

Measurement of Disease

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Measurement of disease

Measurement of disease burden

Prevalence, proportion etc

Measurement of disease occurrence

Incidence, death rate

Measurement of risk

Odd ratio, Relative Risk

- Proportion: It represents the number of cases per survey population
- Prevalence: it is the total number of existing cases in the population at risk without distinction between old or new cases

- **Point Prevalence** = $\frac{\text{Number of existing cases at a point}}{\text{Population at risk at a point of time}}$

Period Prevalence = $\frac{\text{Cases at the start of study} + \text{new cases}}{\text{Population at risk during the period}}$

- Incidence : Incidence is the number of new cases that occur in a population over a specified period of time.
- Incidence=
$$\frac{\text{New cases in a period of time}}{\text{Population at risk}}$$

Components of an incidence rate:

- the number of new cases;
- the period of time over which the new cases occur.

Cumulative incidence

- The cumulative incidence, (also termed risk) : It is the proportion of non-diseased individuals at the beginning of a period of study that become diseased during the period:

No of animal that become diseased during a pd.

No, of healthy animal at the beginning of the pd

Attack rate

- This applies for the cases which is for a short pd, due to brief exposure of infection, or because the risk of developing the
- Hence, when the period of risk is brief, the term attack rate is used to describe the proportion of animals that develop the disease.

Relationship between prevalence and incidence rate

- $P = I \times D$
- Hence prevalence can change be due to:
 - a change in incidence rate;
 - a change in the average duration of the disease;
 - a change in both incidence rate and duration.

Mortality rate

- Mortality rate (mortality density), is calculated as the number of death that occur in a population over a specified period of time.
- Mortality =
$$\frac{\text{Number of death in a period of time}}{\text{Population at risk during the pd.}}$$
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- **mortality rate is disease specific measurement**
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Death rate

- The death rate is the total mortality rate for all diseases rather than one specific disease - in a population.

Case Fatality rate

- The tendency for a condition to cause the death of affected animals in a specified time, or we can say the number of death that has occurred due to the particular disease during the period

Survival

- It is the probability of individuals with a specific disease remaining alive for a specified length of time.
- $S = N - D/N$

where:

- D = the number of deaths observed in a specified period of time,
- N = the number of newly diagnosed cases under observation during the same period of time.

So we can say that Survival is the complement of case fatality. Thus, for a given period of observation, the sum of the case fatality and survival should equal 1 (100%).

- **Odds ratio** is used to find out the probability of outcome of an event when there are two possible outcomes,
- **Relative risk** is a ratio of the probability of an event occurring in the exposed group versus the probability of the event occurring in the non-exposed group.

Odds Ratio (OR)

Contingency (or 2 x 2) Table

	Cases	Controls	Total
Exposed	a	b	a+b
Unexposed	c	d	c+d
Total	a+c	b+d	a+b+c+d

$$\begin{aligned} \text{OR} &= (a/c) / (b/d) \\ &= (a*d) / (b*c) \end{aligned}$$

Relative Risk (RR)

Contingency (or 2 x 2) Table

	Cases	Controls	Total
Exposed	a	b	a+b
Unexposed	c	d	c+d
Total	a+c	b+d	a+b+c+d

$$\begin{aligned}RR &= I_E / I_U \\ &= P(D|E) / P(D|U) \\ &= [a/(a+b)] / [c/(c+d)]\end{aligned}$$

ANY
QUESTIONS?

