Quiz 9

Name: _____

Red ID: _____

Use the following to answer questions 1 through 6

The data in the contingency table below was obtained from a study investigating whether a relationship exists between average number of hours slept per night and obesity.

Average hours sleep	Obese		Total
	Yes	No	
hours ≤ 5	9	7	16
5 < hours < 7	19	37	56
hours ≥ 7	5	16	21
Total	33	60	93

1. What are the odds of obesity?

a) 0.65
b) 1.82
c) 0.35
d) 0.55
e) 0.17

$\left(\frac{33}{93}\right) / \left(\frac{60}{93}\right) = 0.55$

2. For individuals who get at least 7 hours of sleep a night, what is the risk of obesity?

a) 0.24
b) 0.15
c) 0.05
d) 0.31
e) 3.20

$\frac{5}{21} = 0.24$

3. For individuals sleeping 5 or fewer hours a night, what are the odds of obesity?

a) 0.78
b) 0.56
c) 1.29
d) 0.27
e) 0.10

$\left(\frac{9}{16}\right) / \left(\frac{7}{16}\right) = 1.29$

4. What is the risk ratio of obesity for those who sleep between 5 and 7 hours a night vs those who sleep over 7 hours a night?

a) 3.80
b) 1.64
c) 0.26
d) 1.43
e) 2.73

$\left(\frac{19}{56}\right) / \left(\frac{5}{21}\right) = 1.43$

5. What is the odds ratio of obesity for those who sleep 5 or fewer hours a night vs those who sleep over 7 hours a night?

a) 1.80
b) 4.11
c) 0.56
d) 2.36
e) 0.24

$\frac{(9/16)/(7/16)}{(5/21)/(16/16)} = 4.11$

6. Assume the value of the test statistic for the data given above is 4.32. Given this, for the appropriate hypotheses test using $\alpha = 0.10$ which of the following is correct:

a) p-value > α, conclude there is enough evidence to indicate that sleep and obesity are dependent
b) p-value < α, conclude there is not enough evidence to indicate that sleep and obesity are dependent
c) p-value < α, conclude there is enough evidence to indicate that sleep and obesity are dependent
d) p-value > α conclude there is not enough evidence to indicate that sleep and obesity are independent
e) p-value > α conclude there is not enough evidence to indicate that sleep and obesity are dependent

$df = (r-1)(c-1) = (3-1)(2-1) = 2$

H_0: sleep & obesity independent
H_a: sleep & obesity dependent

$0.10 < \text{p-value} < 0.15$
p-value > α
FTRN

7. For the following contingency table, what is the 99% confidence interval for the odds ratio of myocardial infarction for the aspirin group vs the placebo group?

	Myocardial Infarction		
Group	No	Yes	Total
Placebo	15	4	19
Aspirin	20	2	22
Total	35	6	41

a) (0.03, 4.13)
b) (0.02, 6.19)
c) (1.49, 27.28)
d) (0.21, 25.48)
e) (0.24, 29.34)

$\hat{OR} = \frac{(2/22)}{(20/22)} = 0.375$ $\quad SE_{\hat{OR}} = \sqrt{\frac{1}{15}+\frac{1}{4}+\frac{1}{20}+\frac{1}{2}} = 0.931$

$\frac{(4/19)}{(15/19)}$ $\quad \left(\hat{OR}\, e^{-z^* SE_{\hat{OR}}}, \hat{OR}\, e^{z^* SE_{\hat{OR}}}\right)$

$= \left(0.375\, e^{-2.576(0.931)}, 0.375\, e^{2.576(0.931)}\right) = (0.03, 4.13)$

8. Several smokers and non-smokers were examined for signs of myocardial infarction. A 99% confidence interval for the odds ratio of myocardial infarction for smokers vs non-smokers was calculated to be (0.83, 17.29). Given this confidence interval which of the following is correct? 1 in C.I., so odds might be the same

a) There is enough evidence to indicate the odds of myocardial infarction for smokers are different than the odds for non-smokers
b) There is enough evidence to indicate the odds of myocardial infarction for smokers are the same as the odds for non-smokers
c) There is not enough evidence to indicate the odds of myocardial infarction for smokers are different than the odds for non-smokers

9. For the data in the contingency table below, under the appropriate hypotheses test, what would be the value of the test statistic?

Outcome	Treatment			Total
	A	B	C	
A	1	4	10	15
B	13	20	17	50
C	6	6	23	35
Total	20	30	50	100

a) 6.20
b) 11.15
c) 15.25
d) 13.24
e) 9.73

Expected counts

	A	B	C	T
A	3	4.5	7.5	15
B	10	15	25	50
C	7	10.5	17.5	35
T	20	30	50	100

$\frac{(20)(15)}{100} = 3 \quad \frac{(30)(15)}{100} = 4.5$

$\frac{(20)(50)}{100} = 10 \quad \frac{(30)(50)}{100} = 15$

$\sum \frac{(O-E)^2}{E} = \frac{(1-3)^2}{3} + \frac{(4-4.5)^2}{4.5} + \frac{(10-7.5)^2}{7.5} + \frac{(13-10)^2}{10} + \frac{(20-15)^2}{15} + \frac{(17-25)^2}{25}$

$+ \frac{(6-7)^2}{7} + \frac{(6-10.5)^2}{10.5} + \frac{(23-17.5)^2}{17.5} = 11.15$