Mortality Measurement

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Epidemiology NUR404

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Outline

1. Crude death rate
2. Specific death rates
3. Case fatality rate
4. Proportional mortality rate
5. Survival rate

Objectives

- To study mortality measurements.

- To identify advantages & disadvantages of each measurement.

1. Crude death rate (CDR)

- No. of deaths (from all causes) per 1000 estimated mid-year population in one year, in a given place.

- CDR

$$= \frac{\text{Number of deaths during the year}}{\text{Mid - year population}} \times 1000$$

Advantages of CDR

- Widely used for international comparison
- Easily calculated
- Easily understood

2. Specific death rates (SDR)

▶ Cause specific: tuberculosis, cancer, accident.

▶ Group specific: age specific, sex-specific…

$$= \frac{\text{Number of deaths from a specific cause during a given time interval}}{\text{Mid - year population}} \times 1000$$

Cause-specific rates

Mortality or frequency

of a given disease

cause specific = $\qquad$ x 100,000

rate

population size at midpoint

of time period

Advantages of SDR

- Can help us to identify particular groups or groups "at risk", for preventive action.

- They permit comparisons between different causes within the same population.

3. Case fatality rate (CFR)

- It represents the killing power of a disease.
- Case fatality rate is typically used in acute infectious diseases (e.g., food poisoning, cholera, and measles).

$$= \frac{\text{Total number of deaths due to a particular disease}}{\text{Total number of cases due to the same disease}} \times 100$$

Exercise:

Assume a population of 1000 people. In one year,

20 are sick with cholera and 6 die from the disease.

The cause-specific mortality rate in that year from cholera =

The case-fatality rate from cholera =

Exercise:

Assume a population of 1000 people. In one year, 20 are sick with cholera and 6 die from the disease.

The cause-specific mortality rate in that year from cholera =

$$\frac{6}{1000} = 0.006 = 0.6\%$$

The case-fatality rate from cholera =

$$\frac{6}{20} = 0.3 = 30\%$$

4. Proportional mortality rate

- Number of deaths due to a particular cause (or in a specific age group) per 100 total deaths.

- The numerator is a component of denominator.

$$= \frac{Number\ of\ deaths\ from\ the\ specific\ diseas\ in\ a\ year}{Total\ deaths\ from\ all\ causes\ in\ that\ year} \times 100$$

Advantages & Disadvantages of PMR

▸ To know what proportion of total deaths is due to a particular cause or age group.

▸ Usually calculated for a broad disease group (e.g. communicable diseases as a whole).

▸ Useful when population data are not available.

$$= \frac{\textit{Number of deaths from the specific diseas in a year}}{\textit{Total deaths from all causes in that year}} \times 100$$

Quiz

Q1/In the following table, calculate PMR in both age groups.

Age	Death rate/100,000	
	(All causes)	Accidents
1-4	70	28.2
65-74	3190	65.5

Quiz(Cont.)

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Quiz (Cont.)

Q1/In the following table, calculate PMR in both age groups. "?

Age	Death rate/100,000 (All causes)	Accidents
1-4	70	28.2
65-74	3190	65.5

PMR
40%
2.1%

5. Survival rate

- The proportion of survivors in a group, (e.g., of patients) studied and followed over a period, e.g.

- 5-year period survival rate:

- Frequently used in clinical medicine (evaluating treatments of cancer).

$$= \frac{Total\ number\ of\ patients\ alive\ after\ 5\ years}{Total\ number\ of\ patients\ diagnosed\ or\ treated} \times 100$$

References

- **Control of communicable diseases manual**, by Heymann DL, American Public Health Association, 19th edition, 2008.

- **Park's textbook of preventive and social medicine**, by Park K, Banarsidas Bhanot Publishers, 21st edition, 2011.