REDCap
Research Electronic Data Capture
@Yale

Managing Data in REDCap

Reports and Data Import/Export

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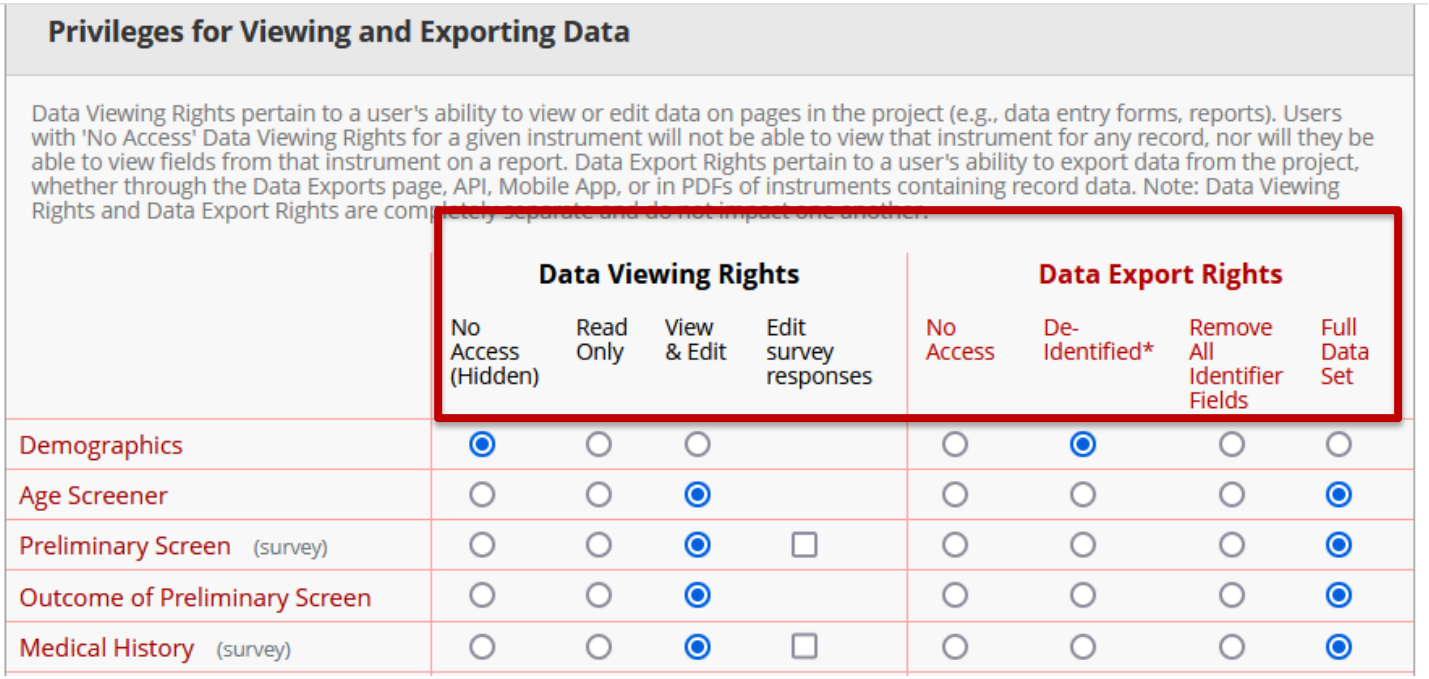
Introduction and Learning Objective

- Understand instrument-level data viewing and export rights
- Learn how to set up a custom data report in REDCap with filters
- Understand how to export data to statistical packages
- Know how to import data to a REDCap project
- Learn what an API is

Instrument Level Data Viewing and Export Rights

Instrument-level Data Export Rights

Options for data export rights for EACH data collection instrument:



Privileges for Viewing and Exporting Data

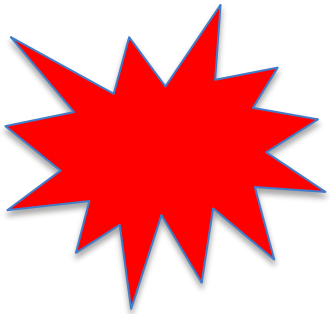
Data Viewing Rights pertain to a user's ability to view or edit data on pages in the project (e.g., data entry forms, reports). Users with 'No Access' Data Viewing Rights for a given instrument will not be able to view that instrument for any record, nor will they be able to view fields from that instrument on a report. Data Export Rights pertain to a user's ability to export data from the project, whether through the Data Exports page, API, Mobile App, or in PDFs of instruments containing record data. Note: Data Viewing Rights and Data Export Rights are completely separate and do not impact one another.

	Data Viewing Rights				Data Export Rights			
	No Access (Hidden)	Read Only	View & Edit	Edit survey responses	No Access	De-Identified*	Remove All Identifier Fields	Full Data Set
Demographics	◉	○	○		○	◉	○	○
Age Screener	○	○	◉		○	○	○	◉
Preliminary Screen (survey)	○	○	◉	☐	○	○	○	◉
Outcome of Preliminary Screen	○	○	◉		○	○	○	◉
Medical History (survey)	○	○	◉	☐	○	○	○	◉

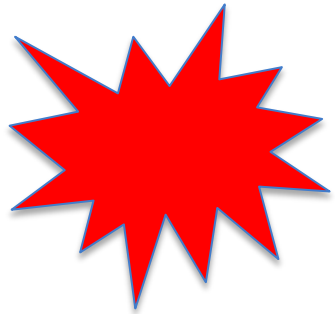
→Match a user's Data Exports Rights with their Data Viewing Rights!

→ Granular control of who can export data from your project.

Instrument-level Data Viewing and Export Rights



Where is my new instrument?



Production Project:

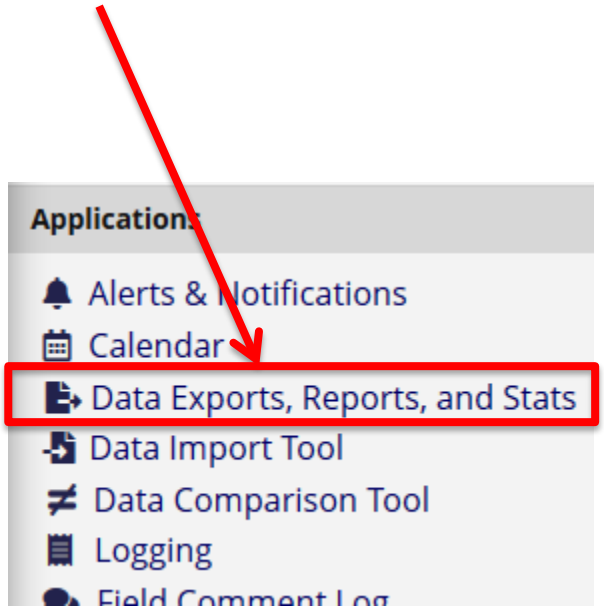
- When adding a new form to a project *that's been put into production*, no users will initially have access to data viewing and data export rights for that new instrument.
- Remember to give you AND your users rights to the new instrument after the production changes have been approved.

REDCap FAQ Troubleshooting

Questions?

Reports

Data Exports, Reports, and Stats



how-to video

Data Exports, Reports, and Stats

VIDEO: How to use Data Exports, Rep

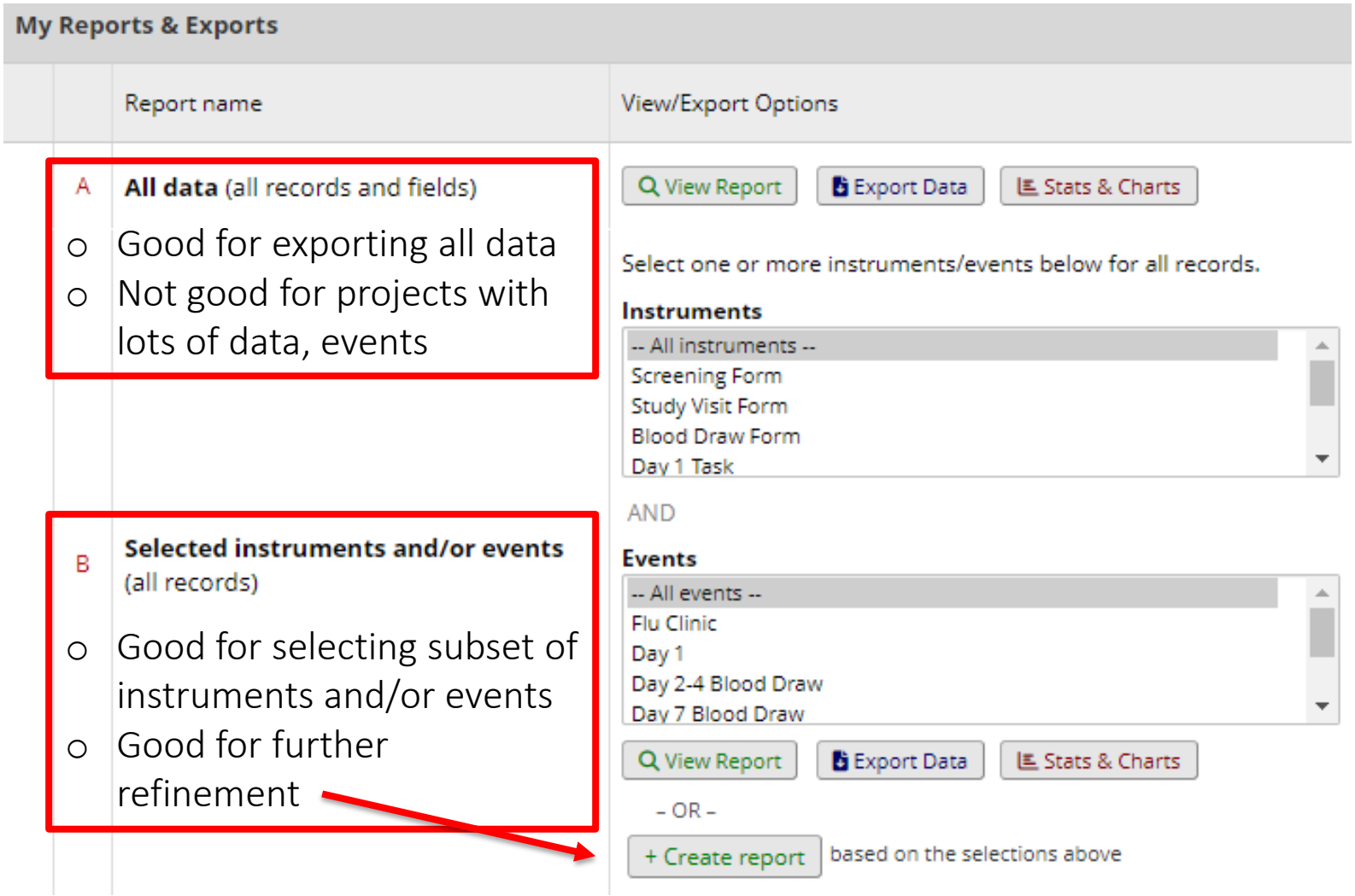
+ Create New Report | My Reports & Exports | Other Export Options

This module allows you to easily view reports of your data, inspect plots and descriptive statistics of your data, data to Microsoft Excel, SAS, Stata, R, or SPSS for analysis (if you have such privileges). If you wish to export you view it as a report, then Report A is the best and quickest way. However, if you want to view or export data fro instruments (or events) on the fly, then Report B is the best choice. You may also create your own custom repo such privileges) in which you can filter the report to specific fields, records, or events using a vast array of filter you get the exact data you want. Once you have created a report, you may view it as a webpage, export it out format (Excel, SAS, Stata, SPSS, R), or view the plots and descriptive statistics for that report.

My Reports & Exports

	Report name	View/Export Options
A	**All data** (all records and fields)	View Report | Export Data | Stats & Charts
B	**Selected instruments and/or events** (all records)	Make custom selections
1	Demographics	View Report | Export Data | Stats & Charts
	+ Create New Report	

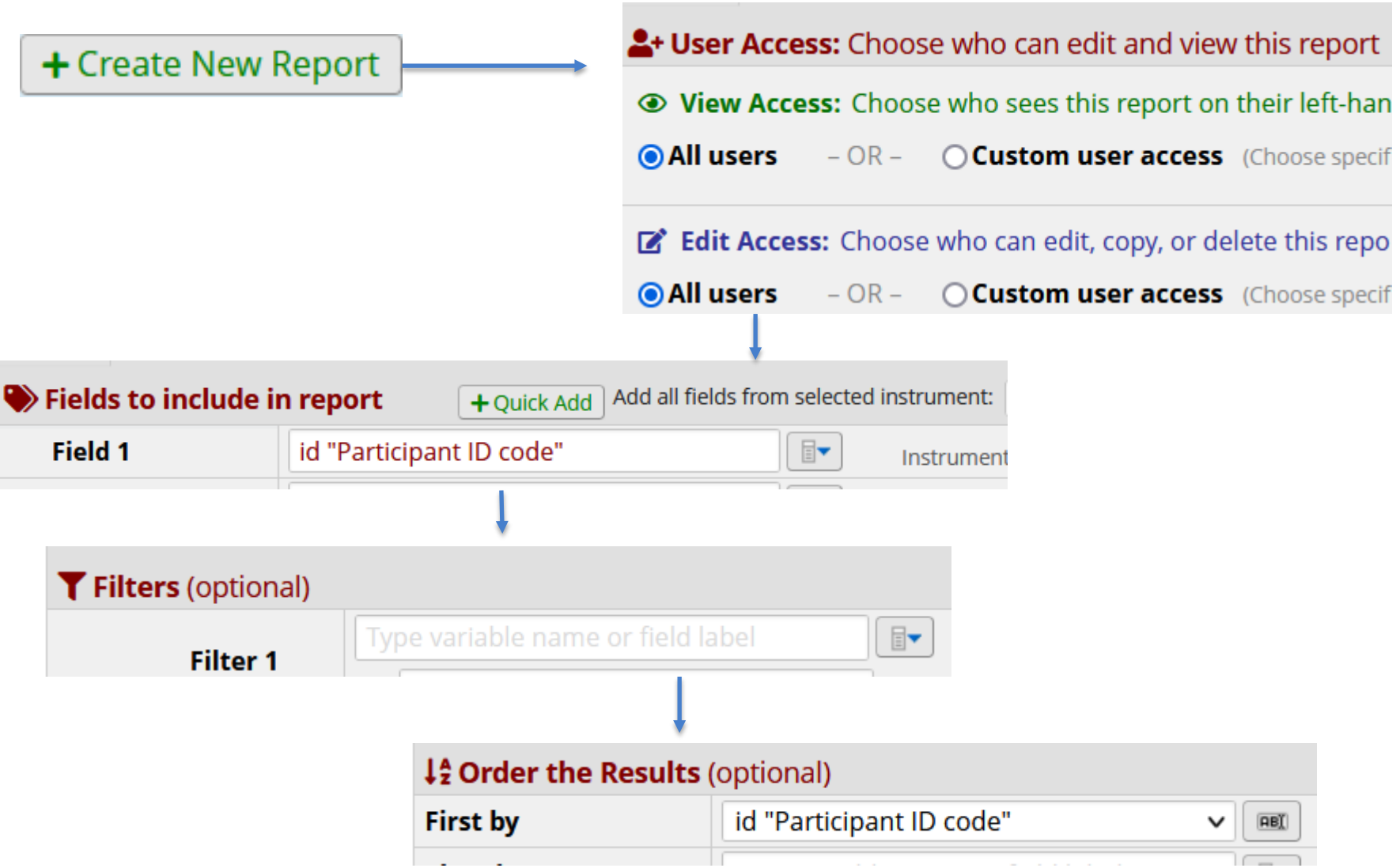
Reports



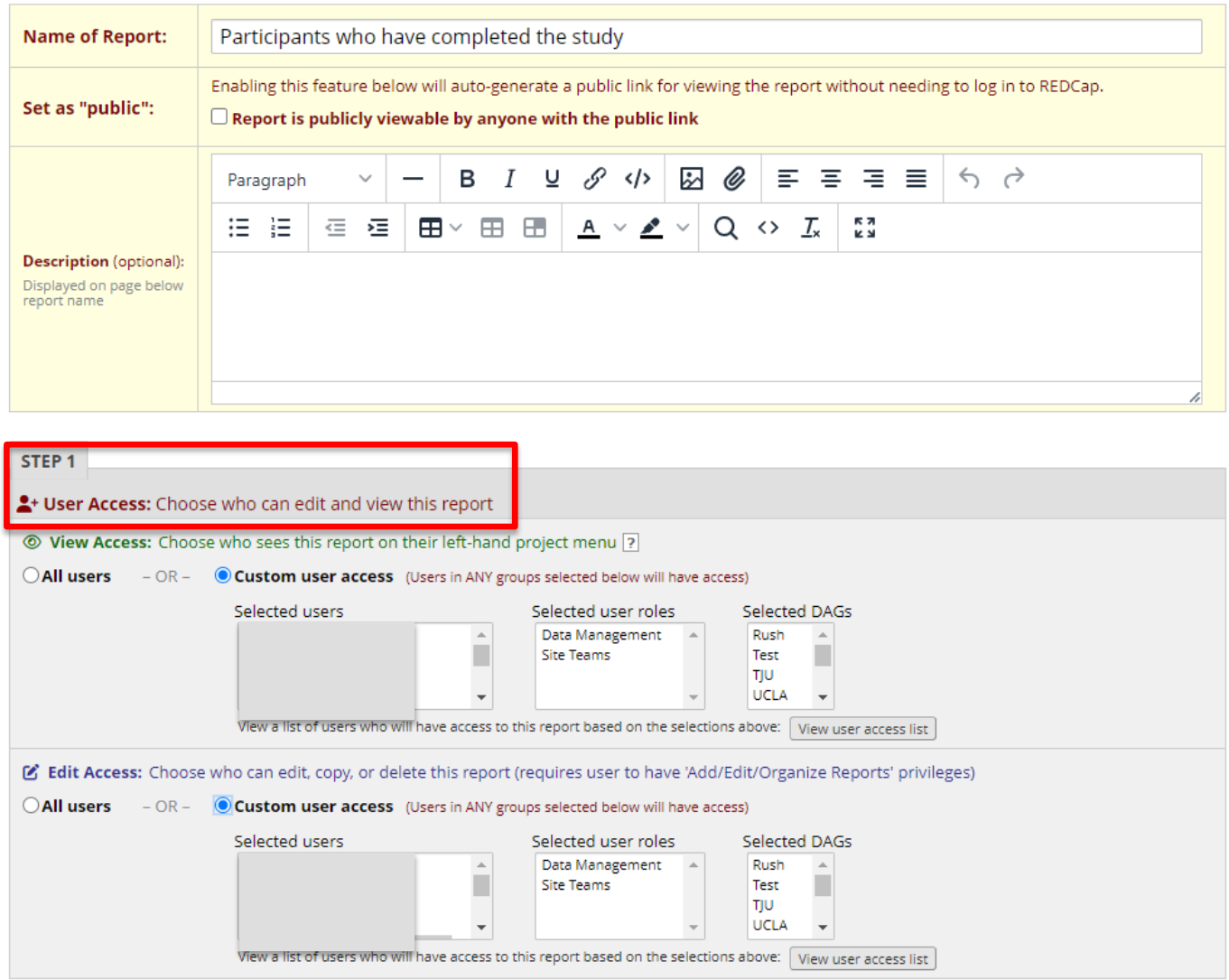
- Good for exporting all data
- Not good for projects with lots of data, events

- Good for selecting subset of instruments and/or events
- Good for further refinement

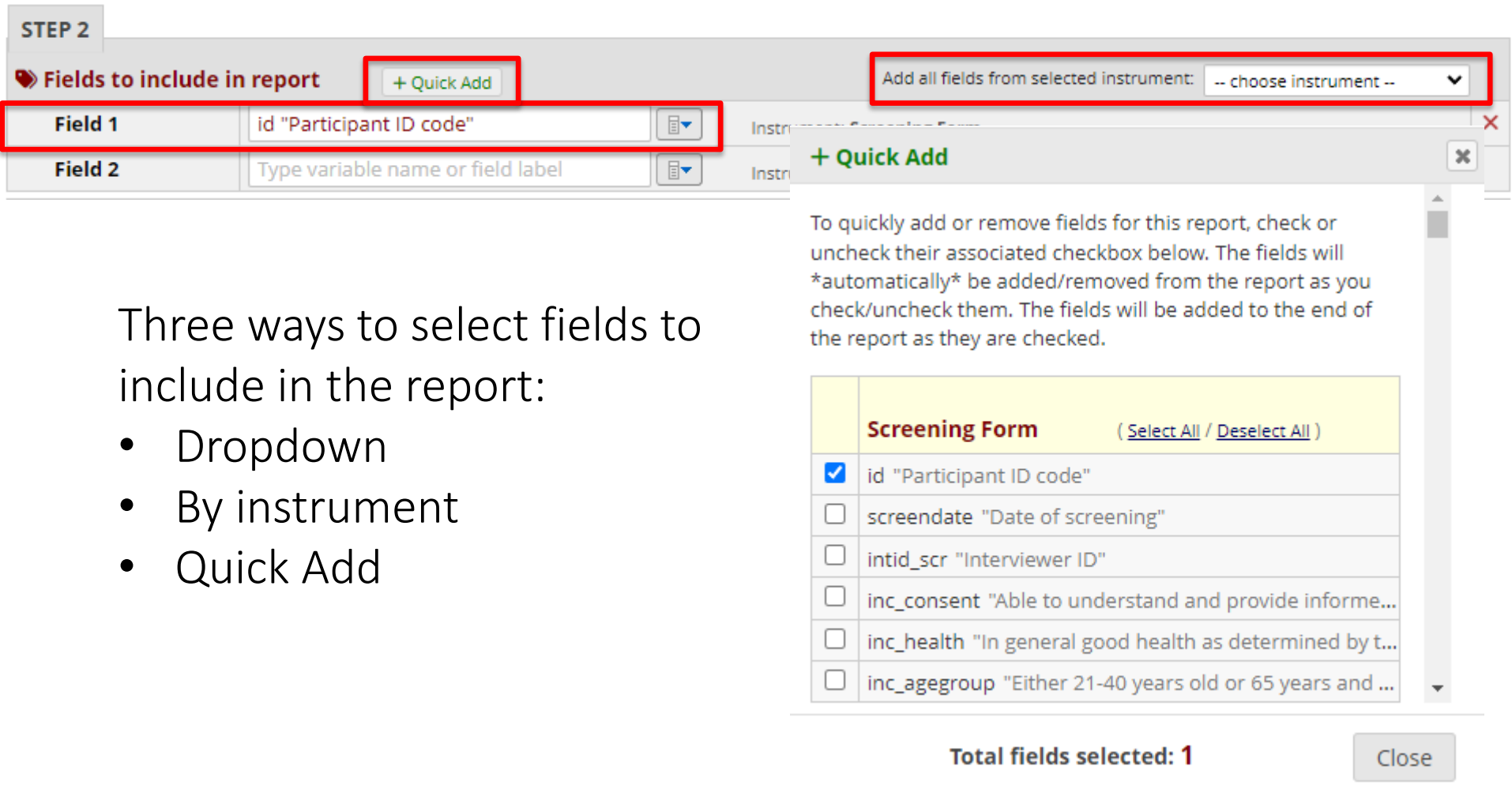
How to create custom reports



Custom Reports
Step 1: Naming and Access



Custom Reports
Step 2: Field Selection



Three ways to select fields to include in the report:

- Dropdown
- By instrument
- Quick Add

Custom Reports
Step 2: Field Selection….options

Additional report options (optional)

- [ ] Include the Data Access Group name for each record (if record is in a group)?
- [ ] 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)
- [x] Include the repeating instance fields (`redcap_repeat_instrument`, `redcap_repeat_instance`) in the report and data export?
- [x] Remove line breaks/carriage returns from all text data values (only applicable for CSV Raw and CSV Label data exports)

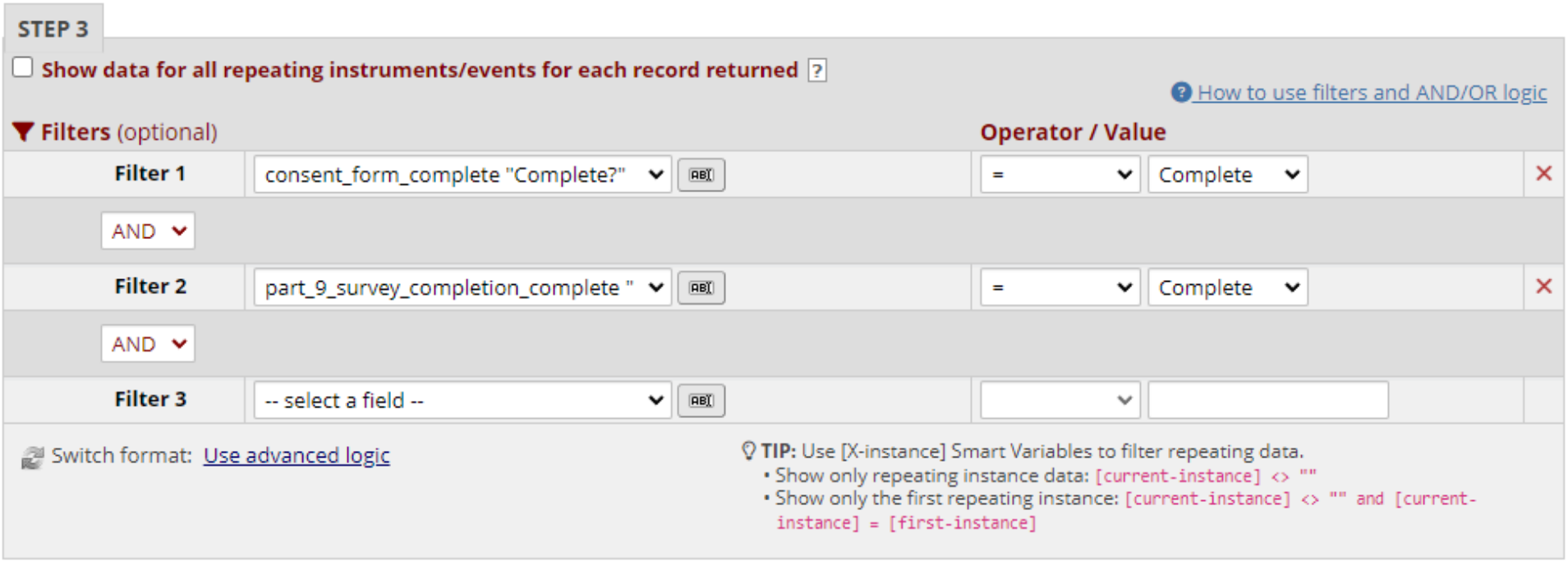
In the report header, display the field label, variable, or both (not applicable for exports)? Both

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

Custom Reports
Step 3: Filters for Classic projects

Example 1: **Classic** project (non-longitudinal)

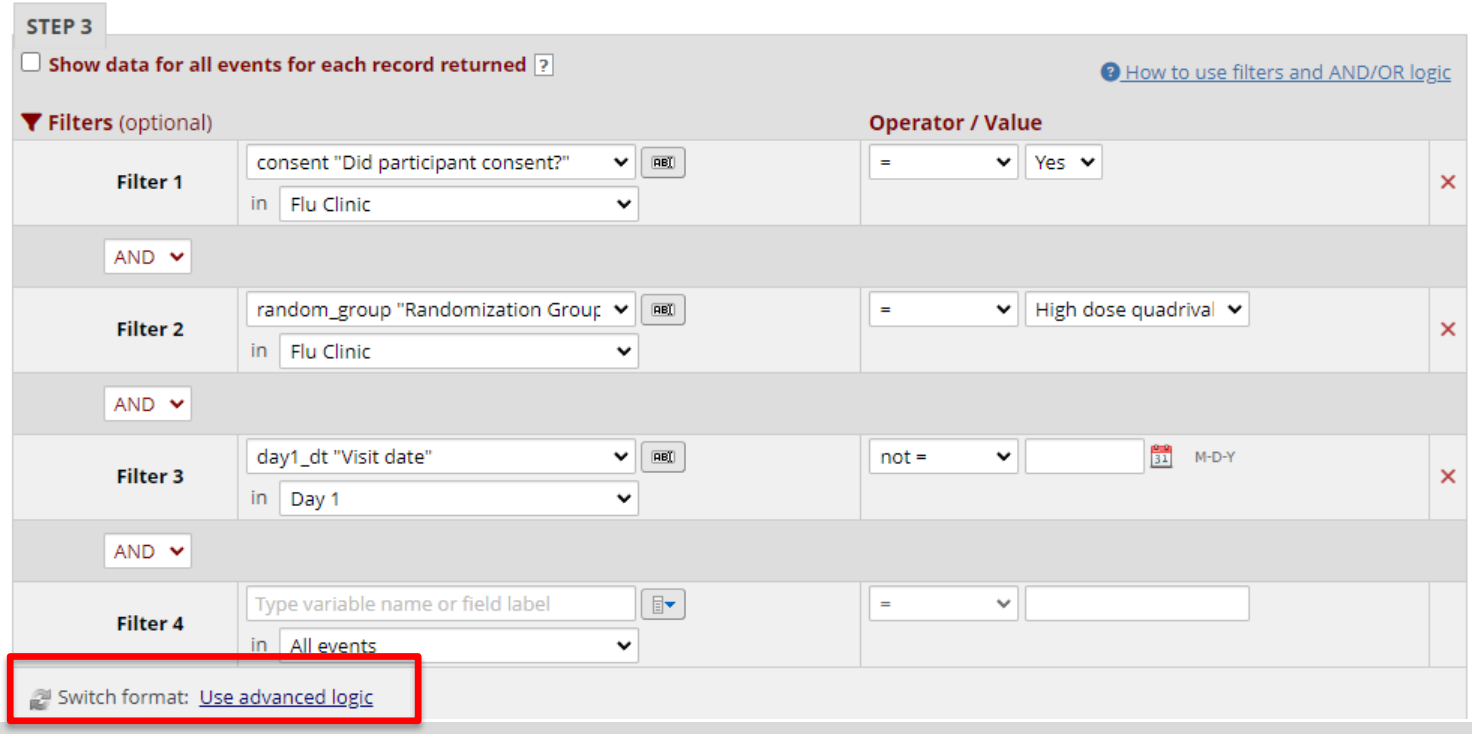
1. Data arranged by records, with one row per record.
2. Choose the field and specify the operator and value for the first filter.
3. Select And/Or for the next filter
4. Choose field and specify the operator and value for the next filter



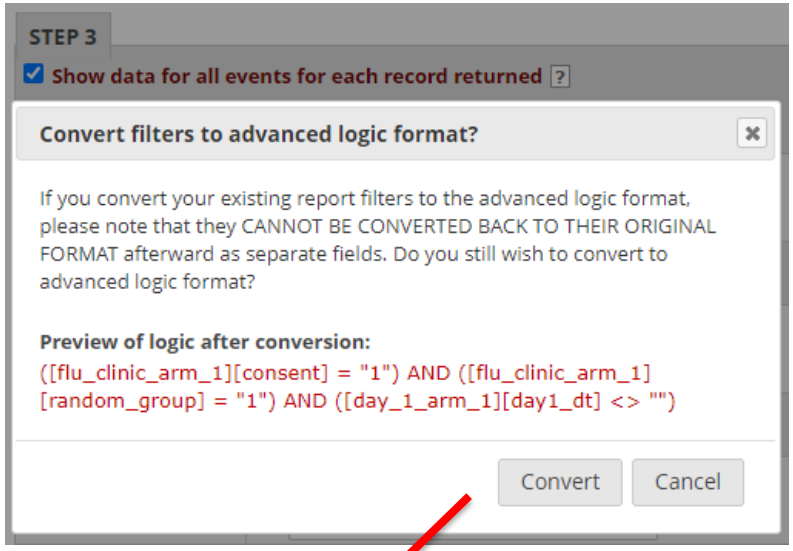
Custom Reports
Step 3: Filters for Longitudinal projects

Example 2: **Longitudinal** project

1. Data arranged by events, with one row per event.
2. Choose the ***event and the field*** before specifying the operator and value for the first filter.
3. Optional: use advanced logic to set up more complex filters



Custom Reports
Step 3: Filters for Longitudinal projects



STEP 3

Show data for all events for each record returned

Filters (optional)

Advanced filter logic: (e.g., [age] > 30 and [sex] = "1") How do I use special functions?

```
([flu_clinic_arm_1][consent] = "1") AND ([flu_clinic_arm_1][random_group] = "1") AND ([day_1_arm_1][day1_dt] <> "")
```

Switch format: Use simple logic (choose fields from list)

Custom Reports
Step 3: Filters for Longitudinal projects

STEP 3

☑ **Show data for all events or repeating instruments for each record returned** ?

Participant ID code id	Event Name redcap_event_name	Date of screening screendate	Did participant consent? consent	Sex at Birth dem_sex	Randomization Group random_group	Visit date day1_dt
15	Flu Clinic	01-30-2022	Yes (1)	Female (0)	High dose quadrivalent (1)	
15	Day 1					06-30-2022
15	Day 2-4 Blood Draw					

STEP 3

☐ **Show data for all events or repeating instruments for each record returned** ?

Participant ID code id	Event Name redcap_event_name	Date of screening screendate	Did participant consent? consent	Sex at Birth dem_sex	Randomization Group random_group	Visit date day1_dt
15	Flu Clinic	01-30-2022	Yes (1)	Female (0)	High dose quadrivalent (1)	
15	Day 1					06-30-2022

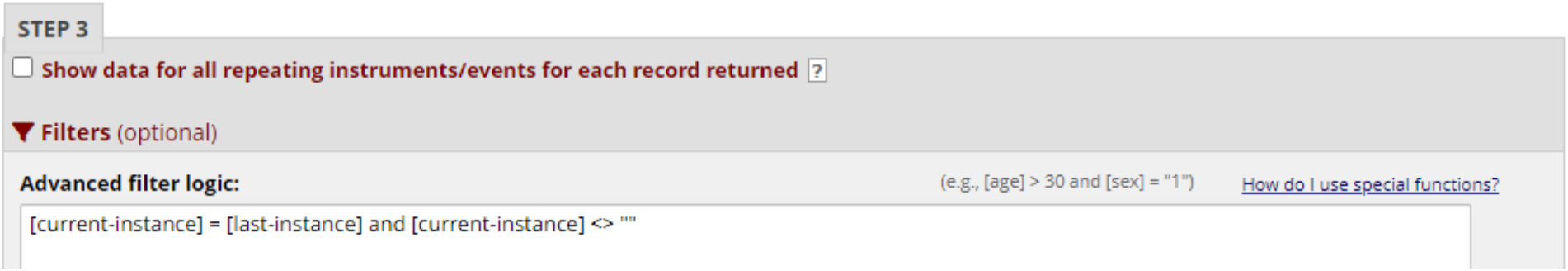
Custom Reports
Step 3: Filters for Repeating forms

Repeating form:

1. Use [X-instance] Smart Variables to filter repeating data
2. Show only the last repeating instance:

   [current-instance] = [last-instance]
3. Show only repeating instance data: [current-instance] <> ""

Example: Include only last instance of call log in the report



Custom Reports
Step 3: Filters for Repeating forms

Filter=[current-instance]=[last-instance]

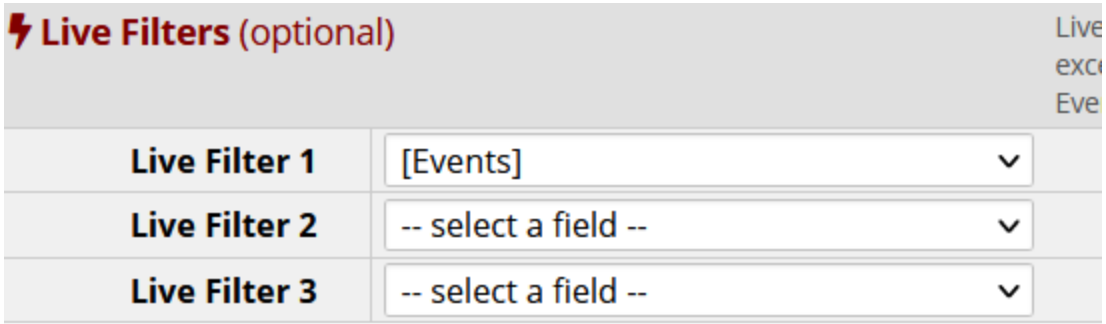
Record ID recordid	Repeat Instrument redcap_repeat_instrument	Repeat Instance redcap_repeat_instance	Contact Attempt Date cont_dt	Contact Method cont_method	Outcome cont_outcome
1					
1	Outreach Log	3	02-13-2024	Phone call (1)	Voicemail full (3)
2					
3					
4					
5					
6					
6	Outreach Log	2	11-29-2023	Phone call (1)	Left VM (2)

Filter=[current-instance]=[last-instance] and [current-instance]<> ""

Record ID recordid	Repeat Instrument redcap_repeat_instrument	Repeat Instance redcap_repeat_instance	Contact Attempt Date cont_dt	Contact Method cont_method	Outcome cont_outcome
1	Outreach Log	3	02-13-2024	Phone call (1)	Voicemail full (3)
6	Outreach Log	2	11-29-2023	Phone call (1)	Left VM (2)
10	Outreach Log	1	02-06-2024	Email (2)	Sent email (6)

Custom Reports: Live Filters

- Dynamically filtering data in real time
- Fields that can be used for live filters: record id, multiple choice fields, events or data access group.



Custom Reports: Live Filters

('records' = total available data across all designated events)

Live filters: [Events]

Subject ID subjectid	**Event Name** redcap_event_name	**Date of Insomnia Severity Index** isi_date	**1. Difficulty falling asleep** isi1	**2. Difficulty staying asleep** isi2	**3. Problems waking up too early** isi3	**4. How SATISFIED/DISSATISFIED are you with your CURRENT sleep pattern?** isi4	**5. How NOTICEABLE to others do you think your sleep problem is in t ... ring the quality of your life?** isi5
51	V0						
51	V1						
51	V2	09-14-2020	Mild (1)	Mild (1)	Mild (1)	Moderately Satisfied (2)	Somewhat (2)
51	V3						
51	V4	01-27-2021	None (0)	Mild (1)	None (0)	Very Satisfied (0)	A Little (1)

Custom Reports: Live Filters

('records' = total available data across all designated events)

Report execution time: 0 seconds

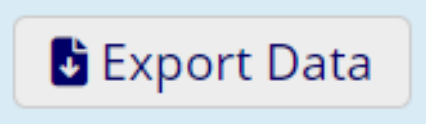
Live filters: V4 Reset

Subject ID subjectid	**Event Name** redcap_event_name	**Date of Insomnia Severity Index** isi_date	**1. Difficulty falling asleep** isi1	**2. Difficulty staying asleep** isi2	**3. Problems waking up too early** isi3	**4. How SATISFIED/DISSATISFIED are you with your CURRENT sleep pattern?** isi4	**5. How NOTICEABLE to others do you think your sleep problem is in t ... ring the quality of your life?** isi5
51	V4	01-27-2021	None (0)	Mild (1)	None (0)	Very Satisfied (0)	A Little (1)
231	V4	05-10-2021	Moderate (2)	Moderate (2)	Moderate (2)	Satisfied (1)	Not at all Noticeable (0)

Questions?

Data Export

Data Export Formats



Data can be exported to Excel, SAS, R, SPSS, STATA, XML.

- Options to remove identifiers from data export.

Select your export settings, which includes the export format (Excel/CSV, SAS, SPSS, R, Stata) and if you wish to perform de-identification on the data set.

Choose export format

- CSV / Microsoft Excel (raw data)
- CSV / Microsoft Excel (labels)
- SPSS Statistical Software
- SAS Statistical Software
- R Statistical Software
- Stata Statistical Software
- CDISC ODM (XML)

De-identification options (optional)

The options below allow you to limit the amount of sensitive information that you are exporting out of the project. Check all that apply.

Known Identifiers:
- Remove all tagged Identifier fields (tagged in Data Dictionary)
- Hash the Record ID field (converts record name to an unrecognizable value)

Free-form text:
- Remove unvalidated Text fields (i.e. Text fields other than dates, numbers, etc.)
- Remove Notes/Essay box fields

Date and datetime fields:
- Remove all date and datetime fields

— OR —
- Shift all dates by value between 0 and 364 days (shifted amount determined by algorithm for each record) What is date shifting?
  - Also shift all survey completion timestamps by value between 0 and 364 days (shifted amount determined by algorithm for each record)

Deselect all options

Apply live filters?

One or more live filters have been selected on this report. Do you wish to apply the live filters to the data export, thus producing the same data set that you currently see displayed on the report?

- Apply live filters selected on this report

Advanced data formatting options

Set CSV delimiter character
Set the delimiter used to separate values in the CSV data file (only valid for CSV Raw Data and CSV Labels export formats):

, (comma) - default

Force all numbers into a specified decimal format?
You may choose to force all data values containing a decimal to have a specified decimal character (comma or period/full stop). This will be applied to all calculations and number-validated text values in the export file.

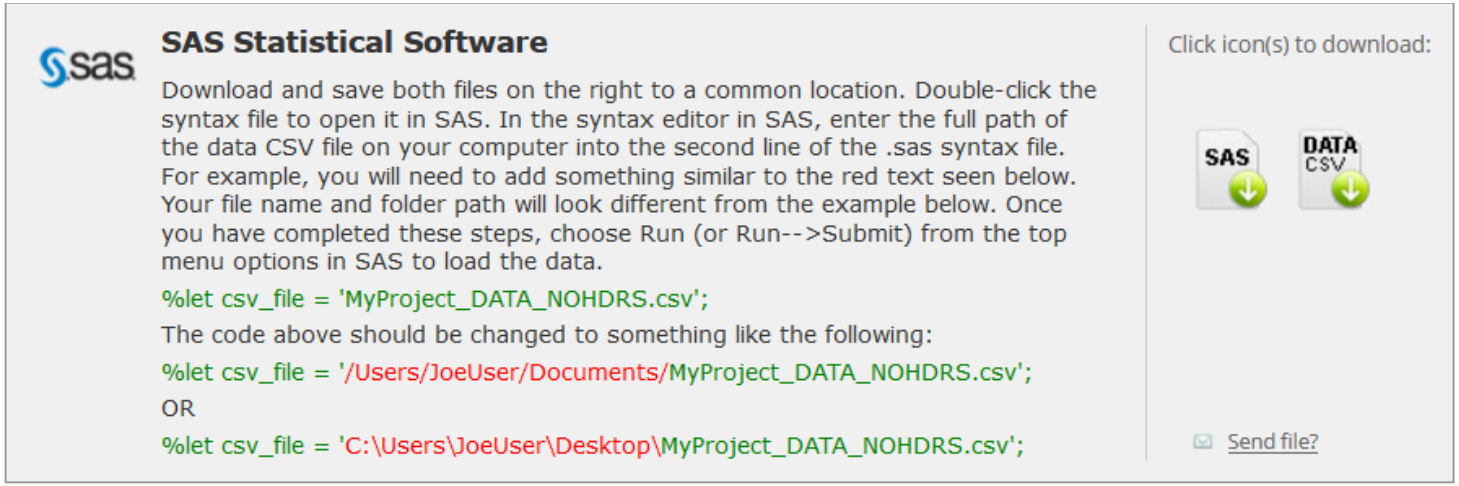
Use fields' native decimal format (default)

NOTE: Your data formatting selections above will be remembered in the future and will be pre-selected upon your next export.

Exporting data to statistical program

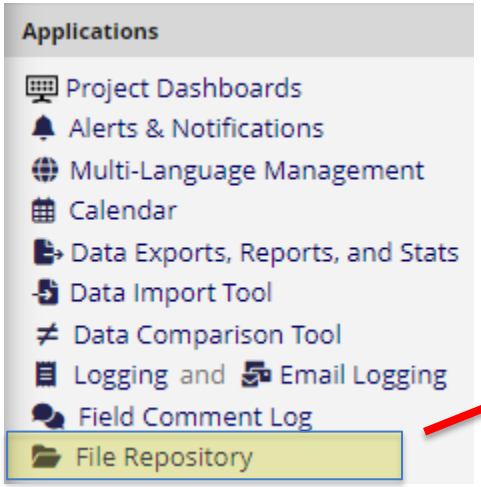
When exporting data to statistical program, REDCap will generate a syntax file and a CSV data file!

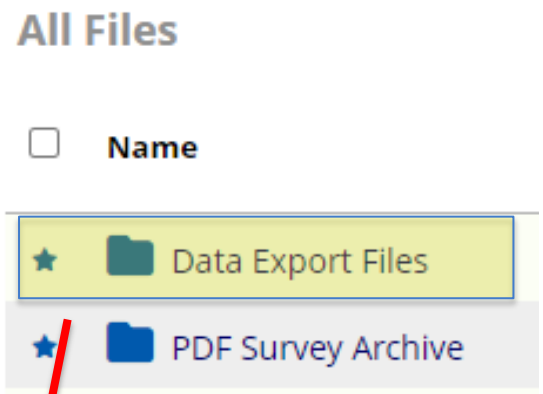
1. Download and save both files to a common location;
2. Follow the instructions on the data export page to add the location of the CSV data file to the syntax file;
3. Run the code to import the data to the statistical program



Data Export Files

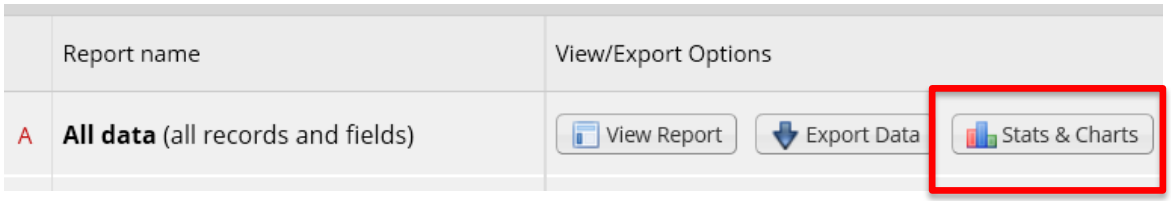
Whenever an export is created, your export is saved in the File Repository

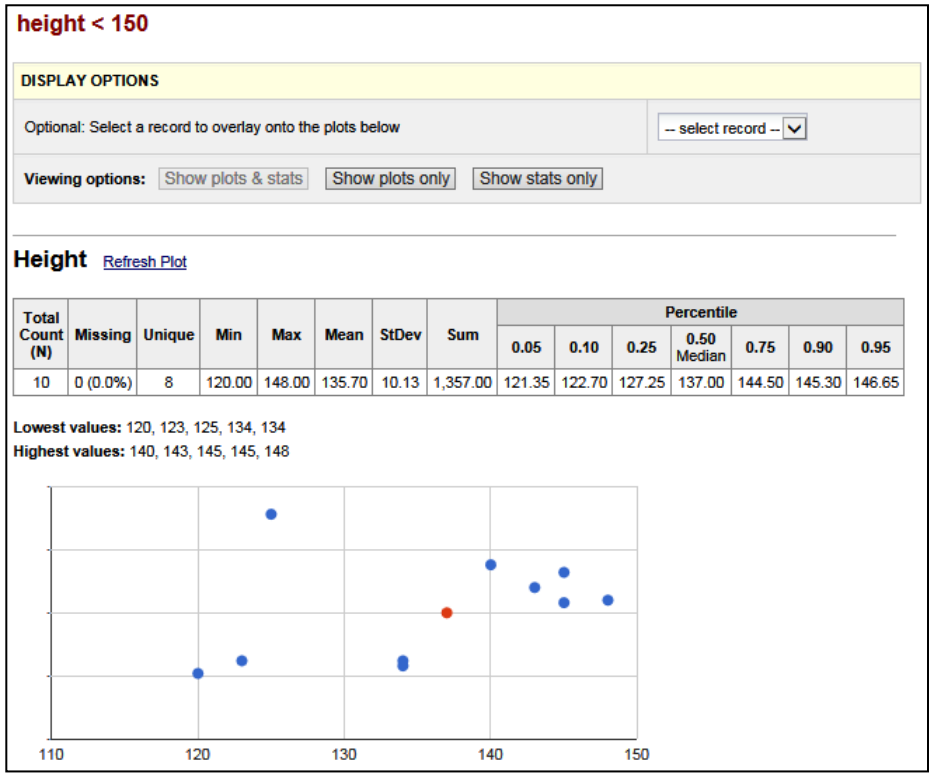




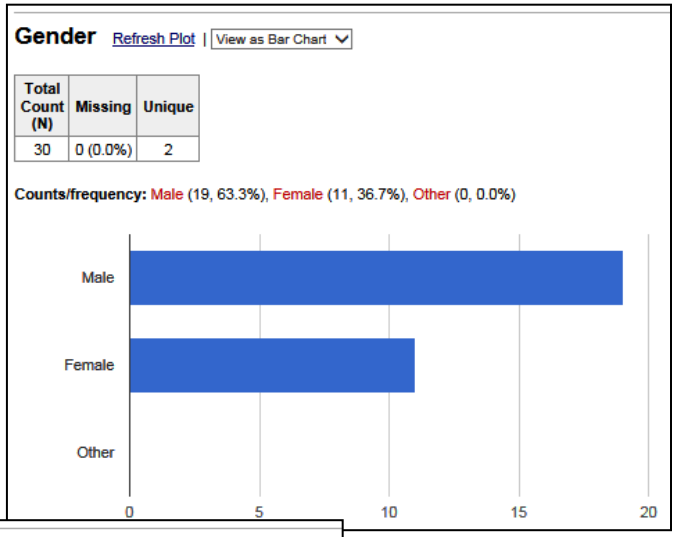
Stats and Charts

Stats and Charts

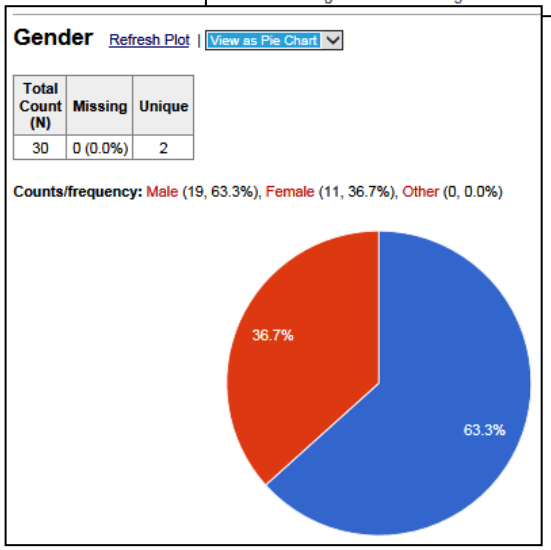




Total Count (N)	Missing	Unique	Min	Max	Mean	StDev	Sum	Percentile						
								0.05	0.10	0.25	0.50 Median	0.75	0.90	0.95
10	0 (0.0%)	8	120.00	148.00	135.70	10.13	1,357.00	121.35	122.70	127.25	137.00	144.50	145.30	146.65



Total Count (N)	Missing	Unique
30	0 (0.0%)	2



Total Count (N)	Missing	Unique
30	0 (0.0%)	2

Using Aggregate Functions in Reports

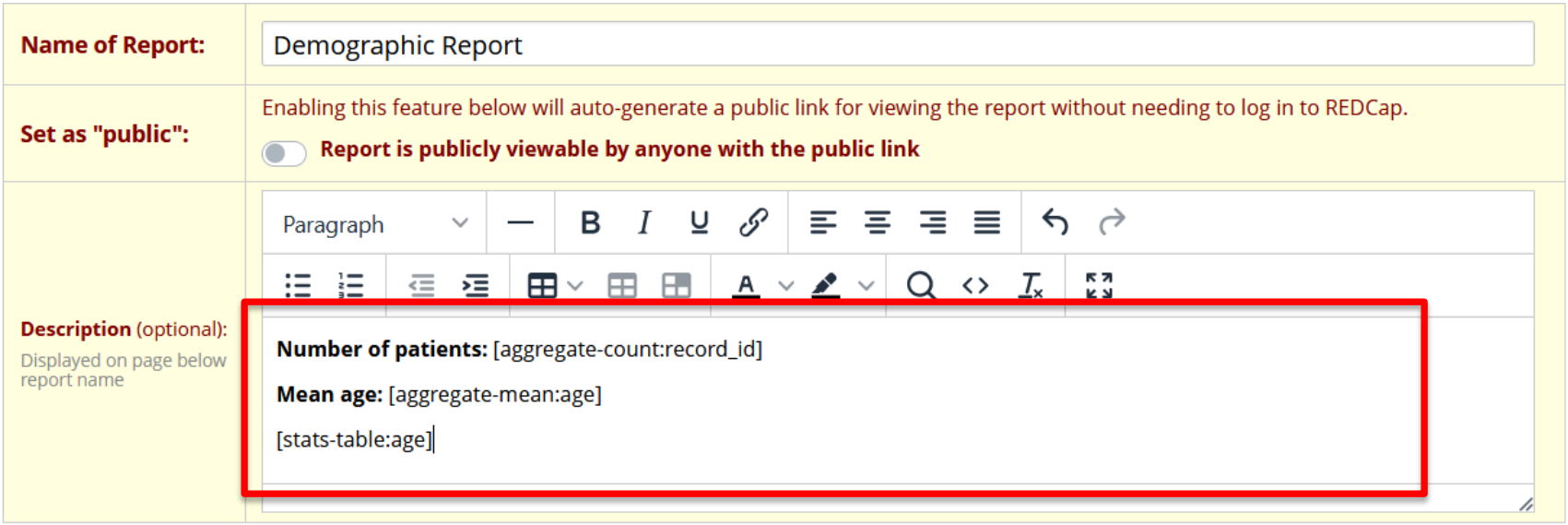
What are Aggregate Functions

[ϟ] Smart Variables

Smart Variables

Name of Smart Variable	Description	Example of Usage	
		Example input	Example output
Aggregate Functions, Charts, and Tables (also known as Smart Functions, Smart Charts, and Smart Tables)		VIDEO: How to use Smart Charts, Functions, and Tables (14 min)	
[aggregate-min:fields:parameters]	The minimum value of a field across all records in the project (including all events and/or repeating instances in all records). Multiple fields may be used and must be comma-separated.	[aggregate-min:age]	13
		[aggregate-min:age,participant_age,other_age]	7
[aggregate-max:fields:parameters]	The maximum value of a field across all records in the project (including all events and/or repeating instances in all records). Multiple fields may be used and must be comma-separated.	[aggregate-max:age]	95
[aggregate-mean:fields:parameters]	The mean/average value of a field across all records in the project (including all events and/or repeating instances in all records). Multiple fields may be used and must be comma-separated.	[aggregate-mean:age]	100.1
[aggregate-median:fields:parameters]	The median value of a field across all records in the project (including all events and/or repeating instances in all records). Multiple fields may be used and must be comma-separated.	[aggregate-median:age]	57

Using Aggregate Functions in Report



Using Aggregate Functions in Report

Demographic Report

Number of patients: 8

Mean age: 46.67

	Count	Missing	Unique	Min	Max	Mean	Median	StDev	Sum
Age	6	2	3	30	60	46.67	50	13.66	280

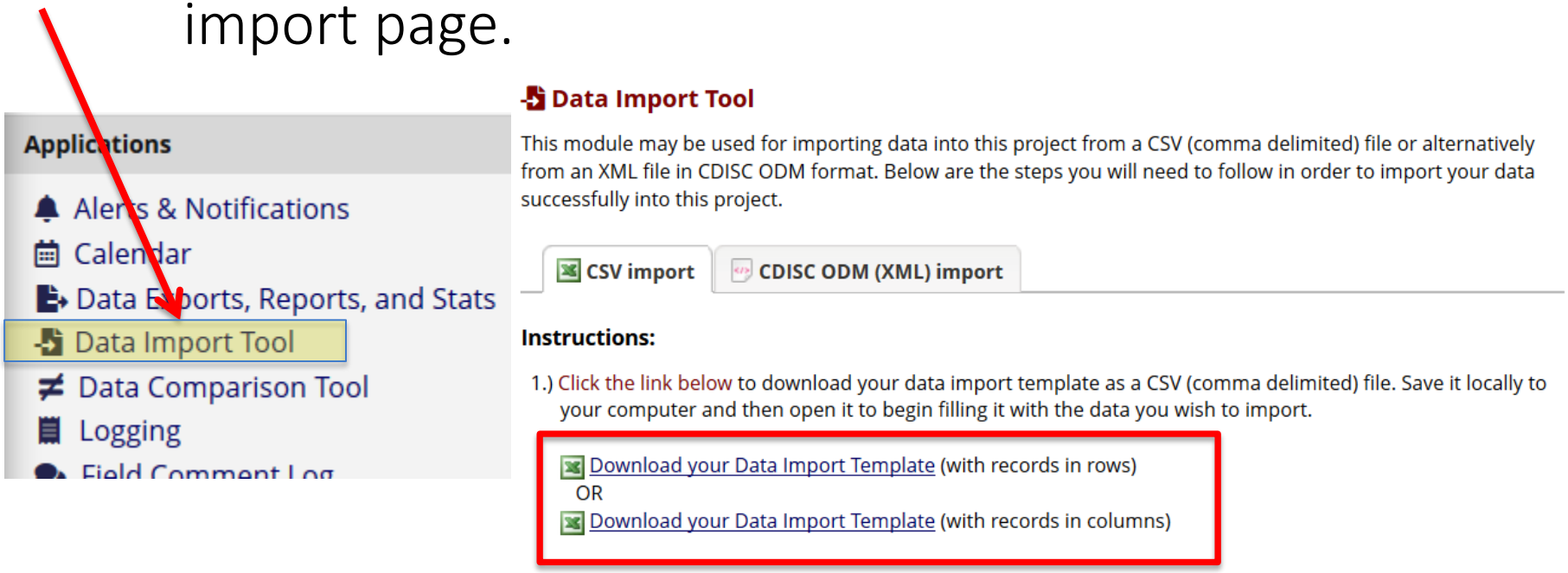
Export table (CSV)

Record ID record_id	**Event Name** redcap_event_name	**Age** age	**Gender** gender	**Race** race	**Contact Method (Check all that apply)**		
					Phone contact_method___1	**Email** contact_method___2	**Mail** contact_method___3
1	Event 1	30	Female (1)	White (5)	Checked (1)	Checked (1)	Checked (1)
2	Event 1	30	Male (2)	Black or African American (4)	Checked (1)	Checked (1)	Unchecked (0)
3	Event 1	50	Female (1)	Native Hawaiian or Other Pacific Islander (3)	Checked (1)	Checked (1)	Checked (1)
4	Event 1	60	Male (2)	Asian (2)	Checked (1)	Checked (1)	Checked (1)
5	Event 1		Female (1)	American Indian/Alaska Native (1)	Checked (1)	Checked (1)	Checked (1)
6	Event 1		Male (2)	Asian (2)	Unchecked (0)	Checked (1)	Checked (1)
7	Event 1	50	Female (1)	Native Hawaiian or Other Pacific Islander (3)	Checked (1)	Checked (1)	Checked (1)
8	Event 1	60	Male (2)	Asian (2)	Checked (1)	Checked (1)	Checked (1)

QUESTIONS?

Data Import

1. Download data import template from the data import page.

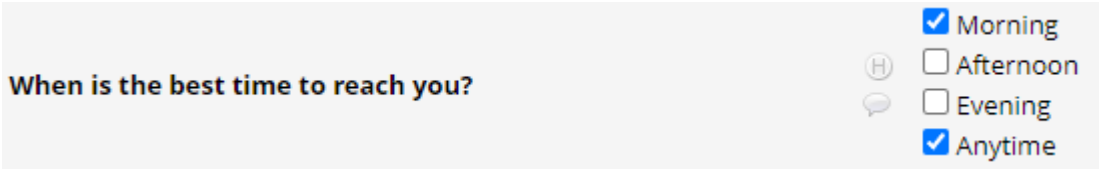


How to import data to project

2. Insert the data for each record that you wish to import into the template. Once all your data has been added, save the file.

   → All multiple-choice fields (e.g., dropdown, radio) must have the raw coded value (rather than the choice label)

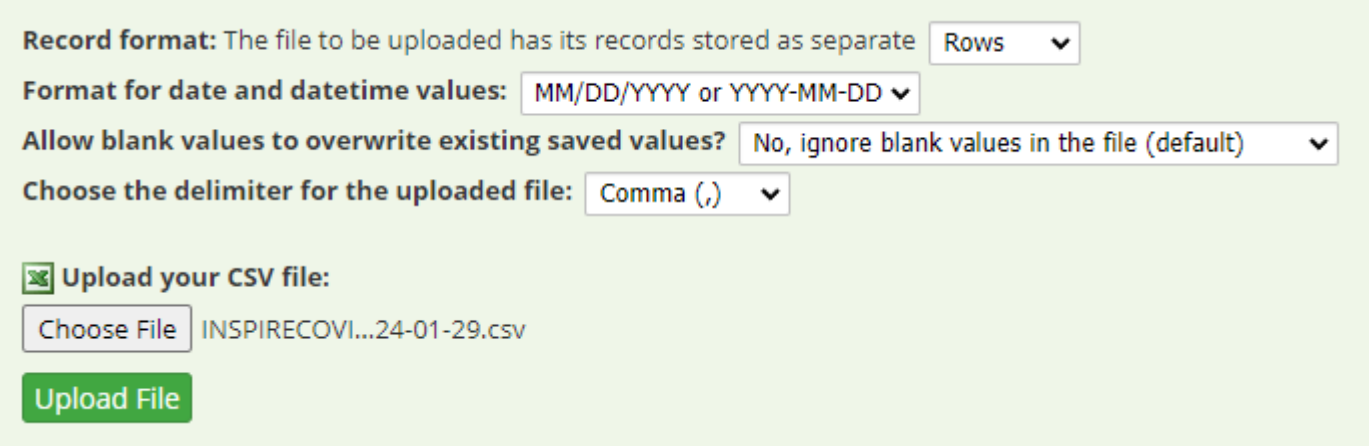
   → Checkbox fields



EC	ED	EE	EF
contact_best___1	contact_best___2	contact_best___3	contact_best___4
1	0	0	1

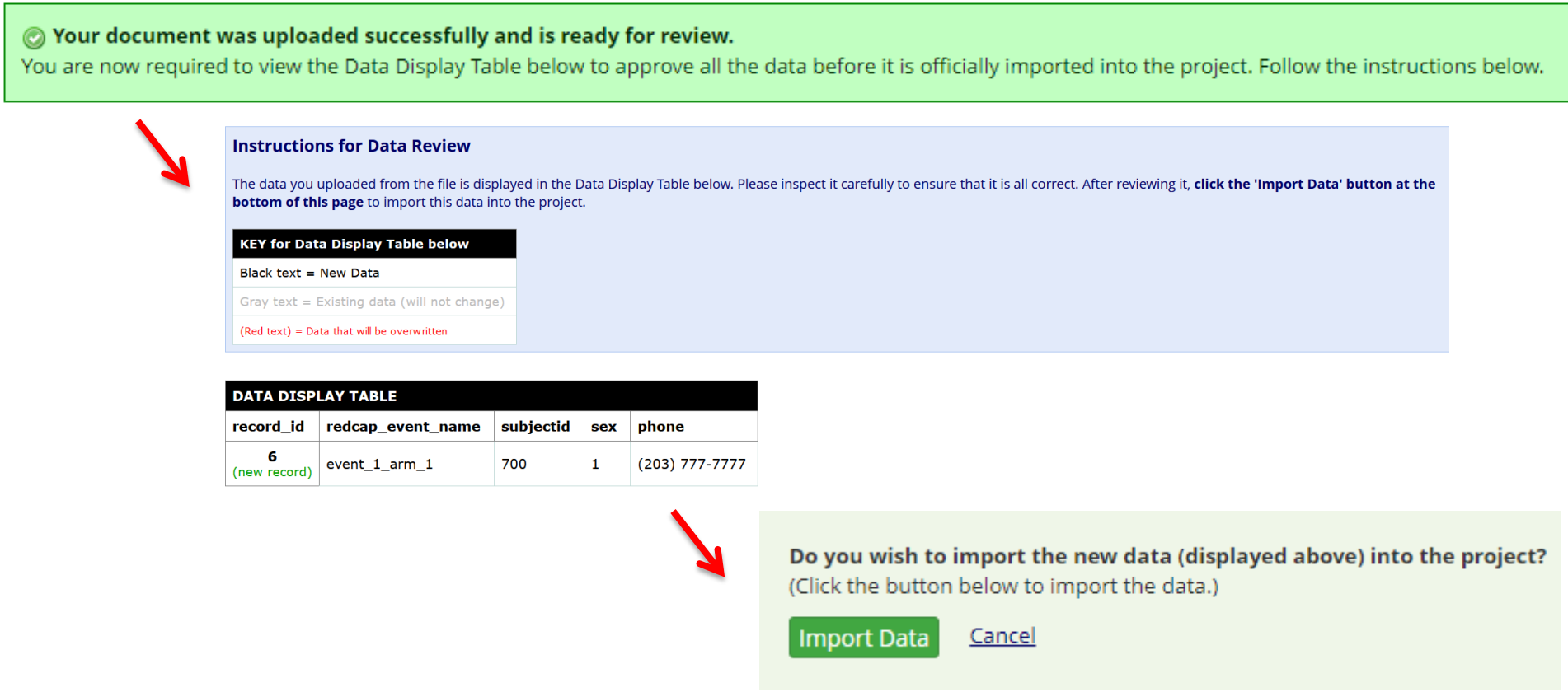
How to import data to project

3. Delete any empty columns or rows to save processing time.
4. Follow the instructions to upload the file.



How to import data to project

5. Once the file is uploaded, the data will be displayed and checked for errors before it is imported.



Data Import: Longitudinal Projects

Longitudinal projects

- Must include 'redcap_event_name' field in your data import file. A list of unique event names can be found on the define my event page.
- redcap_event_name can be found on the 'Define My Events' page

Define My Events

	Event #	Days Offset	Offset Range Min / Max	Event Name	Custom Event Label (optional)	Unique event name (auto-generated)
	1	1	-0/+0	Event 1		event_1_arm_1
	2	2	-0/+0	Event 2		event_2_arm_1
	3	3	-0/+0	Event3		event3_arm_1

	A	B	C	D	E	F	G
1	record_id	redcap_event_name	age	screening_sex	race	test_date1	test_form_complete
2	5	event_1_arm_1	50	2	5	3/18/2020	2

Data Import: Repeating forms

Repeating forms

- Must include ‘redcap_repeat_instrument’ and ‘redcap_repeat_instance’ fields in the import file.
- Repeat instrument name can be found in the codebook and the repeat instance is the instance number of your data.

Codebook:

	#	Variable / Field Name	Field Label *Field Note*
Instrument: **Test form** (test_form)			
	1	record_id	Record ID

CSV file to be imported:

	A	B	C	D	E	F	G	H	I
1	record_id	redcap_event_name	redcap_repeat_instrument	redcap_repeat_instance	age	screening_sex	race	test_date1	test_form_complete
2	1	event_1_arm_1	test_form	2	50	2	5	3/18/2020	2

Data Import: Repeating forms

If importing repeating instances for a repeating event or repeating instrument, you may auto-number the instances by providing a value of 'new' for the 'redcap_repeat_instance' field in the dataset you are importing.

- This is useful because it allows you to import such data without the need to determine how many instances already exist for a given repeating event/instance prior to the import.

Data Import:
Data Access Groups

Data Access Groups

When importing new record, you can assign data access groups to your records. Include the 'redcap_data_access_group' field with your data import. A list of data access group names can be found on the data access group page.

DAGs

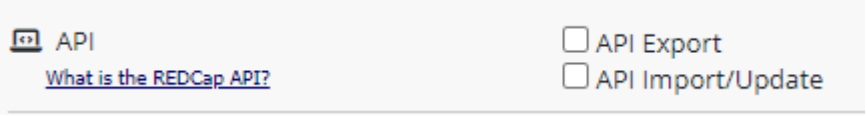
Data Access Groups	Users in group	Number of records in group	Unique group name (auto-generated)	Group ID number	Delete group?
test1		1	test1	2292	✖
test2		1	test2	2293	✖

	A	B	C	D	E	F	G	H
1	record_id	redcap_event_name	redcap_data_access_group	age	screening_sex	race	test_date1	test_form_complete
2	2292-1	event_1_arm_1	test1	50	2	5	3/18/2020	2

QUESTIONS?

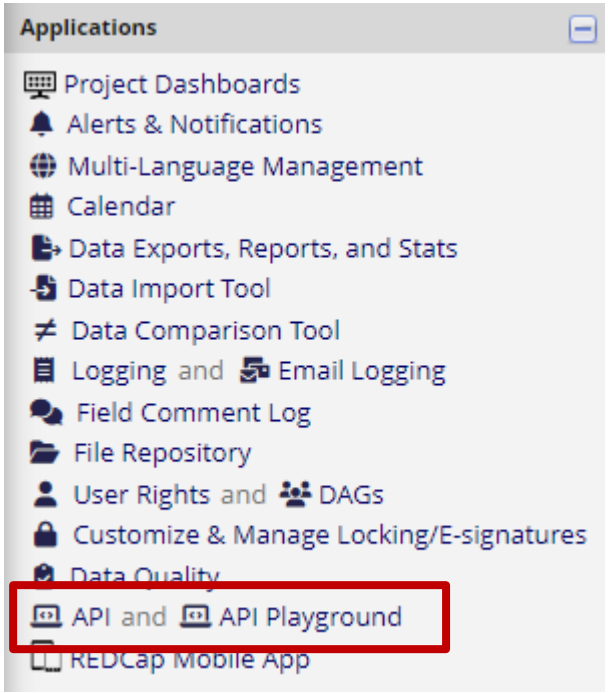
REDCap API (Application Programming Interface)

- REDCap API is an interface that allows external applications to connect to REDCap remotely
- Can be used for automated data imports/exports from a specified REDCap project
- API Token
  - Rather than using username/passwords, the REDCap API uses tokens as a means of secure authentication.
  - A token must be included in every API request.
  - Each user will have a different token for each REDCap project to which they have access.
  - Enable API Export/Import rights before requesting API token.



REDCap API:
API Playground

The API playground is an interface that lets you experiment with the REDCap API without writing code.



- You can explore all the different API methods and their various options to customize a given API request

- You may even execute a real API request and see the exact response that REDCap returns from the request

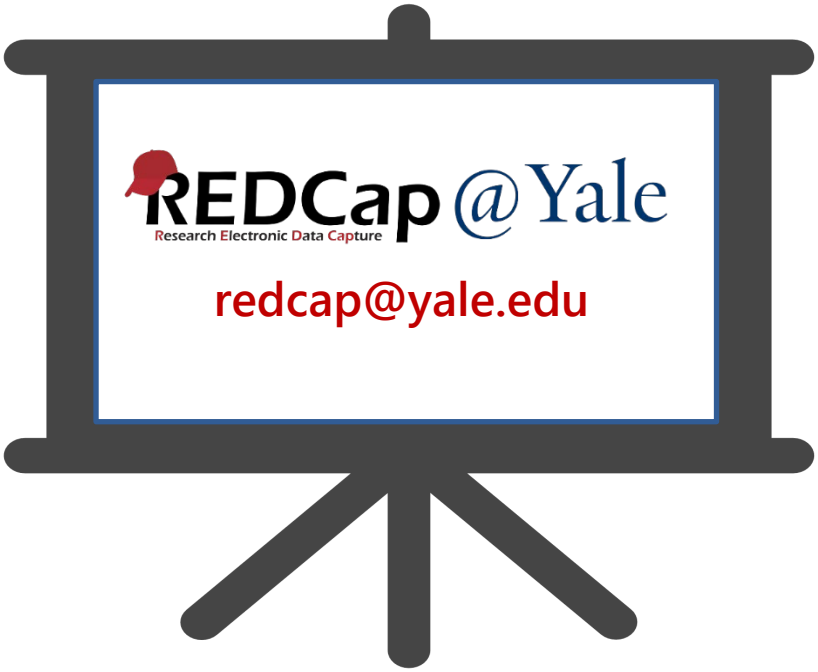
- Example codes can be downloaded from API documentation page

Resources on REDCap@Yale Website

https://portal.redcap.yale.edu/resources/frequently-asked-questions

QUESTIONS?

REDCap@Yale Team



Top Row
Denise Acampora
Katy Araujo
Peter Charpentier
Brian Funaro
Mary Geda

Bottom Row
Dana Limone
Janet Miceli
Jesse Reynolds
Baylah Tessier-Sherman
Sui Tsang

Thank You!

Further Questions: Contact us at REDCap@yale.edu

Extra Slides

Other Export Options

- Export entire project as REDCap XML file (containing metadata & data)
- ZIP file of uploaded files (all records)
- PDF of data collection instruments containing saved data (all records)

+ Create New Report | My Reports & Exports | Other Export Options

Below are some additional export options that are available for your project. Instructions for each type of export are provided. You may click the corresponding icon on the right to download the file for each.

Export entire project as REDCap XML file (containing metadata & data)

The entire project (all records, events, arms, instruments, fields, and project attributes) can be downloaded as a single XML file, which is in CDISC ODM format (ODM version 1.3.1). This XML file can be used to create a clone of the project (including its data, optionally) on this REDCap server or on another REDCap server (it can be uploaded on the Create New Project page). Because it is in CDISC ODM format, it can also be used to import the project into another ODM-compatible system.

REDCap XML

ZIP file of uploaded files (all records)

Uploaded files for all records in this project may be downloaded in a single ZIP file. This file contains any files uploaded for 'File Upload' fields/questions on a survey or data entry form. The ZIP file will contain a folder of all the files organized by record name and variable/field name and also contains an index.html file that serves as a table of contents for all the files. After downloading the ZIP file, extract all the files/folders to a directory on your local computer, after which you may double-click the index.html file inside to view a listing of the files using your web browser, or you may view the files directly by looking in the 'documents' folder. Click the icon to the right to begin downloading the ZIP file.

Note: If your project has a large amount of 'File Upload' fields/questions or records/responses, the resulting ZIP file may be very large in file size. Please be patient if the file takes time to download.

ZIP

PDF of data collection instruments containing saved data (all records)

The data for all records in this project may be downloaded in a single PDF file. This file contains the actual page format as you would see it on the data entry page or survey and includes all data for all records for all data collection instruments. Click the icon to the right to begin downloading the file. Also, you may optionally click the Compact option to download a PDF that excludes fields that have no data saved and excludes unselected multiple choice options. (Note: Section headers and descriptive fields will still be included.)

Note: If your project has a large amount of fields/questions or records/responses, the resulting PDF file may be very large both in file size and in page length. Please be patient if the file takes time to

PDF

Compact PDF