Homework2_henson

Chap.1

1. **What role is attributed to John Snow in the development of the science of epidemiology?**

Epidemiology can be defined as "the study of the **distribution** and **determinants** of health-related states or events in specified populations and the **application** of this study to control health problems" (Gordis, p.3). Using this broad definition, John Snow, in an attempt to solve the cholera outbreak in England, defined these steps and stopped this disease from spreading. Through his grass roots attempt he became known as the father of epidemiology.

Distribution- Snow went house to house inquiring the status of the inhabitants as well confirming the water company that each household used. He recorded this data and plotted it on a map. In doing so, he was able to track the cholera cases in the English districts. His dot mapping enabled him to see that the disease was focused around a fixed point, the Broad Street pump. Snow also used data compiled through public records that tracked where specific water companies received their water source and where each company pumped their water.

Determinants- In 1854 the popular medical belief was that disease was spread through a "cloud" (miasmatic theory of disease). John Snow was a physician, yet he did not feel this theory was the cause of the rampant spread of cholera. The Registrar General, William Farr, had compiled a listing of vital statistics supporting this theory stating that cholera caused a higher mortality rate in lower areas of elevation. By using observational data Snow disproved this theory and hypothesized that cholera was spread through contaminated water and human contact. The fact that Snow did not have an understanding of disease process and transmission makes this even more remarkable.

Application- Through his medical knowledge, experience and discipline John Snow was able to convince the authorities to remove the Broad Street pump. At this point death rates decreased and many people were spared from illness due to cholera. Snow's actions prompted a public health initiative. Many people were still not convinced that the water was the source of the problem. The pump was returned (briefly) and the illness/death rates began to rise again. It was years later that Snow's findings were confirmed with the discovery of cholera microorganisms. However, his example laid a strong foundation for the science of epidemiology.

Chap.2

2. **Describe how you arrived at your answer and show your calculations.**
   a. 60/75

   Total # of people who ate both tuna and egg salad=75 (first table)

   Total # of people who ate both tuna and egg salad w/ sore throats=60 (second table)

   Food-specific attack rate defined as:

   # people who ate certain food and became ill/Total # people that ate that food

   thus: 60/70
3. **Why not "d"?**

Total # persons that ate:	Total # sore throats:	Attack rates for each group:
Egg salad & Tuna=75	60	60/75 (.8 or 80%)
Only egg salad=100	75	75/100 (.75 or 75%)
Only tuna= 200	70	70/200 (.35 or 35%)
Neither= 50	15	15/50 (.3 or 30%)

We see that eating the egg salad and tuna increased the incidence of developing a sore throat compared with those who did not eat either salad (80% vs. 30%). Those who ate the tuna only did not significantly increase their risk of developing a sore throat (35% vs. 30%). Those who ate egg salad only had increased incidence of sore throat (75% vs. 30%). There is little difference between those who ate egg salad only and those who ate both salads who developed sore throats (75% vs. 80%). Cross-tabulation calculations above demonstrate that egg salad is most likely to be the infective source.

4. **Describe how you arrived at your answer.**

d. *a* and *c*

When investigating an outbreak, three variables must be determined: the time the disease began, the time the exposure took place and the incubation period of the disease. An epidemic curve involves plotting the number of people affected by the disease and the time of onset. It helps to determine what type of outbreak has occurred (a). Drawing lines to connect the distribution of the times of the disease onset helps to conclude the median incubation period (c). Unless the disease being investigated is restricted to a single host species, herd immunity does not apply when the reservoir of disease exists outside of the human host. Herd immunity also assumes the probability that random mixing of the population will occur. These basic concepts of herd immunity make answer b incorrect.

5. **Why not "a"?**

The pattern of a rapid, explosive rise in the number of cases is characteristic of a single-exposure, common-vehicle epidemic. An example of this type of epidemic is with a contaminated food source (shighella or salmonella). A person eats the contaminated food (primary case) and becomes ill within a matter of hours. The illness causes infectious diarrhea/emesis, which is usually contained in a private bathroom facility. The chances of a secondary case-a person becoming exposed to the infected stool/emesis are limited. Therefore, there would be few, if any, secondary cases making answer *a* incorrect.

Chap.3

1. **Describe how you arrived at your answer.**

e. incorrect, because of failure to distinguish between incidence and prevalence.

In order to measure risk, we must use incidence, which includes only new cases and a specified time when the headaches occurred. The statement "The inference that…greater risk *of developing*…". There is no reference to a time period and time is not specifically stated. Also, on the initial examination, we do not know if the migraine headaches "found" were newly diagnosed headaches or if they were previously diagnosed. Although prevalence is a snapshot of the population it does not determine when the headaches developed, so it cannot give us a measure of risk.

2. **Show your calculations.**

10%

Total schizophrenia cases= **1,000** in 2,000,000

Incidence rate= 5 in 100,000

5/100,000= .00005

Now calculate how many in 2 million:

.0005* 2,000,000= **100**

100/1000= .1 or 10%of the 1,000 cases were newly diagnosed in 2003.

3. **Describe how you arrived at your answer.**
   c. the more accurate due to reduced reporting burden for health care providers.
   Active surveillance requires trained workers specifically hired to compile information through interviews, field visits, surveys and record reviews. It requires more project staff (a), relatively expensive (b). Passive surveillance relies on data compiled and reported by health care professionals or health officer (in addition to their other job responsibilities). Instruments used are simple and brief (d). This demonstrates why answers a,b and d are incorrect.
6. **Show your calculations.**
   b. 14 per 100,000
   Total Population= 183,000
   New TB= 26
   26/183,000= .000142
   .000142* 100,000= 14.2 0r 14 in 100,000
7. **Show your calculations.**
   c. 144 per 100,000
   Total Population= 183,000
   Active TB= 264
   264/183,000= .001443
   .001442* 100,000= 144.3 or 144 in 100,000