AP STAT DEBRIEF – Question 4

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INTENT OF THE QUESTION:

This question was intended to assess a student's ability to carry out an inference test. Students had to correctly identify hypotheses, identify an appropriate test and check conditions, calculate the correct test statistic and p-value as well as find an appropriate conclusion in context.

2015 QUESTION 4: Inference Test
Please view the questions here:

http://media.collegeboard.com/digitalServices/pdf/ap/ap15_frq_statistics.pdf

a. Students were required to state the hypotheses using appropriate context. Subscripts that are clearly relevant to the problem were acceptable.

b. Students were required to name the test procedure by name (2-sample z-test for proportions) or by formula (using the formula in context is acceptable). Students also had to check the conditions. Randomness was satisfied because as an experiment, the volunteers were randomly assigned to the placebo or the drug. Assess normality with large sample sizes was also required, in context. Therefore students needed to discuss all groups.

c. The calculation of the test statistic and the p-value were required for this part.

d. Students needed to interpret the results of their test in this section in context.

Notes/Common Mistakes/Teacher Notes

1. In step 1, students had to correctly identify the hypotheses in context. When stating the hypothesis in words, it is important to say the "population proportion" of those adults with colon cancer who take the placebo and "population proportion" of those adults with colon cancer who take the placebo, showing the notation used for each part. A common mistake is students saying "the mean" instead of population mean. If a student writes the hypotheses, and then writes the hypotheses in words incorrectly, they are treated as parallel solutions and the least correct is graded.
2. In step 2, students had to identify the correct test by name or by formula. This is critical for students who are not showing their work. Without stating it is a 2-sample x-test for proportions.
3. In step 2, the randomness condition has to clearly apply to random assignment to treatment or placebo. SRS or random sample were not acceptable because it was neither of these---it involved the random assignment of treatments.
4. The p-value in step 3 must be consistent with the hypotheses that were written.

5. The conclusion for step 4 must be related to the alternative hypothesis. Students often relate the conclusion to the null hypothesis, but a statement about the alternative is required.
6. Step 4 requires a linkage between the p-value and the conclusion in context.
7. A generic statement about inference tests: students need to state whether they reject or fail to reject the null and provide linkage to the p-value. They must also state a conclusion that involves the alternative hypothesis---not the null.
8. Students who make a mistake and get a p-value greater than .05, and "accept the null hypothesis" receive a lowered score. Students must use appropriate terminology → fail to reject the null hypothesis.