A GUIDE TO COMMONLY USED STATISTICAL METHODS

(From *Oxford Handbook of Medical Statistics* 2011, Peacock and Peacock. Available online via KCL Library)

AIM OF ANALYSIS	TYPE OF DATA, ASSUMPTIONS, NOTES	STATISTICAL METHOD
COMPARE TWO INDEPENDENT SAMPLES		
Compare 2 means	Continuous. If <50 subjects per group, data must follow Normal distribution with same standard deviation in each group	t test for 2 independent means
Compare 2 proportions	Categorical, 2 categories, all expected values > 5	Chi-squared test
Compare 2 proportions	Categorical, 2 categories, some expected values ≤ 5	Fisher's exact test
Compare distributions	Ordinal	Wilcoxon 2-sample signed rank test equivalent to Mann Whitney U test
Compare time to an event (eg survival) in 2 groups	Continuous	Logrank test
COMPARE SEVERAL INDEPENDENT SAMPLES		
Compare several means	Continuous, Normal distribution, same variance	One-way analysis of variance
Compare time to an event (eg survival) in several groups	Continuous	Logrank test
COMPARE DIFFERENCES IN A PAIRED SAMPLE		
Test mean difference	Continuous. If <100 subjects then the differences must follow a Normal distribution.	t test for 2 paired (matched) means
Compare 2 paired proportions	Categorical, 2 categories (binary)	McNemar's test
Distribution of differences	Ordinal, symmetric distribution	Wilcoxon matched pairs test
Distribution of differences	Ordinal	Sign test

RELATIONSHIPS BETWEEN TWO VARIABLES		
Test strength of linear relationship between 2 variables	Continuous, at least one has Normal distribution	Pearson's correlation
Test strength of relationship between 2 variables	Ordinal	Spearman's rank correlation, Kendall's tau (if many ties)
Examine nature of linear relationship between 2 variables	Continuous, residuals from Normal distribution, constant variance	Simple linear regression
Test association between 2 categorical variables	Categorical, more than 2 categories for either or both variables, at least 80% of expected frequencies > 5	Chi-squared test
Test for trend in proportions	Categorical, one variable has 2 categories and the other has several categories which are ordered, sample > 30	Chi-squared test for trend
MULTIVARIABLE METHODS; ONE DEPENDENT VARIABLE AND MORE THAN ONE INDEPENDENT VARIABLE		
Continuous dependent variable	Regression coefficients are slopes of the line (continuous independent variables) or mean difference between 2 groups (categorical)	Multiple regression
Dichotomous dependent variable	Regression coefficients converted to odds ratios which estimate relative risk	Logistic regression
Time to event (survival) dependent variable	Regression coefficients are hazard ratios (risk ratios)	Proportional hazards (Cox) regression