

Please read the following cases and answer the questions that follow:

Question 1

Benzene exposure has been causally linked with acute myeloid leukemia (AML), but inconsistently associated with other hematopoietic, lymphoproliferative and related disorders (HLD) or solid tumors in humans. Many neoplasms have been described in experimental animals exposed to benzene. The Study used Poisson regression to estimate association and the likelihood statistical to derive confidence intervals for cause-specific mortality and HLD cases in 73,789 benzene-exposed compared with 34,504 unexposed workers in the study in 12 cities in China. Follow-up and outcome assessment was based on factory, medical and other records. Benzene-exposed workers experienced increased risks for all-cause mortality

- A. What is this study design?
- B. What is the comparison group?
- C. What is the difference between Retrospective and prospective cohort?
- D. What measures of effect are possible with this design?
- E. A proportion of parents were worried about living in the area after the accident, and moved to a neighbouring country. How would this affect the study?
- F. What are the advantages and disadvantages of the study design used?

Question 2

In 1948, the Framingham Heart Study -- under the direction of the National Heart Institute (now known as the National Heart, Lung, and Blood Institute; NHLBI) -- embarked on an ambitious project in health research. At the time, little was known about the general causes of heart disease and stroke, but the death rates for CVD had been increasing steadily since the beginning of the century and had become an American epidemic. The objective of the Framingham Heart Study was to identify the common factors or characteristics that contribute to CVD by following its development over a long period of time in a large group of participants who had not yet developed overt symptoms of CVD or suffered a heart attack or stroke. The researchers recruited 5,209 men and women between the ages of 30 and 62 from the town of Framingham, Massachusetts and began the first round of extensive physical examinations and lifestyle interviews that they would later analyze for common patterns related to CVD development. Since 1948, the subjects have continued to return to the study every two years for a detailed medical history, physical examination, and laboratory tests.

2.1 Describe the population at risk.

2.2 Is this an open or a closed cohort? Explain your answer

2.3 What is incidence rate of stroke in this population?

2.3.1 Estimate incidence rate for overall population and in age groups and sex

2.3.2 Present your results in the table

Table 2.1: The incidence rate of stroke

	Total	New	Total	incidence rate n
		stroke	person-	per 1000-person
		Cases	years	years
Overall	4434	383	88675.5	?
Sex				
Female	2490	204	51400.6	?
Male	1944	179	37275.0	?

2.3.3 Summarise your results

Question 3

NHANES is a robust, nationally-representative cross-sectional study designed to assess the health and nutritional status of adults and children in the United States. For the past ~18 years it sampled different communities across the US in 2 year continuous cycles. An ongoing annual survey combines interviews and physical examinations. The NHANES interview includes demographic, socioeconomic, dietary, and health-related questions. A detailed description of the NHEFS, together with publicly available data sets and documentation, can be found at wwwn.cdc.gov/nchs/nhanes/. The dataset is available as Stata exemplary dataset. <https://www.stata-press.com/data/r17/nhanes2.dta>.

We will use nhanes2.dta dataset to answer some questions in class.