

2023 AP Daily: Practice Sessions



AP Statistics

Session 3 – FRQ (Part A: Sampling)

1. A dermatologist will conduct an experiment to investigate the effectiveness of a new drug to treat acne. The dermatologist has recruited 36 pairs of identical twins. Each person in the experiment has acne and each person in the experiment will receive either the new drug or a placebo. After each person in the experiment uses either the new drug or the placebo for 2 weeks, the dermatologist will evaluate the improvement in acne severity for each person on a scale from 0 (no improvement) to 100 (complete cure).
 - a. Identify the treatments, experimental units, and response variable of the experiment.
 - Treatments
 - Experimental units
 - Response variable

Each twin in the experiment has a severity of acne similar to that of the other twin. However, the severity of acne differs from one twin pair to another.

- b. For the dermatologist's experiment, describe a statistical advantage of using a matched-pairs design where twins are paired, rather than using a completely randomized design.
- c. For the dermatologist's experiment, describe how the treatments can be randomly assigned to people using a matched-pairs design in which twins are paired.

2. Alzheimer's disease results in a loss of cognitive ability beyond what is expected with typical aging. A local newspaper published an article with the following headline.

Study Finds Strong Association Between Smoking and Alzheimer's

The article reported that a study tracked the medical histories of 21,123 men and women for 23 years. The article stated that, for those who smoked at least two packs of cigarettes a day, the risk of developing Alzheimer's disease was 2.57 times the risk for those who did not smoke.

- a. Identify the explanatory and response variables in the study.
 - Explanatory variable:
 - Response variable:
- b. Is the study described in the article an observational study or an experiment? Explain.
- c. Exercise status (regular weekly exercise versus no regular weekly exercise) was mentioned in the article as a possible confounding variable. Explain how exercise status could be a confounding variable in the study.