

Introduction to Probability Distributions

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Review Question 9

In the same RCT with $n=150$, if 69 end up in the treatment group and 81 in the control group, how far off is that from expected?

- a. Less than 1 standard deviation
- b. **1 standard deviation**
- c. Between 1 and 2 standard deviations
- d. More than 2 standard deviations

Expected = 75
81 and 69 are both 6 away from the expected.
Variance = $150(.25) = 37.5$
Std Dev ≈ 6
Therefore, about 1 SD away from expected.



Proportions...

- The binomial distribution forms the basis of statistics for proportions.
- A proportion is just a binomial count divided by n .
 - For example, if we sample 200 cases and find 60 smokers, $X=60$ but the observed proportion $= .30$.
- Statistics for proportions are similar to binomial counts, but differ by a factor of n .



Stats for proportions

For binomial:

Differs by
a factor of
 n .

For proportion:

Differs
by a
factor
of n .

P-hat stands for "sample
proportion."



It all comes back to normal...

- Statistics for proportions are based on a normal distribution, because the binomial can be approximated as normal if $np > 5$