

To write an article about Denver for a tourist magazine you would like to estimate the average nightly cost for a hotel room in the Denver area. You open up the yellow pages and take a random sample of 45 hotels from the hundreds of hotels.

The sample of 45 hotels gives an average nightly cost of \$55.98 and a standard deviation of \$10.73.

a) Give a 95% confidence interval for the mean nightly cost of a hotel room in this area.

$$\begin{aligned} \$55.98 \pm 2 \times \left( \frac{\sqrt{45} \times 10.73}{45} \right) &= 55.98 \pm 3.20 \\ &\quad \underbrace{\hspace{1.5cm}}_{3.199 \approx 3.20} \quad \$52.78 \text{ to } \$59.18 \end{aligned}$$

b) The distribution of costs is not normal. The distribution is skewed because there are several expensive hotels downtown. Explain why the confidence interval in (a) is valid anyway.

Because the distribution of sample mean IS NORMAL and centered around the true parameter (the population mean)

c) The Denver Chamber of Commerce claims the average price is \$54.50 per night. Is your average of \$55.98 unreasonable?

No, our interval of \$52.78 to \$59.18 contains \$54.50 and it's based on our \$55.98 estimate. The difference is due to chance error.

d) Your editor finds the confidence interval in (a) is too wide. Describe two things that can be done to make the interval narrower.

- 1) I could settle for lower confidence (e.g. 68% instead of 95%)
- 2) I could get a larger sample