Chapter 8 Review

1. $\bar{x} = 101.82°$ $\sigma = 1.2°$ $n = 5$

$z = \pm 1.96$ $\quad C.I. = 101.82 \pm 1.96\left(\frac{1.2}{\sqrt{5}}\right)$

$= 101.82 \pm 1.0518$

$100.77° \leq \mu \leq 102.87°$

We are 95% conf. that the mean boiling temp is between 100.77° and 102.87°

2. $n = 1000$ $\bar{x} = 180$ $\sigma = 30$

$df = 999$

$t = \pm 1.962$

$C.I. = 180 \pm 1.962\left(\frac{30}{\sqrt{1000}}\right)$

$= 180 \pm 1.8613$

$178.14 \leq \mu \leq 181.86$

We are 95% conf. that ave weight of an adult male in Dekalb County, GA, is between 178.14 lbs and 181.86 lbs.

3. $n = 50$ $\hat{p} = \frac{25}{50} = .5$ $\hat{q} = .5$

$z = \pm 1.96$ $\quad s_{\hat{p}} = \sqrt{\frac{(.5)(.5)}{50}} = .0707$

$C.I = .5 \pm 1.96(.0707)$

$.5 \pm .1386$

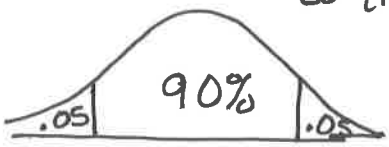
$.36 \leq p \leq .64$

We are 95% conf that mean cure rate is between 36% & 64% so it may not be better.

4. $\hat{p} = \frac{646}{1025} = .63$ $\hat{q} = .37$

$z = \pm 1.64$ $\quad s_{\hat{p}} = \sqrt{\frac{(.63)(.37)}{1025}}$

$= .0151$



$C.I. = .63 \pm 1.64(.0151)$

$.63 \pm .0248$

$.61 \leq p \leq .65$

We are 90% conf that the percentage of people who report financial hardships is between 61% and 65%.

(If you used a $z = 1.65$ $.61 \leq p \leq .65$)

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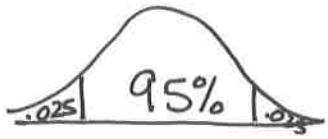
5. $n = 61 \quad \bar{x} = 48 \quad s = 14$



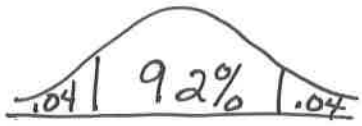
$df = 60 \quad t = \pm 2$

$C.I. = 48 \pm 2\left(\frac{14}{\sqrt{61}}\right)$

$= 48 \pm 3.5850 \qquad 44.42 \le \mu \le 51.59$

The mean amount of stage IV sleep is between 44.42 min and 51.59 minutes

6. $n = 1500 \quad \hat{p} = \frac{600}{1500} = .4 \quad \hat{q} = .6$



$z = \pm 1.75$

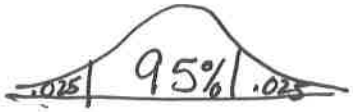
$SP = \sqrt{\frac{(.4)(.6)}{1500}} = .0126$

$C.I. = .4 \pm 1.75(.0126)$

$= .4 \pm .0221 \qquad .38 \le p \le .42$

We are 92% confident that between 38% and 42% of adults fear going out at night.

7. $\sigma = .6 \quad n = 25 \quad \bar{x} = .11$



$z = \pm 1.96$

A $C.I. = .11 \pm 1.96\left(\frac{.6}{\sqrt{25}}\right)$

$.11 \pm .2352 \qquad -.13 \le \mu \le .35$

B) $.11 \pm 2.064\left(\frac{.6}{\sqrt{25}}\right) \qquad -.14 \le \mu \le .36$

C) It would be wider than the correct conf. int.

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8. $\sigma = 2.5$ $E = 1$ $95\% \rightarrow z = \pm 1.96$

$$n = \frac{(1.96)^2(2.5)^2}{1^2} = 24.01 \approx \boxed{25 = n}$$

9. a) $\hat{p} = .76$ $\hat{q} = .24$ $E = .03$ $99\% \rightarrow \pm 2.58$

$$n = \frac{2.58^2(.76)(.24)}{.03^2} = 1349.03 \approx \boxed{1350 = n}$$

b) $\hat{p} = .5$ $\hat{q} = .5$ $n = \frac{2.58^2(.5)(.5)}{.03^2} = \boxed{1849 = n}$