**Solution for Homework 3.**

1. **Briefly define the terms Relative risk, Attributable risk and population attributable risk. What kind of information does each term give?**

 **Relative risk: the association between the exposure and the disease . Measures the strength of association between the exposure and the disease .**

**Attributable risk: How much if the risk if disease is because of the exposure . Measures the excess risk in the exposed people .**

**population attributable risk the whole population of exposed and nonexposed**

 **2. A study is conducted to evaluate the relationship between serum cholesterol level and the occurrence of myocardial infarction in women.**

**In the study 500 women with high serum cholesterol levels and 500 women without high serum cholesterol levels were followed over a 10 year period. During the study 40 of the women with high serum cholesterol levels and 15 of the women with normal serum cholesterol levels develop a newly diagnosed myocardial infarction.**

1. **Calculate absolute risk ( EAR ) and calculate the AR% (EAF).**

**EAR = Re – R0**

**= 40\500 - 15\500**

**=0.08 - 0.03 = 0.05**

**AR% = Re – R0 \ Re \* 100%**

**= 0.05\ 0.08 \* 100%**

**= 62.5 %**

1. **Calculate the population attributable risk (PAR) and the population attributable fraction (PAF.)**

**PAR = Rt – R0**

**= 55\ 1000 – 0.03**

**= 0.055 - 0.03 = 0.025**

**PAF= Rt-R0 \Rt \*100%**

**= 0.025\ 0.055\* 100% = 45.4%**

**3 . If high cholestrol level cause MI , 45.4 % of MI in the population could be prevented if the women had a normal cholestrol level**

1. **case-control study- stomach cancer and coffee drinking**

 **Stomach cancer**

 **cases controls**

|  |  |
| --- | --- |
| **28** **Yes** **no****Coffee**  **N** | **280** |
| **140** | **2600** |

 **168 2880**

1. **calculate the OR.**

**OR = 28 / 140 | 280 / 2000**

 **= 0.2 /0.1076**

 **= 1.86**

1. **Calculate the prevalence of coffee drinking in this population ( estimated from the prevalence in controls).**

**Pe = 280 / 2880 = 0.097**

1. **Calculate the population attributable fraction (PAF)**

**PAF = 0.097 \* ( 1.86 -1 ) / 0.097 ( 1.86 -1 ) +1 \* 100%**

 **= 7.7%**

 **If coffee drinking causes stomach cancer, 7.6 % of stomach cancer in the population can be prevented if coffee drinking was discontinued**