Statistical Conclusion & Scope of Inference

Overview

A major part of a statistical analysis is relaying the results in a readable and accurate way that includes

- Evidence **(STATISTICAL CONCLUSION)**
- Interpretation **(SCOPE OF INFERENCE)**

This is the idea behind the STATISTICAL CONCLUSION and SCOPE OF INFERENCE

Statistical Conclusion

This should include any statistical evidence you think are relevant and valid. This includes

- Estimates of parameters of interest
- Confidence interval(s)
- p-value(s) and a description of the relevant hypotheses

(Don't forget to include the unit (e.g. miles, years, ...))

Example: These data provide overwhelming evidence that from 1976 to 1978, the mean beak depth increased (one-sided p-value < 0.001 from a two sample t-test). The difference in means is estimated to be 0.67 mm (95% confidence interval [0.38,0.96] mm).

Scope of Inference

Inform the reader about the limits of this particular data or study

This includes:

- Pointing out what type of study it is
- Does the sampling mechanism allow us to extend the results to a larger population than just the subjects in the study?
- Does the experimental condition allow for a causal inference?
  (this could include a discussion of why causation might be reasonable to infer even in an observational study)
- Are the assumptions underlying the evidence stated in the statistical conclusion seriously violated?

Scope of Inference

Example: Since this was an observational study, a causal conclusion doesn't formally follow. However, a lack of alternate explanations make it difficult to identify possible confounders. The study took a census of all the birds on the islands and hence no sampling mechanism was used. Thus, the results can't be extended to any broader population. A potential serious problem with the statistical analysis is that the same birds are likely to be in both the before and after groups and hence the groups are not independent.