Incidence and Prevalence: Examples

TABLE OF CONTENTS

Incidence and Prevalence: Examples

Incidence/Incidence Rates

Incidence Rates: Example

► Consider Chicken Pox, where the cumulative incidence rate is 20 percent per year, and 100 individuals are followed up. On average, after 6 months, 10 individuals will catch the disease.

► In diseases that happen only once (as with Chicken Pox), the 10 individuals having caught it are no longer considered to be "at risk." Therefore, the denominator is 100 at the start of the study, but the size of the "at risk" population will decrease thereafter. With studies such as these, where the first occurrence in an individual is the only one of interest, the denominator should be decremented by 1 for each case that occurs. In this case, the denominator would presumably be 95 at the 3 month stage, 90 at the 6 month stage, etc.

► Under these conditions, the denominator can be expected to decrease almost constantly. In order to account for this, incidence rates must be calculated for small time periods. Here, one might use the person-time incidence rate, as it allows a certain incidence rate to be investigated at a particular point in time. This property makes person-time incidence rates popular in cohort studies.

Incidence Rates: Another Example

► Consider a cohort study with follow-up over 5 years which aims to discover the type of incidence rate that best investigates the risk of lung cancer within 50-70 year olds. Discuss the pros and cons of both approaches.

► Deciding which method to use rests almost solely in the type of study being conducted. If the cohort is being considered at a single point in time (e.g. all the individuals graduated from high school in the same year), the option is left open.

► For our example, we would recruit individuals within our target age group. The participants would be observed for a specified time period to document results. Here, either a cumulative incidence rate, or a person-time incidence rate could be used.

► Approaching this study realistically, however, subjects are not likely to be recruited all at once, but over a prolonged time period. As such, the cumulative incidence rate is not appropriate and the person-time incidence rate would be the better selection.

Prevalence/Prevalence Rates

Example: Examining the Prevalence of Hypertension

► First, the disease must be defined. For instance, the World Health Organization (WHO) defines hypertension to be 3 congruous measurements of blood pressure exceeding 140/90 mmHg. For your study population to meet this requirement, testing will be needed. Generally, blood pressure measurements can be easily obtained.

► Now, a suitable "at risk" population must be chosen. Often, it is hard to find an unbiased sample population for prevalence studies, unlike incidence studies. Incidence studies usually deal with instances such as death, while point prevalence studies typically consider survivors.

► Determining how long the study lasts relies solely on the type of study (point, period or lifetime prevalence). For the given example, the best selection would be period prevalence. Point prevalence can be excluded, as it may potentially provide a value unhelpful to organizations looking to create ways of dealing with the problem; whereas, lifetime prevalence can be ruled out because hypertension is typically a condition of old age.

► In the end, the onus is on the epidemiologist to come up with an appropriate course of action for researching the prevalence of a particular disease, as every case is different.