Department of Epidemiology
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EPID 160   Principles of Epidemiology   Fall, 1967

Final Laboratory Exercise Examination

GRADING GUIDE

Grade
Points   Question 1

           Cut-off Point (Blood Sugar 110+):

Blood Sugar	Diabetes	Not Diabetes	Total
110+	94	270	364
109 or less	6	730	736
TOTAL	100	1000	1100

$\frac{1}{2}$ Sensitivity: $\frac{94}{100} = 94\%$

$\frac{1}{2}$ Specificity: $\frac{730}{1000} = 73\%$

Cut-off Point (Blood Sugar 130+):

Blood Sugar	Diabetes	Not Diabetes	Total
130+	85	70	155
120 or less	15	930	945
TOTAL	100	1000	1100

½   Sensitivity: $\frac{85}{100} = 85\%$

½   Specificity: $\frac{930}{1000} = 93\%$

Advantages and Disadvantages:

2   110+   Few cases of diabetes will be missed (i.e. high sensitivity), but many cases will be referred for diagnostic work-up who will not have diabetes, thus burdening the diagnostic facilities and imposing upon the time of healthy individuals (i.e. relatively low specificity).

2   130+   More cases of diabetes will be missed, but fewer non-diabetics will be referred.

The objective of this question is to determine whether the students understand the implications of sensitivity and specificity in the context of a screening program.

Question 2

½   Sex – Under 45: Male rate approximately equal to female rate for both races.

½   45+:   Female rate exceeds male for both races.

½   Race: Non-whites have higher rates than whites at all ages and for both sexes.

½   Age: Rates increase with age for both sexes and both races.

Question 3

2   Non-whites have lower rates than whites at all ages above 25 – true for both sexes.

Question 4

2   Selection: Non-white diabetics not using hospital to the same extent as white.

Question 5

Inappropriate analysis: This analysis is based upon numerator data only (i.e. neither a population group nor alterntively a control group is presented).

6

% Calories Derived From Refined Carbohydrate	Number in Population	Number of Diabetics	Diabetic Rate
10 - 14			
15 - 19			
etc.			

OR

% Calories from Refined Carbohydrate	Number of Non-Diabetics (Controls)	Number of Diabetics	Proportion of Diabetic

Question 6

3

In Tables 5 and 6, both income level and place of residence are shown to be associated with diabetes prevalence rates. In Table 7, it is shown that income is associated with diabetes prevalence, but not place of residence.

Question 7

4

Thus the higher rates found in urban residents (in Table 6) must be due to the higher proportion of higher income people living in urban areas.

Question 8

Expected numbers:

Age	Expected Number of Diabetics
45 - 54	30/100 X 10 = 3
55 - 64	10/100 X 150 = 1.5
65 - 74	5/100 X 40 = 6.5

4

Expected Number of diabetics over 45 who would be active = 6.5

Question 9

3   a.   This was a prevalence (cross-sectional) study. It is therefore quite conceivable that diabetes antedated sedentary living rather than sedentary living increasing the risk of diabetes (i.e. diabetes became more sedentary following discovery of their diabetes.

     b.   A cohort approach (longitudinal, prospective) study is necessary. A group of active and sedentary men free of diabetes need to be followed to determine the occurrence of diabetes in each group.

Question 10

5   Doctors' data based upon <u>incidence</u> (new cases) survey based upon <u>prevalence</u>.

Incidence in low income groups as high as high income, but prevalence lower in low income. Therefore, higher case fatality rate in low income (selective survival).