

You may work with one partner on this assignment, submitting one report with both names, provided that both students contribute substantially to the work. Word-processed reports are preferred to hand-written ones. Please copy/paste relevant computer output into your report as appropriate.

Nicotine Lozenge?

Helping smokers to quit continues to be a very important and challenging public health goal. In a recent study of the effectiveness of a nicotine lozenge, smokers who wanted to quit were recruited to participate through advertisements near four sites in the United Kingdom and 11 sites in the United States. Those smokers who met the screening qualifications were randomly assigned to one of two groups: one group received nicotine lozenges and the other group received placebo lozenges. The subjects were compared on various background variables at the beginning of the study, and at the end of the study they were compared on whether or not they successfully abstained from smoking.

Of the 459 subjects in the nicotine group, 42.9% were male. Of the 458 subjects in the placebo group, 40.2% were male.

a) Conduct a significance test, using a normal approximation, of whether these proportions differ significantly at the .05 level. Report the hypotheses, test statistic, p -value, and test decision. Also summarize your conclusion.

b) Explain why the researchers would be glad for the null hypothesis not to be rejected in the test in a).

At the end of the 52-week study, 17.9% of the nicotine group had successfully abstained from smoking, compared to 9.6% of the placebo group.

c) Organize these data in a 2×2 table, with the explanatory variable in columns.

d) Use the normal approximation to test whether these data provide strong evidence that the nicotine lozenge is more effective than the placebo lozenge, using the .01 significance level. Report the hypotheses, test statistic and p -value. Also verify that the technical conditions are satisfied, and summarize your conclusion from this test.

e) Based on this study and your test result, is it legitimate to draw a cause-and-effect conclusion between the nicotine lozenge and the increased rate of abstaining from smoking? Explain.

f) Produce a 95% confidence interval for the difference in proportions of successfully abstaining from smoking between the two groups. Also interpret this interval.

g) Produce a 95% confidence interval for the odds ratio of successfully abstaining from smoking between the two groups. Also interpret this interval.

h) Now consider only the subjects that received nicotine lozenges. Produce a 95% confidence interval to estimate the population proportion who would successfully abstain from smoking for 52 weeks when using the nicotine lozenge. Also interpret this interval.