What type of outcome?	How many predictor variables?	What type of predictor?	If a categorical (nominal) predictor, how many categories?	If a categorical (nominal) predictor, are the same or different entities in each category?	Assumptions of linear model met	Assumptions of linear model not met

Continuous → **One** → **Continuous** → Pearson correlation or simple linear regression | Spearman Rank correlation

One → **Categorical** → **Two** → **Same** → Paired-samples t-test | Wilcoxon Signed Rank

Different → Two-sample t-test | Mann Whitney Test

More than two → **Same** → One-way repeated measures ANOVA

Different → One-way ANOVA | Kruskall Wallis Test

Two or more → **Continuous** → Multiple linear regression

Categorical → **Different** → 2-way ANOVA/Multiple linear regression with dummy variables

Both → Multiple linear regression/ANCOVA

Categorical → **One** → **Continuous** → Logistic regression

Categorical → **Two or more** → **Different** → Chi-Square/Fisher's test

Two → **Same** → McNemar's test

Two or more → **Continuous** → Logistic regression

Categorical → **Different** → Logistic regression

Both → **Different** → Logistic regression

Lipids and Insulin Sensitivity

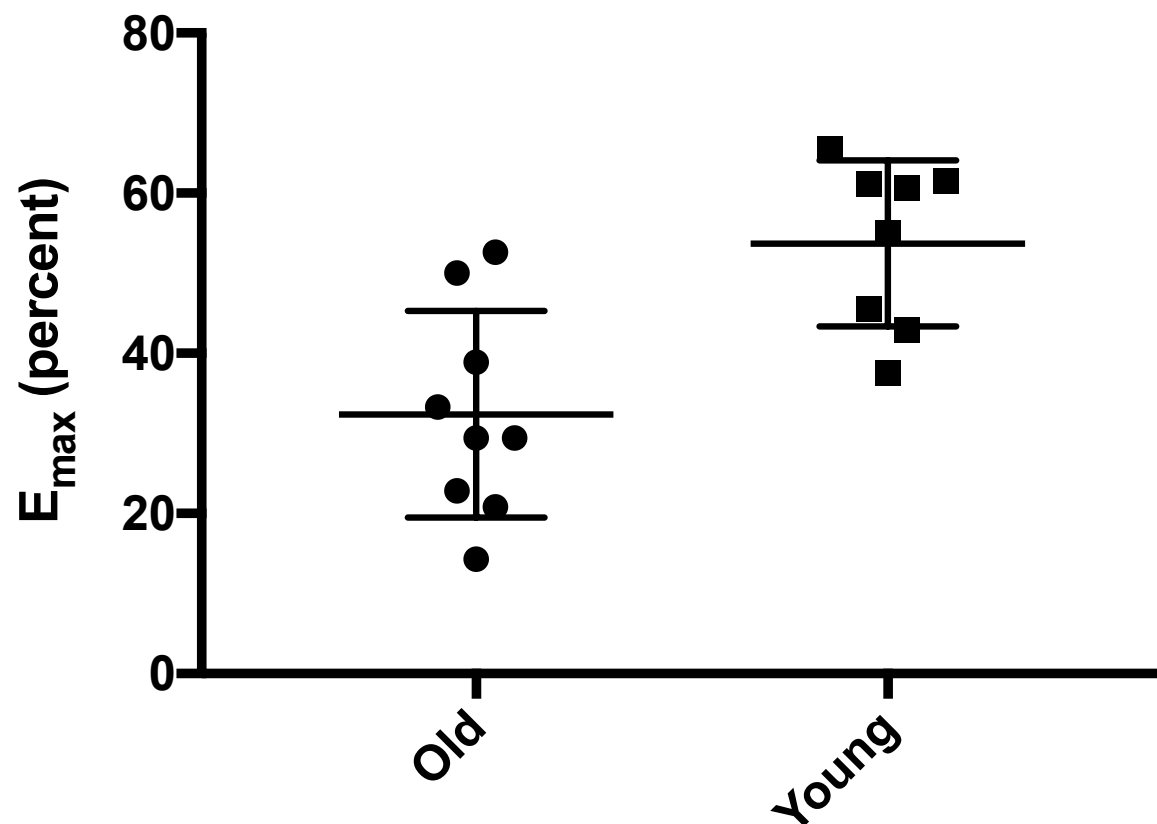| fatty acid	insulin sensitivity
X	Y
17.9	250
18.3	220
18.3	145
18.4	115
18.4	230
20.2	200
20.3	330
21.8	400
21.9	370
22.1	260
23.1	270
24.2	530
24.4	375

The investigators wanted to understand why insulin sensitivity (ml/kg/min/µIU ml) varies so much among individuals. They hypothesized that the lipid composition of the cell membranes of skeletal muscles affects the sensitivity of the muscle for insulin. They determined the insulin sensitivity of 13 healthy men along with the fatty acid composition of a muscle biopsy.

Effect of drug on relationship between heart rate and BMI

The investigators have designed a drug to reduce heart rate, but are concerned that the effectiveness of the drug may depend on BMI. They randomly assigned patients to receive either the drug or a placebo and measured their heart rate and BMI after drug administration.

Association between age and how well the neurotransmitter norepinephrine relaxes bladder muscles

To determine the association between age and the effectiveness of norepinephrine, researchers want to compare the maximal bladder relaxation in young and old rats.

Hormonal changes in women runners

The investigators measured the level of luteinizing hormone in non runners, recreational runners, and elite runners. They are interested in differences in this hormone across running groups.

Difference in effect of alcohol drinking history on liver function between genders

The investigators want to examine difference between males and females in the effect of alcohol consumption on liver function. Both males and females were recruited for the study. Each participant was classified as a non-drinker, light drinker, or heavy drinker based on detailed drinking history questionnaire. Aspartate aminotransferase (AST) was measured on all participants to represent liver function.

Matched Case/Control

The investigator studied 134 cases and 134 matched controls. Each entry in the table represents one pair (one case and one control). Participants were retrospectively examined for a particular risk factor. What is the association between the risk factor and disease.

Cases

Controls	Risk Factor +	Risk Factor -	Total
Risk Factor +	13	4	27
Risk Factor -	25	92	117
Total	38	96	134

Does a cholera vaccine work?

The investigators performed a case-control retrospective study to examine the effectiveness of a cholera vaccine. They gathered cases (people with cholera) and controls (people without cholera) and asked whether they received the vaccine or not.

	Cases (Cholera)	Controls
received vaccine	10	94
no vaccine	33	78
Total	43	172

Darwin's comparison of plant growth between types of seeds

cross fertilized	self-fertilized
Y	Y
23.500	17.375
12.000	20.375
21.000	20.000
22.000	20.000
19.125	18.375
21.500	18.625
22.125	18.625
20.375	15.250
18.250	16.500
21.625	18.000
23.250	16.250
21.000	18.000
22.135	12.750
23.000	15.500
12.000	18.000

Darwin planted two kinds of seeds (cross fertilized and self fertilized) side-by-side in different locations. By designing the experiment this way, Darwin controlled for any changes in soil, temperature, or sunlight that would affect both kinds of sides. He wanted to compare plant growth (inches) between groups.

Predicting creatinine clearance from age, BMI, and diuretics exposure

Investigators wanted to determine the association between age, BMI, and diuretics exposure (yes or no) with creatinine clearance (mL/min) and to build a model to predict creatinine clearance using these factors.