**Homework Questions Biostats**

**Question. Glucose levels of males are normally distributed with a mean of 170 mg/dL and a standard deviation of 8 mg/dL. Which of the following statements is true about this population:**

< > 95% of the population have Glucose levels between 154 mg/dL and 186 mg/dL

< > 80% of the population have Glucose levels between 154 mg/dL and 186 mg/dL

< > 85% of the population have Glucose levels between 154 mg/dL and 186 mg/dL

< > 97% of the population have Glucose levels between 154 mg/dL and 186 mg/dL

< > 90% of the population have Glucose levels between 154 mg/dL and 186 mg/dL

< > Population C.I. cannot be estimated from the provided data.

**Question. Glucose levels of males are normally distributed with a mean of 170 mg/dL and a standard deviation of 8 mg/dL. What is the probability of selecting a male who has blood sugar level of 170 mg/dL or more?**

< > 0.5000

< > 0.6000

< > 0.2734

< > 0.2500

< > 0.2266

**Question. Heart Rates of a group of patients follow a normal distribution with a mean of 65 beats/min and a standard deviation of 12 beats/min. Approximately what percentage of the patients have a heart rate above 50 beats/min?**

**Note that:**

**The cumulative normal probability for z= 1.25 = 0.8944**

**The cumulative normal probability for z= - 1.25 = 0.1056**

< > 11%

< > 89%

< > 15%

< > 18%

< > 39%

< > 50%

**Question. Pulse rates of adult men are normally distributed with a mean of 80 and a standard deviation of 10.**

**For a pulse rate of 100, we found that the z score = 2.00.**

**The area under the normal distribution curve for z = 2.00 was found to be 0.84.**

**Which of the following statements is correct?**

< > 20% of adult men have a pulse rate of 80 or less

< > 16% of adult men have a pulse rate of 80 or more

< > 20% of adult men have a pulse rate of 100 or less

< > 16% of adult men have a pulse rate of 100 or more

< > All statements are correct

< > None of the statements is correct

**Question. In a sample of 250 patients, we found that the mean heart rate was 85 beats per minute with a 95% C.I between 70 and 90 beats per minutes.**

Which of the following statements is correct regarding these findings:

< > We are 95% confident that the sample mean for the 250 patients is between 70 and 90.

< > We are 95% confident that the Population mean is between 70 and 90.

< > We are 95% confident that the sample mean is 85.

< > We are 95% confident that the population mean is 85.

< > Non of the answers is correct.

< > All answers are correct.

Question. Birth weights at a certain hospital are normally distributed with mean = 112 oz and standard deviation = 21 oz.

What is the z-score for an infant with birthweight = 154 oz.?

< > 2

< > 21

< > -2

< > 154

**Question. Suppose a student finished 2 exams, getting 60 in Exam A and 65 in Exam B.**

The class scores for each exam are normally distributed. For Exam A, the mean is 50 and the standard deviation is 10; for Exam B, the mean is 50 and standard deviation is 18. Which of the following statements is correct?

< > Since the z score for Exam A is larger than for Exam B then the student did better in Exam A than in Exam B.

< > Since the z score for Exam A is smaller than for Exam B then the student did better in Exam A than in Exam B.

< > Since the standard deviation score for Exam B is larger than for Exam A then the student did better in Exam B than in Exam A.

< > Since the mean for Exam A is equal to the mean in Exam B then the student did better in Exam A than in Exam B.

<Q> Below are hypothetical results from women who had a mammogram

|  |  |  |  |
| --- | --- | --- | --- |
|  | Breast Ca | No Breast Ca | Total  |
| Positive mammogram | 200 | 50 | 250 |
| Negative mammogram | 10 | 740 | 750 |
| Total  | 210 | 790 | 1000 |

The sensitivity and specificity of the test is:

<C>80%; 99%

<C> 21%; 79%

<C> 95%; 94%

<C>99%; 95%

1. A diagnostic test is 97% sensitive and 94% specific. You have 100 patients and you know that 50 of them do not have the disease, the rest do. How many of the known negatives will actually test negative. How many of the known positives would actually test positive?
2. The prevalence of colon cancer is 40%.  A colonoscopy can test for colon cancer, and it has a sensitivity of 75% and a specificity of 67%.  The predictive value positive (PVP) of this test is about \_\_\_\_ and the predictive value negative (PVN) is about \_\_\_\_\_.
3.

|  |  |  |  |
| --- | --- | --- | --- |
|   | colon cancer | no colon cancer |   |
| positive test | 30 | 20 | 50 |
| negative test | 10 | 40 | 50 |
|   | 40 | 60 | 100 |

1. a)\*       60%; 80%
2. b)         99%; 65%
3. c)         75%; 67%
4. d)         17%; 80%

Calculate Sensitivity and Specificity.

What do each of these mean?

<Q> The probability of having the disease given that you screened positive is called Positive Predictive Value.

<C> True

<C> False

<Q> The probability of screening negative given that you don’t have the disease is called Negative Predictive Value.

<C> True

<C> False

**Answers**

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<C> Non of the answers is correct.

<C> All answers are correct.

**<Q> In a sample of 250 patients, we found that the mean heart rate was 85 beats per minute with a 95% C.I. between 70 and 90 beats per minutes.**

Which of the following statements is correct regarding these findings:

<C+> The point estimate of the population mean is 85.

<C> The point estimate for the population mean is 70 to 90.

<C> The point estimate for the population mean is 70.

<C> The point estimate for the population mean is 90.

<C> None of the answers are correct.

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<C> True

<C+> False