

Week 2 Quiz

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5/6 points earned
(83%)

Quiz passed!



1 / 1
points

1.
Which of the following is the width of the box in a box plot (shown in orange in the following figure)?



- ☐ standard deviation
- ☒ IQR

Correct Response

- ☐ mean
- ☐ median
- ☐ range

0 / 1
points

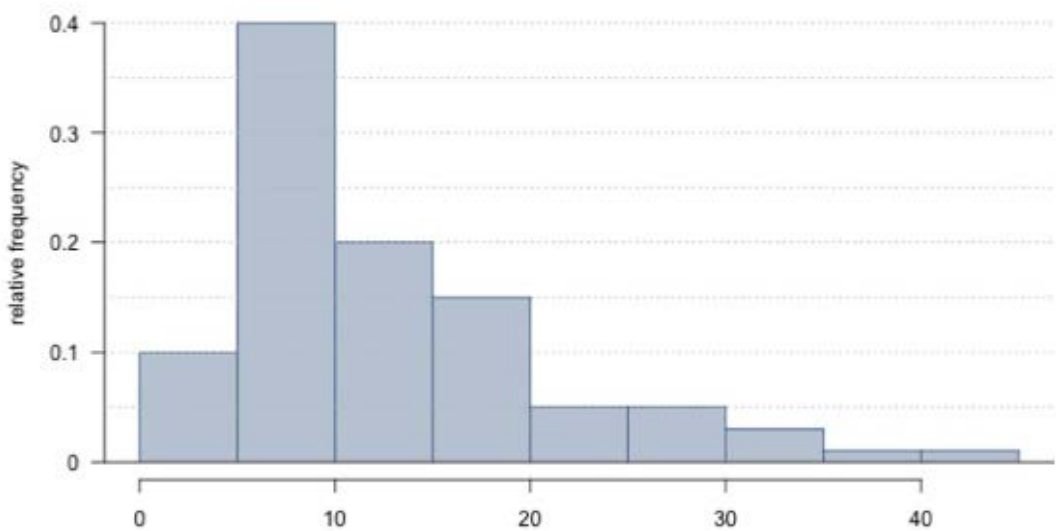
2.
The distribution of exam scores (ranging from 0 - 100%) where the mean score is 75%, the standard deviation is 12%, and the median is 78% is most likely

- ☐ left skewed
- ☐ uniform
- ☐ symmetric
- ☒ right skewed

Incorrect Response

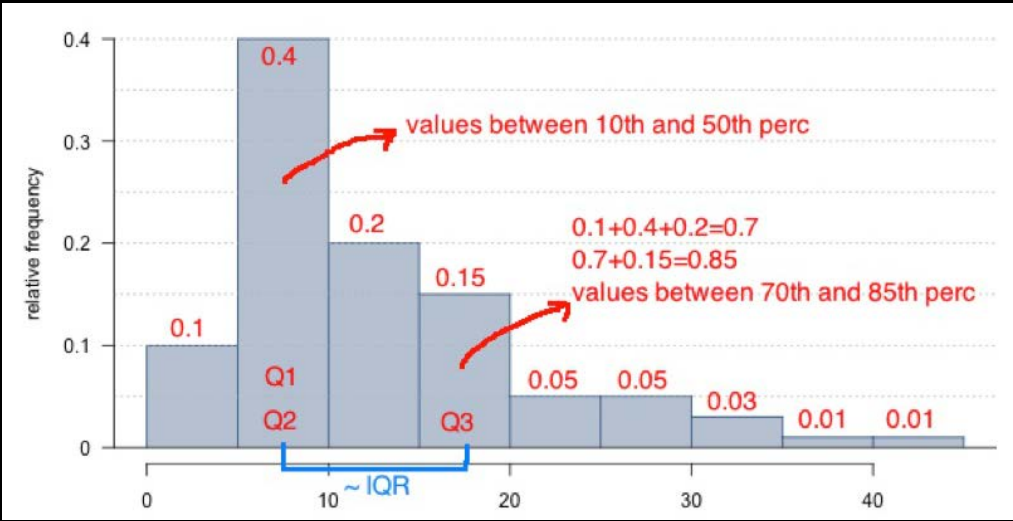
1 / 1
points

3.
Based on the relative frequency histogram below, which of the following statements is supported by the plot?



- ☐ The distribution is multimodal.
- ☐ The mean of the distribution is smaller than its median.
- ☐ It is not possible to estimate the median without knowing the sample size.
- ☒ The IQR of the distribution is roughly 10.

Correct Response



- ☐ There are no outliers in the distribution.



1 / 1
points

4.
A recent housing survey was conducted to determine the price of a typical home in a city

that is mostly middle-class, with one very expensive suburb. The mean price of a house in this city is roughly \$650,000. Which of the following statements is **most likely** to be true?

- ☒ Majority of houses in this city cost less than \$650,000.

Correct Response

- ☐ We need to know the standard deviation to answer this question
- ☐ There are about as many houses in this city that cost more than \$650,000 than less than this amount.
- ☐ Majority of houses in this city cost more than \$650,000.

☒

1 / 1
points

5.
Phi Delta Kappa (PDK) is an international professional organization for educators that, in collaboration with Gallup, has been conducting polls on the public’s attitudes toward the public schools since 1969. The following was one of the questions on the 2011 poll:

”Most teachers in the nation now belong to unions or associations that bargain over salaries, working conditions, and the like. Has unionization, in your opinion, helped, hurt, or made no difference in the quality of public school education in the United States?”

The respondents’ answers broken down by party affiliation are shown below. Which of the following statements is **most justified** by these data?

	Republican	Democrat	Independent	Total
Helped	35	146	69	250
Hurt	197	78	178	453
Made no difference	52	105	90	247
Don't know / refused	6	12	4	22
Total	290	341	341	972

- ☐ The results of the survey suggest that opinion on teachers belonging to unions or bargaining associations and political party affiliation appear to be independent.
- ☐ 14% of Republicans and 58% of Democrats think that teachers belonging to unions or bargaining associations helped the quality of public school education in the United States.
- ☒ The results of the survey suggest a relationship between opinion on teachers belonging to unions or bargaining associations and political party affiliation.

Correct Response

- ☐ A histogram or a box plot would be useful for investigating if distribution of opinion on teachers belonging to unions or bargaining associations varies by political party affiliation.



1 / 1
points

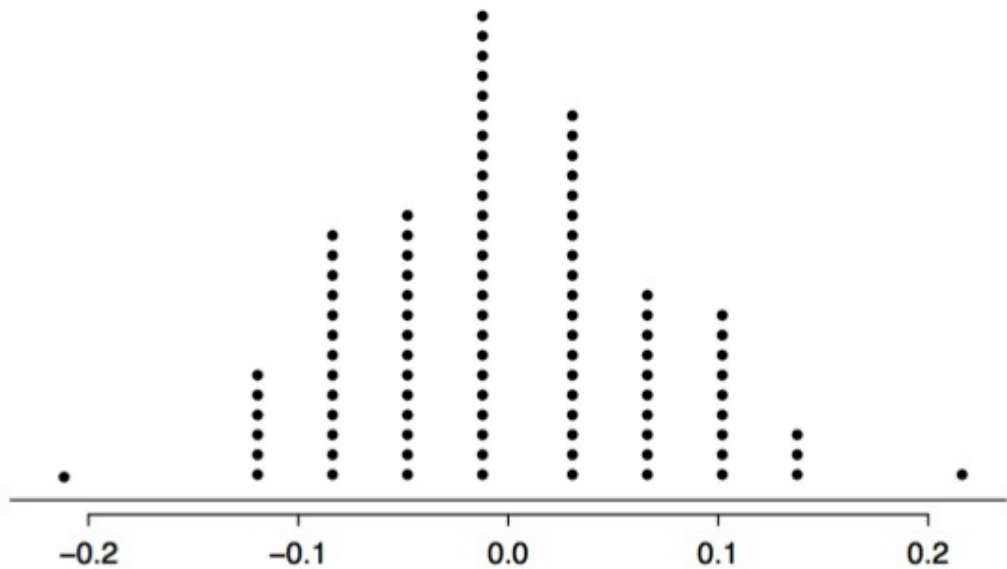
6.

In 1948, Austin Bradford Hill, designed a study to test a new treatment for tuberculosis that at the beginning of the study there was no evidence whether it would be any better or

worse than bed rest. He randomly assigned some patients who volunteered to be a part of this study to receive the treatment Streptomycin, an antibiotic. The other patients received only bed rest as the control group. Hill then observed the patients' outcomes: which patients died and which recovered. The results of the study are shown below.

	Died	Recovered	Total
Control	14	38	52
Streptomycin	4	51	55
Total	18	89	107

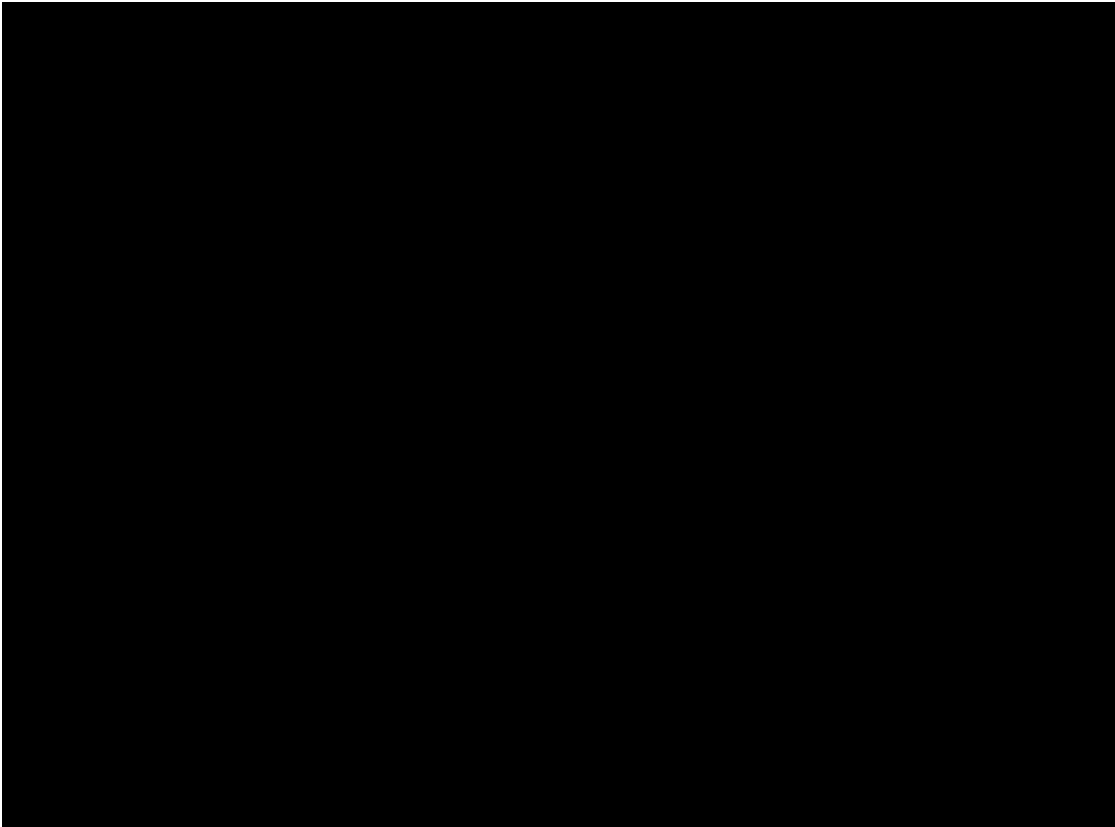
We use the following simulation test if there is a difference between the recovery rates under the two treatments: We write “died” on 18 index cards and “survived” on 89 index cards to indicate whether or not a patient died. Next, we shuffle the cards and deal them into two groups of 52 and 55, for control and treatment, respectively. We then calculate the simulated difference between the recovery rates in Streptomycin and control groups ($p_{\text{Streptomycin}} - p_{\text{Control}}$), and record this value. We repeat this simulation 100 times. The histogram below shows the distribution simulated difference between the recovery rates in these 100 simulations.



Which of the following is correct? Choose all that apply (there are multiple correct answers).

- ☒ If Streptomycin and bed rest are equally effective in curing tuberculosis, the probability of observing a difference in the recovery rates at least as high as the one observed is 2%.

Correct Response



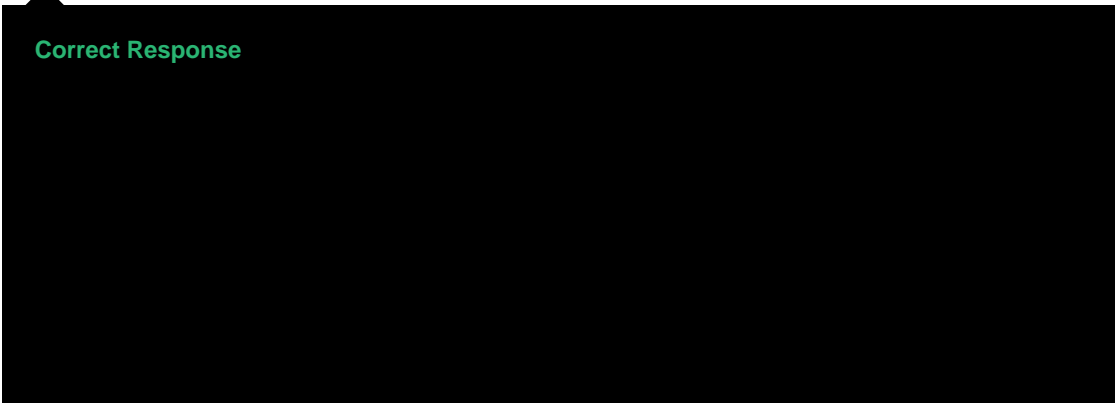
The conclusion of this study is generalizable to all tuberculosis patients.

Correct Response



The alternative hypothesis is that the Streptomycin treatment is more effective than bed rest.

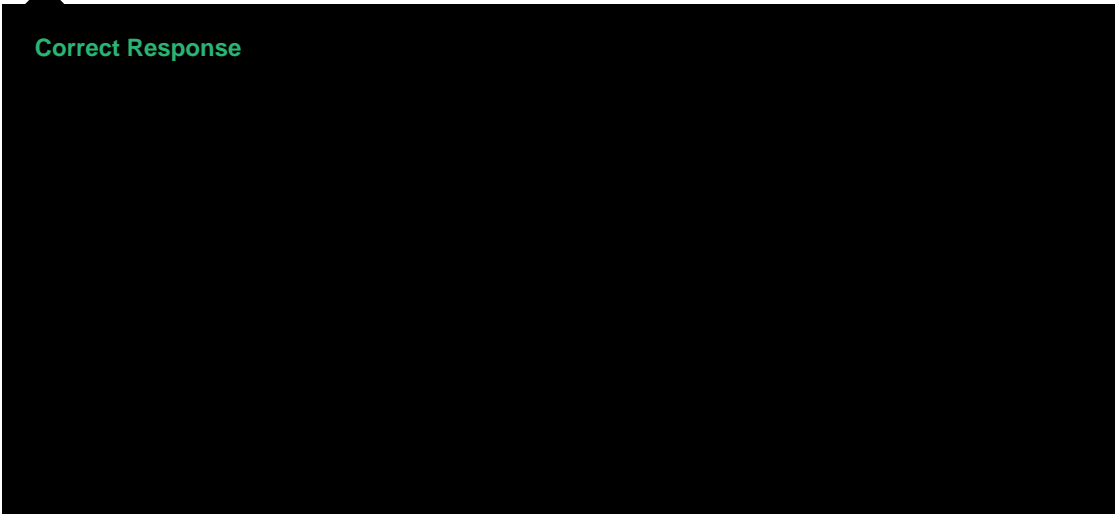
Correct Response





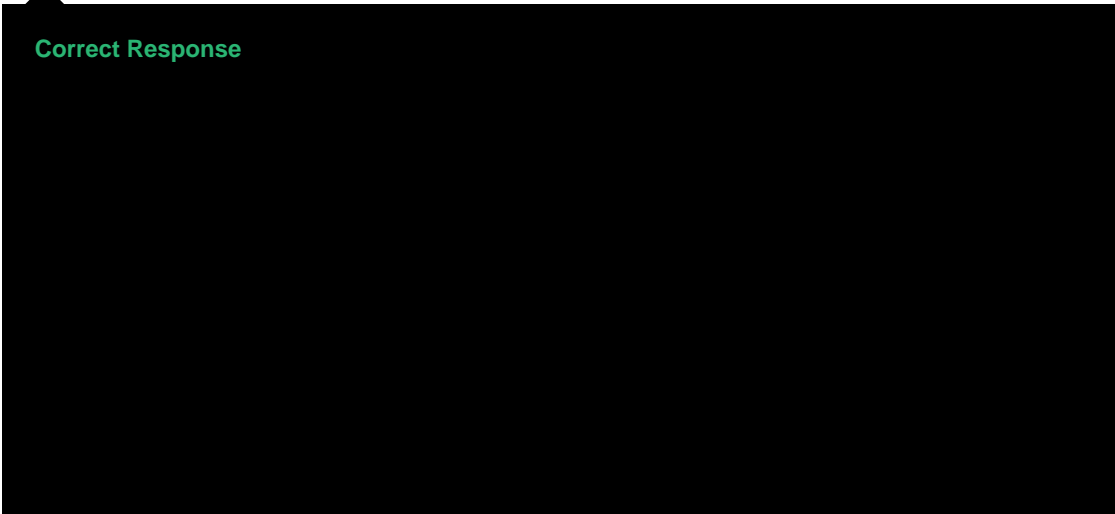
Hill's study is observational.

Correct Response



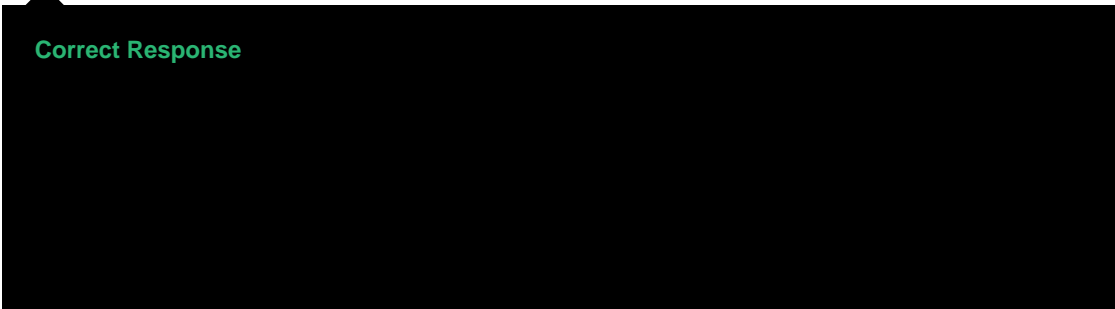
Based on this study we can conclude a causal relationship between Streptomycin and better tuberculosis recovery rate.

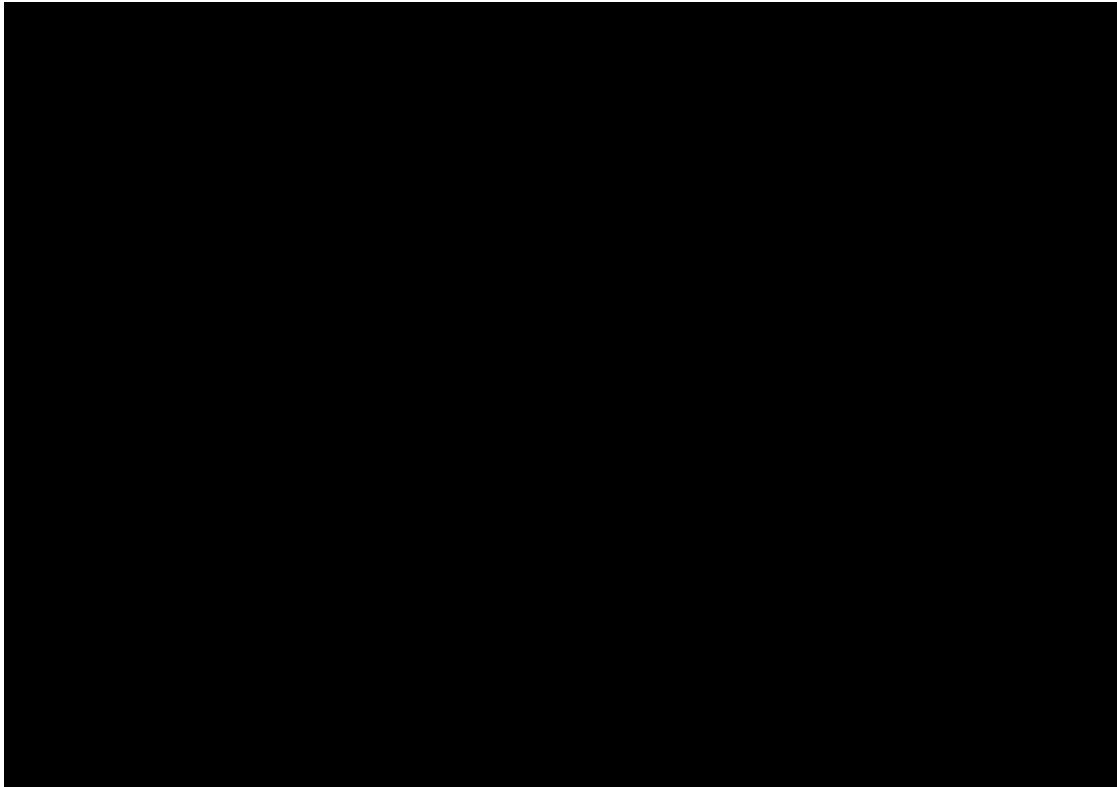
Correct Response



Streptomycin treatment does not appear to be effective in treating tuberculosis since the observed number of deaths in the treatment group would not be considered unusual based on the simulation results.

Correct Response





Streptomycin treatment appears to be effective in treating tuberculosis since the observed difference in recovery rates would be considered unusual based on the simulation results.

Correct Response



The difference between the survival rates in the control and treatment groups appear to be simply due to chance.



Correct Response



The alternative hypothesis should be that there is a difference between the recovery rates under the two treatments.

Correct Response
