Scientific Computing and Data Research Data Services

Introduction to REDCap

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Scientific Computing and Data Mission

To enable and accelerate biomedical discovery through collaborative research using high performance computing, biomedical informatics and data science

- We aim for our biomedical informatics ecosystem to be:
 - -More accessible to stakeholders, ensuring broad, user-friendly, integrated access to diverse data sources while maintaining robust, secure, bi-directional information flow between research programs and point-of-care information systems through a flexible infrastructure
 - -More actionable, to enable innovative applications of translational bioinformatics research and data-driven medicine
 - ...not just for the ecosystem at Sinai, but also for national research projects we lead and participate in.
 - High Performance Computing
 - Mount Sinai Data Warehouse
 - Research Data Services
- Unlike other computing resources, Scientific Computing stakeholders are also actively engaged in research projects
- ▶ We partner with other investigators to create a robust research environment at Mount Sinai, expand our profile in national research efforts, and help with grant funding success

REDCap at Mount Sinai

- Research Electronic Data Capture a platform developed by Vanderbilt University as a proper replacement for pen and paper data collection
- ▶ 21 CFR Part 11 compliant joint effort by Scientific Computing, IT, IRB and Privacy Offices
- ▶ Data resources and integration between many existing system with more to come
 - Import clinical data into REDCap from Epic (over 1800 mapped)
 - -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 14,000 databases, with over 11,000 active users
- Services for project building, data protection, support, and training

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

Mount Sinai / Presentation Name / Date 5

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

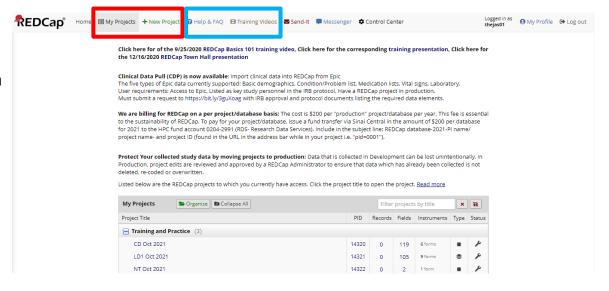
External Users:

► For users without Mount Sinai credentials, the PI or their delegate must request Mount Sinai credentials via SailPoint: https://sailpoint.mountsinai.org/

▶ Users new to Mount Sinai's REDCap instance will be presented email verification. After filling in their desired email, they will receive a verification link. Once verified, they can login to create projects or be added to existing ones.

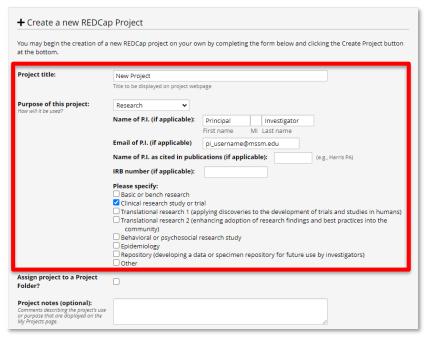
Creating a New Project

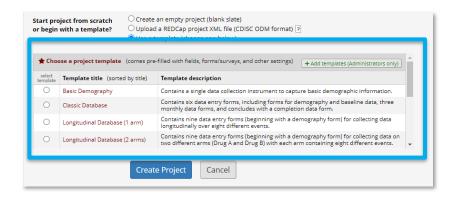
- Users can find the projects they have access to under My
 Projects at the top of the page.
 These are projects they've been added to or have created.
- ➤ To create a project, click on the adjacent New Project button.
- Along the top bar, users will also find great resources under Help & FAQ as well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





Getting Familiar with the Project Page

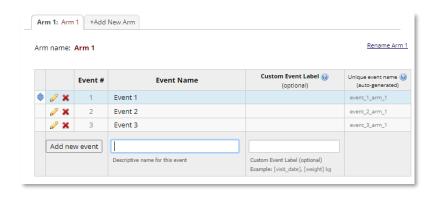


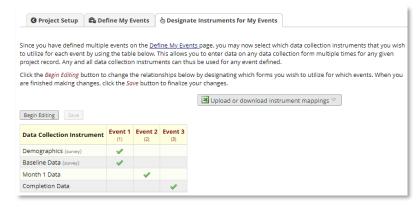
collected data

Modules

Longitudinal Studies

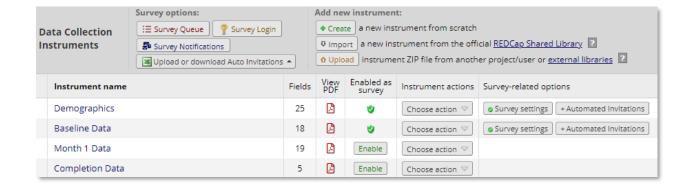
- With longitudinal studies, additional options are available
- ▶ Define each of the study **Arms** and **Events** for those Arms
- Designate Instruments for each Arm and Event





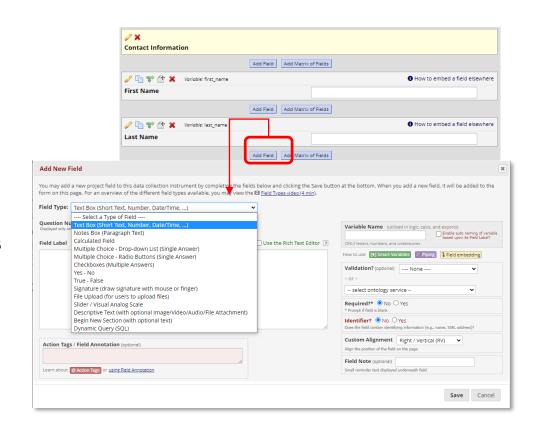
Online Designer – Instruments/Surveys

- 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



Online Designer – Variables

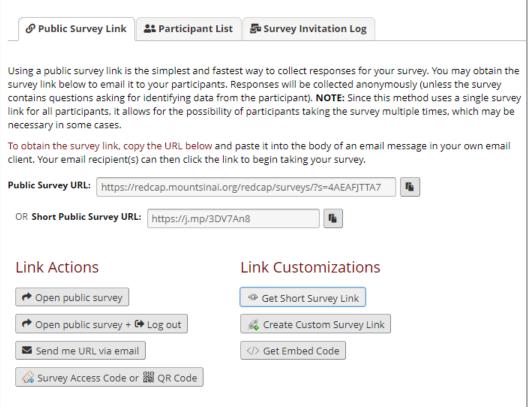
- Variables allow users to define discrete data points for collection
- Short, simple, and identifiable names for variables are preferred
- Choose the field type that best fits the data point
- Note: Collection and maintenance of PHI in a protected and confidential manner is the responsibility of the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



Obtaining Data

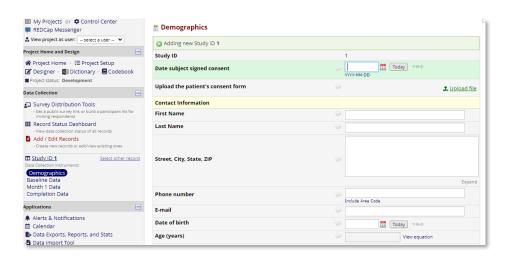
Survey Distribution Tools

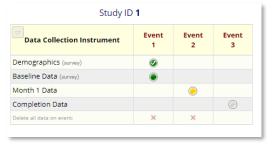
- Invite participants to take a survey by sharing Public Survey URLs or QR codes
- Monitor follow-up surveys and previously sent invitations, manage the survey's participants list



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





Data Management

▶ Data Exports, Reports, and Stats contain methods to export collected data in various formats

Exporting "All data (all records and fields)" Custom selections can be 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 De-identification options (optional) Additional export options made to isolate data of The options below allow you to limit the ✓ Export survey identifier field and survey CSV / Microsoft Excel (raw data) amount of sensitive information that you are timestamp field(s)? exporting out of the project. Check all that interest from larger project Advanced data formatting options CSV / Microsoft Excel (labels) Known Identifiers: Set CSV delimiter charact Remove all tagged Identifier fields (tagged in Data databases Set the delimiter used to separate values in the CSV data file (only valid for CSV Raw Data and CSV Labels export formats): Hash the Record ID field (converts record name to an SPSS Statistical Software . (comma) - default 💙 unrecognizable value) Force all numbers into a specified decimal format? Remove unvalidated Text fields (i.e. Text fields other You may choose to force all da a values containing a decimal SAS SAS Statistical Software to have a specified decimal character (comma or period/full Remove Notes/Essay box fields stop). This will be applied to all calculations and numbervalidated text values in the export file. Date and datetime fields: you get the exact data you want. Once you have created a report, you may view it as a webpage, export it out of F R Statistical Software **Data Collection** Use fields' native decimal format (default) Remove all date and datetime fields format (Excel, SAS, Stata, SPSS, R), or view the plots and descriptive statistics for that report. _ OR _ Survey Distribution Tools NOTE: Your data formatting selections above will be Shift all dates by value between 0 and 364 days remembered in the future and will be pre-selected upon your - Get a public survey link or build a participant list for Stata Statistical Software (shifted amount determined by algorithm for each record) What is date shifting? inviting respondents My Reports & Exports Also shift all survey completion timestamps III Record Status Dashboard by value between 0 and 364 days - View data collection status of all records View/Export Options (shifted amount determined by algorithm for each Report name CDISC ODM (XML) Add / Edit Records - Create new records or edit/view existing ones Deselect all options A All data (all records and fields) Q View Report Export Data ■ Stats & Charts Applications ▲ Alerts & Notifications Selected instruments and/or events Make custom selections **Export Data** Cancel Calendar B Data Exports, Reports, and Stats Data Import Tool + Create New Report CSV / Microsoft Excel (raw data) lick icon(s) to download ≠ Data Comparison Tool You may download the survey results in CSV (comma-separated) format, which can be opened in Excel. You have the choice of downloading the data either with the full headers and answer labels or just with the answer codes (i.e. raw data). NOTE: If you are using a version of Microsoft Excel prior to Excel 2007, due to limitations the data will only be read to 255 columns when opened. Send file

Data Management – Editing Data

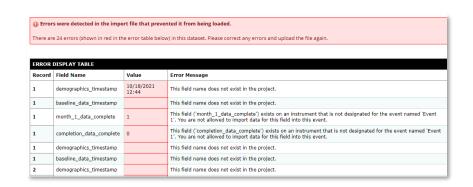
- ▶ Data edits can be made on csv files in Excel
- Records show all data collected for a specific Event and Arm
- ▶ Some data will appear as entered by survey participants with free text entry, while other data is coded as discrete selections as in the case of multiple-choice selections

4	Α	В	С	D	E	F	G	Н	1	J	K	L	М	N	0	Р	Q
1	study_id	redcap_event_name	redcap_su	demograp	date_enro	patient_d	first_nam	last_name	address	telephone_1	email	dob	age	ethnicity	race	sex	given_birt r
2	1	event_1_arm_1		************	########		test1	test1	Some place	(444) 444-4444		***********	C	1	1	1	
3	1	event_2_arm_1															
4	2	event_1_arm_1			########		test2	test2	Somewhere	(555) 555-5555		************	C	2		0	0
5	3	event_1_arm_1		***************************************	***************************************		test1	test1	Some place	(444) 444-4444		***************************************	C	1	1	1	
6	3	event_2_arm_1															
7	4	event_1_arm_1			########		test2	test2	Somewhere	(555) 555-5555		***************************************	C	2		0	0
8	5	event_1_arm_1		***************************************	#########		test1	test1	Some place	(444) 444-4444		***************************************	C	1	1	1	
9	5	event_2_arm_1															
10	6	event_1_arm_1			########		test2	test2	Somewhere	(555) 555-5555		***************************************	C	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

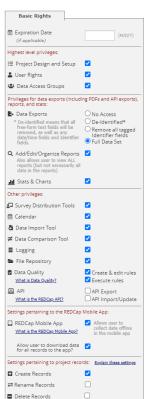




Managing Project Users

- 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





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	Edit survey responses						
Demographics (survey)	0	0	•	✓						
Baseline Data (survey)	0	0	•	✓						
Month 1 Data	0	0	•							
Completion Data	0	0	(

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



REDCap – 2021/2022 Updates

- ▶ New REDCap Production fee of \$200 per project
- Database Improvements
 - -Stronger encryption for protecting PHI
- ▶ REDCap Upgrades
 - -Server hardware upgrades and consolidation
 - –Upgrade to REDCap version 11 in the works
 - -Project Dashboards, Smart Functions, Smart Tables, and Smart Charts
- ▶ Deploying External Modules
 - -Deployed 4 new external modules for use in projects
 - Additional deployments underway and can also be requested by users

Digital Concierge Service - https://zoom.us/my/digitalconcierge

- Virtual REDCap Office Hours: Wednesdays from 3:30pm to 4:30pm
 - CRIO Office; Office of Research Services (ORS);
 - Scientific Computing; CTSA;
 - Levy Library ASC-IT; Research Academic IT
- Guiding use of self-service tools
- Directing to optimal digital services and data sources
- Identifying right data sets
- Formulating and/or executing search queries
- Advising on Mount Sinai policies including data sharing, security and patient privacy
- Posting de-identified counts for the most common queries
- Aggregating feedback and questions from research community
- Providing informatics support for grant submissions