MS Module 7 Hypothesis testing – *p* values homework assignment

(The attached PDF file has better formatting.)

The average proportion of death from a disease is 0.78. A study tests whether a drug reduces the proportion of death from the disease. Of 100 subjects who are given the drug, 71 die from the disease. Let μ be the expected proportion of death from the disease among subjects given the drug.

- The null hypothesis is H_0: the expected proportion of subjects dying $\mu = \mu_0 = 0.78$
- The one-tailed alternative hypothesis is H_a: the expected proportion dying $\mu < \mu_0$
- The two-tailed alternative hypothesis is H_a: the expected proportion dying $\mu \neq \mu_0$

If the null hypothesis is tested at a 0.01 significance level and the true incidence of death with the drug is 0.66:

A. What is the incidence of death from the disease in the sample?
B. What is the standard deviation of the incidence of death in the sample if the null hypothesis is true?
C. What is the *z* value used to test the null hypothesis?
D. What is the *p* value for the one-tailed alternative hypothesis?
E. What is the *p* value for the two-tailed alternative hypothesis?
F. What are the expected value and variance of the *z* value if the null hypothesis is true?
G. What is the standard deviation of the sample mean if the true incidence of death with the drug is 66%?
H. What are the expected value of the *z* value for testing the null hypothesis if the true incidence of death with the drug is 66%?
I. What is the standard deviation of the *z* value for testing the null hypothesis if the true incidence of death with the drug is 66%?
J. What is the probability of a Type II error for the one-tailed test if the true incidence of death with the drug is 66%?
K. What is the probability of a Type II error for the two-tailed test if the true incidence of death with the drug is 66%?
L. How many observations are needed for a one-tailed test if α = 1% and β = 5% if the true incidence of death with the drug is 66%?
M. How many observations are needed for a two-tailed test if α = 1% and β = 5% if the true incidence of death with the drug is 66%?

To check your solutions, compare the practice exam questions for this topic.