

Name _____

Date _____

ID __ Residents _____

N-PREP RESEARCH SURVEY

PART I

Instructions: Please circle the letter of the answer you find to be most correct.

1. In a study designed to estimate the prevalence of hypertension among adults in an inner-city community, a sample of residents is selected for examination. Which of the following sampling methods is apt to introduce the least bias?

- A. Residents who respond to a call for volunteers in the community's weekly newspaper.
- B. Residents living in a random selection of addresses from the street directory of the community.
- C. Residents living in a random selection of addresses from the phone directory of the community.
- D. Residents selected randomly from the records of local physicians.
- E. Residents selected randomly from the checkout lines of local markets.

2. The IQs of a class of students attending a university are distributed according to the normal curve, with a mean of 115 and a standard deviation of 10.

Therefore

- A. 50% have IQs between 105 and 115
- B. 95% have IQs between 105 and 115
- C. 2.5% have IQs above 135
- D. 5% have IQs above 135
- E. 5% have IQs below 95

3. You have come across a study of a cohort of patients with heart failure.

A cohort is a group of people who:

- A. have something in common at the beginning of a follow-up
- B. are a random sample of a defined population
- C. experience the outcome of interest
- D. are examined at a point in time
- E. have the outcome of interest and are available for study

4. Which of the following is true regarding an “intention-to-treat” analysis of a randomized clinical trial involving an active drug and a placebo?
- A. It compares outcomes in participants who took the drug throughout the trial with those who took the placebo throughout the trial.
 - B. It compares outcomes for patients assigned to take the drug with those assigned to take the placebo, regardless of whether either was actually on the drug at the end of the trial.
 - C. It excludes those who were assigned to the placebo but were found to be taking the active drug at the end of the trial.
 - D. It excludes those who had an unfavorable outcome before they began their assigned treatment.
 - E. It excludes those in the drug group who were not taking the drug for the period of time needed for efficacy, as specified by the protocol of the trial.
5. A randomized controlled trial of thrombolytic therapy versus angioplasty for acute myocardial infarction finds no difference in survival to discharge from the hospital, which is the main outcome event. The investigators explored whether this was also true for subgroups of patients defined by age, number of vessels affected, ejection fraction, comorbidity, and other patient characteristics. Which of the following is not true about these subgroup analyses?
- A. Examining subgroups increases the risk of a false-positive (misleading statistically significant) result in one of the comparisons.
 - B. Examining subgroups increases the chance of a false-negative finding in one of these subgroups, relative to the main outcome.
 - C. Subgroup analyses would be more credible if a limited number were identified beforehand.
 - D. Reporting results in subgroups help clinicians tailor information in the study to individual patients.
6. A report of a clinical trial of a new drug versus a placebo noted that the new drug gave a higher proportion of success than did the placebo. Attached to this finding was the statement $X^2=4.72$, $P < 0.05$. In light of this information, we may conclude:
- A. Fewer than 1 in 20 will fail to benefit more from the drug than the placebo.
 - B. Fewer than 1 in 20 patients will benefit more from the placebo than the drug.
 - C. The probability of treatment success is less than 5% for a patient given the drug.
 - D. If the drug were effective, the probability of the reported finding is less than 5%.
 - E. If the drug were ineffective, the probability of the reported finding is less than 5%.

7. A study was conducted to assess a new surgical procedure designed to reduce the incidence of postoperative complications. The incidence of complications was found to be 40% in 25 patients having the new procedure and 60% for 20 patients having the old procedure. The difference is not statistically significant. Thus, it may be concluded that

- A. The new procedure is effective in reducing postoperative complications.
- B. The new procedure is ineffective in reducing postoperative complications.
- C. The sample is biased.
- D. The result is clinically significant.
- E. The evidence is insufficient to demonstrate that the new procedure is effective in reducing postoperative complications.

8. Which of the following is a case control study?

- A. Study of previous mortality and/or morbidity trends to permit estimates of the occurrence of disease in the future
- B. Analysis of previous research in different places and under different circumstances to permit establishment of a hypothesis based on cumulative knowledge of all known factors identified in the disease under study
- C. Obtaining histories and other information from a group of known cases and from a comparison group to determine the relative frequency of characteristics under study in cases
- D. Study of relative risk of cancer among men who have quit and controls who still smoke
- E. A survey of the prevalence of a disease in the different strata of a population

9. A patient comes to you because she has read that cell phones cause brain cancer, and she wants to know your opinion. You discover that the incidence of malignant tumors is increasing in the United States. What is the most important reason a randomized controlled trial (RCT) cannot be done to determine whether or not cell phones cause brain cancer?

- A. An RCT would cost too much
- B. People would not agree to participate
- C. It would be unethical
- D. It would take too long
- E. An RCT is a research method that cannot answer the question

10. You know that case-control studies are not a strong research design when evaluating a possible cause-and-effect relationship. Which of the following would strengthen your sense that cell phones are or are not related to brain tumors?

- A. A dose-response was sought.
- B. Different measures of "dose" were explored.
- C. Analysis was made according to which side the tumor occurred and telephone was used.
- D. All of the above.

11. When a new treatment is developed that prevents death but does not produce recovery from a disease, the following will occur:

- A. Prevalence of the disease will decrease.
- B. Incidence of the disease will increase.
- C. Prevalence of the disease will increase.
- D. Incidence of the disease will decrease.
- E. Incidence and prevalence of the disease will decrease.

12. Many children in your practice have attacks of otitis media. You want to base your management on the best available evidence. Which of the following is the least credible source of information on this question?

- A. A clinical practice guided by a major medical society
- B. A systemic review published in a major journal
- C. The Cochrane Database of Systemic Reviews
- D. The most recent research article on this question
- E. Clinical Evidence

13. Which if the following is the most important to the validity of the conclusions drawn from a clinical trial?

- A. Equal numbers of treated individuals and those given placebos
- B. Follow up of 100% of the participants
- C. Effective randomization of participants
- D. A relatively high incidence of the disease in the population studied
- E. Inclusion in both groups of individuals of all ages

14. A “double-blind” study of a vaccine is one in which

- A. The study group receives the vaccine and the control group receives a placebo.
- B. Neither the observer nor subjects know the nature of the placebo.
- C. Neither observer nor subjects know which subjects receives the vaccine and which receives a placebo.
- D. Neither the study group nor the control group knows the identity of the observers.
- E. The control group does not know the identity of the study group.

15. In a study designed to measure the frequency of minor symptoms due to administration of a drug:

- A. Control subjects who receive no medication are necessary in order to interpret the data.
- B. Control subjects who receive a placebo are necessary in order to interpret the data.
- C. The inclusion of control subjects is likely to mislead the investigator, especially if the incidence of adverse reaction is low.
- D. The desirability of having controls depends on the kind of reactions expected.
- E. The desirability of having controls depends on their ages.

16. In order to assess how strongly related an exposure is to a disease, which would be the best health statistic?

- A. Incidence of the disease among the exposed
- B. Attributable risk
- C. Prevalence of the exposure
- D. Relative risk
- E. Proportionate mortality

17. An advertisement for raspberry-flavored aureomycin claimed that, "Out of 1,000 children with upper respiratory tract infection treated with our raspberry-flavored aureomycin, 970 were asymptomatic within 72 hours." The inference that for a child with upper respiratory tract infection, raspberry-flavored aureomycin is the treatment of choice is

- A. Correct
- B. Incorrect because the comparison is not based on rates
- C. Incorrect because no control or comparison group is used
- D. Incorrect because no test of statistical significance is made
- E. Incorrect because a cohort effect may be operating

18. Which of the following statements describes the major advantages of a randomized clinical trial?

- A. It avoids observer bias.
- B. It lends itself to ethical justification.
- C. It yields results replicable in other patients.
- D. It rules out self-selection of participants to the different treatment groups.
- E. It enrolls representative patients.

34. Choose an appropriate research design.

1 2 3 4 5 6 7 8 9 10 NA
Not at all confident Extremely confident

35. Obtain IRB approval to conduct research.

1 2 3 4 5 6 7 8 9 10 NA
Not at all confident Extremely confident

36. Choose appropriate statistics to analyze data.

1 2 3 4 5 6 7 8 9 10 NA
Not at all confident Extremely confident

37. Use a computer for data analysis and interpret results.

1 2 3 4 5 6 7 8 9 10 NA
Not at all confident Extremely confident

38. Identify limitations of a study.

1 2 3 4 5 6 7 8 9 10 NA
Not at all confident Extremely confident

39. Write an article for submission to a refereed journal.

1 2 3 4 5 6 7 8 9 10 NA
Not at all confident Extremely confident

40. Defend your research results to a critical audience.

1 2 3 4 5 6 7 8 9 10 NA
Not at all confident Extremely confident

OPTIONAL QUESTIONS

41. When a distribution of a measurement in a healthy population is severely skewed, which of the following is the most probable result?
- A. The normal range cannot be determined.
 - B. The 2.5th and 97.5th percentiles cannot be determined from the cumulative distribution.
 - C. The 2.5th and 97.5th percentiles are no longer the normal limits.
 - D. The mean is distorted by extreme observations.
 - E. The mean is equal to the 50th percentile.
42. Censoring in a prospective study whose end point is mortality occurs when
- A. Subjects die before the planned termination of the study.
 - B. The study ends before all subjects have died.
 - C. Subjects are excluded from the study because of the presence of a particular factor or complication.
 - D. Subjects die and the cause of death is unknown.
 - E. Subjects fail to comply with their assigned intervention.
43. You are finishing residency and will begin practice in a small town. You want to keep up with new developments in your field even though there are few professional colleagues in your community. All of the following might be useful but which one will be most useful to you?
- A. Subscribe to a few good journals
 - B. Buy new editions of printed textbooks
 - C. Subscribe to a service that reviews the literature in your field
 - D. Search Medline at regular intervals
 - E. Keep up contacts with colleagues in your training program by e-mail and telephone
44. Circle the best response.
All of the following statements are true about both prospective and retrospective cohort studies except:
- A. They measure incidence of disease directly.
 - B. They allow assessment of possible associations between exposure and many diseases.
 - C. They allow investigators to decide beforehand what data to collect.
 - D. They avoid bias that might occur if measurement of exposure is made after the outcome of interest is known.
45. In a well-designed clinical trial of treatment of ovarian cancer, remission rate at 1 year is similar for a new drug and usual care. The P value is 0.4. This means that:
- A. Both treatments are effective.
 - B. Neither treatment is effective.
 - C. The statistical power of this study is 60%.
 - D. The best estimate of treatment effect size is 0.4.
 - E. It is not possible, given just this information, to decide whether one treatment is better than the other.

46. A study describes the clinical course of patients who have an uncommon neurologic disease. Patients are identified at a referral center that specializes in this disease. Their medical records are reviewed for patient characteristics and treatments and are then related to their current status. This study is best described as a:

- A. Cohort study
- B. Case control study
- C. Case series
- D. Cross-sectional study
- E. A randomized controlled trial

References

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Hebel, J.R. & McCarty, R.J. *Study Guide to Epidemiology and Biostatistics*, 6th ed. Boston: Jones and Bartlett Publishers; 2006.

Papanastasiou, E.C. (2005). Factor structure of the "Attitudes toward Research Scale", *Statistics Education Research Journal*. 2005; 4(1): 16-26.

Bieschke, KJ, Bishop, RM, & Garcia, VL. The utility of the research self-efficacy scale. *Journal of Career Assessment*. 1996; 4: 59-75.

Phillips, JC & Russell, RK. Research self efficacy, the research training environment, and research productivity among graduate students in counseling psychology. *The Counseling Psychologist*. 1994; 22: 628-641.

Cross-reference of survey questions sources and numbering on survey:

NPREP Survey	Source	Answers
1	Hebel 109	B
2	Hebel 111	C
3	Fletcher 4.9	A
4	Hebel 125	B
5	Fletcher 10.1	D
6	Hebel 108	E
7	Hebel 97	E
8	Hebel 67	C
9	Fletcher 11.1	C
10	Fletcher 11.3	D (added)
11	Hebel 7	C
12	Fletcher 13.3	D
13	Hebel 53	C
14	Hebel 56	C
15	Hebel 65	B
16	Hebel 20	D
17	Hebel 78	C
18	Hebel 90	D
OPTIONAL		
A	Hebel 45	D
B	Hebel 123	B
C	Fletcher 13.1	C
D	Fletcher 5.10	C
E	Fletcher 10.3	E
F	Fletcher 7.3	C