2. (3 points) Find a news article reporting the results of a scientific study.

. (a) Report the headline of the article and identify whether it implies population or causal inferences, neither or both.

Answer:

Colorado's investment in IUDs and other fire-and-forget birthcontrol produced a "miracle"

The implied neither causal nor population inference.

http://metroamazon.com/the-colorado-family-planning-initiative-spent-nearly-little-totals-influencing-iuds-and-other-long-haul-to-anti-conception-medication-strategies-for-example-inserts-and-infusions-accessible-to-lad/

. (b) What inferences are justified by the study? Justify your answer by including parts of the article that report details of the study crucial to identifying the scope of inference. If the article doesn't provide enough information, specify what additional information is required.

Answer:

This is an observational study concerning the availability of IUD and observed outcomes stating "The outcomes were stunning: teenager births and premature births dropped by about half, and the birth-rate among youngsters who were at that point moms fell by 58%; there were likewise sensational decreases in high-chance births." The article does not make a population inference such as stating how much Colorado or other states would save if the program were expanded or the number of teen pregnancies that would be potentially avoided at Colorado's current and projected populations. Oddly, the grammar in this article weird. Without another new organization confirming these results I'd be included to call this 'fake news' in the parlance of our times.

3. (1 point) A study found that individuals who have large yards tend to have pets more often than individuals who do not have large yards.
(a) Can cause and effect be inferred? Why or why not?
(b) List two possible confounding factors that may be contributing to the difference.

Answer:

(a) No, casual inference cannot be concluded. Famously: 'Correlation does not imply causation.'

(b) Confounding factors: 1) pets can be expensive. Those with more wealth may can more easily afford pets. 2) cities may have ordinances constricting the number of pets at smaller properties thereby skewing lower the number of pets at smaller properties.

5. (1 point) Random samples of people from New York and Texas are invited to participate in a study comparing income of the two geographic groups. Volunteers participate in the study and their income for the last three years is recorded. In order to make inference to the population of all New Yorkers and all Texans, what must we assume? Why?

Answer:

We must assume that the volunteers in the study are representative of the larger populations of Texas and New York. This assumption is necessary because the participants volunteer or self-selected rather than being selected purely at random from the states' population.

6. (1 point) A random sample of monarch butterflies and a random sample of swallowtail butterflies were captured in Montana. Their weights were measured and recorded. We would like answer whether monarch butterflies are heavier on average than swallowtail butterflies in Montana. Explain which of the following best describes the goal(s) of this data analysis (description, estimation, hypothesis testing, or prediction)? Why is it important that the samples were randomly collected?

Answer:

Hypothesis testing. It is important that the samples be chosen at random in order to assert that 1) the sample is representative of the population and 2) the differences in the experimental units (monarch vs. swallowtail butterflies) are approximately balanced at the start of the experiment.