

EPIDEMIOLOGY-BIOSTATISTICS
Exam 1, 2005

Print Your Legal Name: _____

ID Number: _____

Instructions: This exam is 25% of your course grade. The maximum number of points for the course is 1,000 hence this exam is worth 250 points. There are 20 questions on this exam. Each question is worth 10.5 points to yield the maximum of 250 points for this exam. For questions 1-10, record the best answer in pencil on the answer sheet provided. For questions 11-20, write your answers neatly in the spaces provided. Be sure you have printed your legal name and ID number on the top of each page.

1. Which of the following is not a part of the informed consent process for participating as a subject in a randomized controlled trial:
 - a. Informing the subject that the lead investigator will determine the subject's assignment arm based on the subject's past medical history.
 - b. Informing the subject about the potential pros and cons (risks and benefits) of participating in the trial.
 - c. Providing the subject a description of study procedures, identifying any that are experimental.
 - d. Telling the subject the duration of the trial and their length of participation.
 - e. Providing the subject with a statement concerning the purpose of the study.

2. Which of the following epidemiologic study designs is best suited for assessing a possible association between an exposure and a rare outcome.
 - a. Case Series
 - b. Prospective Cohort Study
 - c. Case Control Study
 - d. Retrospective Cohort Study
 - e. Cross-Sectional Study

3. Which of the following epidemiologic study designs is most prone to interviewer bias?
 - a. Randomized Controlled Trial
 - b. Case Control Study
 - c. Prospective Cohort Study
 - d. Case Series
 - e. Cross-Sectional Study

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4. The most important difference between a cohort study and a case control study is:
- a. A cohort study is prospective and a case control study is retrospective.
 - b. A case control study can assess multiple outcomes while a cohort study can assess multiple exposures.
 - c. It is easier to assess incidence data in a case control study than in a cohort study.
 - d. At the beginning of the study, a cohort study classifies subjects by exposure status while a case control study classifies subjects by outcome status.
 - e. A prospective cohort study is more prone to selection bias than a case control study.
5. A study reports that regular exercisers have a relative risk of 0.20 compared to non-regular exercisers in the prevention of strokes. The correct interpretation of this relative risk is:
- a. Regular exercisers are 20% less likely to develop a stroke vs. non-regular exercisers.
 - b. Regular exercisers have 80% of the risk of developing a stroke vs. non-regular exercisers.
 - c. Non-regular exercisers are 80% less likely to develop a stroke vs. regular exercisers.
 - d. Non-regular exercisers are 20% more likely to develop a stroke vs. regular exercisers.
 - e. Regular exercisers are 80% less likely to develop a stroke vs. non-regular exercisers.
6. Select the correct statement concerning association and causation:
- a. For an exposure and outcome to be causally related, there must be an association between the exposure and outcome.
 - b. Effect modification (interaction) is a type of non-causal association.
 - c. All of the Bradford Hill criteria for causation must be present for an association between an exposure and outcome to be causally related.
 - d. The relative risk, or odds ratio, must be greater than one for an exposure to be causally related to an outcome.
 - e. The Z score may be used to measure an association between an exposure and outcome.

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7. Select the correct statement concerning the selection of controls in a case control study:

- a. Controls should come from a different geographic area than the cases.
- b. Randomization can help assure comparability of cases and controls.
- c. Matching can be used to reduce confounding bias.
- d. It is less important to assure comparability of cases and controls in a case control study than in assuring comparability of study arms in a randomized controlled trial.
- e. It is best to identify controls with conditions that are related to the outcome in the case control study.

8. Select the correct statement concerning differential (non-random) and non-differential (random) misclassification of exposures and outcomes.

- a. Blinding investigators helps to avoid differential misclassification of exposure status in randomized controlled trials.
- b. Blinding subjects helps to avoid non-differential misclassification of exposure status in randomized controlled trials.
- c. Blinding investigators helps to avoid non-differential misclassification of outcomes.
- d. Random misclassification of outcome status results in an underestimate of a true association.
- e. Random misclassification of outcome status may either underestimate or overestimate a true association, depending on the situation.

9. Select the correct statement concerning effect modification (interaction):

- a. If the authors report that gender is an effect modifier in their study, they should adjust for gender.
- b. Effect modification can invalidate a trial's result.
- c. If a crude relative risk is significantly different from an age-adjusted relative risk in a trial, age was an effect modifier.
- d. Matching is one way to address effect modification in a prospective cohort study.
- e. If the overall relative risk in a study is 0.6, and the relative risk of men was 0.4 and the relative risk of women was 1.2, gender might be an effect modifier in the study.

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10. Select the correct statement concerning case fatality rate.
- a. It is a measurement of the burden of illness.
 - b. It is possible for a disease to have a low case fatality rate if patients with the disease die quickly after getting the disease.
 - c. It is a measurement of disease at a particular point in time.
 - d. It is possible for a disease to have a high case fatality rate but a low mortality rate.
 - e. It measures the relative risk of death in the exposed vs. the non-exposed.

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11. What is the difference between a crude rate and an adjusted rate?

The following refers to questions 12 and 13. You are reviewing the following table from a prospective cohort study conducted in adult females over 20 years.

	Breast Cancer	No Breast Cancer
Non Exercisers	400	600
Exercisers	100	900

12. Calculate the attributable risk for non-exercisers and breast cancer. Show your work.

13. Interpret the attributable risk that you calculated in question # 12 above.

14. A researcher reports that exercisers have a relative risk of 0.10 compared to non-exercisers for developing prostate cancer. Write a sentence interpreting the 0.10 relative risk. (It is not acceptable to only write that the risk for developing prostate cancer is higher or lower in exercisers vs. non-exercisers.)

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15. A randomized controlled trial assessing Med A vs. Med B in the prevention of heart attacks in 500 subjects has the following table 1:

	Med A (n = 200)	Med B (n = 300)
% smokers	10%	10%
% with high cholesterol	20%	20%
% with high blood pressure	25%	25%

Should the investigators adjust for smoking, high cholesterol and high blood pressure because the two trial arms have different sample sizes? Explain your answer.

16. Define the interquartile range.

17. List two of the major environmental determinants of health.

18. An investigator wants to determine if there is an association between heart disease (the outcome) and having more than \$5 billion in the bank (the exposure). What is the best study design to assess this association? Explain your reason.

19. Why would the FDA prefer (in general) and intention to treat analysis vs. an efficacy analysis in a clinical trial?

20. One of the criteria to consider for causation vs. association is temporality. What does this mean?

THE END