

Project #3 Confidence Intervals Project

For this project, we will use a subset of the North Carolina birth data set. The data set **ncbirth150.MTW** is a random sample of 150 births from the data set **ncbirth650.MTW**. When doing this assignment, make sure you are working with the data set with only 150 observations!

Variable Label	Description
PLURALITY	Number of children born of the pregnancy
SEX	Sex of child (1=Male, 2=Female)
MAGE	Age of mother (years)
WEEKS	Completed Weeks of Gestation (weeks)
MARITAL	Marital status (1=married, 2=not married)
RACEMOM	Race of Mother (0=Other Non-white, 1=White, 2=Black 3=American Indian, 4=Chinese, 5=Japanese, 6=Hawaiian, 7=Filipino, 8=Other Asian or Pacific Islander)
HISPMOM	Mother of Hispanic origin (C=Cuban, M=Mexican, N=Non-Hispanic, O=Other and Unknown Hispanic, P=Puerto Rican, S=Central/South American, U=Not Classifiable)
GAINED	Weight gained during pregnancy (pounds)
SMOKE	0=mother did not smoke during pregnancy 1=mother did smoke during pregnancy
DRINK	0=mother did not consume alcohol during pregnancy 1=mother did consume alcohol during pregnancy
POUNDS	Weight of child (pounds)
TGRAMS	Weight of child (grams)
LOW	0=infant was not low birth weight 1=infant was low birth weight
PREMIE	0=infant was not premature 1=infant was premature premature defined at 36 weeks or sooner

Give a point estimate for the following:

- a. The percent of mothers who give birth to a low birth weight baby
- b. The percent of mothers who admit to smoking
- c. The percent of mothers who are black
- d. The percent of mothers who are of Hispanic origin
- e. The mean age of mothers giving birth
- f. The mean amount of weight gained during pregnancy

For each of the following confidence intervals follow the steps outlined in class for constructing a confidence interval for a proportion or for a mean.

- a. Give a 90% confidence interval for the proportion of mothers who give birth to a low birth weight child
- b. Give a 99% confidence interval for the proportion of mothers who give birth to a low birth weight child
- c. Give a 95% confidence interval for the proportion of mothers who admit to smoking.

- d. Give a 99% confidence interval for the proportion of mothers who gave birth to premature children.
- e. Give a 90% confidence interval for the mean age of mothers giving birth
- f. Give a 99% confidence interval for the mean age of mothers giving birth
- g. Give a 90% confidence interval for the mean amount of weight gained during pregnancy.
- h. Give a 95% confidence interval for the difference in mean weight in pounds of the child between smokers and nonsmokers
- i. Give a 90% confidence interval for the difference in mean weight in pounds of the child between married mothers and unmarried mothers.

Explain why the 90% confidence interval for the proportion of mothers who give birth to a low birth weight child (part **a** above) is smaller than the 99% confidence interval given in part **b**.

Explain why increasing the sample size gives confidence intervals tighter estimates of the unknown mean or proportion.

The 99% confidence interval for the mean weight gain of mothers is (26.7090, 33.1685). Explain why this does not imply that 99% of mothers will gain between 26.7 and 33.2 pounds.

From the results of parts **h** and **i** above, is it plausible that the mean birth weight of smokers is the same as nonsmokers? What about the mean birth weight of married mothers and unmarried mothers? Explain your answers.

Lastly, propose your own confidence interval for an unknown mean, unknown proportion, or unknown difference in means. Perform all the appropriate steps.

