Introduction to Biostatistics

Exercises on Lecture 3

September 26, 2022

(Q1): The mean cholesterol levels for all 20-74 year old US males is μ=211 mg/100 ml and the corresponding sd is σ=46 mg/100ml. If we selected repeated samples of size 25 from the population of 20-74 year old US males,

- What proportion of the samples will have a mean value of 200 mg/100ml or above?
- What proportion of the samples will have a mean value of 150 mg/100ml or below?

(Q2): What mean value of the serum cholesterol level cuts off the upper 10% of the sampling distribution of the sample means?

(Q3): What mean value of the serum cholesterol level cuts off the lower 10% of the sampling distribution of the sample means?

(Q4): What are the lower and upper mean values of the serum cholesterol level that enclose 95% of the sample means?

(Q5): There is an inverse relation between the level of confidence and the width of a CI. The more confidence we require, the less precise a statement we can make. How can we increase precision without loss of confidence, or vice versa?

(Q6): Which of the following are correct about a 95% CI

- There is a 95% chance that μ is in the interval, i.e., the probability that μ lies in $\left(\bar{X} - 1.96\frac{\sigma}{\sqrt{n}}, \bar{X} + 1.96\frac{\sigma}{\sqrt{n}}\right)$=0.95
- We are 95% confident that the interval contains μ, i.e., the probability that the interval $\left(\bar{X} - 1.96\frac{\sigma}{\sqrt{n}}, \bar{X} + 1.96\frac{\sigma}{\sqrt{n}}\right)$ contains μ is 0.95