

AP Statistics

Unit VII Review – Inference with Proportions

****ANSWERS ONLY**** (for explanations, please come in for tutorials)

1. B
2. A
3. a) 1-proportion z-interval: (0.0428, 0.0692) [be sure to ALWAYS interpret the interval!]
b) If we took repeated random samples using this method, about 90% of the resulting confidence intervals would contain the true proportion of accidents that result in the hospitalization of the driver.
4. a) Type I Error:
We decide that the new drug IS more effective than the current treatment, when in reality, it is NOT. A possible consequence is that the company continues investing (**WASTING?**) money on a treatment that is no more effective than the current treatment.
Type II Error: ???
b) 1-proportion z-test: $z = 1.3861$, $p\text{-value} = 0.0829$
c) If the treatment is truly 32% effective, then this is the probability of it being effective on at least 18 of a random sample of 43 patients.
d) This would be a type II error (incorrectly failing to reject the H_0).
e) 0.568 – this is the probability of correctly concluding that the new treatment is more effective than the old.
f) Increase the sample size, or raise the level of significance (increasing the “effect size” is a third).
5. a) 2-proportion z-test: $z = 0.8963$, $p\text{-value} = 0.3701$
b) If the two assembly procedures were truly equal in terms of defect rates, then there is roughly a 37% probability of observing a difference this large as a result of the random assignment.
6. a) 2-proportion z-interval: (-0.2451, 0.0043)
b) No. Since zero is contained in this interval, we lack evidence of a difference in the failure rates...
7. a) 0.0414
b) Either 0.0207 or 0.9793
8. a) ??? (sorry, you'll need to think about this one)
b) Yes
c) We don't know.
d) ???
9. a) In a large number of repeated random samples, roughly 95% of the resulting intervals would contain the true proportion of households in Austin that have experienced some sort of crime.
b) 1-proportion z-interval: (0.179, 0.275)
c) No, as the interval is not completely below 0.25.
d) 2048 households (if you use $z^* = 1.81$ and $p = 0.5$... if you use $p = 0.23$, then you get $n = 1451$)