* *Rate: Numerator (a) is a part of denominator (b) and multiplier is 1000 or 10,000 or 100,000 or so on…*
* *Ratio: Numerator (a) is not a part of denominator (b) and BOTH numerator and denominator are unrelated*
* *Proportion: Numerator (a) is a part of denominator (b) and multiplier is 100. and Proportion is always expressed in percentage (%)*

-----------------------------------------------------------------------------------------------------------------

1. The following is true about prevalence and incidence:
2. Both are rates
3. Prevalence is a rate but incidence is not
4. Incidence is a rate but prevalence is not
5. Both are not rates

2. Prevalence is a:

(a) Rate

(b) Ratio

(c) Proportion

(d) Mean

3. Incidence of a disease in a population of 30,000 and 300 new cases is:

(a) 0.1 per 1000

(b) 10 per 1000

(c) 100 per 1000

(d) 1 per 1000

4. For calculation of incidence denominator is taken as:

(a) Mid year population

(b) Population at risk

(c) Total number of cases

(d) Total number of deaths

5. True about prevalence:

(a) It is a ratio

(b) Prevalence rate is the ideal measure for studying disease etiology or causation

(c) Increases with increase in duration of disease

(d) Decreases with decrease in case fatality

6. The rate adjusted to allow for the age distribution of the population is:

(a) Peri-natal mortality rate

(b) Crude mortality rate

(c) Fertility rate

(d) Age- standardized mortality rate

7. Which is best in order to make a comparison between 2 populations?

(a) Standardized mortality rate

(b) Disease specific death rate

(c) Proportional mortality rate

(d) Age specific death rate

8. At what point in time is the population assessed for calculation of the crude death rate?

(a) 1st Jan

(b) 1st May

(c) 1st July

(d) 31st Dec

9. All are indicators of mortality except:

(a) Case fatality rate

(b) Life expectancy

(c) Duration of sickness

(d) Standardised death rate

10. In an outbreak of cholera in a village of 2000 population 20 cases have occurred and 5 have died. Case fatality rate is:

(a) 1%

(b) 0.25%

(c) 5%

(d) 25%

Thus, CFR = Total no. of deaths due to a disease/ Total no. of cases due to that disease × 100

Or, CFR = (5/20) × 100 = 25%

And, Survival rate = 1 – CFR = 1 – 0.25 = 0.75 (75%)

11. Which one of the following is a better indicator of the severity of an acute disease?

(a) Cause specific death rate

(b) Case fatality rate

(c) Standardized mortality ratio

(d) Five year survival rate

CFR is the *‘complement of Survival Rate’*

CFR = 1 – Survival Rate

12. Estimating the burden of particular disease in a community is measured by:

(a) Proportional mortality rate

(b) Disease specific mortality

(c) Crude death rate

(d) Incidence of disease

13. Case fatality rate is a method measuring:

(a) Infectivity

(b) Pathogenicity

(c) Virulence

(d) Average duration of disease

14. Which one is not true of case fatality rate?

(a) It is a rate

(b) Time interval is non-specified

(c) It may vary from the same disease in different epidemics

(d) It is useful in chronic diseases

16. The usefulness for “Case Fatality Rate” is very limited in:

(a) Sub-acute illness

(b) Acute illness

(c) Chronic illness

(d) All of the above

17. Most useful parameter to predict the virulence of acute illness is:

(a) Standardised mortality ratio (SMR)

(b) Case fatality rate (CFR)

(c) Secondary attack rate (SAR)

(d) Incidence

18.. Standardised mortality rate is standardised for:

(a) Age

(b) Disease

(c) Region

(d) A particular time period.

19. Direct standardization is used to compare mortality rates between 2 countries. This is done because there are differences in:

(a) Causes of death

(b) Age distributions

(c) Numerators

(d) Denominators

20. A district has total population 1000, with under-16 population being 30%. The prevalence of blindness is 0.8/1000 among under-16 population. Calculate total number of blind among under-16 population in the district.

(a) 240

(b) 2400

(c) 24000

(d) 240000

21. All are true about standardised mortality rates Except:

(a) Two population can be compared

(b) Age specific data not required

(c) It removes confounding effect of different age group

(d) Age, sex, race adjusted rate can be obtained

22. True statement regarding specific death rates:

(a) Specific for age and sex

(b) Identify particular group or group “at risk for preventive action”

(c) Maybe cause or disease specific

(d) All of the above

23. Which of the following estimating the burden of a disease in the community is:

(a) Disease specific mortality

(b) Proportional mortality rate

(c) Maternal mortality rate

(d) Child mortality rate

24. Case fatality rate is:

(a) Speading power of a disease

(b) Killing power of a disease in a time

(c) Killing power of a disease with no time interval

(d) Resistance of disease

25. Severity of the disease best assessed by:

(a) Disease specific mortality rate

(b) Crude death rate

(c) Age specific mortality rate

(d) Case fatality rate

26. Case fatality rate indicates:

(a) Infectivity of disease

(b) Herd immunity of disease in community

(c) Killing power of disease

(d) Relative importance of disease in community

27. The relationship between incidence and prevalence can be expresses as:

(a) The product of incidence and mean duration of disease

(b) The dividend of incidence and mean duration of disease

(c) The sum of incidence and mean duration of disease

(d) The difference of incidence of mean duration of disease

28. Health status of two populations is best compared by:

(a) Standardized mortality

(b) Case fatality rate

(c) Survival rate

(d) Secondary attack rate

1. If a new effective treatment is initiated and all other factors remain the same; which of the following is most likely to happen:

(a) Incidence will not change

(b) Prevalence will not change

(c) Neither incidence nor prevalence will change

(d) Incidence and prevalence will change

*• Relationship between Incidence and Prevalence: Given the assumption that population is stable AND incidence & duration are unchanging,*

*Prevalence = Incidence × Mean duration of the disease*

*P = I × d*

*– Incidence reflects causal factors*

*– Duration reflects the prognostic factors*

*In the given question, a new effective treatment is initiated and all other factors remain the same,*

*Thus new cases will keep on occurring at the same rate,*

*So, incidence will not change*

*However, effective treatment will cure more cases, so old cases will reduce,*

*So, prevalence will reduce*

*HOWEVER, OVER LONG PERIOD OF TIME, incidence MAY also reduce if it is an infectious disease (as total case load in the community is reducing)*

30. Improved prevention of an acute, nonfatal disease is likely to:

(a) decrease the prevalence of the disease

(b) increase the prevalence of the disease

(c) decrease the incidence of the disease

(d) increase the incidence of the disease

*• Is defined as the ‘no. of new cases’ occurring in a defined population during a specified period of time*

*• For a given period,*

*Incidence = Number of new cases of disease/Total population at risk × 1000*

*• Incidence is a RATE, expressed per 1000*

*• Special types of incidence rates:*

*– Attack rate: Incidence rate used when population is exposed for a small interval of time, e.g. epidemic*

*– Secondary Attack Rate (SAR): Is no. of exposed persons developing the disease within range of incubation period, following exposure to the primary case*

*In the given question, there is an improved prevention of an acute, nonfatal disease,*

*Thus, no. of new cases or incidence will reduce*

31. A diagnostic test has been introduced that will detect a certain disease 1 yrs earlier than it is usually detected. Which of the following is most likely to happen to the disease within the 10 yrs after the test its introduced? (Assumed that early detection has no effect on the natural history of the disease. Also assume that no changes in death certification practices occur during the 10yrs.):

(a) The period prevalence rate will decrease

(b) The apparent 5 yr survival rate will increase

(c) The age adjusted mortality rate will decrease

(d) The incidence rate will decrease

*• Incidence: Is ‘number of new cases occurring in a defined population over a specified period of time’*

*• Prevalence: Is total current (Old + New) cases in a given population over,*

*– Types of prevalence:*

*i. a point of time (Point Prevalence)*

*ii. a period of time (Period Prevalence)*

*– Prevalence = Incidence × Mean duration of disease [P = I × d]*

*– Prevalence describes the balance between incidence, mortality and recovery*

*• Age adjusted (standardized) mortality rate:*

*– Removes confounding effect of different age structures in 2 populations, while comparing crude death rates*

*– Standardization may be:*

*1. Direct standardization: Availability of age-specific death rates and population in each age group*

*2. Indirect standardization: Standardized mortality ratio (SMR): Age-specific rates are not available*

*• Survival rate:*

*– Survival rate calculation: SR = Total No. of patients alive after 5 years Total No. of patients diagnosed or treated × 100*

*– Survival rate is complement of Case fatality rate (CFR): SR = 1 – CFR*

*– WHENEVER screening is performed: Higher 5-year survival rate is observed; THIS IS A POTENTIAL BIAS DUE TO earlier diagnosis being made (and not because people live longer)*

*In the given question, a diagnostic test has been introduced that will detect a certain disease 1 yrs earlier than it is usually detected,*

*Thus, Incidence rate (new cases) will remain same after 10 years*

*Since duration of disease will remain same, the period prevalence rate will reamin same after 10 years*

*And it will also have no effect on age adjusted mortality rate*

*But, since disease is getting detected 1 year earlier than usual (LEAD TIME), treatment can be started 1 year earlier (CFR will be apparently lowered), thus leading to apparent increase in survival rate*

1. If the prevalence is very low as compared to the incidence for a disease, it implies:

(a) Disease is very fatal and /or easily curable

(b) Disease is non-fatal

(c) Calculation of prevalence & incidence is wrong

(d) Nothing can be said, as they are independent

*• Relationship between Incidence and Prevalence: Given the assumption that population is stable AND incidence & dura­tion are unchanging,*

*Prevalence = Incidence × Mean duration of the disease P = I × d*

*– Incidence reflects causal factors*

*– Duration reflects the prognostic factors*

*• In the given question, the prevalence is very low as compared to the incidence for a disease, and P = I × d,*

*Thus, d has to be low; duration of the disease can be short under 2 circumstances:*

*– Either disease is very fatal, or*

*– Disease is easily curable*

*• Another situation, if incidence for a disease is higher among females but prevalence is same in both the sexes, Since P = I × d,*

*Thus, d (duration of disease) must be lower among females:*

*– Either the disease is more fatal among females, or*

*– Disease is easily curable among females*

33. The incidence rate of a disease is 5 times greater in women than in men, but the prevalence rates show no sex difference. The best explanation is that:

(a) The case fatality rate for this disease is lower in women

(b) The case fatality rate for this disease is higher for women

(c) The duration of disease is shorter in men

(d) Risk factors for developing the disease are more common in women

In the given question, if incidence for a disease is 5 times higher among females but prevalence rate show no sex difference,

Since P = I × d,

Thus, d (duration of disease) must be lower among females

– Either the disease is more fatal among females, or

– Disease is easily curable among females

1. In a village having population of 1000, we found patients with certain disease. The results of as new diagnostic test on that disease are as follows:

|  |  |  |
| --- | --- | --- |
| Test result | Disease | |
|  | Present | Absent |
| + | 180 | 400 |
| – | 20 | 400 |

What is the percent prevalence of disease?

(a) 0.20

(b) 2

(c) 18

(d) 20

*• Prevalence is defined as all current cases (old + new) at a given point of time*

*• Prevalence = No. of all current cases of a disease at a time Estimated total population at that time × 100*

*And ‘cases are those persons having the disease’ (Controls are healthy people, without the disease)*

*In the given question,*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Test result* | *Disease* | | | |
| *Present: Cases* | | *Absent: Controls* |
| *+* | *180* | *400* | | |
| *–* | *20* | *400* | | |
| *Total* | *200* | *800* | | |

*Thus, Prevatence = 200/(200 + 800) × 100 = 20%*

35. Measurement of incidence rate of a disease includes:

(a) Number of new cases

(b) Number of new and old cases

(c) Only notified cases

(d) Whole population

36. Incidence rate refers to:

(a) Only old cases

(b) Both old and new cases

(c) Only new cases

(d) None of the above