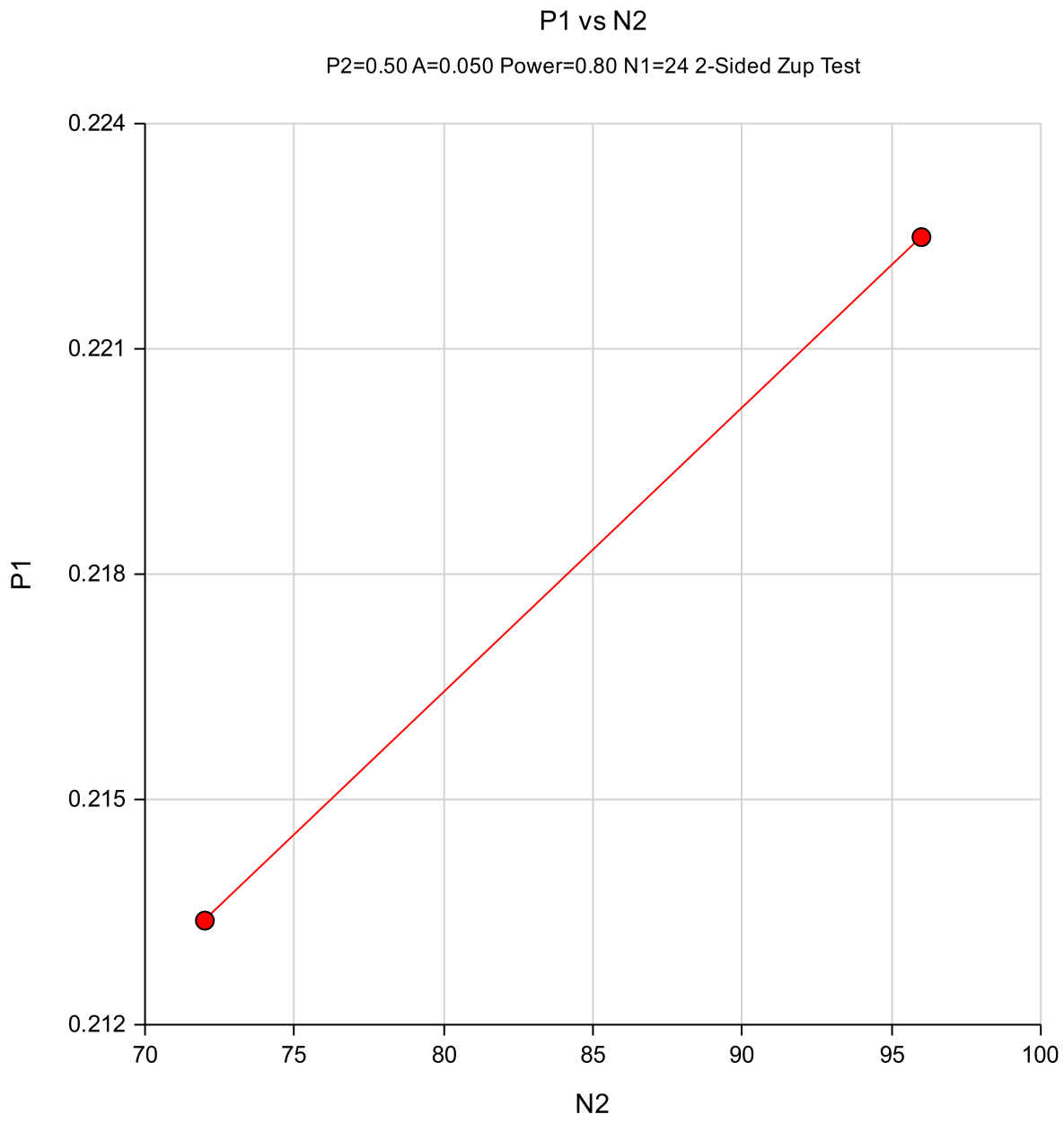
Dropout Rate (DR) is the percentage of subjects (or items) that are expected to be lost at random during the course of the study and for whom no response data will be collected (i.e. will be treated as "missing").

N1, N2, and N are the evaluable sample sizes at which power is computed (as entered by the user). If N1 and N2 subjects are evaluated out of the N1' and N2' subjects that are enrolled in the study, the design will achieve the stated power.

N1', N2', and N' are the number of subjects that should be enrolled in the study in order to end up with N1, N2, and N evaluable subjects, based on the assumed dropout rate. N1' and N2' are calculated by inflating N1 and N2 using the formulas N1' = N1 / (1 - DR) and N2' = N2 / (1 - DR), with N1' and N2' always rounded up. (See Julious, S.A. (2010) pages 52-53, or Chow, S.C., Shao, J., and Wang, H. (2008) pages 39-40.)

D1, D2, and D are the expected number of dropouts. D1 = N1' - N1, D2 = N2' - N2, and D = D1 + D2.

Chart Section



Tests for Two Proportions

Procedure Input Settings
Autosave Inactive

Design Tab

Solve For:	Effect Size (P1, D1, R1, OR1)
Power Calculation Method:	Normal Approximation
Alternative Hypothesis:	Two-Sided
Test Type:	Z-Test (Unpooled)
Power:	0.80
Alpha:	0.05
Group Allocation:	Enter N1 and N2 individually
N1:	24
N2:	72,96
Input Type:	Proportions
P1 (Group 1 Proportion|H1):	Search < P2
P2 (Group 2 Proportion):	0.5