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Integrating REDCap and Statistical Analysis for Biomedical Research

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## REDCap Creating Reports

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## REDCap Creating Reports

# REDCap Creating Reports

Hannah Kostan<sup>1</sup>, Rishika Reddy<sup>2</sup>, Margarita Amihava<sup>2</sup>, and Jeremy Solomon<sup>2</sup>



## Summary

- Creating REDCap reports can help you query and organize data for a specific purpose. For example, you can create a report to determine the number of people who were screened for your research study in a given time frame.
- REDCap reports can help with improving data quality, such as monitoring for missing or incorrect data entries.
- REDCap reports are for internal use within the research team. Study participants cannot utilize the reports feature.
- Navigating “Stats & Charts” on REDCap reports allows for data visualizations from survey responses.

## Introduction

When working on a research study, a large amount of data is collected by many staff members. REDCap reports are a beneficial tool for organizing this large amount of data. Reports include many benefits such as organization, basic data analysis, and personal/peer analysis for as many fields/variables you have from your created instruments.

## What is a Report?

A REDCap report is a useful tool for selecting the specific fields/variables for your analysis. You can add as many fields/variables to your report as you would like and you can choose who has access to view the report.

### *Why are creating reports important?*

The creation of reports is important as it will help with organization, data analysis, and personal/peer analysis. With research, depending on what your study aims, procedures, and

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participant samples are, large collections of data are often acquired. To minimize looking through hundreds of unnecessary data and variables, generating a report is not only organized, but also efficient. With this organization, the process of data analysis becomes simplified. As your research team may increase with co-workers, trainees, and students, you can use reports to see how much work each person is doing to increase accountability.

### *Who uses reports?*

Principal investigators and project managers can use REDCap reports to view and monitor the progression of their research study. For example, they can utilize the reports to determine if recruitment numbers are being maintained or improving throughout the study.

Additionally, research coordinators/assistants can use the reports for several purposes. When built properly, the reports can greatly relieve a generous amount of workload and future data analysis within the research team. Trainees and students can view how REDCap survey responses are compiled into a comprehensive and organized report that allows for personal and peer analysis.

Study participants cannot utilize the reports feature on REDCap. This tool is for internal use within the research team.

### *How do you create a report?*

To create a report, first, you should determine the purpose of creating the report. For example, you may be interested in the number of people you screened during a certain time frame. Second, you should determine the fields and variables you would like to include in your report. To determine the fields and variables, consult the REDCap codebook, which provides a quick reference for all the fields and variables within your database.

1. Once you navigate to the project you are working on, click on “Data Exports, Reports, and Stats,” which is located on the left-hand column, under “Applications.”

**Figure 1. Access Data Exports, Reports, and Stats.**

2. REDCap will bring you to the “My Reports & Exports” tab, where you can see the history of all the reports that were generated. A good rule of thumb is to view the history of reports before making your own. This ensures that there is no duplication of reports with the same fields/variables. You may also want to consult with your research team to see if there is already a report created for similar purposes.
3. Click on “+ Create New Report.” In this tab, you are able to create and modify your report. As you can see, you can modify the report’s name, accessibility, fields, and filters. Not listed in this picture (but nonetheless are there) are controls for ordering the results and providing for live filters (for the sake of seeing instant responses to multiple choice questions).

**Figure 2. + Create a New Report.**

+ Create New Report

My Reports & Exports

Other Export Options

You may create a new report by selecting the fields/variables below that you want to include in the report. You may add as many fields to your report as you wish, and you can choose which users may view this report. You will also need to provide a name for your report, which will then be displayed on the project's left-hand menu for anyone to whom you have given access. You can filter the results returned in the report in a variety of ways, including using complex AND/OR logic. When you are finished, click the Save Report button at the bottom. The new report will then be added to your list of reports, after which you may immediately begin viewing them or exporting them.

<b>Name of Report:</b>	<input type="text" value="Insomnia Severity Index"/>
<b>Set as "public":</b>	Enabling this feature below will auto-generate a public link for viewing the report without needing to log in to REDCap. <input type="checkbox"/> <b>Report is publicly viewable by anyone with the public link</b>
<b>Description (optional):</b> <small>Displayed on page below report name</small>	<div style="border: 1px solid #ccc; padding: 5px;"> <div style="display: flex; border-bottom: 1px solid #ccc;"> <span>Paragraph</span> <span>–</span> <span><b>B</b></span> <span><i>I</i></span> <span><u>U</u></span> <span></span> <span></span> <span></span> <span></span> <span></span> </div> <div style="display: flex; border-bottom: 1px solid #ccc;"> <span></span> <span></span> <span></span> <span></span> <span></span> <span></span> <span></span> <span></span> <span></span> <span></span> <span></span> <span></span> <span></span> </div> <div style="height: 100px;"></div> </div>

4. Name the report with an appropriate title and end with “\_[your initials].” The title should be brief so that other research members can understand it. It can be helpful to include the report creator’s initials at the end of the title to allow others on your research team to know who to contact if they have questions about the contents of the report. You can choose to provide a description that further explains the purpose of the report.
  
5. For Step 1, you can choose who can edit and view your report. You can customize the user access or keep it in default for all users. When customizing the user access, you can manually click on the users you would like to have access to the report.

**Figure 3. Step 1. User Access**

**STEP 1**

+
User Access:
Choose who can edit and view this report

👁
View Access:
Choose who sees this report on their left-hand project menu [?](#)

**All users**    – OR –     **Custom user access**
(Choose specific users, roles, or data access groups who will have access)

✍
Edit Access:
Choose who can edit, copy, or delete this report (requires user to have 'Add/Edit/Organize Reports' privileges)

**All users**    – OR –     **Custom user access**
(Choose specific users, roles, or data access groups who will have access)

6. For Step 2, you can choose a specific variable name or field label from an instrument. You select how many variables you would like to include in the report. It is recommended that you choose 10-15 variables, since the more variables you add, the wider your report table will be. Use the “+ Quick Add” to add fields more easily.

**Figure 4. Step 2. Fields to Include in Report**

**STEP 2**

**Fields to include in report** + Quick Add Add all fields from selected instrument: -- choose instrument --

Field 1	record_id "Record ID"	⌵	Instrument: Enrollment And Status	✖
Field 2	difficulty_falling_asleep "Difficulty falling i	⌵	Instrument: ISI	✖
Field 3	difficulty_staying_asleep "Difficulty stayin	⌵	Instrument: ISI	✖
Field 4	waking_early "Problem waking up too ear	⌵	Instrument: ISI	✖
Field 5	isi_matrix_1_score "Matrix 1 total score:"	⌵	Instrument: ISI	✖
Field 6	isi_satisfied_sleep "How SATISFIED/DISSA"	⌵	Instrument: ISI	✖
Field 7	isi_noticeable_prob "How NOTICEABLE to	⌵	Instrument: ISI	✖
Field 8	isi_worried_prob "How WORRIED/DISTRE"	⌵	Instrument: ISI	✖
Field 9	isi_sleep_interfere "To what extent do you	⌵	Instrument: ISI	✖
Field 10	isi_total_score "Total Score"	⌵	Instrument: ISI	✖
Field 11	isi_complete "Complete?"	⌵	Instrument: ISI	✖
Field 12	Type variable name or field label	⌵	Instrument:	

**Additional report options** (optional)

Include the survey identifier field and survey timestamp field(s)?

Combine checkbox options into single column of only the checked-off options (will be formatted as a text field when exported to stats packages)

Include the repeating instance fields (`redcap_repeat_instrument`, `redcap_repeat_instance`) in the report and data export?

Remove line breaks/carriage returns from all text data values (only applicable for CSV Raw and CSV Label data exports)

In the report header, display the field label, variable, or both (not applicable for exports)? Both

In the report's data, display the field label, raw data value, or both for multiple choice fields (not applicable for exports)? Both

- a. If you plan on using either all or even most of your instrument variables, then click the drop-down tab next to “Add all fields from the selected instrument. You will see a list of all of the instruments associated with this report and can select one or more to add fields from that instrument into your analysis. You can remove unnecessary fields by clicking on the red “X” button for that field on the far right.

**Figure 5. Step 3. Filters**

**STEP 3**

Show data for all events or repeating instruments for each record returned [How to use filters and AND/OR logic](#)

**Filters (optional)**

<b>Filter 1</b>	<input type="text" value="Type variable name or field label"/>	<b>Operator / Value</b>	<input type="text" value="="/>
	<input type="text" value="in"/>		<input type="text" value=""/>

Switch format: [Use advanced logic](#)

**TIP:** Use [X-instance] Smart Variables to filter repeating data.

- Show only repeating instance data: `[current-instance] <> ""`
- Show only the first repeating instance: `[current-instance] <> ""` and `[current-instance] = [first-instance]`

**Additional Filters (optional)** (Records belonging only to ALL selections below will appear in the report)

<b>Filter by event(s):</b>	<input type="text" value="Enrollment_D0 (Arm 1: Arm 1)"/>
	<input type="text" value="Week_1_D7 (Arm 1: Arm 1)"/>
	<input type="text" value="Mid_D14 (Arm 1: Arm 1)"/>
	<input type="text" value="Week_3_D21 (Arm 1: Arm 1)"/>
	<input type="text" value="End_D28 (Arm 1: Arm 1)"/>

**Live Filters (optional)** Live Filters can be selected on the report page for dynamically filtering data in real time. With the exception of the Record ID field, only multiple choice fields can be used as Live Filters (as well as Events, if longitudinal, and Data Access Groups, if any exist).

<b>Live Filter 1</b>	<input type="text" value="-- select a field --"/>
<b>Live Filter 2</b>	<input type="text" value="-- select a field --"/>
<b>Live Filter 3</b>	<input type="text" value="-- select a field --"/>

- For Step 3, you can create filters. Filters can help you only see certain subjects’ data or specific data for an event. The “Live Filter” option you see above can allow you to dynamically filter out data you would like to see in terms of real-time. You have to choose a variable that you have set as a multiple-choice option in the instrument. Using the operator/value feature for the filters can increase the specificity of the report as it can limit the chosen fields further. If you choose to use advanced logic format, the drop-down filters will convert to syntax and allow for more sophisticated filtering. However, once you convert to advanced logic, you cannot convert back to the original format and the simple logic will be erased.

**Figure 6. Step 4. Order the Results**

**STEP 4**

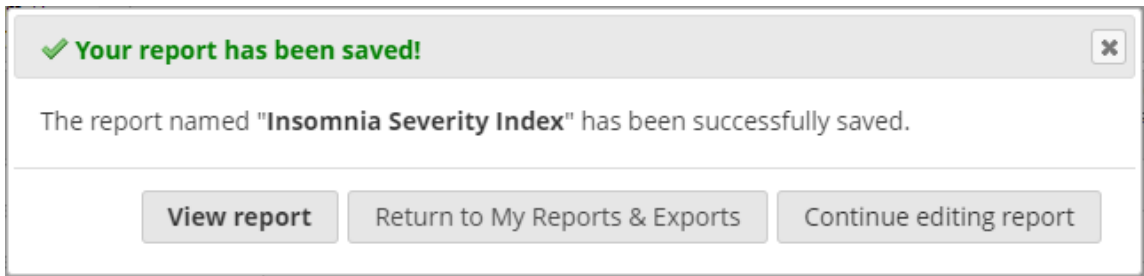
**Order the Results (optional)**

<b>First by</b>	<input type="text" value="record_id 'Record ID'"/>		<input type="text" value="Ascending order"/>
<b>Then by</b>	<input type="text" value="Type variable name or field label"/>		<input type="text" value="Ascending order"/>
<b>Then by</b>	<input type="text" value="Type variable name or field label"/>		<input type="text" value="Ascending order"/>



8. For Step 4, you can determine how you want to order the results by clicking on the drop down list where it says “Ascending order”. You can choose to order your results by ascending or descending order. In this example, we have chosen to create a report that filters by Record ID (record\_id) in ascending order.
9. Click on “Save Report” to save the report. REDCap will display an image shown in Figure 8 to confirm your report has been saved.

**Figure 8. Save Report.**



10. From here, you can view the report with all the filtered and specified information you have chosen or to edit your report. To see what information the report organized, click “View Report.” After clicking on “View Report,” you can see the entirety of the report generated. It is recommended that you take a look at the data to make sure that the “Number of results returned” makes sense to you and your research team. If the number does not make sense or if you decide you do modify the report, you can always edit it by clicking on the “Edit Report” button.

**Figure 9. View Report.**

[+ Create New Report](#)
[My Reports & Exports](#)
[Other Export Options](#)
[View Report: Insomnia Severity Index](#)

**Number of results returned: 10**
[Stats & Charts](#)
[Export Data](#)
[Print Page](#)
[Edit Report](#)

Total number of records queried: 10  
 ('records' = total available data across all designated events)  
 Report execution time: 0 seconds

### Insomnia Severity Index

Record ID record_id	Event Name redcap_event_name	Repeat Instrument redcap_repeat_instrument	Repeat Instance redcap_repeat_instance	Difficulty falling asleep: difficulty_falling_asleep	Difficulty staying asleep: difficulty_staying_asleep	Problem waking up too early: waking_early	Matrix 1 total score: isi_matrix_1_score	How SATISFIED/DISSATISFIED are you with your current pattern? isi_satisfied_sleep
1	Enrollment_D0 (Arm 1: Arm 1)			Severe (3)	Moderate (2)	Moderate (2)	7	Dissatisfied (3)
2	Enrollment_D0 (Arm 1: Arm 1)			None (0)	None (0)	None (0)	0	Satisfied (1)
3	Enrollment_D0 (Arm 1: Arm 1)			Mild (1)	Mild (1)	None (0)	2	Satisfied (1)
4	Enrollment_D0 (Arm 1: Arm 1)			Moderate (2)	Moderate (2)	None (0)	4	Dissatisfied (3)
5	Enrollment_D0 (Arm 1: Arm 1)			Very severe (4)	Very severe (4)	Severe (3)	11	Very Dissatisfied (4)
6	Enrollment_D0 (Arm 1: Arm 1)			Moderate (2)	Moderate (2)	Moderate (2)	6	Dissatisfied (3)
7	Enrollment_D0 (Arm 1: Arm 1)			None (0)	Mild (1)	None (0)	1	Satisfied (1)
8	Enrollment_D0 (Arm 1: Arm 1)			Severe (3)	Moderate (2)	Moderate (2)	7	Dissatisfied (3)
9	Enrollment_D0 (Arm 1: Arm 1)			Very severe (4)	Severe (3)	Severe (3)	10	Very Dissatisfied (4)
10	Enrollment_D0 (Arm 1: Arm 1)			Mild (1)	Mild (1)	None (0)	2	Dissatisfied (3)

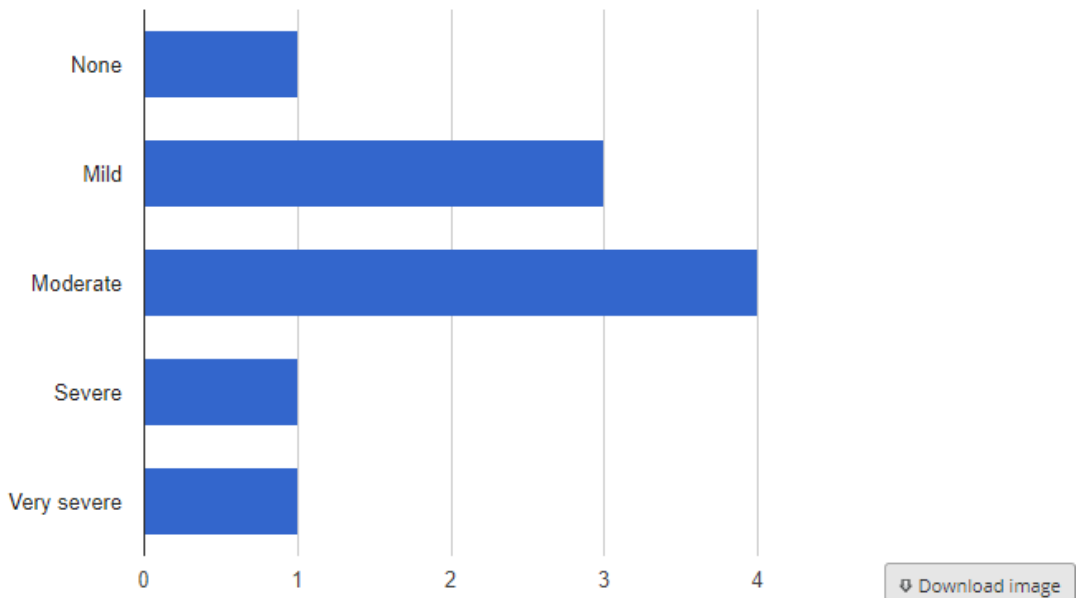
- By clicking “Stats & Charts”, you will be able to see various statistics and plots/charts from your survey responses. For example, Figure 10 shows a frequency count for the question Difficulty staying asleep.(see Figure 10 below).

**Figure 10. Stats & Charts.**

**Difficulty staying asleep:** (*difficulty\_staying\_asleep*) [Refresh Plot](#) | View as Bar Chart ▾

Total Count (N)	Missing*	Unique
10	0 (0.0%)	5

**Counts/frequency:** *None* (1, 10.0%), *Mild* (3, 30.0%), *Moderate* (4, 40.0%), *Severe* (1, 10.0%), *Very severe* (1, 10.0%)



## Conclusion

Understandably, large amounts of data are collected in research studies. Creating reports adds to your advantage by allowing for a less complicated evaluation of data and the following analysis while improving organization. This is a valuable tool that you can circulate to other members of the team to determine progress of the research as well.

## Resources

### *Creating a Customized Report In REDCap*

University of Florida

<https://www.ctsi.ufl.edu/wordpress/files/2017/06/Creating-a-Customized-Report-in-REDCap.pdf>

This source provides a detailed guide and addresses the specifics of longitudinal studies in relation to creating reports while comparing REDCap to a familiar tool, Excel.

### *Data Export, Reports, and Stats*

University of Southern Denmark

[https://www.sdu.dk/-/media/files/om\\_sdu/institutter/klinsk+institut/forskningsenheder/open/vejledninger/redcapdata+exports+reports+and+stats+module.pdf](https://www.sdu.dk/-/media/files/om_sdu/institutter/klinsk+institut/forskningsenheder/open/vejledninger/redcapdata+exports+reports+and+stats+module.pdf)

This guide will allow readers to find detailed and comprehensive information on creating REDCap reports. The source also allows for a deeper understanding of the stats and charts tool discussed in this chapter.

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