

# community medicine (Epidemiology)

## Measures of Association

### ① chi-square

- cross-sectional studies
- association BTW 2 categorical variables. (yes or No, it doesn't tell us how strong)
- chi-square value  $> P < 0.05$  → there is a significant association BTW the Risk Factor & the disease.

(القانونية مش مطلوب)

### ② RR / Relative Risk or Risk Ratio

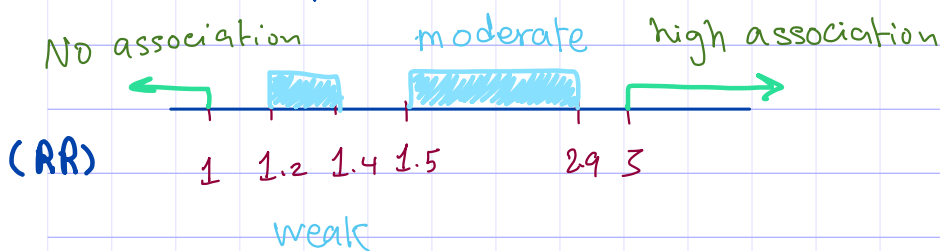
- cohort study
- measure the strength of association
- Expresses risk of developing a disease in exposed group as compared to non-exposed group.

$$RR = \frac{\text{Incidence among exposed}}{\text{Incidence among non exposed}}$$

means:

the exposed group is n times at a higher risk of developing the disease when compared to non-exposed.

a	b
c	d
$\frac{a/(a+b)}{c/(c+d)}$	



### ③ OR / Odds ratio

→ case-control studies

→ measure the strength of the association BTW Risk factor & outcome

$$OR = \frac{\text{odds of exposure among diseased}}{\text{odds of exposure among non-diseased}}$$

a	b
c	d

$$= \frac{ad}{bc}$$

\* RR can be estimated by OR if:-

- Ⓐ controls are representative of general population
- Ⓑ selected cases are representative of all cases
- Ⓒ The disease is rare.

### ④ AR / Attributable Risk

→ also called risk difference

→ how much of the risk is due to the specific exposure, by removing the risk of the disease that occurred to other causes -

$$AR = \text{Risk in exposed} - \text{Risk in non-exposed}$$

a	b
c	d

$$AR \% = \frac{AR * 100 \%}{\text{Risk in exposed}}$$

$$= \frac{a}{a+b} - \frac{c}{c+d}$$

$$\left( \frac{a}{a+b} - \frac{c}{c+d} \right) * 100 \%$$

$$\frac{a}{a+b}$$

Exposure

disease

AR% = 90% [Smoking & lung cancer]

means 90% of the lung cancer among smokers was due to their smoking.

$RR=1$  ,  $AR=0$   
↳ No association

$RR > 1$  ,  $AR > 0$   
↳ positive association  $\Rightarrow$  Risk factor: any factor +vely associated with disease / increase  $\downarrow$  the occurrence of a disease

↳ [may not be amenable to change]

$RR < 1$  ,  $AR < 0$   
↳ Negative association  $\Rightarrow$  preventive factor: any factor +vely associated with a disease / decreased occurrence of a disease