**Openinto questions 4.14 to 4.47**

4.14 n = 436 Spending mean= 84.71 95% interval – (80.31,89.11)

Right skew.

1. True
2. False – Since the sample size is considerably large, we can assume the condition of normality.
3. False
4. False
5. False, the 90% confidence interval will be narrower than the 95% confidence interval.
6. False
7. 0.1915 is std error, 4.4 is difference between 95% confidence level and mean.

4.15 n =203 mean=3.2 s=1.97 (TBD)

Right skewed, but sample size is large enough to assume the data is normal.

Observations are independent as relationships for different students are not interrelated to each other.

SE = s/sqrt(n) = 1.97/sqrt(203) = 1.97/14.24 = 0.138

Z-score for 90% 1.3

3.2 +- 1.3\*0.138

(3.109,3.291) 2.97,3.43

4.16 n=5534 mean=23.44 s=4.72

95% confidence interval

SE = 4.72/sqrt(5534) = 4.72/74.39 = 0.063

23.44 +- 0.063\*1.96 = 23.44 +-0.124 = (23.316,23.56)

4.17

a. H0 = New Yorkers sleep for 8 hours every night on an average

HA = New Yorkers don’t sleep for 8 hours every night on an average.

b. H0 = Employees spend 15 minutes on personal things.

HA – Employees spend > 15 minutes

4.18 a. H0 = Calories count is 1100

HA = Calories not equal to 1100.

b. H0 = 462

HA > 462

4.19 a. Null hypothesis is always written as an equality.

H0: x = 10

HA: x>= 13.5

4.20 mean = 23.44

H0 = 23.44

HA < 23.44

4.21 a. No this claim is not supported by the confidence interval alone. (2.1,2.45)

b. Yes 2.2 hours is close to the average value as per confidence interval.

c. Yes, the 99% confidence interval will be wider than the 95% confidence interval.

4.22 95% interval –( 80.31,89.11)

a. Since 100 is nor included in the confidence interval so the claim is not supported.

b. No as the 90% confidence interval will be less wider than the 95% confidence interval.

4.23 mean = 134 calories sd = 17 calories n = 35

No there is no evidence that nutriotion label does not provide an accurate measure pf calories.

4.24 a. Yes

b. mean = 32

H0: mu = 32 HA: mu<32 SE = s/sqrt(n) = 4.31/6 = 0.719

Z = 32-0/SE = 32/0.719 = 44.50

P value is < .00001 which is less than 0.10.

d. 32 +- 1.645\*0.719 = 1.82 +- 32 = (30.18,33.18)

e. No 32 lies within the 90% confidence interval and the hypothesis test p-value contradicts this. Since the p-value is so small we can’t reject the null hypothesis here making a close decision.

4.25

N = 64 avg time = 137.5 min s=39min last year avg=127min

1. Samples are large enough to assume the normality and observations are independent as patients are not related to each other.
2. H0: mu = Time is equal to – 127

HA: mu /= 127

SE = 39/sqrt(64) = 4.88

Z-score = 137.5-127/SE = 2.1516 - pvalue = 0.03<0.05

Reject the null hypothesis.

1. 0.03>0.01. Null hypthosesis holds good.

4.26

N = 36 H0: mu = 100 HA: mu/= 100 s=6.5

SE = 6.5/6 = 1.08

1. Zscore = 118.2-100/1.08=18.2/1.08 = 16.85. P-value is less than 0.00001 and less than 0.10.

Reject the null hypothesis.

1. 90% confidence interval = 118.2 +/- 1.64\*1.08 = 118.2 +/- 1.77 = (116.43,119)

Yes they coincide as 118.2 falls into the 90% confidence range.

4.27 Zscore = 1.64 = Mean – 30/10/sqrt(70) = Mean – 30 / 1.825 = 32.993

4.28 two sides (28.36,32.993)

4.29 H0: mu = Anti depressants show no change in symptoms

HA: mu /= Anti depressants works for betterment of symptoms.

Anti depressants works but actually they don’t work

Anti depressants not works but actually they work.

4.30

a. H0: u = the regulations are met

HA: u /= the regulations are not met.

1. The regulations are not met when actually they are met
2. The regulations are met when actually are not met.
3. Type 1 error is more problematic as the license will be revoked if regulations are not met.
4. Type 2 error is more problematic for diners as if the regulations are not met, it raises severe health issues.
5. As a diner I believe the food inspector should have very strong evidence to revoke the license as it raises major health risks for the diners eating there.

4.31 a. 120/5 – 24 - I - Large

120/sqrt(125) – 10.90 - II –

b. 90% = 1.64 \* SE - Large 80% - 1.24\*SE

c. Equal because n doesn’t affect Z score.

4.32

a.Yes, as the interval goes wider.

b. False

c. True

d. Don’t know

e. Yes probably.

4.33 a. The distribution has a string a right skew.

b. For small sample size the values are less near the mean value. As the sample size increases the distribution is centralized at mean value.

c. mean = 10.44 sd=9.2

4.35 mean = 1300000 sd = 300000 min = 600000 max = 3000000

a. mean is large so its rightly skewed.

b. Cost more than

c. No

d. The std deviation should decrease.

4.37 3 – plotC 2- Plot A 1-Plot B

4.39 mean = 2.5 grams sd = 0.03 grams

a. 99.99%