1. As I understand it, the mortality rate is the true rate; hence, it considers the amount of time that each member of the population is at risk of dying. Is this right?

The mortality or death rate is the proportion of a population who die of a defined cause. The numerator is the number of persons dying, and the denominator is the total population in which the deaths occurred. The mortality rate is the ratio of the number of deaths in the year to the average total population of the year.

The crude death rate is defined as the mortality rate from all causes of death for a population in a defined time period (often a calendar year) calculated as the "total number of deaths during a given time interval" divided by the "mid-interval population", per 1,000 or 100,000.

2. Not knowing the cause of death is even worse when a patient dies at home, and not everyone goes for a post-mortem examination. What is the best way to deal with this issue?

This a critical issue. One approach would be to report in-hospital and out of hospital deaths in addition to the total. This would allow the reader to consider the impact of the situation. Nonetheless, this is a major issue and should always be reported as a limitation when assessing mortality data in the population.

3. Why is it important to standardize age while reporting mortality or morbidity? Some clarification would be helpful.

Correcting for age is particularly important when comparing disease rates in multiple populations where the age distributions are different. Since age structure varies in populations between countries and in the same country over time, this adjustment allows us to see how mortality and morbidity vary without age differences. A "standard" population distribution is used to adjust death and hospitalization rates. The age-adjusted rates are rates that would have existed if the population under study had the same age distribution as the "standard" population. Therefore, they are summary measures adjusted for differences in age distributions. Age standardization involves adjusting the observed rates of a particular outcome to a “standard population” with a specific age structure. Similarly – mortality rates can be reported in age specific categories.

4. Just need a clarification related to the rate: If the age-standardized rate of disease A is higher for males than females, is it possible to say that males are at higher risk of having disease A?

When comparing two age-adjusted death rates (for two different or independent populations) to determine whether a significant difference exists between them, 95% confidence intervals for both rates are compared. If the intervals overlap, then there is no significant difference.

5. What was responsible for the reduced mortality of stomach cancer? (slide 20)
A key factor for the past declines in stomach cancer mortality is a decrease in the exposure to Helicobacter pylori (H. pylori) infection with H. pylori prevalence declining in parallel with the decrease of incidence of stomach cancer estimated to account for only half of the global burden of stomach cancer. Other explanations for the observed declines in stomach cancer mortality include better food preservation and refrigeration, improvement in environmental conditions and lifestyle changes including dietary intake. Also, declines in the near future may be largely driven by recent improvements in the living conditions that current generations had experienced during their childhood and adulthood. Improved.

6. In case of an infectious disease or during an outbreak of the infectious disease, how would you determine the population at risk?

A key feature of epidemiology is the measurement of disease outcomes in relation to a population at risk. The population at risk is the group of people, healthy or sick, who would be counted as cases if they had the disease being studied.

7. Can prevalence be a count? I haven’t read any material which states that prevalence can be a count. It always is a proportion.

Prevalence may be reported as a percentage (5%, or 5 people out of 100), or as the number of cases per 10,000 or 100,000 people. The way prevalence is reported depends on how common the characteristic is in the population.

8. I believe the prevalence calculation should be 1500 at the numerator (new and existing cases). Can you clarify? (slide 28)

500 per week with a 2-week study period = 1000.

Prevalence = 1,000/101,000 = 9.9/1,000

9. The admission requires independence between events. This thing is valid for acute diseases. For chronic diseases, some patients may be readmitted within two months. So, the second admission does not necessarily mean a new case. (slide 28)

This is just an example for the calculation. As this is two WEEKS not two months – the likelihood of readmission is smaller. This is the reason the example was in weeks as this point of readmission is important as you indicate.

10. What about the unreported cases? For example, I am calculating the incidence rate of typhoid in Pakistan; I have all the data from hospitals, but there are some unreported cases in the community and some carriers. Wouldn't this affect the incidence rate?

Another excellent and critical point. It is important to determine the validity of the data sources and determination of a case, and important to describe the definitions.

11. When calculating cumulative incidence, how significant is the time period used?
The incidence proportion or cumulative incidence measures the average risk of disease in a population (ranging from zero to one) and is defined as the number of persons who develop disease divided by the total number of persons at risk. In contrast to prevalence, incidence is a measure of the occurrence of new cases of disease during a specific span of time. So the time period is very significant.

12. Suppose a person was infected by a microbe capable of dormant and re-infection after recovering from the infection. Will the person still be considered at risk since the microbe is still in the person?

Very interesting question. It would depend on the specific organism and condition, as well as the specific immunology. But this is all important. One approach is to report a reinfection incidence rate.

13. At the start of the mammography examination, we are unsure that all individuals were healthy. So, how can we say incident? (slide 44)

Very important point. Typically, it is NEWLY diagnosed which can make the incident rates confusing. So access to diagnostics becomes available to a population and you get high incident rates as individuals with all stages of disease are being newly diagnosed. So it is important to consider these points when interpreting the incident rates.

14. Sometimes, the population size (denominator) is missing. For example, to report the incidence of STIs in key population groups (e.g. MSM, sex workers). Do you have any tips on how to go about it?

When the denominator is unclear – it is sometimes best to report the incident numbers. The number of cases of disease having their onset during a prescribed period of time. For example -More than 1 million curable STIs are acquired every day. In 2020, WHO estimated 374 million new infections with 1 of 4 STIs: chlamydia (129 million), gonorrhea (82 million), syphilis (7.1 million) and trichomoniasis (156 million).

15. If I want to calculate the incidence rate of a disease for the second half of the year, what is the population in the denominator?

One approach would be the mid 6-month population for period 1 and then the mid 6-month population period for period 2. If this data is not available – using the same denominator (mid-year population) for both periods. But this should be clearly defined.

16. Can routine health data like Malaria cases notified in a year be used as a proxy for the incidence of Malaria in a country?

Yes - Incidence represents the occurrence of new cases of infection or disease per unit of population per time period. It is common to express incidence rates in terms of person-years of exposure. Prevalence describes the number of current cases of disease per population unit at the time of observation. an annual assessment of global trends in malaria control and elimination, noted that an estimated 249 million cases of malaria occurred in 85 malaria-endemic countries in 2022, a case incidence of 58 per 1000 population risk.
17. How can we calculate the incidence of diarrhea and ARI, which have episodic presentations?

Chronic diarrhea is defined as the presence of loose stools with or without increased stool frequency for at least 4 weeks. As the definition has varied significantly, best estimates are that roughly 3% to 5% of the population suffers from chronic diarrhea. Incidence is the preferred outcome measure in etiological studies, health services research and vaccine trials. Repeated prevalence measurements (longitudinal prevalence) are appropriate in high-mortality settings where malnutrition is common, although many repeat measures are rarely useful. Period prevalence is an inadequate outcome if an intervention affects illness duration.

18. Could you please explain the term secular change? The explanation is not clear to me.

The secular trend describes the occurrence of disease over a prolonged period, usually years; it is influenced by the degree of immunity in the population and possibly nonspecific measures such as improved socioeconomic and nutritional levels among the population. Changes over a long period of time, generally years or decades. Examples include the decline of tuberculosis mortality and the rise, followed by a decline, in coronary heart disease mortality in many industrial countries in the past 50 years. Secular trends are gradual changes in disease frequency over long periods of time, while cohort effects are differences between people born at different times. Secular trends and cohort effects are related since they both assess or evaluate some form of exposure to a disease.

19. Can we also compute the odds ratio in cohort studies? If so, how do we choose between risk ratio and odds ratio?

Odds ratios (OR) are commonly reported in the medical literature as the measure of association between exposure and outcome. However, it is relative risk that people more intuitively understand as a measure of association. Relative risk can be directly determined in a cohort study by calculating a risk ratio (RR). This is based on calculating the difference between the incidence in the exposed population and the incidence of the unexposed population.

20. Can we calculate OR from the cohort study?

Yes.
In a 2-by-2 table with cells a, b, c, and d, the odds ratio is odds of the event in the exposure group (a/b) divided by the odds of the event in the control or non-exposure group (c/d). Thus the odds ratio is \((a/b) / (c/d)\) which simplifies to \(ad/bc\).

In the cohort studies, you can calculate the incidence directly, so you can safely calculate the relative risk, while you can't do that in the case-control studies, so you calculate the Odds ratio instead.

The relative risk (RR) is the risk of the event in an experimental group relative to that in a control group. The odds ratio (OR) is the odds of an event in an experimental group relative to that in a control group. An RR or OR of 1.00 indicates that the risk is comparable in the two groups.
21. Why can’t we calculate the incidence rate in a cross-sectional study?

Incidence requires the identification of NEW cases which is typically not adequately assessed in a cross-sectional study. A study with follow-up of a disease free study cohort allows the identification of new cases.

22. Looking at DALYs, how do we calculate the lost years?

DALYs for a specific cause are calculated as the sum of the years of life lost due to premature mortality (YLLs) from that cause and the years of years of healthy life lost due to disability (YLDs) for people living in states of less than good health resulting from the specific cause. A DALY is represented by the equation DALY = YLL + YLD. YLL is calculated as the number of deaths (n) x the standard life expectancy at age of death (L1). This measures the reduction in life expectancy.

23. How can we know that the 1918 pandemic had few asymptomatic cases? (slides 61-63)

From historical survey data and computer models.

Analysis of historical data has strongly shaped our understanding of the epidemiology of pandemic influenza and informs analysis of current and future epidemics. Here, the authors analyzed previously unpublished documents from a large household survey of the “Spanish” H1N1 influenza pandemic, conducted in 1918, for the first time quantifying influenza transmissibility at the person-to-person level during that most lethal of pandemics. The authors estimated a low probability of person-to-person transmission relative to comparable estimates from seasonal influenza and other directly transmitted infections but similar to recent estimates from the 2009 H1N1 pandemic. The authors estimated a very low probability of asymptomatic infection, a previously unknown parameter for this pandemic, consistent with an unusually virulent virus. The authors estimated a high frequency of prior immunity that they attributed to a largely unreported influenza epidemic in the spring of 1918 (or perhaps to cross-reactive immunity). Extrapolating from this finding, the authors hypothesize that prior immunity partially protected some populations from the worst of the fall pandemic and helps explain differences in attack rates between populations. Together, these analyses demonstrate that the 1918 influenza virus, though highly virulent, was only moderately transmissible and thus in a modern context would be considered controllable.


24. I have 10 cases of mushroom poisoning. Can we present/publish these as case series?

Yes, indeed. Important to target a journal that published case reports. Below is an example:

25. I did a study about HIV in a specific university, so I was considering the College of study as my strata, is it ok to take weighted….(appears to be an incomplete question).

Need the complete questions but if the question regards case weights:

Case weights determined by multiplying each data point by its corresponding weight, summing the products, and dividing by the sum of the weights. If you want a sample that has the desired distribution according to the proportions in the population, first you need to calculate how much weight each group needs to be properly represented in the sample. For this you can use an easy formula: \( \frac{\% \text{ population}}{\% \text{ sample}} = \text{weight} \).

Questions on World Hypertension Congress.

- How can I take part in the Scientific Writing Series at the World Hypertension Congress Writers' Workshop? [Register here at the Congress website](#)
- When will the World Hypertension Congress Writers' Workshop be held? Workshops will be held the morning of each of the three days of the Congress