

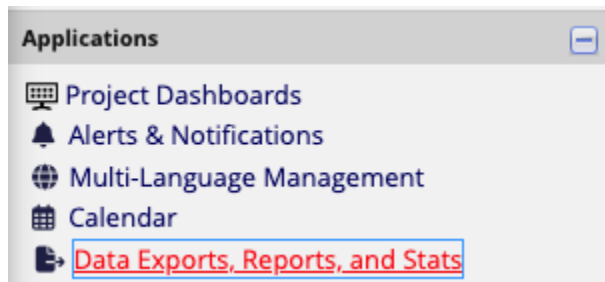
How do I use REDCap to complete a T-Test

Notes: This is a quick guide written mostly for students who have questions about using REDCap for projects. While working in stats, it's always important to be able to conceptually understand what you are comparing. This guide was written by a REDCap Admin, not a stats expert. Comments or change requests can go to help-redcap@cchmc.bmi.org.

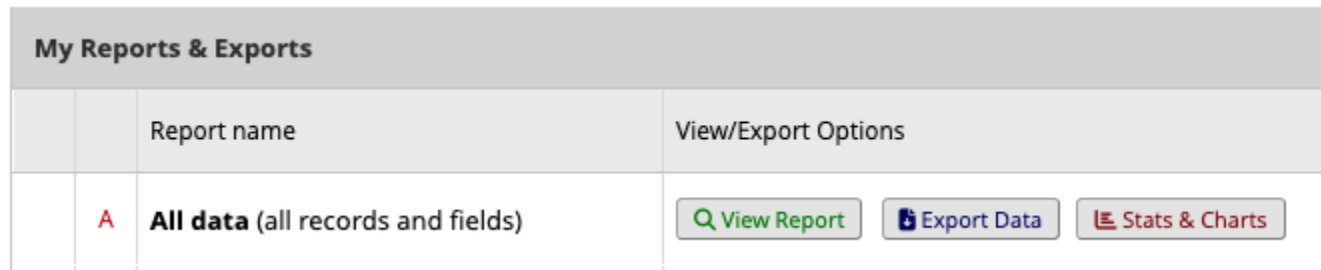
REDCap is a research electronic data collection tool. Its primary purpose is to help you collect, store, and save your research data. REDCap is structured in a way that creates systematic separations between records. Although it has some tools that can view data in the aggregate (summarize across different records) typically it's calculated fields and smart variables can only analyze data within the same form. Therefore, it is difficult, if not impossible, for REDCap to perform a T-Test calculation that compares 2 independent means (groups) for differences.

If you are a student doing a class project or a researcher that would like to do a quick analysis of the difference between two group distributions in REDCap (i.e., pre versus post-events, control versus experimental groups) and would like a quick way to analyze the difference between two groups via a T-test we suggest the following.

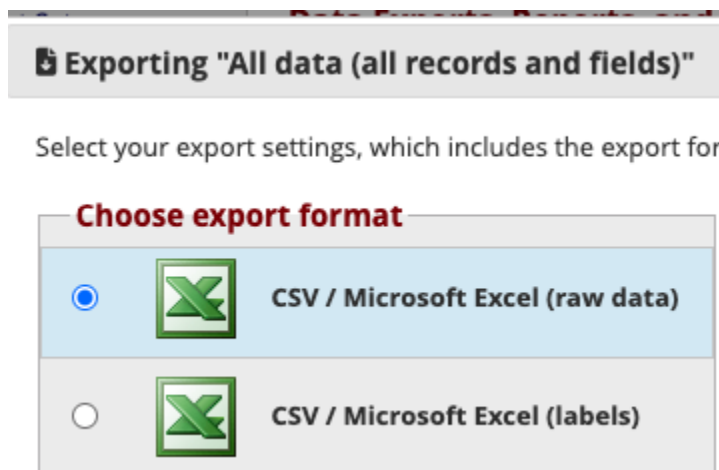
First, make sure you understand how your data is formatted, and then go to Data Exports, Reports, and Stats



Then select Export Data



And select Raw Data



This will give you an export.

record_id	redcap_repeat_instrument	redcap_event	Pre-Test	Post Test
1	visit_information	1	1	0
2	visit_information	1	1	0
3	visit_information	1	1	0
4	visit_information	1	2	0
5	visit_information	1	2	0
6	visit_information	1	2	1
7	visit_information	1	2	0
8	visit_information	1	2	0
9	visit_information	1	2	0
10	visit_information	1	2	1

If your groups filled out different instruments, you'll find the data already sorted in different columns as shown above.

If you used events to separate the same instrument by time point the data will look more like this.

Below the REDCap event is designating which time point the data belongs to. If this is the case you can use Excel tools to move the data to two different columns.

record_id	redcap_repeat_instrument	redcap_event	Test
1	visit_information	1	1
1	visit_information	2	1
2	visit_information	1	1
2	visit_information	2	2
3	visit_information	1	2
3	visit_information	2	2
4	visit_information	1	2
4	visit_information	2	2
5	visit_information	1	2
5	visit_information	2	2
6	visit_information	1	2
6	visit_information	2	2

Once you have the data from each group separated, you can use an online T-test calculator to help you do the group comparison:

We suggest the Social Science Statistics Page....go to: <https://www.socscistatistics.com/tests/studentttest/default2.aspx>

Copy and text your data from Excel into the calculator

T-Test Calculator for 2 Independent Means

Note: You can find further information about this calculator, [here](#).

Enter the values for your two treatment conditions into the text boxes below, either one score per line or as a comma delimited list. Select your significance level and whether your hypothesis is one or two-tailed. Then give your data a final check, and press the "Calculate T and P Values" button.

Treatment 1 (X)

1
1
1
2
2
2
2
2
2
2
2
2

Treatment 2 (X)

0
0
0
0
0
1
0
0
0
1
0

And select Calculate P and T Scores

No calculation has yet been performed.

Calculate T and P Values

Reset

The output will give you a lot of data.....

Significance Level:

☐ .01

☒ .05

☐ .10

One-tailed or two-tailed hypothesis?:

☒ One-tailed

☐ Two-tailed

Difference Scores Calculations

Treatment 1

N_1 : 11

$df_1 = N - 1 = 11 - 1 = 10$

M_1 : 1.73

SS_1 : 2.18

$s^2_1 = SS_1 / (N - 1) = 2.18 / (11 - 1) = 0.22$

Treatment 2

N_2 : 11

$df_2 = N - 1 = 11 - 1 = 10$

M_2 : 0.18

SS_2 : 1.64

$s^2_2 = SS_2 / (N - 1) = 1.64 / (11 - 1) = 0.16$

T-value Calculation

$s^2_p = ((df_1 / (df_1 + df_2)) * s^2_1) + ((df_2 / (df_1 + df_2)) * s^2_2) = ((10 / 20) * 0.22) + ((10 / 20) * 0.16) = 0.19$

$s^2_{M_1} = s^2_p / N_1 = 0.19 / 11 = 0.02$

$s^2_{M_2} = s^2_p / N_2 = 0.19 / 11 = 0.02$

$t = (M_1 - M_2) / \sqrt{(s^2_{M_1} + s^2_{M_2})} = 1.55 / \sqrt{0.03} = 8.3$

The t -value is 8.29515. The p -value is $< .00001$. The result is significant at $p < .05$.

Note: If you wish to calculate the effect size, [this calculator](#) will do the job.

In the results, you can focus on the Mean (M1) of the two groups to get a sense of directionality. The results in Blue (t-Value, p-value, and statement of significance) are usually what you would report in a research project for class, and/or what you might be reviewing as a researcher doing a quick check.