**Prof. Giuseppe Verlato – Exercises of Medical Statistics – University of Verona**

**Exercise 1:** In 1999 a survey was performed in order to estimate the prevalence (proportion) of asthma and allergic rhinitis in the Italian adult population. The results of the survey are summarized in the following table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Asthma | No asthma |  |
| Allergic rhinitis | 915 | 2604 | 3,519 |
| No allergic rhinitis | 646 | 14,555 | 15,201 |
|  | 1561 | 17,159 | 18,720 |

**1a)** Which is the probability of asthma in the subjects participating in the survey ?

**1b)** Which is P(asthma/rhinitis), i.e. the conditional probability of asthma in subjects suffering from allergic rhinitis ?

**1c)** Which is P(asthma/no-rhinitis), i.e. the conditional probability of asthma in subjects without allergic rhinitis ?

**1d)** Which statistical test should be used to verify whether asthma and allergic rhinitis are significantly associated ?

**1e)** Please specify degrees of freedom and critical threshold for a significance level of 5%?

**1f)** Perform the statistical test and draw conclusions.

**Exercise 2**. Infant mortality is the number of deaths during the 1st year of life per 1000 live births. In Italy infant mortality has largely decreased during the 20th century, as reported in the following table:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| year | 1905 | 1915 | 1925 | 1935 | 1945 | 1955 | 1965 | 1973 | 1978 | 1983 |
| Infant mortality per 1000 live births | 159.7 | 144.6 | 122.6 | 103.9 | 93.0 | 52.7 | 35.6 | 25.2 | 17.1 | 12.3 |

Σx = 19479 Σy = 766.7

Σx2 =37949877 Σy2 = 86011.61

Σxy =1479990.8

**2a)** Please compute the mean, median and standard deviation of infant mortality values.

2b) Please compute the regression line of infant mortality on calendar year.

**2c**) What is r, the linear correlation coefficient, equal to ? and r2 (coefficient of determination) ?

2d) Is the linear correlation coefficient r significant?

2e) Please draw your conclusions about the relation between infant mortality and calendar year.