

1. An epidemiologist is interested in the change in relative risk of cancer (measured as the Odds ratio) due to cigarette smoking (3 categories) and age (continuous variable). There are 100 cases (each case is one person). Do the odds of having cancer depend on cigarette smoking and age? Assign symbols to variables. Write a generalized linear model for $\ln(\text{Odds of cancer})$ as a function of cigarette smoking and age. Assume that interactive effects are possible.

Name	Symbol
_____	_____
_____	_____
_____	_____

Source	df
<u>intercept</u>	1

GzLM $\ln(\text{Odds}) =$ _____

Complete the first two columns of the Analysis of deviance table, above.

2. A geneticist finds that the odds of have a particular allele increase with altitude (in kilometers) according the following model, with parameter estimates obtained from logistic regression.

$$\text{Odds} = 1.8e^{0.077 * \text{Altitude}}$$

Compute the odds of having the allele, at Altitude = 1 km Odds = _____

Compute the odds of having the allele, at Altitude = 2 km Odds = _____

Compute the odds ratio, for 2000m relative to 1000 m OR = _____

3. An ethologist obtains a goodness of fit statistic of $G = 3.84$ in a test of whether foraging success (successes per attempt) depends on whether conspecifics are foraging in the same area.

$G = 2 \sum f \ln(f/\hat{f})$ where \hat{f} is the value expected if the foraging success is the same regardless of number of conspecifics. Summation is over 2 classes (presence or absence of conspecifics).

Explain how you would evaluate the result, including statistical support for a statement that foraging success did (or did not) depend on number of conspecifics.