

# # Calculate Cohen's d in R (With Example)

Authored by  
**stats writer**

November 29, 2025

## RECOMMENDED CITATION

stats writer (2025). # Calculate Cohen's d in R (With Example). PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=101546>

In statistics, we often use to determine if there is a statistically significant difference between the mean of two groups.

However, while a p-value can tell us whether or not there is a statistically significant difference between two groups, an effect size can tell us how large this difference actually is.

One of the most common measurements of effect size is **Cohen's d**, which is calculated as:

$$\text{Cohen's } d = (x_1 - x_2) / \sqrt{(s_1^2 + s_2^2) / 2}$$

where:

$x_1$  ,  $x_2$ : mean of sample 1 and sample 2, respectively

$s_1^2$ ,  $s_2^2$ : variance of sample 1 and sample 2, respectively

Using this formula, here is how we interpret Cohen's d:

A  $d$  of **0.5** indicates that the two group means differ by 0.5 standard deviations.

A  $d$  of **1** indicates that the group means differ by 1 standard deviation.

A  $d$  of **2** indicates that the group means differ by 2 standard deviations.

And so on.

Here's another way to interpret cohen's d: An effect size of 0.5 means the value of the average person in group 1 is 0.5 standard deviations above the average person in group 2.

We often use the following rule of thumb when interpreting Cohen's d:

A value of **0.2** represents a small effect size.

A value of **0.5** represents a medium effect size.

A value of **0.8** represents a large effect size.

The following example shows how to calculate Cohen's d in R.

### Example: How to Calculate Cohen's d in R

Suppose a botanist applies two different fertilizers to plants to determine if there is a significant difference in average plant growth (in inches) after one month.

There are two methods we can use to quickly calculate Cohen's d in R:

#### Method 1: Use lsr Package

**library(lsr)**

```
#define plant growth values for each group
group1 <- c(8, 9, 11, 11, 12, 14, 15, 16, 16, 18, 20, 21)
group2 <- c(7, 9, 10, 10, 11, 11, 12, 14, 14, 16, 20, 23)

#calculate Cohen's d
cohensD(group1, group2)

0.2635333
```

## Method 2: Use effsize Package

### library(effsize)

```
#define plant growth values for each group
group1 <- c(8, 9, 11, 11, 12, 14, 15, 16, 16, 18, 20, 21)
group2 <- c(7, 9, 10, 10, 11, 11, 12, 14, 14, 16, 20, 23)

#calculate Cohen's d
cohen.d(group1, group2)

Cohen's d

d estimate: 0.2635333 (small)
95 percent confidence interval:
lower upper
-0.5867889 1.1138555
```

Notice that both methods produce the same result: Cohen's d is **0.2635**.

We interpret this to mean that the average height of plants that received fertilizer #1 is **0.2635** standard deviations greater than the average height of plants that received fertilizer #2.

Using the rule of thumb mentioned earlier, we would interpret this to be a small effect size.

In other words, whether or not there is a statistically significant difference in the mean plant growth between the two fertilizers, the actual difference between the group means is trivial.

The following tutorials offer additional information on effect size and Cohen's d: