Statistical analysis plan

- The project's data analysis will include both descriptive and inferential statistics. Primary endpoints include change in weight, fat to fat-free mass ration, and composite strength from baseline to months 6 and 12. Secondary endpoints include side effect incidence, pathology results and change in BMI from baseline to months 6 and 12. Statistical tests will be run to measure associations between primary endpoints and demographic variables such as BMI category, age and ethnicity.
- Raw data will be extracted from the Eucalyptus central data repository in the form of an .csv file. This file will be uploaded to R for all subsequent analyses (descriptive and inferential) and data visualisations.
- For all analyses, plots and tests of normality will be used to determine which figures to report and/or which correlation tests to run, i.e., those that conform with parametric or non-parametric standards. Plots will include quantile-quantile plots and frequency histograms, while Shapiro-Wike and Levene's tests will be used to confirm distribution normality and homogeneity of variance, respectively. For example, if a quantile-quantile plot and Shapiro-Wike test reveal weight-loss outcomes are not normally distributed across BMI categories, median figures will be reported instead of the mean. Similarly, if the p-value of a Levene's test is lower than .05 (homogeneity of variance assumption not met), a Kruskall-Wallis test will be used to test a correlation between ethnicity and weight-loss/gain percentage, rather than the parametric equivalent, ANOVA test.
- T-tests (parametric) and Mann-Whitney tests (non-parametric) will be used to test associations between binary category explanatory variables and continuous dependent variables, e.g. over/under 10 percent weight loss at month 6 and final weight loss percentage.
- Chi-square (parametric) and fisher's exact tests (non-parametric) will be used to test associations between categorical explanatory and dependent variables, such as BMI category and fat to fat-free ratio improvement at month 6 or 12 (yes/no).
- Pearson's (parametric) and Spearman's tests (non-parametric) will be used to determine relationships between continuous explanatory and dependent variables, such as baseline bench press and 12-month bench-press.
- Logistic regression will be used to determine associations between continuous predictor variables and categorical dependent variables, such as program engagement (percentage of days over trial period) and weight-loss threshold (5, 10 and 15 percent of baseline weight – yes/no).
- Multiple regression will be used to compare the effect of various independent variables on primary endpoints.
- All correlations of statistical significance will be reported in the final manuscript. The project's principal investigator will use his professional discretion in determining which insignificant associations are interesting enough to report.
- All descriptive statistics related to the project's endpoints will be reported.