Mortality Rates

The study of mortality can be made through the following death rates:-

- Crude Death Rate (CDR)
- Specific Death Rate (SDR w.r.t. age and sex)
- Standardized Death Rate (STDR)
- Infant Mortality Rate (IMR)

- **Crude Death Rate (CDR)**

  CDR may be defined as the ratio of the number of deaths which occur within a population during a specified year to the size of that population at midyear. The following formula is used to estimate CDR, i.e.,

$$CDR = \frac{\sum D}{\sum P} \times 1000$$

where, $\sum D$= Total death in a region at a given time

$\sum P$= Total population of the same region during that period.

  - **Merits**: CDR indicates the probability of death within a given population. It is used to access the proportion of death. It is a simple measure as it requires only the figures of total death and total population at the mid year.
  - **Demerits**: CDR suffers from some drawbacks as for instance, it is unsuitable to make inter regional comparisons. Mortality varies from age to age. If the age distribution differs from place to place any comparison of CDR will lead to misleading conclusions.

- **Specific Death Rate (SDR)**

  In order to arrive at a more useful figure than CDR, we must take into account the fact that the mortality pattern is different in different segment of the population. Various segments may age, sex, occupation etc. For example, the people engaged in infant or child welfare would be interested to know the mortality condition in the age groups below 1 year, 1-4 years, 5-9years, etc. Again, those engaged in maternal health programmes would like to know the number of deaths occurring among women in the reproductive period (usually 15 to 49 years), insurance authorities would be interested in the mortality pattern at different ages of the population.

Death rate computed for a particular specified section of the population is termed as specific death rate (SDR). SDR for given geographical region during a given period is defined as:

$$SDR = \frac{\text{Total number of deaths in the specified section of the population in the given period}}{\text{Total population of the specified section in the same period}} \times 1000$$

Usually SDR is computed specific to (i) age and (ii) sex which are described below:

- **Age Specific Death Rate (Age- SDR):** To formulate ideas mathematically , let

  ${}_nD_x$ = Number of deaths in the age-group $(x, x + n)$

  ${}_nP_x$ = Total population of the age-group x to $(x + n)$

Then the age-specific death rate for the age-group x to $x + n$, usually denoted by ${}_nm_x$, is given by:

$${}_nm_x = ({}_nD_x / {}_nP_x) \times 1000$$

To be more specific, the Age-SDR for males is given by :

$${}^{m}_{n}m_x = \frac{{}^{m}_{n}D_x}{{}^{m}_{n}P_x} \text{X1000}$$

Where ${}^{m}_{n}P_x$ is the number of males in the population in the age-group x to $x + n$ and ${}^{m}_{n}D_x$ is the number of deaths amongst this population.

Similarly, the Age - SDR for females is given by the formula:

$$m_x = \frac{{}^{f}_{n}D_x}{{}^{f}_{n}P_x} \text{X1000}$$

The above two formulae give the death rates specific to both age and sex.

- **Merits**: The death rates specific to age and sex overcome the drawback of CDR, since they are computed by taking into consideration the age and sex composition of the population. By eliminating the variation in the death rates due to age-sex distribution of the population SDR's provide more appropriate measures of the relative mortality situation in the regions. Moreover, the death rate specific for age and sex is one of the most important and widely applicable types of death rate.
- **Demerits**: It is not applicable for overall comparison of mortality conditions prevailing in two different regions, say A and B. Moreover, in addition to age and sex distribution of the population social, occupational and topographical factors come into operation causing what is called different mortality and SDR is completely ignored these factors, for which standardized death rates are computed.