

ASA Principles on p -values

1. p -values can indicate how incompatible the data are with a specified statistical model.
2. p -values do not measure the probability that the studied hypothesis is true, or the probability that the data were produced by random chance alone.
3. Scientific conclusions and business or policy decisions should not be based only on whether a p -value passes a specific threshold.
4. Proper inference requires full reporting and transparency.
5. A p -value, or statistical significance, does not measure the size of an effect or the importance of a result.
6. By itself, a p -value does not provide a good measure of evidence regarding a model or hypothesis.

Type I and Type II errors

- With an α level of 0.05, we have a 5% chance of falsely rejecting the null hypothesis (H_0).
- Falsely rejecting H_0 is known as a Type I error (i.e., thinking we have found a difference when there isn't one).
- There are also Type II errors which involve failing to find a difference when one is actually present.
- Most of what you have been taught at UG level will have involved trying to avoid Type I errors.