



Week 7 Lab Assignment

Name: Name Instructor Name: Dr. Megan

1. Write a paragraph summarizing what you learned from the articles provided. Consider the use of confidence intervals in health sciences with these articles as inspiration and insights.

Researchers use samples to draw conclusions about a study population and rely on confidence intervals (CIs) to assess the validity of their assumptions. A CI represents the range of values believed to encompass the true population value being studied. CIs are commonly used to report mean or proportion data and are expressed with a specific level of confidence, often 95%. For instance, if a sample of hypertension patients has a mean blood pressure of 120 mmHg with a 95% CI of 110-130 mmHg, it implies that 95% of intervals generated from similar samples would contain the true mean blood pressure. The width of the CI reflects the reliability of the sample's representation of the population. A narrower CI, such as 110-130 mmHg, suggests a more reliable estimate of the population mean compared to a wider CI like 110-210 mmHg. Wider CIs raise concerns and indicate the need for more data collection before drawing substantial conclusions about the population. The width of the CI serves as an essential indicator of the reliability of the sample value in representing the true population value.

Researchers employ representative samples to make conclusions about study populations, relying on confidence intervals (CIs) as robust indicators of the validity of their assumptions. A CI denotes the range of values believed to encompass the true population value under investigation. CIs are often used to report mean or proportion data and are expressed with varying confidence levels, like 95%, 90%, or 99%. The 95% CI implies that if researchers repeatedly sampled from the same population and calculated ranges for estimates, 95% of those intervals would enclose the population value. For instance, if a hypertension patient sample yielded a mean blood pressure of 120 mmHg with a 95% CI of 110-130 mmHg, 95% of intervals from similar samples would include the genuine mean blood pressure. A narrower CI, such as 110-130 mmHg,



suggests a more reliable estimate of the population mean compared to a wider one, like 110-210 mmHg. A conspicuously wide CI should be a cautionary sign, indicating the need for more data before substantial population conclusions are drawn. In essence, CI width serves as a pivotal gauge of how accurately the sample value reflects the population value.

Data Collection

	A1				
	A	B	C	D	E
1	65				
2	66				
3	67				
4	67				
5	67				
6	68				
7	68				
8	69				
9	69				
10	73				
11	63				
12	65				
13	66				
14	66				
15	67				
16	68				
17	72				
18	72				
19	73				
20	74				
21					
22					
23					
24					
25					



Summarize the Preliminary Calculations (Round to 2 decimal places):

Sample Mean: ___68,25___

Standard Deviation: _____3,06_____

Your Height: ___65_____

Please answer the following questions in complete sentences:

1. Discuss your method of collection for the values that you are using in your study (systematic, convenience, cluster, stratified, simple random).

Random value collection method is used.

2. What are some faults with this type of data collection?

The disadvantages include the error that can occur when the sample is not large enough.

3. What other types of data collection could you have used, and how might this have affected your study?

One can use the quantitative type of data collection. It is useful for comparing key statistics.

Calculation of 95% Confidence Interval



1. Give a point estimate (mean) for the average height of all people at the place where you work. What is your point estimate, and what does this mean? I think it is 70.
2. Find a 95% confidence interval for the true mean of heights. What is the interval? **[Provide a Screenshot of your work from the t value Confidence Interval for μ from the Confidence Interval tab on the Week 6 Excel spreadsheet]**

66.82 ... 69.68

	A	B	C	D	E
1	Enter the data in the blue highlighted area and the results will show in the yellow highlight				
2					
3					
4					
5	t or z Confidence Interval for μ				
6					
7	Confidence Level	0,950	Enter decimal		
8	n	20			
9	Mean	68,2500			
10	StDev	3,0600			
11	pop stdev	No	Enter yes if population stdev known Enter No if population stdev is unknown		
12					
13					
14	SE	0,684237			
15	t	2,093			
16	Margin of Error	1,432108			
17	Lower Limit	66,817892			
18	Upper Limit	69,682108			
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

3. Give a practical interpretation of the 95% confidence interval **[Write a complete sentence]**.



There is a 95% confidence interval that the population mean growth is between 66.82 and 69.68

Calculation of 99% Confidence Interval

Now, change your confidence level to 99% for the same data.

1. Find a 99% confidence interval for the true mean of heights. What is the interval? **[Provide a Screenshot of your work from the t value Confidence Interval for μ from the Confidence Interval tab on the Week 6 Excel spreadsheet]**

66,29 ... 70,2

	A	B	C	D	E
1	Enter the data in the blue highlighted area and the results will show in the yellow highlight				
2					
3					
4					
5	t or z Confidence Interval for μ				
6					
7	Confidence Level	0,990	Enter decimal		
8	n	20			
9	Mean	68,2500			
10	StDev	3,0600			
11	pop stdev	No	Enter yes if population stdev known		
12			Enter No if population stdev is unknown		
13					
14	SE	0,684237			
15	t	2,861			
16	Margin of Error	1,957601			
17	Lower Limit	66,292399			
18	Upper Limit	70,207601			
19					
20					
21					
22					
23					
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31					



2. Give a practical interpretation of the 99% confidence interval [**Write a complete sentence**].

There is a 99% confidence interval that the average population growth is between 66.29 and 70.2.

Compare Margins of Error

1. Would the margin of error be larger or smaller for the 99% CI? Explain your reasoning.
For the 99% confidence interval, the error will be larger, since the probability of error in this case should be less.
2. As the confidence level increases, what happens to the Margin of Error?
As the confidence level increases, the margin of error decreases.