

Section 1: Descriptive statistics & Sampling and experiments

MINI QUIZ:

9. What does it mean when a data set has a standard deviation equal to zero?

- A. There are no data to begin with.
- B. The mean of the data is also zero.
- C. All of the data have the same value.
- D. All values of the data appear with the same frequency.

ANSWER: C. All of the data have the same value.

EXPLANATIONS:

- A. A data set of any size can have a standard deviation of zero.
- B. A data set can have a nonzero mean and zero standard deviation, or vice versa.
- C. A zero standard deviation means no data values can have any deviation from the mean, so all data values must equal the mean and therefore are equal to each other.
- D. The standard deviation measures average squared deviation from the mean, not the frequency of data values.

10. A large city passed a new tax on sugary beverages. A few months after the tax goes into effect, the mayor wants to use social media to learn about how residents feel about the tax. The mayor creates a poll on Twitter and invites residents to share how they feel about the new tax. About 70% of responses oppose the new tax.

Which of these is the best explanation for why this result is probably biased?

- a) Non residents may participate, so 70% is likely an overestimate
- b) Non resident may participate, so 70% is likely an underestimate
- c) Opponents of the new tax are more likely to respond than anyone else, so 70% is likely an overestimate.
- d) Opponents of the new tax are more likely to respond than anyone else, so 70% is likely an underestimate.

Correct answer: C. Opponents are much more likely to participate and skew the distribution