Measurement of Mortality

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Objectives

Identify the Types of Mortality measures. Understand the characteristics and importance of these mortality indicators.

What is Mortality ?? Its usefulness?

Sources of mortality data ??? Limitations?? Accurate Cause of Death is Important.

WHY?

TYPES OF MORTALITY MEASURES

- 1- Crude death rates
- 2- Specific mortality rates
- 3- Proportionate Mortality Ratio
- 4- Some special mortality rates
- 5- CFR

1- Crude Death Rate

- It is the total number of deaths in a population divided by the (midyear population-MYP-)
- **CDR** = all deaths / (MYP) * K
- Deaths include??
- In this rates we use the <u>mid year pop.</u> (1st July), why?

Crude Death Rate

Advantages;

- ▶ It represents the <u>actual experience</u> of the population.
- Provides data useful for <u>public health planning</u>.
- Used for "general" international comparison. WHY??
- the simplest measure of mortality

Disadvantage;

CDR giving a general picture of mortality, not the accurate.
Gives <u>No idea</u> about age, sex or cause of dying.
Is confounded with differences in the pop. structures.

AT 1999, CDR in highly developed countries in Europe was 11/1000 pop, while in less developed in Asia was 8/1000 pop? Why?

2- Specific mortality rates

- cause specific MRs ... (leading cause of death)
 age specific MRs ... (LE)
- sex specific MRs
- race, religion

Category Specific Death Rate:

CSDR = <u>No. of deaths of specific category</u> No. of pop. of that category. at that yr.

*

K

Category specific mortality rates

Advantages;

- ▶ <u>Un-confounded</u> by age distribution.
- ► Is the most informative mort. Rates *WHY??*
- ► Is a good indicator to a particular group "at risk".
- ► Useful in listing <u>the 10 leading causes</u> of death in a pop.
- ► Useful in <u>comparison</u>.

Disadvantage;

Comparison is difficult Long list of No. and rates.

3- Proportionate Mortality Ratio:

- = Total number of deaths due to a certain
- disease / Total number of deaths from all causes x100
- Note that ;
- **It expressed in %** *WHY?.*
- Does it represent the risk of death of specific disease?
- Why??

To know the risk of death of specific disease, use?

- 16.5% of deaths are due to cancer ??
 What type of mortality measure??
 PMR Indicates??
- Cancer mortality rate = 442.4/100000 of population ??
- Which of them could measure the risk of cancer death in that population ??
- Leading cause of death depend on???
- Life expectancy depend on??

PROPORTIONAL MORTALITY RATIOs

Exhibit 17: Projected main causes of death, worldwide, 2005



⁽Source: WHO, 2005)

4. Some special mortality rates

Stillbirth Rate:

Is the No. of fetus deaths of ≥ 28 wks / Total birth (no. of live and dead births) X 1000.

Indicator for ??

Neonatal mortality rate

 NMR = (deaths in the 1st 28 days of life / Live births) X1000

- It reflects the events at ??

Post neonatal mortality rate = [deaths of infants at 28 days to the

= [deaths of infants at 28 days to the end of 1st yr / Live births] X 1000.

It reflects:

- Env. events, infectious dis. Nutritional level, quality of health system.

Perinatal mortality

Stillbirth + early neonatal death (1st 7 days) at a given yr/ Total births of that yr X 1000

- It reflects:
 - ANC Levels
 - Intrapartum care.
 - After birth care

Approximately 6 million perinatal deaths/yr (globe).

Developed count.:10 deaths /1000 T. births. Developing Count.: 60/ 1000 T. births

Infant Mortality Rate

► IMR is:

<u>No of infants dying during 1st year</u> x1000 No. of live births during the same year

Quality of life indicators of pop. are:

□ IMR

Literacy rate

gross national products.

Importance of Infant Mortality Rates ?

- Indicator of the overall <u>health status</u> of a population
- ► It is a major determinant of *life expectancy* at birth
- Sensitive to levels of <u>Socio-economic</u> & Env. Conditions.
- IMR used for *international c<u>omparisons</u>*.
 IMR is in Sweden of 2/1000
 In Afghanistan 165/1000. (least developing)

Maternal Mortality

- Maternal death' is death of a woman
- ✓ while pregnant ,or
- ✓ During Delivery, or
- ✓ within 42 days of termination of pregnancy
- > Irrespective of the <u>duration or site</u> of the pregnancy
- From any cause related to, or aggravated by the pregnancy or its management
 - Not from accidental causes.

Globally every 2 minutes a woman dies... 85% of maternal deaths are in Africa and Asia.

Maternal Mortality Ratio

 # of maternal deaths/ # of live births × K
 Represents the danger of death in a single live birth "obstetric risk" in that pop.

Maternal Mortality Rate

of maternal deaths/ # of women ages 15 - 49 \times K

Represents both the <u>"obstetric risk"</u> and the frequency with which women are exposed to this event "<u>fertility level</u>" in that pop.

5. Case Fatality Rate

- . The proportion of people who die from specified disease among all diagnosed with that disease in a certain period of time.
- No. of deaths of specific disease/ No. of cases of that disease x 100.
- Mainly used in Acute diseases with epidemic properties.
- In chronic dis. .. Problem of time.
- It is a <u>measure virulence or killing power.</u>
 Can <u>measure effectiveness</u> of a new treatment.
 Can measure the risk of death of that disease?
 Can measure the morbidity of the disease??

Case Fatality Rate

Noting that:

The CFR <u>may vary</u> in different epidemics because of changes in the agent, host & environmental factors

Epidemiology in Medicine by: CHARLES H. HENNEKENS & JULIE E. BURING