Part I:

選擇題 (20%)　※ 本大題請於試卷內之「選擇題作答區」依序作答。

( ) 1. Which of the following statements is true?
A. Systemic errors usually have a recognizable source
B. Systemic errors cannot cause information bias
C. Systemic errors cannot cause differential misclassification
D. Random errors are consistently wrong in a particular direction

( ) 2. Which of the following statements is not true?
A. Selection bias is an error in study design or execution
B. Selection bias may be prevented by study design
C. Selection bias can usually be solved by analysis of the data collected in the same study
D. Selection bias can hardly occur in a prospective cohort study

( ) 3. Which of the following statements about information bias is not true?
A. Information bias is also called misclassification bias because it is caused by misclassification
B. Information bias is caused by non-differential misclassification bias
C. Information bias cannot be solved by analysis of the data collected in the same study
D. Recall bias is a type of information bias

( ) 4. Selection bias cannot be prevented by
A. blinding the investigator to the exposure status of the participants in a case-control study
B. selecting multiple control groups in a case-control study
C. blinding the investigator to the outcome status of the participants in a cohort study
D. randomize the outcome status in a cohort study

( ) 5. Temporality is
A. a necessary condition for causal relationship
B. a sufficient condition for causal relationship
C. a necessary and sufficient condition for causal relationship
D. impossible to evaluate in cohort studies

( ) 6. "All of the relationships and findings should make biological and epidemiologic sense." indicates
A. consistency
B. specificity
C. plausibility
D. analogy

( ) 7. Which of the following item is not among the CDC criteria for evaluating the performance of a surveillance system
A. Simplicity
B. Flexibility
C. Timeliness
D. Completeness

見背面

( ) 8. Which of the following item is not true for meta-analysis?
A. Narrative literature review
B. Summarize published data
C. Re-analyze the data for the same hypothesis
D. May still be biased

( ) 9. The weight that most commonly used in meta-analyses is
A. Sample size
B. Inverse of variance
C. Effect size
D. Study design

( ) 10. Which of the following doesn't usually enhance causal inference of a study?
A. Use measurement tools with high accuracy
B. Adopt prospective study design
C. Apply standard interview procedures
D. Conduct matching on intermediate variables

問答題 (10%)

某學者觀察住輻射屋之居民是否較容易得到癌症，對一群輻射屋之居民進行癌症篩檢，並同時對一群不是住輻射屋之居民進行癌症篩檢做比較，結果發現輻射屋居民得到癌症者較多。

1. 請問在什麼情況下輻射屋居民得到癌症者較多是選擇偏差（selection bias）的結果？(5分)

2. 如何預防以上之選擇偏差情形發生？(5 分)

接次頁

Part II.

1) In order to predict the incidence rate of influenza from September to December in 2008 in Taipei City, which of the following study design is appropriate? (A) case-control study, (B) cohort study, (C) cross-sectional study, (D) case series. (2%)

2) Interlukin-1 (IL-1) gene has been associated with central obesity and metabolic syndrome in coronary heart disease. If IL-1 genotypes are dichotomized into carriers and non-carriers and metabolic syndrome is defined as yes or no, how could we assess the interaction between metabolic syndrome and genetic polymorphisms? (A) Use a multiplicative term that multiplies IL-1 genotypes with the existence of metabolic syndrome, (B) create 3 dummy variables to get the effect of interaction, (C) Use the multiplicative term as described in (A) followed by dummy variables as described in (B), (D) None of the above. (2%)

3) In a follow-up study, 50,000 subjects were recruited in year 1986 and then followed up to year 2008. A total of 900 incident prostate cancer patients were observed by year 1996, and 900 controls were selected to match with the cases on age. In 1996, these cases and controls had blood drawn for genotyping. This study was to explore the association between genetic polymorphisms of some candidate genes and the risk of prostate cancer. What is the design of this study? (3%) Compared with the traditional case-control study, what are the strengths of this type of studies? (5%)

4) Prostate-specific antigen (PSA) is a screening tool commonly used for early diagnosis of prostate cancer. The following table demonstrates the association between the PSA screening and the risk of prostate cancer among a group of men aged 45 to70. (18%)

		Prostate Cancer	
		Present	Absent
PSA Test	Positive (>4ng/ml)	260	140
	Negative (<=4ng/ml)	120	360

(A) Please calculate sensitivity, specificity, and test efficiency of the PSA screening test. (6%) What could be done to improve the sensitivity and specificity of the PSA screening test in this case? (5%)

見背面

(B) If a man had PSA screening in year 1999 and the value was >4.0 ng/ml (the value indicating a higher risk of prostate cancer as compared with those with PSA≦4 ng/ml. At that time, digital rectal exam failed to diagnose the occurrence of prostate cancer. This man was diagnosed with prostate cancer in 2002 and died of this disease in year 2008. How long is the lead time in this case? (2%) Please use this example to explain "lead time bias". (5%)

接次頁

Part III.

Chinese or English answer is Ok:

American Journal of Epidemiology
Vol 169 No 2
DOI 10.1093/aje/kwn341
Advance Access publication December 8, 2008

Original Contribution

Influence of Birth Weight on White Blood Cell Count in Biracial (Black-White) Children, Adolescents, and Young Adults

The Bogalusa Heart Study

Wei Chen, Sathanur R. Srinivasan, and Gerald S. Berenson

Initially submitted July 7, 2008; accepted for publication September 23, 2008.

The effect of birth weight on white blood cell (WBC) count among blacks and whites was examined in 2,080 children (aged 4–11 years, 57.4% white, and 49.2% male), 892 adolescents (aged 12–17 years, 57.2% white, and 50.8% male), and 1,872 adults (aged 18–38 years, 68.4% white, and 41.9% male) from Bogalusa, Louisiana, in 2005. After adjustment for age, sex, race, body mass index, and smoking status (in adolescents and adults), the WBC count decreased across quantiles of increasing birth weight specific for race, sex, and gestational age in children (P_{trend} = 0.0007) and adults (P_{trend} = 0.005). In multivariate regression analyses that included the covariates above, birth weight was inversely associated with WBC count in children (β coefficients (unit, cells/μL per kg) = −256, −241, and −251 for whites, blacks, and the combined sample, with P = 0.003, 0.029, and 0.001, respectively) and in adults (β = −224 and −211 for whites and the combined sample, with P = 0.015 and 0.008, respectively). These results show that low birth weight is associated with increased systemic inflammation as depicted by the WBC count in childhood and adulthood, thereby potentially linking fetal growth retardation to cardiovascular disease and diabetes.

birth weight; inflammation; leukocyte count

1. (15%) You search the study on the child health and find the above publication in *American Journal of Epidemiology*. You read the abstract and have several questions to be answered:

a. What is the primary hypothesis of this study? (2%)
b. What is the study design? (2%)
c. How the authors handle the association? (2%)
d. What are the confounding factors? (2%)
e. What is the potential bias?, please just list two items (2%)
f. Please explain the value, P_{trend} and how to get it. (2%)
g. Please explain the β coefficients in the multivariate regression analysis result, for example, -256 for whites (2%)
h. Please give your comment on this study (1%)

見背面

2. (25%) You are asked to design a study of smoking and risk of dementia. Please explain the following:

a. the study design you would choose;
b. how you would identify information on exposure;
c. how you would identify cases;
d. how you would try to control for confounding;
e. what is a key source of possible bias other than confounding, and how would you address it

For each of parts a-d; carefully consider the strengths and weaknesses of your choice versus other potential choices for studying this relation, and how these strengths/weaknesses might eventually impact the interpretation of your results.

試題隨卷繳回