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What we do when we are sick at home. *USA Today* (Feb. 15, 2007) reported on the results of an opinion poll in which adults were asked what one thing they are most likely to do when they are home sick with a cold or the flu. In the survey, 63% said that they are most likely to sleep and 18% said that they would watch television. Although the sample size was not reported, typically opinion polls include approximately 1,000 randomly selected respondents.

- a. Assuming a sample size of 1,000 for this poll, construct a 95% confidence interval for the true percentage of all adults who would choose to sleep when they are at home sick.
- b. If the true percentage of adults who would choose to sleep when they are at home sick is 70%, would you be surprised? Explain.

$$\begin{aligned} \text{a. } CI_{95\%}(p) &= \left(\hat{p} \pm z_{0.025} \cdot \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \right) = \left(0.63 \pm 1.96 \sqrt{\frac{0.63 \cdot 0.37}{1000}} \right) \\ &= (0.63 \pm 0.03) \end{aligned}$$

b. $70 \notin CI_{95\%}(p) \Rightarrow$ Yes, we'd be surprised.