

# Scientific Computing and Data Research Data Services

## Introduction to REDCap

<https://redcap.mountsinai.org>

Priscilla Acquaye— REDCap Administrator



Icahn  
School of  
Medicine at  
**Mount  
Sinai**

## Introduction – Team Members



**Patricia Kovatch**

Professor and Dean for  
Scientific Computing and Data



**Ranjini Kottaiyan**

Senior Director,  
Finance & Research Engagement



**Priscilla Acquaye**

REDCap Analyst



**Catherine Bauer-Martinez**

REDCap Analyst



**Farhan Mahmood**

IT Director



**Jing Yang, PhD**

Applications Support Analyst

# Acknowledgements



## Acknowledge CTSA:

An acknowledgement of support from the Icahn School of Medicine at Mount Sinai and the Clinical and Translational Science Awards (CTSA) grant UL1TR004419 from the National Center for Advancing Translational Sciences should appear in a publication of any material, whether copyrighted or not, based on or developed with Mount Sinai-supported computing resources:

Please use the following acknowledgement in your publications:

**“This work was supported in part through the computational and data resources and staff expertise provided by Scientific Computing and Data at the Icahn School of Medicine at Mount Sinai and supported by the Clinical and Translational Science Awards (CTSA) grant ULTR004419 from the National Center for Advancing Translational Sciences.”**

## Acknowledge Scientific Computing and Data:

All publications must include the following language in the acknowledgments section:

**“This work was supported in part through the Mount Sinai Data Warehouse (MSDW) resources and staff expertise provided by Scientific Computing and Data at the Icahn School of Medicine at Mount Sinai.”**

# Your Publications

## Report publications to Scientific Computing and Data:

All publications that resulted from Scientific Computing and Data resources and services, including Leaf and ATLAS, should be reported annually.

**To report your publications, submit them here:** <https://redcap.link/a21haj0q>

For 20 or more publications, please email Maria Castro at [mariajulia.castro@mssm.edu](mailto:mariajulia.castro@mssm.edu)

# Overview

## ▶ **Creating your REDCap account**

## ▶ **Project Setup**

- Templates
- Project page
- Longitudinal Studies
- Online Designer
  - Surveys
  - Variables
- Obtaining Data

## ▶ **Data Management**

## ▶ **Managing Users**

## ▶ **Project Life Cycle**

# REDCap at Mount Sinai

- ▶ **Research Electronic Data Capture** – It was created in 2004 at Vanderbilt University for the purpose of supporting a small group of researchers who needed a secure data collection tool
- ▶ **21 CFR Part 11 compliant** – joint effort by Scientific Computing, IT, IRB and Privacy Offices
- ▶ **Data resources and integration between existing systems**
  - Import clinical data into REDCap from Epic (over 1800 mapped fields)
    - Basic Demographics
    - Conditions/Problems list
    - Medications
    - Vital signs
    - Laboratory Results (lab results where LOINC code is stored in Epic)
  - Submit requests to <https://bit.ly/3guXoag>
- ▶ **We host more than 10,000 databases, with over 18,000 active users**
- ▶ **Services for project building, data protection, support, and training**

## Digital Concierge Service

Virtual REDCap Office Hours: Wednesdays at 3:30pm to 4:30pm

- Open to all users

- Get help with specific project questions

Every Wednesday from 3:30 p.m. – 4:30 p.m. (ET): [Click here to register and join](#)

You can also get help with other services such as: DTP Academic Technology, HPC, MSDW, Self-service Cohort Query Tools, eRAP, Data Ark Data Commons, DTP Cybersecurity, and Levy Library Resources and Services

Additionally we plan on opening an extra day once a month to accommodate users who cannot attend on Wednesdays.

# Creating a REDCap Account

## Mount Sinai Users:

- ▶ Mount Sinai faculty, students and staff can log into REDCap using their regular Mount Sinai username and password here: <https://redcap.mountsinai.org>

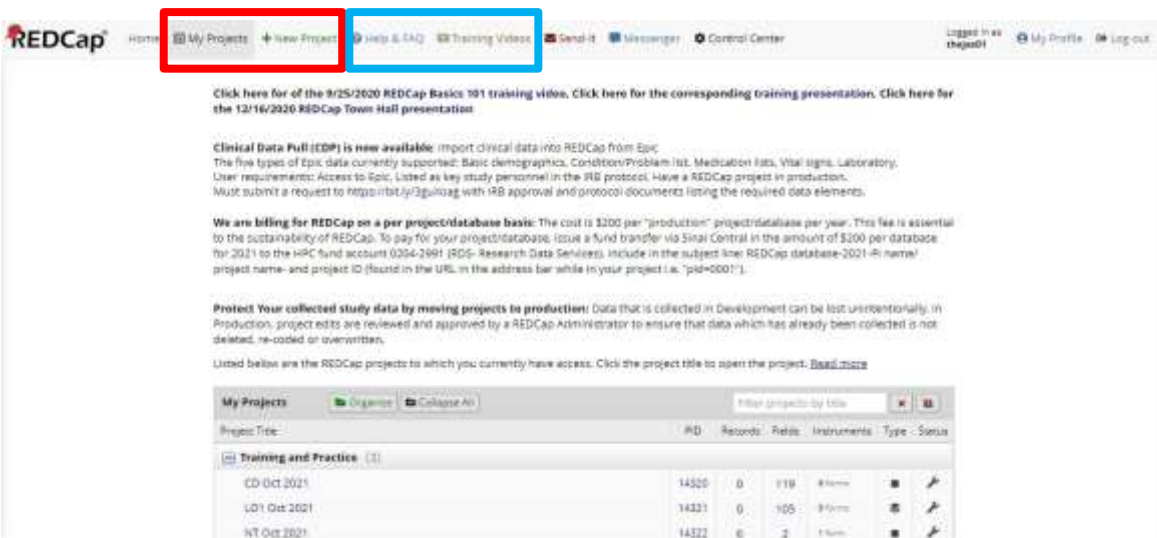
## External Users:

- ▶ For external collaborators without Mount Sinai credentials, the PI or their delegate must request Mount Sinai credentials via SailPoint: <https://sailpoint.mountsinai.org/>



# Creating a New Project

- ▶ Users can find the projects they have access to under **My Projects** at the top of the page. These are projects they've been added to or have created.
- ▶ To create a project, click on the adjacent **New Project** button.
- ▶ Along the top bar, users will also find great resources under **Help & FAQ** as well as **Training Videos** for learning to use REDCap.



# Creating a New Project Cont'd

- ▶ When creating a new project, users can fill out **project details** and the type of research that will be conducted
- ▶ On the same page are **templates** for getting started on a new project

**+ Create a new REDCap Project**

You may begin the creation of a new REDCap project on your own by completing the form below and clicking the Create Project button at the bottom.

**Project title:**   
Title to be displayed on project webpage

**Purpose of this project:**   
How will it be used?

**Name of P.I. (if applicable):**    
First name MI Last name

**Email of P.I. (if applicable):**

**Name of P.I. as cited in publications (if applicable):**  (e.g., Harris PA)

**IRB number (if applicable):**

**Please specify:**

- ☐ Basic or bench research
- ☒ Clinical research study or trial
- ☐ Translational research 1 (applying discoveries to the development of trials and studies in humans)
- ☐ Translational research 2 (enhancing adoption of research findings and best practices into the community)
- ☐ Behavioral or psychosocial research study
- ☐ Epidemiology
- ☐ Repository (developing a data or specimen repository for future use by investigators)
- ☐ Other

**Assign project to a Project Folder?** ☐

**Project notes (optional):**  
Comments describing the project's use or purpose that are displayed on the My Projects page.

**Start project from scratch or begin with a template?**

☐ Create an empty project (blank slate)

☐ Upload a REDCap project XML file (CDISC ODM format) ?

☒ Use a project template (recommended)

**★ Choose a project template** (Some are pre-filled with fields, forms/surveys, and other settings) [+ Add templates \(administrators only\)](#)

select template	Template title (sorted by title)	Template description
<input type="radio"/>	Basic Demography	Concerns a single data collection instrument to capture basic demographic information.
<input type="radio"/>	Classic Database	Concerns six data entry forms, including forms for demography and baseline data, three monthly data forms, and concludes with a completion data form.
<input type="radio"/>	Longitudinal Database (1 arm)	Concerns nine data entry forms (beginning with a demography form) for collecting data longitudinally over eight different events.
<input type="radio"/>	Longitudinal Database (2 arms)	Concerns nine data entry forms (beginning with a demography form) for collecting data on two different arms (Drug A and Drug B) with each arm containing eight different events.

**Create Project** **Cancel**

# Creating a New Project Cont'd

Mount Sinai Department or Office

\* must provide value

Is this a hospital project?

\* must provide value

reset

Please select the option that best describes the purpose of your project.

\* must provide value

reset

Please include the email addresses and relevant contact information for individuals involved with this project:  
(1 per line)

\* must provide value

Expand

First Name  
(\* Project Lead)

\* must provide value

Last Name  
(\* Project Lead)

\* must provide value

Employee ID (Life number):  
(\* Project Lead)

\* must provide value

Email Address  
(\* Project Lead)

\* must provide value

Project Funding (Currently ~~free~~ for development projects)

Please provide your fund account number.

Project Description

Please provide a brief description for this project.

\* must provide value

# Project Page

The screenshot shows the REDCap Project Page for a project named 'CD Oct 2021'. The interface is divided into a left sidebar and a main content area. The sidebar contains navigation links for 'Project Home and Design', 'Data Collection', 'Applications', and 'Help & Information'. The main content area has tabs for 'Project Home', 'Project Setup', 'Other Functionality', and 'Project Revision History'. The 'Project Setup' tab is active, showing sections for 'Main project settings', 'Design your data collection instruments & enable your surveys', 'Define your events and designate instruments for them', and 'Enable optional modules and customizations'. Each section contains various settings and links for project management.

- Manage a project

- Check and edit participants' records, share survey invitation links and QR code

- Import, Export, and run Reports on collected data
- Modify User Access
- Configure External Modules

- Modify project title, PI, and descriptions
- Enable Longitudinal data collection

- Access the Online Designer
- Access/download the data dictionary
- Find information on unique REDCap functions

- Define how a longitudinal study is structured










- Extended customizations and modules options

# Longitudinal Studies

- ▢ Define each of the study **Arms** and **Events** for those Arms
- ▢ Designate Instruments for each Arm and Event

Arm 1: Arm 1 [+Add New Arm](#)

Arm name: **Arm 1** [Rename Arm 1](#)

	Event #	Event Name	Custom Event Label (optional)	Unique event name (auto-generated)
  	1	Event 1		event_1_arm_1
  	2	Event 2		event_2_arm_1
  	3	Event 3		event_3_arm_1
<div>Add new event</div> <div><input type="text"/></div> <div>Descriptive name for this event:</div> <div><input type="text"/></div> <div>Custom Event Label (optional) Example: [visit_data], [weight] kg</div>				

[Project Setup](#) [Define My Events](#) [Designate Instruments for My Events](#)

Since you have defined multiple events on the [Define My Events](#) page, you may now select which data collection instruments that you wish to utilize for each event by using the table below. This allows you to enter data on any data collection form multiple times for any given project record. Any and all data collection instruments can thus be used for any event defined.

Click the [Begin Editing](#) button to change the relationships below by designating which forms you wish to utilize for which events. When you are finished making changes, click the [Save](#) button to finalize your changes.

[Upload or download instrument mappings](#)

[Begin Editing](#) [Save](#)

Data Collection Instrument	Event 1 (1)	Event 2 (2)	Event 3 (3)
Demographic (Survey)	✓		
Baseline Data (Survey)	✓		
Month 1 Data		✓	
Completion Data			✓

# Online Designer – Instruments/Surveys

- ▶ Create, import, and manage data collection forms
- ▶ Enable instruments as surveys
- ▶ Edit data collection instruments and variables
- ▶ Define how participants can get automated invitations by email

**Data Collection Instruments**

**Survey options:**

- Survey Queue
- Survey Login
- Survey Notifications
- Upload or download Auto Invitations

**Add new instrument:**

- Create: a new instrument from scratch
- Import: a new instrument from the official [REDCap Shared Library](#)
- Upload: instrument ZIP file from another project/user or [external libraries](#)

Instrument name	Fields	View PDF	Enabled as survey	Instrument actions	Survey-related options
Demographics	25			Choose action	Survey settings + Automated Invitations
Baseline Data	18			Choose action	Survey settings + Automated Invitations
Month 1 Data	19		Enable	Choose action	
Completion Data	5		Enable	Choose action	

# Online Designer – Variables

- ▶ Variables allow users to define discrete data points for collection
- ▶ Short, simple, and identifiable names for variables are preferred
- ▶ Choose the field type that best fits the data point
- ▶ Note: Collection and maintenance of PHI in a protected and confidential manner is the responsibility of the investigators

The screenshot shows the REDCap Online Designer interface. The main form area displays two fields: 'First Name' and 'Last Name', both with 'Variable:' labels. A red box highlights the 'Add Field' button in the top right corner of the main form area. A red arrow points from this button to the 'Add New Field' dialog box. The 'Add New Field' dialog box is open, showing a list of field types. The 'Text Box (Short Text, Number, DateTime)' option is selected. The dialog box also includes sections for 'Field Label', 'Validation', 'Required', 'Identified', 'Custom Alignment', and 'Field Note'.

# Obtaining Data

- ▶ Invite participants to take a survey by sharing Public Survey URLs or QR codes
- ▶ Monitor follow-up surveys and previously sent invitations, manage the survey's participants list

## Survey Distribution Tools


 Public Survey Link

 Participant List

 Survey Invitation Log


Using a public survey link is the simplest and fastest way to collect responses for your survey. You may obtain the survey link below to email it to your participants. Responses will be collected anonymously (unless the survey contains questions asking for identifying data from the participant). **NOTE:** Since this method uses a single survey link for all participants, it allows for the possibility of participants taking the survey multiple times, which may be necessary in some cases.



To obtain the survey link, copy the URL below and paste it into the body of an email message in your own email client. Your email recipient(s) can then click the link to begin taking your survey.

Public Survey URL:  


OR Short Public Survey URL:  

### Link Actions

 Open public survey


 Open public survey +  Log out

 Send me URL via email

 Survey Access Code or  QR Code

### Link Customizations

 Get Short Survey Link

 Create Custom Survey Link

 Get Embed Code



# Obtaining Data – Data Entry Form

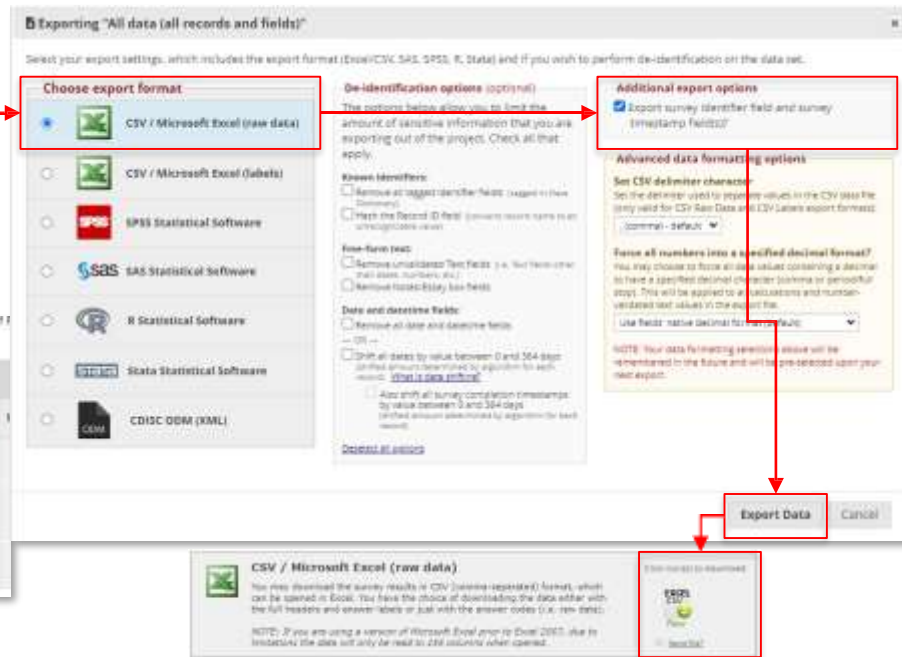
- ▶ For data points that are not collected during the surveys, they can be entered in the **Record Home Page**
- ▶ Can enter new data, overwrite data, or make notes on data for the record

The screenshot displays the REDCap interface for Study ID 1. The left sidebar contains navigation options: My Projects, Control Center, REDCap Messenger, View project as user, Project Home and Design, Project Home, Project Setup, Designer, Dictionary, Codebook, Project status, and Development. The main content area is titled 'Demographics' and includes sections for 'Adding new Study ID 1', 'Study ID', 'Date subject signed consent', 'Upload the patient's consent form', 'Contact Information' (First Name, Last Name, Street, City, State, ZIP, Phone number, E-mail, Date of birth, Age (years)), and 'Applications' (Alerts & Notifications, Calendar, Data Exports, Reports, and Stats, Data Import Tool).

Study ID 1				
Data Collection Instrument	Event 1	Event 2	Event 3	
Demographics (survey)	✓			
Baseline Data (survey)	✓			
Month 1 Data		✓		
Completion Data				Ⓢ
Deletes all data for events	✗	✗		

# Data Management- Export Data

- ▶ **Data Exports, Reports, and Stats** contain methods to export collected data in various formats
- ▶ Custom selections can be made to isolate data of interest from larger project databases



## Data Management – Editing Data

- ▶ Data edits can be made on csv files in Excel
- ▶ Records show all data collected for a specific **Event** and **Arm**
- ▶ Some data will appear as entered by survey participants with free text entry, while other data is coded as discrete selections as in the case of multiple-choice selections

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	study_id	redcap_event_name	redcap_su	demograp	date_enrc	patient_d	first_name	last_name	address	telephone_1	email	dob	age	ethnicity	race	sex	given_birt
2	1	event_1_arm_1		#####	#####		test1	test1	Some place	(444) 444-4444		#####	0	1	1	1	
3	1	event_2_arm_1															
4	2	event_1_arm_1			#####		test2	test2	Somewhere	(555) 555-5555		#####	0	2		0	0
5	3	event_1_arm_1		#####	#####		test1	test1	Some place	(444) 444-4444		#####	0	1	1	1	
6	3	event_2_arm_1															
7	4	event_1_arm_1			#####		test2	test2	Somewhere	(555) 555-5555		#####	0	2		0	0
8	5	event_1_arm_1		#####	#####		test1	test1	Some place	(444) 444-4444		#####	0	1	1	1	
9	5	event_2_arm_1															
10	6	event_1_arm_1			#####		test2	test2	Somewhere	(555) 555-5555		#####	0	2		0	0
11																	

# Data Management – Importing

- ▶ **Data Import Tool** allows for users to import new data or edited data by each record
- ▶ An effective tool for importing larger blocks of data
- ▶ Don't be intimidated by errors since they are a common occurrence in data imports
- ▶ Each error will need to be resolved before a set of data can be successfully uploaded

The screenshot shows the REDCap Data Import Tool interface. It includes several configuration options: 'Record format' set to 'Rows', 'Format for date and datetime values' set to 'MM/DD/YYYY or YYYY-MM-DD', 'Allow blank values to overwrite existing saved values?' set to 'No, ignore blank values in the file (default)', and 'Name the imported records automatically (force record auto-numbering)' set to 'No, use the record name provided'. Below these options is a section for uploading a CSV file, with a 'Choose File' button and a file named 'CDOct2021\_18\_1325.csv' selected. An 'Upload File' button is also present.

Errors were detected in the import file that prevented it from being loaded.

There are 24 errors shown in red in the error table below in this dataset. Please correct any errors and upload the file again.

ERROR DISPLAY TABLE			
Record	Field Name	Value	Error Message
1	demographics_timestamp	10/18/2021 12:44	This field name does not exist in the project.
3	baseline_data_timestamp		This field name does not exist in the project.
1	month_1_data_complete	1	This field ('month_1_data_complete') exists on an instrument that is not designated for the event named 'Event 1'. You are not allowed to import data for this field into this event.
1	completion_data_complete	0	This field ('completion_data_complete') exists on an instrument that is not designated for the event named 'Event 1'. You are not allowed to import data for this field into this event.
1	demographics_timestamp		This field name does not exist in the project.
1	baseline_data_timestamp		This field name does not exist in the project.
2	demographics_timestamp		This field name does not exist in the project.

# Managing Project Users

- ▶ Users with accounts can be added to a project in the **User Rights** section of your project
- ▶ When adding or modifying existing users, a long checkbox section will appear to manage their access
- ▶ It is important to properly manage user rights to protect data and PHI, control project design and life cycle, and maintain accountability

The screenshot displays the REDCap User Rights configuration interface. It is divided into two main sections: 'Basic Rights' and 'Data Entry Rights'.

**Basic Rights:**

- Expiration Date:** A text input field with a 'YYYY' format indicator.
- Highest level privileges:** A section with checkboxes for 'Project Design and Setup', 'User Rights', and 'Data Access Groups', all of which are checked.
- Privileges for data exports (including RDR and API exports, reports, and charts):**
  - Data Exports:** Radio buttons for 'No Access', 'Deidentified\*', 'Remove all tagged identifier fields', and 'Full Data Set'. 'Full Data Set' is selected.
  - Add/Edit/Organize Reports:** A checkbox that is checked.
  - Stats & Charts:** A checkbox that is checked.
- Other privileges:** A section with checkboxes for 'Survey Distribution Tools', 'Calendar', 'Data Import Tool', 'Data Comparison Tool', 'Logging', 'File Repository', 'Data Quality', 'What's New/Status', 'API', and 'What's New/Status', all of which are checked.
- Settings pertaining to the REDCap mobile app:**
  - REDCap Mobile App:** A checkbox that is checked.
  - Allow user to download data for all records to the app?** A checkbox that is checked.
- Settings pertaining to project records:** A section with checkboxes for 'Create Records', 'Rename Records', and 'Delete Records', all of which are checked.

**Data Entry Rights:**

NOTE: The data entry rights "only" pertain to a user's ability to view or edit data on a web page in REDCap (e.g., data entry forms, reports). It has no effect on data imports or data exports.

	No Access	Read Only	View & Edit	Full Access
Demographics (survey)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Baseline Data (survey)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Month 1 Data	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Completion Date	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

# Project Life Cycle

- ▶ **Development** phase of the project is best for creating and testing a project
- ▶ **Production** phase protects collected data by flagging project changes for data loss review
- ▶ **Analysis/Cleanup** phase for finalizing analysis and ending a study (no changes can be made to the project in this phase, only access to view data)



# Thank You!

Thank you for your time! We hope you enjoyed this presentation.

Please take a minute to complete a short survey to provide your feedback and help improve our services:



<https://redcap.link/iwughq7m>