

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. Integrate computer output into your report as appropriate.

Pet Birds and Lung Cancer?

Researchers investigated whether owning a pet bird might be associated with having lung cancer. They studied a sample of 239 lung cancer patients and a sample of 429 people who did not have lung cancer, chosen to have similar characteristics to those with lung cancer. They asked all subjects whether they owned a pet bird in adulthood.

- a) Identify the explanatory and response variables in this study.
- b) What kind of observational study is this: case-control, cohort, or cross-classification? Explain briefly.

The researchers found that 98 of the lung cancer patients owned a pet bird, and 101 of those without lung cancer owned a pet bird.

- c) Organize these data into a 2×2 table, with the explanatory variable in columns.
- d) Calculate the odds ratio of having lung cancer, comparing those who owned a pet bird to those who did not.
- e) Use the normal approximation to test whether these data provide strong evidence that the probability of lung cancer differs between those who owned a pet bird and those who did not. Report the hypotheses, test statistic and p-value, along with the test decision at the .05 significance level. Also verify that the technical conditions are satisfied, and summarize your conclusion from this test.
- f) Produce a 95% confidence interval for the odds ratio of having lung cancer between the two groups. Also interpret this interval.
- g) Summarize your conclusion from this study and your analysis. Be sure to address the issues of causation and generalizability as well as statistical significance.