

Data to analyse	Type of analysis	Unpaired/Paired	Purpose of analysis	Parametric / Nonparametric	Hypothesis-test	Assumptions	STATA-commands	R-commands	Day	Standard analysis solution
Numerical / Continuous	One sample mean	Irrelevant	Compare one group to a hypothetical value	Parametric	One-sample ttest	Sample from normal distribution with unknown mean and sd. Independent.	Check normality: qnorm, hist Describe: sum, graph box Test: t.test(var ,#) CI: ci var Centile: centile var	Check normality: qqnorm, qqline Describe: summary, describe Test: t.test(var ,#) CI: smean.ci.normal(var) Centile: smean.sd(var)	Day 1	Standard 1-1 Standard 1-2
				Nonparametric	Irrelevant	Observations independent and from same sample with same distribution.	Median: centile var	Median: median(var), MedianCI(var)	Day 1	Standard 3-1
					Wilcoxon signed-rank test	Observations independent and from same sample with same distribution.	signrank var =#	wilcox.test(var ,#)	Day 1	Standard 3-1
	Two sample mean	Non-paired	Compare two unpaired groups	Parametric	unpaired samples ttest	Both samples from normal distribution with unknown mean and sd. Samples and Observations Independent.	Check normality as above. Same sd: sdtest var , by(group). ttest var , by(group).	Check normality as above. Same sd: var.test(var ~ group). t.test(var , group).	Day 2	Standard 2-1
				Nonparametric	Wilcoxon Mann-Whitney Median test	Independence between and within the groups. Observations within groups are from same distribution.	Same distribution: ranksum var , by (group) Same median: median var , by(group) No size of difference, only p-value of hypothesis	Same distribution: wilcox.test(var ~ group) Same median: mood.medtest(var ~ group). No size of difference, only p-value of hypothesis	Day 2	Standard 2-1
		Paired	Compare two paired groups or samples - significance of group differences	Parametric	Paired sample ttest / Pearson correlation	Random sample from a normal distribution. (Paired) differences should be independent and from same distribution.	Check normality ttest var1 = var2 Check same distribution: Bland Altman & y=x plot ttest diff=0 or ttest logdiff=0 pworth var1 var2	Check normality t.test(var1 , var2 ,paired = T) Check same distribution: Bland Altman & y=x plot t.test(diff,0) or t.test(logdiff,0) cor(var1 , var2)	Day 3	Standard 3-1 Standard 3-2
				Nonparametric	Wilcoxon signed-rank test / Spearman correlation	Random sample. (Paired) differences should be independent and from same distribution.	signrank var1 = var2 No size of difference, only p-value of hypothesis (null). spearman var1 var2	wilcox.test(var1 , var2 , paired=T) No size of difference, only p-value of hypothesis (null). cor(var1 , var2 , method="spearman")	Day 3	Standard 3-1
	Regression	Non-paired	General linear model for the mean	Parametric	Linear regression	Samples from normal distribution with unknown mean and sd. Observations Independent.	regress y x	lm(y ~ x)	Day 5	Standard 5-1
	Several means	Non-paired	Comparing several means	Parametric	One-way analysis of variance.	Samples from normal distribution with unknown mean and sd. Observations Independent.	oneway: var group	sov(var ~ group)	Day 6	
				Nonparametric	Non-parametric one-way analysis of variance.	Observations independent and from same sample with same mean and sd.	kwallis var , by(group)	kruskal.test(var ~ group)	Day 6	
	Repeated measurements	Repeated	Summary measure	Parametric/ nonparametric					Day 6	
Binary / Dichotomous	One sample mean	Irrelevant	Compare one group to a hypothetical value	Parametric	Binomial test	Binomial distribution: 1. Sample size independent on observations, e.g number "yes" 2. Observations independent 3. Same two possible outcomes 4. Probability of "yes" same for all participants.	bittest var =# (exact) prtest var =# (approximate) ci var , bin	prop.test(x, n) binconf(x, n, method="exact")	Day 4	Standard 4-1
	Two sample mean	Non-paired	Compare two unpaired groups	Parametric	Chi-square test / Fischers exact test (Large/small sample)	Within groups: Assumptions of binomial distribution in groups. Between Groups: samples Independent	Describe: Risk diff, risk ratio, OR: cs var group , or woolf tab2 var1 var2 , chi2 exact tabulate var1 var2 , exact Test for trend in RxC table: Spearman Rank correlation: spearman var1 var2	Describe: Risk diff, risk ratio, OR: table <- table(group , var) epi2x2(table) table2x2(table=c("rr","fisher")) Test for trend in RxC table: Spearman Rank correlation: cor(var1 , var2 , method="spearman")	Day 4	Standard 4-1
		Paired	Compare two paired groups or samples - significance of group differences	Parametric	McNemar	Within groups: Assumptions of binomial distribution in groups. Samples pairs independent	mcc var1 var2	table <- table(var1 , var2) mcNemar(table)	Day 4	Standard 4-2 Standard 4-3
	Regression	Non-paired	Binary regression	Parametric	Binary regression for the	Assumptions of binomial distribution, but the probability is modeled as a function of covariates.	binreg y x , rr	glm(y ~ x , family=binomial(link=log))	Day 7	Standard 7-1
Time to event	One sample: Cumulative risk	Irrelevant	Estimating the cumulativ risk	Nonparametric	Log-rank test/Kaplan-Meier estimate	Observations independent, independent right censoring.	sts graph sts test group	fit <- survfit(Surv(time , event= status) ~ 1) plot(fit1,conf.int=T) survdiff(Surv(time , event= status) ~ group)	Day 8	Standard 8-1
	Regression: Rate/hazard ratio	Non-paired	Comparing rates	Semi-parametric	Cox regression	Observations independent, independent right censoring.	stcox x stphplot x	coxph(Surv(time , event= status) ~ group) fit <- survfit(Surv(time , event= status) ~ group) plot(fit, fun="cloglog")	Day 8	Standard 8-1

Overview Basic Biostatistics