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MATH 263H

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Assignment #8

#8.1.16

1. i) 71.50%. ii) 28.5%
2. i) 62.75%. ii) 37.25%.
3. I want to say no as the percentages aren’t too far off from one another so right now it appears that there is no correlation between heart disease and baldness.
4. Null: No association between heart disease and varying degrees of baldness. Alternate: There is an association between heart disease and varying degrees of baldness.
5. Mean group diff: 0.099. P-value: 0.0029. Graph is skewed to the right. Peaks towards the left around 0.03. Since the p-value<0.01, reject the null and can conclude that there is enough evidence to support the alternate that there is an association between heart disease and varying degrees of baldness. Sample was not stated to be random, so may not be able to assume causation. Since the sample was not random, cannot be generalized for the general population.

#8.1.30

* 1. Null: Probability of answering yes is the same for all methods. Alternate: The probability of answering yes is not the same for the different methods.
  2. Human text: 21.5%. Auto text: 29.3%. Human voice: 13.1%. Auto voice: 12.6%.
  3. Mean group diff: 0.0098
  4. P-value: 0.0001.
  5. Since p-value < 0.01, we have evidence to believe that the probability of answering yes is not the same for the different methods. Since random assignment was employed, may assume cause and effect. No idea about subjects, so no generalization.

#8.2.24

1. Observation. Not assigned treatment.
2. Amount of fish consumed/in diet.
3. Explanatory: Amount of fish consumed or in the diet, quantitative. Response: Prostate cancer, categorical.
4. Large: πL. Moderate: πM. Small: πS. None: πN.
5. Null: πL = πM = πS = πN. Alternate: πL ≠ πM ≠ πS ≠ πN.
6. Null: No association between varying amounts of fish consumed and prostate cancer. Alternate: There is an association between the varying amounts of fish consumed and prostate cancer.
7. We have at least 10 success and 10 fails.
8. i) Chi-square stat: 3.6773. ii) P-value: 0.298487. 1% significance level. Not enough evidence to reject the null.
9. With a chi-squared value of 3.6773, in the long run, the probability of having
10. We do not have enough evidence to reject the null therefore we can conclude that there is no association between consuming fish and having prostate cancer. Sample was not stated to be random so can’t conclude cause and effect. Generalization also not possible since the sample was not random.
11. Not relevant as the applet won’t let me put in more than 3 variables. So in this case it’s not relevant. Also not relevant as the p-value is way too large. If the p-value was smaller, it would help to look at the confidence interval to see where the data lies.

#8.CE.12

Hypotheses:

Null: No association between highest educational degree and whether or not someone trusts other people.

Alternate: There is an association between highest educational degree and whether or not someone trusts other people.

Validity conditions:

Randomness: Stated.

Large Enough: At least 10 success and failures for all except Less than high school, “It depends” which had 9.

Mechanics:

Multiple proportions chi-squared test.

Chi-squared value: 156.5673.

P-value: 0.0000001.

Decision linked in context:

As the p-value << 0.01, we have strong evidence to reject the null and conclude that there is an association between highest educational degree and trusting another person. Although in one cell, the value was 9, we still proceeded as all the other values appeared to be large enough and the value of 9 was close to 10.