

Purpose of one-way ANOVA

The one-way ANOVA is used to determine whether there are any significant differences between the means of several independent groups.

Assumptions necessary for one-way ANOVA

1. The dependent variable is normally distributed within each group that is being compared in one-way ANOVA.
 2. The population variances in each group are equal.
 3. The samples are independent, random samples from defined populations.
- If data is *not* normally distributed, you can: (1) transform data so that it becomes normally distributed or (2) use the Kruskal-Wallis H test, which does not require the assumption of normality.
 - If population variances are *not* equal, you can use: (1) the Welsh test or (2) the Brown and Forsythe test.

Hypothesis for one-way ANOVA

The null hypothesis states that the means between groups are equal to one another.

$H_0: \mu_1 = \mu_2 = \mu_3 = \dots = \mu_k$ where μ = group mean, and k = number of groups.

If the one-way ANOVA returns a significant result, we reject the null hypothesis.

$H_A: \mu_1 \neq \mu_2 \neq \mu_3 \neq \dots \neq \mu_k$