

Statistics
Notes for 10.4
Proportions

Some things to remember from Chapter 9

A. *Sample Size < 1/10 of Population*

B. *$np \geq 10$ and $nq \geq 10$*

1. Time magazine reported the result of a telephone poll of 800 adult Americans. The question posed of the Americans who were surveyed was: "Should the federal tax on cigarettes be raised to pay for health care reform?" The results of the survey were:

Non Smokers	Smokers
N = 605	N = 195
361 said "yes"	41 said "yes"

Is there significant evidence to conclude that the proportion of Non-Smokers that support raising the tax is different than the proportion of Smokers. Test at the level of significance of 5%.

- A. Is this a hypothesis test or confidence interval?
- B. Is this a proportions or average problem? How can you tell?
- C. What is the assumption for the Null Hypothesis?
- D. What is the Alternative Hypothesis for this situation?
- E. Write up Step 1. Include all 3 requirements.

- F. What are the 3 major components that must be checked for Step 2?

- G. In one of the components for Step 2, I've asked you to multiply the sample size by 10. What is the product (the number multiplied by 10) compare to?

- H. In a hypothesis test between two proportions we POOL the proportions together. How is that value found? (Equation)

- I. Once the pooled proportion is found, what do you multiply it by? In addition, once the product is found what value do you compare it to?

- J. What is the compliment (opposite) of Proportion Pooled (P_p) and how is it found?

- K. Complete the table below for Step 2

	Population 1 (Name it)	Population 2 (Name it)
1.		
2.		
3.		

- L. What are the 4 required items in Step 3 in a hypothesis test?

M. What is the calculator function used for this hypothesis test?

N. When you create the curve for this step, what value goes in the middle of the curve?

O. On your calculator screen, define the following variables

p	
\hat{p}_1	
\hat{p}_2	
\hat{p}	

P. Complete all the components for Step 3 below.

Q. When can the null hypothesis be rejected?

R. What is your conclusion after this test? (Step 4)

2. According to the Insurance Institute for Highway Driving, the percentage of male drivers (age 16-19) that died in an auto accident is much lower now than it was in the 1970's. The data is below.

Year	Total number of Teen Fatalities	Total number of Male Fatalities
1975	8,748	6,532
2016	2,820	1,858

Estimate with 95% confidence the difference in proportion between male drivers (age 16-19) that were in a fatal accident in 1975 against 2016.

- A. Is this a Hypothesis Test or Estimation?
- B. What are the two words you need to include in your statement if you are doing an estimation for this problem?
- C. What are the two population proportions you are comparing in this problem?
- D. Do Step 1 for this problem
- E. What are the 3 required items to check in Step 2?
- F. Step 2 for Hypothesis Test and Estimation is very similar. What is the main difference in Step 2 that separates Hypothesis Testing and Estimation?

G. Complete Step 2 for this problem.

	Population 1 (Name it)	Population 2 (Name it)
1		
2		
3		

I. What are the 2 components necessary for Estimation between 2 proportions?

J. What is the equation for Estimation between 2 proportions?

K. Regarding the up arrow and down arrow for the Result, what must you do to determine the direction of the arrows for your population of choice?

L. Complete Step 3

M. Now complete Step 4 based on your result from Step 3. What must you always include in Step 4...if it exists?