12. Inferential statistics allows us to make conclusions and predictions about a population based on a sample of data.

* Correlation

When two variables move together (increase/decrease), but one does not necessarily cause the other.

Ice cream sales and drowning incidents are positively correlated (both increase in summer), but ice cream does not cause drowning.

* Causation

When one variable directly causes a change in another variable.

Smoking causes lung disease—there is a cause-and-effect relationship.

13. Population: The entire group of individuals or items that we want to study.

Sample: A subset of the population that we actually collect data from.

If we want to know the average height of all adults in a country, the population would be all adults in the country. Measuring everyone is impossible, so we take a sample (e.g., 1,000 randomly selected adults) to estimate the population’s average height.

14.

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| Null Hypothesis (H₀) | =Assumes no difference or no effect. |

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| --- | --- |
| Alternate Hypothesis (H₁) | =Suggests a difference or effect exists. |

|  |  |
| --- | --- |
| Significance Level (α) | =The cutoff (eg 0.05) for rejecting H₀. |

|  |  |
| --- | --- |
| P-value | =The probability of observing the data if H₀ is true. |