**An overview of selected statistical procedures**

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| --- | --- | --- | --- | --- |
| Type | Number of variables | Descriptive statistics | Visualization | Inferential statistics |
| categorical  (usually tabulated data) | one table(catvar) | proportions prop.table(tabdata), percentages | bar plot barplot(tabdata),  pie chart pie(tabdata) | Binomial test (2 outcomes)  binom.test(outcome1, total) |
| two  table(catvar1,catvar2) | odds ratio, Kramer’s V vcd::assocstats(tabdata) | bar plot barplot(tabdata) | Chi-squared test chisq.test(tabdata),  Fisher test fisher.test(tabdata) |
| numeric | one  numvar | mean mean(numvar), median median(numvar), mode, variance var(numvar), standard deviation sd(numvar), etc.  summary(numvar),  boxplot.stats(numvar) | box plot boxplot(numvar),  histogram hist(numvar),  density plot  plot(density(numvar)) | Not discussed in this course |
| two  numvar1, numvar2 | correlation coefficient  cor(numvar1, numvar2) | scatter plot  plot(numvar1, numvar2) | correlation test  cor.test(numvar1, numvar2) |
| categorical and numeric | two  numvar for cat1 and cat2, or numvar and catvar | difference between the group means | box plots  boxplot(numvar\_cat1, numvar\_cat2) or  boxplot(numvar ~ catvar) | t-test  t.test(numvar\_cat1, numvar\_cat2) or  t.test(numvar ~ catvar) |
| categorical response, any predictor(s) | one response, any number of predictors | regression coefficients (odds ratios) | bar plots, box plots (see above) | logistic regression, conditional inference tree, conditional random forest  rms::lrm(Response ~ Predictor1 + Predictor2)  party::ctree(Response ~ Predictor1 + Predictor2)  party::cforest (Response ~ Predictor1 + Predictor2) |
| numeric response, any predictor(s) | one response, any number of predictors | regression coefficients | scatter plots, box plots  (see above) | linear regression, conditional inference tree,  conditional random forest  lm(Response ~ Predictor1 + Predictor2)  party::ctree(Response ~ Predictor1 + Predictor2)  party::cforest (Response ~ Predictor1 + Predictor2) |