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| --- | --- | --- | --- | --- | --- |
| **Variables of Interest** | **Parameter of Interest** | **Statistic of Interest** | **Descriptive Methods** | **Inferential Methods** | **Assumptions for Inferential Methods** |
| **Two Categorical Variables (in general)** | True Conditional Population Proportions  () | Sample Proportions | * Report sample proportions * Contingency table   Stacked/Dodged/Filled Bar Plot | Chi-square test | * Observations are independent   EXPECTED counts should be greater than 5 |
| **Single Numerical Variable** | True Population Mean (µ) | Sample Mean  () | * Report measures of center and variation * Dotplot, boxplot, histogram, etc. * Describe shape + outliers | * One-sample t-test * CI for population mean | * Either the sample size is fairly large or the data reasonably follow a normal distribution |
| **Comparing Numerical Variable across Two Categories of a Categorical Variable (INDEPENDENT samples)** | Difference in True Population Means  (µ1 - µ2) | Difference in Sample Means  () | * Report , , and s1, s2 * Side-by-side boxplots, facet histograms, etc. | * Two-sample t-test * CI for µ1 - µ2 | * Observations are independent * Either both sample sizes are fairly large or the data from each group reasonably follow a normal distribution |
| **Comparing Numerical Variable across Two Categories of a Categorical Variable (DEPENDENT samples)** | True Mean Difference (µd) | Sample Mean Difference  (d) | * Report measures of center and variation for the differences * Dotplot, boxplot, histogram, etc. | * paired t-test * CI for population mean difference | * Either the number of pairs is fairly large or the differences reasonably follow a normal distribution |