

※ 注意：請於試卷上依序作答，並應註明作答之大題及小題題號。

1) Please define the following terms (10%):

- (A) Caliper matching (2.5%)
- (B) Length bias (2.5%)
- (C) Lead time bias (2.5%)
- (D) Misclassification (2.5%)

2) Please select a correct answer. (A) Systematic error remains when sample size increases, (B) Random error remains when sample size increases, (C) Random error also called bias, (D) None of the above. (3%)

3) In order to determine the average height of women in a city ( $n=500,000$ ), we randomly select 100 women from the population to estimate the average height. Which of the following is NOT a systematic error when we measure the height? (A) Use a shrank tape, (B) Hold the tape crookedly, (C) How the measuring tape is held, (D) None of the above. (3%)

4) A screening test was offered to a community for detection of colon cancer. The test compared the efficacy of the test between volunteers and residents who did not participate. Some volunteers were more health-conscious than non-volunteers and thus have a lower risk of colon cancer. In contrast, some volunteers had a family history of colon cancer and thus tended to have a higher risk of colon cancer. This type of error is called (A) confounding, (B) Simpson's paradox, (C) selection bias, (D) lead time bias, (E) none of the above. (3%)

5) Compare the death rate among workers in a specific job with that among the general population. Healthy worker effect occurred because (A) general population is healthier than the workers, (B) workers include more ill people than general population, (C) general population includes more ill people than workers, (D) none of the above. (3%)

6) Which of the following is non-differential misclassification of exposure? (A) Smokers and their physicians tend to search for respiratory disease more thoroughly than nonsmokers, (B) Imperfectly dichotomize fat diet is unrelated to the occurrence of heart attack, (C) Moms delivered babies with serious birth defect tend to recall exposure to nonprescription drugs or fevers more accurately than moms with normal babies, (D) Association between consumption of red wine and the development of emphysema. The % of under-diagnosis of emphysema has little to do with wine drinking, (E) none of the above. (3%)

7) Which of the following is the property of being a confounder? (A) associated with disease, (B) associated with exposure, (C) not an effect of the exposure, (D) all of the above. (3%)

見背面

- 8) Which of the following could be used to control for confounding in data analysis stage? (A) Stratification and regression models, (B) Randomization and stratification, (C) Restriction and regression models, (D) Matching and restriction. (3%)
- 9) Which of the following is NOT true? (A) p value is a statistic used for hypothesis testing, usually testing the  $H_0$ , (B) p value is the probability, conditional on  $H_0$ , of observing as strong an association as was observed or a stronger one, (C) When  $p=0.01$ , there is 1% probability that the  $H_0$  ( $RR=1$ ) is correct (D) p value is a measure that tests the comparability between the data and  $H_0$  ( $RR=1$ ). (3%)
- 10) Which of the following is NOT true? (A) The assumption for pooling is that the estimate is constant across strata, (B) The assumption for standardization is that the estimate is constant across strata, (C) Stratum-specific estimates is good when the effect changes considerably across the strata, (D) All of the above. (3%)
- 11) Which of the following is true? (A) Only pooling, but not standardization, is to aggregate the information from stratum-specific estimates over all strata, (B) Weighted average does not necessarily falls within the range of stratum-specific estimates of the effect, (C) Pooling takes weighted average that assigning more weights to the strata with more data, (D) None of the above. (3%)

二、

1. (10%)由於慢性疾病，如動脈硬化的發生，自然史變化是連續性而非間歇性，因此預防策略上採取三段五級的策略，分別來避免危險因子的暴露，並斷疾病的發生，遏止病期的惡化，斷絕殘障及死亡的結果。請簡述針對動脈硬化疾病(高血壓)之三段五級的目的及內容。
2. (10%)慢性疾病自然史常分期為五個階段，包括易感受期，次臨床期，臨床期，殘障期，死亡。試回答以下各狀態是屬於何種階段？
  - A. 頸動脈硬化-
  - B. 轉移癌-
  - C. 戒菸防治-
  - D. 騎車帶安全帽-
  - E. 車禍受傷造成植物人-
3. (10%)針對臨床各種 outcomes(結果)的評估可以有各式各樣的測量，例如生物標識(biomarkers)及全死因(all-cases death)，試根據肝癌為例，舉出以下 5 種不同的 outcomes 測量例子，並且說明其優點及缺點。
  - A. 生活品質面向 (Quality of life)
  - B. 健康經濟測量指標 (Health economics indicator)
  - C. 血清生化指標 (Serum biomarker)
  - D. 特定疾病發生 (Specific disease incidence)
  - E. 全死因 (All-cause death)

見背面

三、

One method of echogram for breast cancer screening was applied on healthy women in a community. The following data was the result from screening. (4%×5 = 20%)

Breast cancer (100 subjects)	Test + (85)	Test - (15)
Healthy women (1000 subjects)	Test + (100)	Test - (900)

1. Please calculate the sensitivity of this screening method.
2. Please calculate the specificity of this screening method.
- \_\_\_ 3. If we want to use this screening method in a high-risk population, what would expect to see in such method: (1) high sensitivity (2) high specificity (3) high positive predictive value (4) high negative predictive value
- \_\_\_ 4. In clinical trial, what is the main purpose of randomization: (1) to reduce information bias (2) to reduce selection bias (3) to reduce the effects of confounding bias (4) to increase the compliance of participants.
- \_\_\_ 5. In population-based study, we always want to increase sample size because (1) to reduce selection bias (2) to reduce information bias (3) to increase validity (4) to increase precision.

## 四、問答題 (10%)

某市衛生局致力於推動某種特定癌症的篩檢活動，希望能藉此找出尚未有症狀的初期患者，加以早期治療來延長壽命。此衛生局承辦人員發現社區中篩檢出來的患者之平均存活率，遠高於那些因症狀就醫而診斷出來的患者，他以此數據推論，此項篩檢計劃是非常成功的。請討論這樣的推論是否恰當？有哪些因素應該要考慮？

試題隨卷繳回