The pooled standard deviation is defined as

$$S_p = \sqrt{\frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{(n_1+n_2-2)}}$$

However, it is often that data are not available for each comparison group. It is more often the case that data on the variability of the outcome are available only one group, often the untreated (e.g., placebo control) or unexposed group.

When planning a clinical trial to investigate a new drug or procedure, data are often available from other trials that involved a placebo or an active control group (i.e., a standard medication or treatment given for the condition under study). The standard deviation of the outcome variable measured in patients assigned to the placebo, control or unexposed group can be used to plan a future trial.