**Semester 5**

**HSTDS5012P**

**Problem Set 1**

**Measures of association**

1. Out of 178 children who appeared to be in remission from leukaemia using the standard criterion after undergoing chemotherapy, 75 children showed traces of cancer by using PCR (polymerase chain reaction) test. During 3 years of follow-up, 30 of these children suffered a relapse. Out of 103 children who did not show traces of cancer, 8 suffered a relapse. Identify the type of study. Present the leukaemia relapse data in a 2x2 contingency table. Compare the relapse rates for the two groups and give your comment.
2. Table below comes from one of the first studies of the link between lung cancer and smoking, by Richard Doll and A. Bradford Hill. In 20 hospitals in London, U.K. patients admitted with lung cancer in the previous year were queried about their smoking behaviour. For each patient admitted, researchers studied the smoking behaviour of a non-cancer control patient, of the same hospital of the same sex and within the same 5-year grouping on age. A smoker was defined as a person who had smoked at least one cigarette a day for at least a year.

|  |  |  |
| --- | --- | --- |
| **Have smoked** | **Lung Cancer** | |
| Cases | Control |
| Yes | 688 | 650 |
| No | 21 | 59 |

1. Identify the type of study.
2. Can you use these data to compute an estimate of the probability of a smoker developing lung cancer? Why or why not?
3. Summarize the association (computing suitable measure) and explain how to interpret it.
4. Given below is the data on 413 college students giving results of visual acuity test and a balance test. Compute a measure of association and give your comments.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Left eyed | Ambi-ocular | Right eyed |
| Left handed | 48 | 25 | 52 |
| Ambidextrous | 32 | 13 | 25 |
| Right handed | 94 | 33 | 91 |

1. The following table gives the data from the 2002 General Social Survey cross classifying a person’s perceived happiness with their income level.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Happiness** | | |
| **Income** | Not too Happy | Pretty Happy | Very Happy |
| Above Average | 21 | 159 | 110 |
| Average | 53 | 372 | 221 |
| Below Average | 94 | 249 | 83 |

Judge whether there is any association between a person’s perceived happiness with his income level.