

Two-Sample T-Tests Assuming Equal Variance

Numeric Results for Two-Sample T-Test Assuming Equal Variance

Alternative Hypothesis: $\mu_1 \neq \mu_2$

Target Power	Actual Power	N1	N2	N	μ_1	μ_2	$\mu_1 - \mu_2$	σ	Alpha
0.80	0.80704	17	17	34	1.0	0.0	1.0	1.0	0.050
0.90	0.91250	23	23	46	1.0	0.0	1.0	1.0	0.050
0.80	0.80146	64	64	128	1.0	0.0	1.0	2.0	0.050
0.90	0.90323	86	86	172	1.0	0.0	1.0	2.0	0.050
0.80	0.80208	143	143	286	1.0	0.0	1.0	3.0	0.050
0.90	0.90135	191	191	382	1.0	0.0	1.0	3.0	0.050
0.80	0.82837	15	15	30	1.1	0.0	1.1	1.0	0.050
0.90	0.90967	19	19	38	1.1	0.0	1.1	1.0	0.050
0.80	0.80097	53	53	106	1.1	0.0	1.1	2.0	0.050
0.90	0.90225	71	71	142	1.1	0.0	1.1	2.0	0.050
0.80	0.80091	118	118	236	1.1	0.0	1.1	3.0	0.050
0.90	0.90131	158	158	316	1.1	0.0	1.1	3.0	0.050
0.80	0.80208	12	12	24	1.2	0.0	1.2	1.0	0.050
0.90	0.90719	16	16	32	1.2	0.0	1.2	1.0	0.050
0.80	0.80370	45	45	90	1.2	0.0	1.2	2.0	0.050
0.90	0.90312	60	60	120	1.2	0.0	1.2	2.0	0.050
0.80	0.80365	100	100	200	1.2	0.0	1.2	3.0	0.050
0.90	0.90148	133	133	266	1.2	0.0	1.2	3.0	0.050
0.80	0.82630	11	11	22	1.3	0.0	1.3	1.0	0.050
0.90	0.91148	14	14	28	1.3	0.0	1.3	1.0	0.050
0.80	0.80892	39	39	78	1.3	0.0	1.3	2.0	0.050
0.90	0.90159	51	51	102	1.3	0.0	1.3	2.0	0.050
0.80	0.80202	85	85	170	1.3	0.0	1.3	3.0	0.050
0.90	0.90030	113	113	226	1.3	0.0	1.3	3.0	0.050
0.80	0.84131	10	10	20	1.4	0.0	1.4	1.0	0.050
0.90	0.90595	12	12	24	1.4	0.0	1.4	1.0	0.050
0.80	0.81165	34	34	68	1.4	0.0	1.4	2.0	0.050
0.90	0.90086	44	44	88	1.4	0.0	1.4	2.0	0.050
0.80	0.80509	74	74	148	1.4	0.0	1.4	3.0	0.050
0.90	0.90156	98	98	196	1.4	0.0	1.4	3.0	0.050
0.80	0.84761	9	9	18	1.5	0.0	1.5	1.0	0.050
0.90	0.91690	11	11	22	1.5	0.0	1.5	1.0	0.050
0.80	0.80141	29	29	58	1.5	0.0	1.5	2.0	0.050
0.90	0.90487	39	39	78	1.5	0.0	1.5	2.0	0.050
0.80	0.80146	64	64	128	1.5	0.0	1.5	3.0	0.050
0.90	0.90323	86	86	172	1.5	0.0	1.5	3.0	0.050
0.80	0.84479	8	8	16	1.6	0.0	1.6	1.0	0.050
0.90	0.92237	10	10	20	1.6	0.0	1.6	1.0	0.050
0.80	0.80749	26	26	52	1.6	0.0	1.6	2.0	0.050
0.90	0.90150	34	34	68	1.6	0.0	1.6	2.0	0.050
0.80	0.80587	57	57	114	1.6	0.0	1.6	3.0	0.050
0.90	0.90056	75	75	150	1.6	0.0	1.6	3.0	0.050
0.80	0.83099	7	7	14	1.7	0.0	1.7	1.0	0.050
0.90	0.92258	9	9	18	1.7	0.0	1.7	1.0	0.050
0.80	0.80486	23	23	46	1.7	0.0	1.7	2.0	0.050
0.90	0.90865	31	31	62	1.7	0.0	1.7	2.0	0.050
0.80	0.80109	50	50	100	1.7	0.0	1.7	3.0	0.050
0.90	0.90250	67	67	134	1.7	0.0	1.7	3.0	0.050
0.80	0.80192	6	6	12	1.8	0.0	1.8	1.0	0.050
0.90	0.91683	8	8	16	1.8	0.0	1.8	1.0	0.050
0.80	0.81211	21	21	42	1.8	0.0	1.8	2.0	0.050
0.90	0.90064	27	27	54	1.8	0.0	1.8	2.0	0.050
0.80	0.80370	45	45	90	1.8	0.0	1.8	3.0	0.050

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Alternative Hypothesis: $\mu_1 \neq \mu_2$

Target Power	Actual Power	N1	N2	N	μ_1	μ_2	$\mu_1 - \mu_2$	σ	Alpha
0.90	0.90312	60	60	120	1.8	0.0	1.8	3.0	0.050
0.80	0.84206	6	6	12	1.9	0.0	1.9	1.0	0.050
0.90	0.90299	7	7	14	1.9	0.0	1.9	1.0	0.050
0.80	0.81306	19	19	38	1.9	0.0	1.9	2.0	0.050
0.90	0.90838	25	25	50	1.9	0.0	1.9	2.0	0.050
0.80	0.80867	41	41	82	1.9	0.0	1.9	3.0	0.050
0.90	0.90337	54	54	108	1.9	0.0	1.9	3.0	0.050
0.80	0.87642	6	6	12	2.0	0.0	2.0	1.0	0.050
0.90	0.92907	7	7	14	2.0	0.0	2.0	1.0	0.050
0.80	0.80704	17	17	34	2.0	0.0	2.0	2.0	0.050
0.90	0.91250	23	23	46	2.0	0.0	2.0	2.0	0.050
0.80	0.80759	37	37	74	2.0	0.0	2.0	3.0	0.050
0.90	0.90434	49	49	98	2.0	0.0	2.0	3.0	0.050

References

- Julious, S. A. 2010. Sample Sizes for Clinical Trials. Chapman & Hall/CRC. Boca Raton, FL.
- Chow, S.-C., Shao, J., and Wang, H. 2008. Sample Size Calculations in Clinical Research (Second Edition). Chapman & Hall/CRC. Boca Raton, FL.
- Machin, D., Campbell, M., Fayers, P., and Pinol, A. 1997. Sample Size Tables for Clinical Studies, 2nd Edition. Blackwell Science. Malden, MA.
- Zar, Jerrold H. 1984. Biostatistical Analysis (Second Edition). Prentice-Hall. Englewood Cliffs, New Jersey.

Report Definitions

Target Power is the desired power value (or values) entered in the procedure. Power is the probability of rejecting a false null hypothesis.

Actual Power is the power obtained in this scenario. Because N1 and N2 are discrete, this value is often (slightly) larger than the target power.

N1 and N2 are the number of items sampled from each population.

N is the total sample size, $N_1 + N_2$.

μ_1 and μ_2 are the assumed population means for power and sample size calculations.

$\mu_1 - \mu_2$ is the difference between population means at which power and sample size calculations are made.

σ is the assumed population standard deviation for each of the two groups.

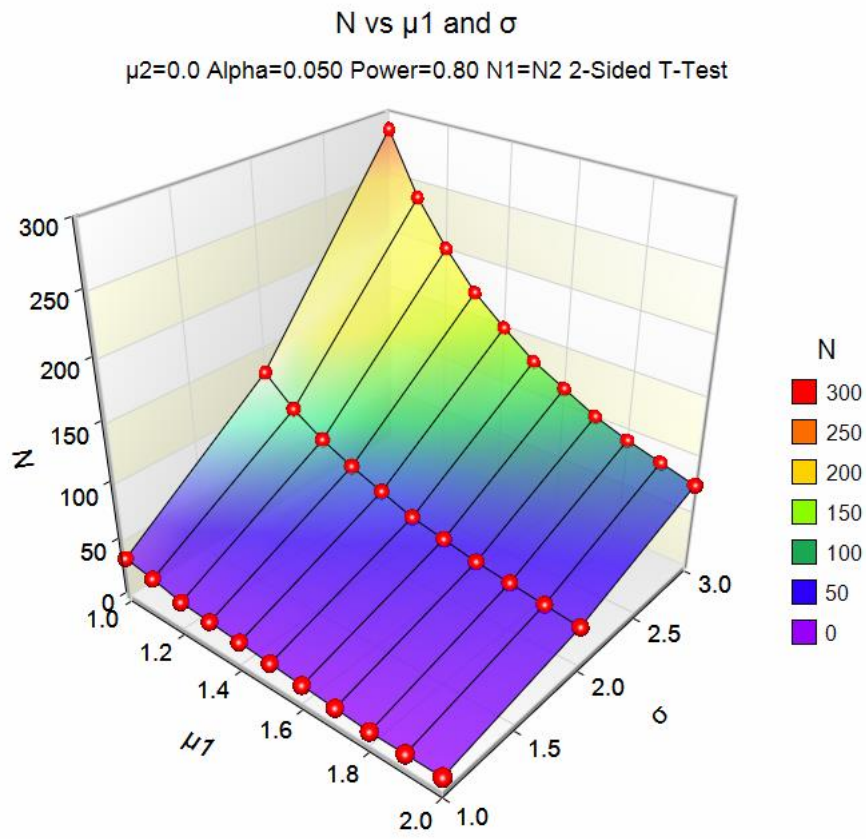
Alpha is the probability of rejecting a true null hypothesis.

Summary Statements

Group sample sizes of 17 and 17 achieve 80.704% power to reject the null hypothesis of equal means when the population mean difference is $\mu_1 - \mu_2 = 1.0 - 0.0 = 1.0$ with a standard deviation for both groups of 1.0 and with a significance level (alpha) of 0.050 using a two-sided two-sample equal-variance t-test.

Two-Sample T-Tests Assuming Equal Variance

Chart Section



Two-Sample T-Tests Assuming Equal Variance

