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MATH 263H

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Assignment #5

#5.1.24

1. Experiment as there is a treatment taking place, with a control and observation group.
2. Explanatory: If a woman received the AZT drug. Control: If their baby were HIV-positive.
3. Table of counts

|  |  |  |  |
| --- | --- | --- | --- |
|  | Has AZT | No AZT (placebo) | Total |
| HIV-Pos | 13 | 40 | 53 |
| HIV-Neg | 151 | 120 | 271 |
| Total | 164 | 160 | 324 |

1. AZT: 0.07927. No AZT: 0.250.
2. Relative risk = 0.25/0.07927= 3.154.
3. Segmented bar graph for the table in part c:
4. Based on the proportional difference in both groups, it is plausible to conclude that AZT is an effective treatment for reducing the HIV-positive proportion of newborn babies.

#5.2.30

1. Table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | College: Yes | College: No | Total |
| Census: Yes | 195 | 271 | 466 |
| Census: No | 331 | 702 | 1033 |
| Total | 526 | 973 | 1499 |

1. College, Yes: 0.3707. College, No: 0.2785. 0.3707-0.2785 = 0.0922
2. Education, maybe those with the college degree have taken some gen ed law courses. Living location, a person in an environment that has high volumes of traffic regarding governmental stuff might be more aware of these kinds of laws.
3. Observational. There was no treatment or goal in sight.

#5.3.12 (S2N)

1. Experiment as there is an ultimate goal to see if one drug is more effective than the other.
2. Explanatory: Using tamoxifen or raloxifene, categorical. Response: Developing invasive breast cancer, categorical.
3. Table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Tamoxifen | Raloxifene | Total |
| Breast Cancer: Yes | 163 | 168 | 331 |
| Breast Cancer: No | 9563 | 9577 | 19140 |
| Total | 9726 | 9745 | 19471 |

1. 0.01723-0.01676= 4.80E-4
2. Null: Women who used either tamoxifen or raloxifene had a less likely chance of developing invasive breast cancer. Alternate: Women who used either tamoxifen or raloxifene still developed breast cancer.
3. Because the observed difference in proportion is so small, a theory based method would be more accurate than a simulation based method.
4. Two Proportion: Standardized stat: z=-0.26. P-value: 0.3977
5. Confidence interval: (-0.0041, 0.0032). Based on the data and the confidence interval, it is plausible to fail to reject the null as the observed difference in within the confidence interval.

#5.3.36

1. Difference in proportion of people married within two different time period. (π)
2. Randomness: Assumed. Independence: 10(2538) < population, 10(1484) < population. Large enough: 45.6% and 77.8% should be large enough success as 45.6% of 2538 = 1157 and 77.8% of 1484 = 1154.
3. (0.28405, 0.35946)
4. 99% confident that the difference in proportions of people who are married in two different time periods is within (0.28405, 0.35946)