

Using REDCap and R to Rapidly Produce Biomedical Publications

01 - Introduction

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The Plan

- What is REDCap (and why bother)?
- How to build a basic case report form
- What is rational to do in REDCap
 - Multiple instruments
 - Longitudinal assessments
 - Repeated instruments
- Show the Miami needle exchange database (IDEA)
- Using `rUM` to make a publication ready paper
- The manual export (and why it is suboptimal)
- Importing all forms from a project into R with `tidyREDCap`
- Using `tidyREDCap` summary functions to add to the paper
- What `REDCapTidieR` does
- What `REDCapDM` does
- Getting data into REDCap with `REDCapR`

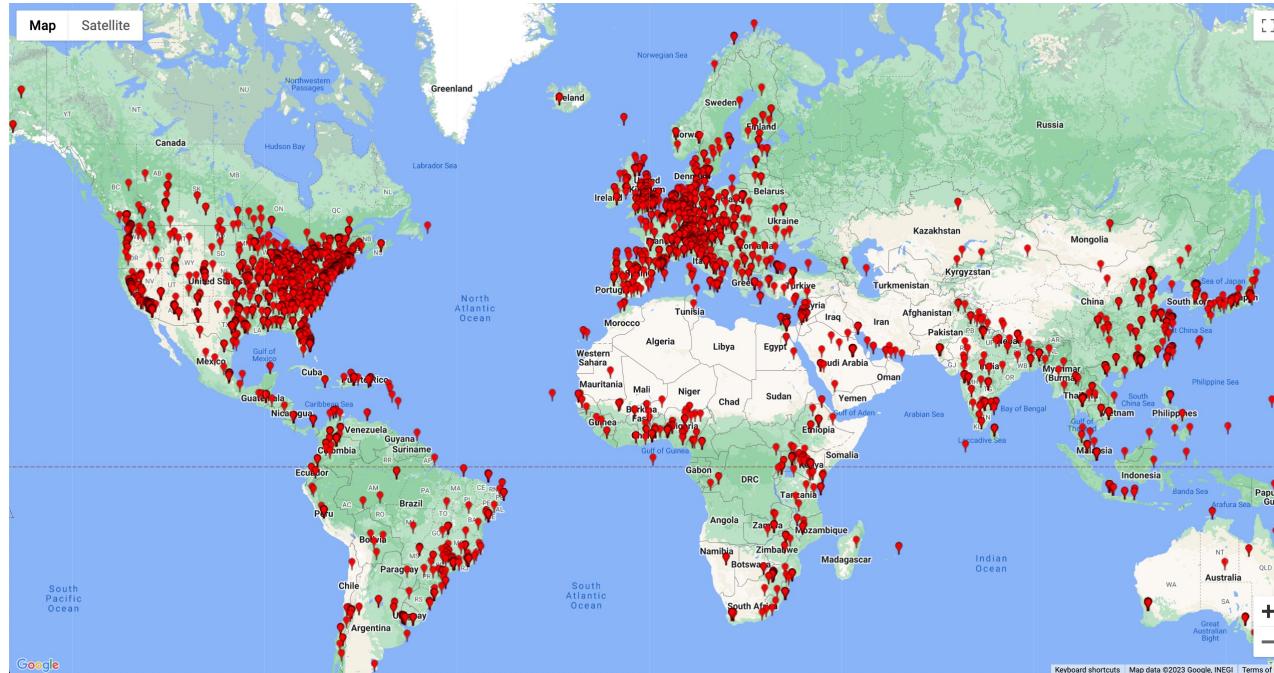
What is REDCap (and why bother)?

What's the big deal?

- Based at Vanderbilt University and supported by the National Institutes of Health
- Not open-source (the license specifies noncommercial research use only)
- Continuous development since 2004
- Supports researcher- and participant-facing data entry
- Supports online and offline data collection

By the Numbers

- Free to consortium members (slightly limited by international export controls)
- Wildly popular
 - 6,000+ institutions in more than 150 countries
 - Acknowledged in more than 23,000 articles



Technology and Legal

- Tech
 - Written in PHP
 - Database is MySQL or Maria DB
 - Authentication includes LDAP, Shibboleth, OpenID, Google OAuth2 and more
 - Solid API support
- Legal
 - REDCap is 21 CFR Part 11-ready
 - Built-in logging and audit trails
 - Designed to support *safe harbor* deidentification

How do I access it?

- Most academic medical centers have it.
- Check the partner list: <https://projectredcap.org/partners/>.
- We will use the demo instance at Vanderbilt: <https://redcapdemo.vanderbilt.edu/>.
 - Normally, you will use point-and-click tools.
 - Today, we will show you things and you will have read-only access to some data.

Workflows

Steps

1. Create a project
2. Add/create a data entry form/instrument
3. Collect/enter data
4. View/summarize in REDCap
5. Export for additional magic

But wait... there's more!

- Multi-site support with Data Access Groups
- Built-in, multi-language support
- Randomization
- Longitudinal projects with study calendars and scheduling
- Repeated instruments for assessing unplanned repeats
 - Describe each "stop by" clinic visit
 - Describe each adverse event
- Public or private dashboards
- Send emails/text
- Extensible via *External Modules*

Create A Project 1

+ 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. **Your project will not be created immediately**, but your request will be quickly reviewed by a REDCap administrator, after which you will be notified via email when the project has been created.

Project title: R/Medicine 2023 Demo

Project's purpose: Practice / Just for fun ▾
How will it be used?

Assign project to a Project Folder?

Project notes (optional):
Description of the project's use or purpose
(displayed on the My Projects page)
This is for showing how to use the library.

Project creation option:

Empty project (blank slate)
 Upload a REDCap project XML file (CDISC ODM format) ?
 Use a template (choose one below)

★ Choose a project template

select template	Template title (sorted by title)	Template description
<input type="radio"/>	21 CFR Part 11 eConsent Template	21 CFR Part 11 Validated Template with eConsent Framework enabled. To be used for FDA-regulated studies.
<input type="radio"/>	Basic Demography	Contains a single data collection instrument to capture basic demographic information.
<input type="radio"/>	Classic Database	Contains 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"/>	CTSI - eConsent Template	IRB Approved Consent form Template with eConsent Framework enabled for Non-FDA regulated projects.
<input type="radio"/>	Human Cancer Tissue Biobank	Contains five data entry forms for collecting and tracking information for cancer tissue.
<input type="radio"/>	Longitudinal Database (1 arm)	Contains nine data entry forms (beginning with a demography form) for collecting data over eight different visits.

Send Request **Cancel**

Create A Project 2

- Use the **Designer** to add your content.

The screenshot shows the REDCap Project Home and Design interface. On the left, a sidebar menu includes 'Project Home and Design' (highlighted with a purple dashed arrow), 'Data Collection', 'Applications', and 'Help & Information'. The main content area is titled 'R/Medicine 2023 Demo' (PID 6754). It features tabs for 'Project Home', 'Project Setup', 'Other Functionality' (selected), and 'Project Revision History'. Below the tabs, it says 'Project status: Development' and 'Completed steps 0 of 7'. The 'Main project settings' section includes options for surveys and longitudinal data collection, both marked as 'Not started'. The 'Design your data collection instruments' section is also marked as 'Not started' and contains links to the Online Designer, Data Dictionary, and REDCap Instrument Library. The 'Enable optional modules and customizations' section includes options for repeatable instruments, auto-numbering, scheduling, randomization, and communication fields, all marked as 'Optional'. The 'Set up project bookmarks (optional)' section is also marked as 'Optional'.

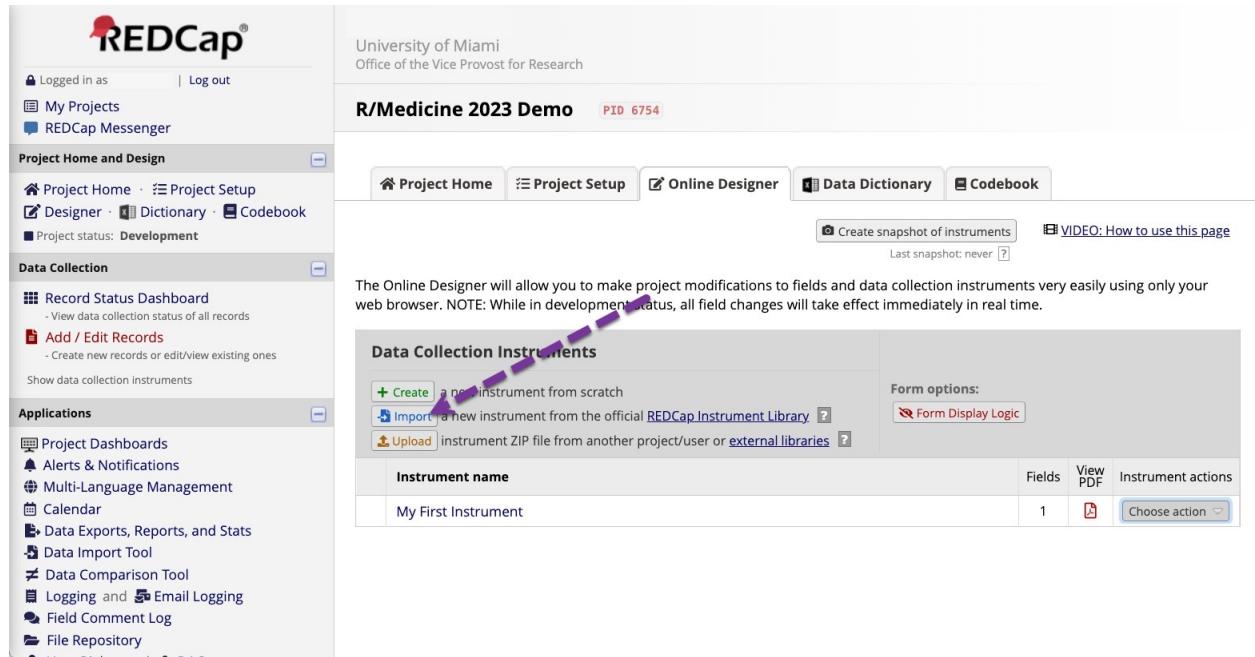
Add/create a data entry instrument/form.

- Add an instrument from the REDCap Shared Instrument library (at Vanderbilt).
- Make your own data entry form.
- Do both.

The screenshot shows the REDCap interface for the 'R/Medicine 2023 Demo' project (PID 6754). The left sidebar includes links for 'My Projects', 'REDCap Messenger', 'Project Home and Design' (selected), 'Data Collection' (selected), and 'Applications'. The main content area displays the 'Data Collection Instruments' section. A purple circle highlights the 'Import' button, which is described as 'a new instrument from the official REDCap Instrument Library'. Below this, there are buttons for 'Create' (a new instrument from scratch) and 'Upload' (an instrument ZIP file from another project or external libraries). The table lists one instrument: 'My First Instrument' with 1 field. Form options like 'Form Display Logic' are also visible.

REDCap Shared Instrument Library 1

- You can point and click to add one of the thousands of instruments in the REDCap library.



The screenshot shows the REDCap interface for the R/Medicine 2023 Demo project (PID 6754). The left sidebar includes links for My Projects, REDCap Messenger, Project Home and Design (with Project Home, Project Setup, Designer, Dictionary, and Codebook), Data Collection (with Record Status Dashboard, Add / Edit Records, and Show data collection instruments), and Applications (with various tools like Project Dashboards, Alerts & Notifications, Multi-Language Management, Calendar, Data Exports, Reports, and Stats, Data Import Tool, Data Comparison Tool, Logging, Email Logging, Field Comment Log, and File Repository). The main content area displays the 'Data Collection Instruments' section. It features three buttons: '+ Create' (highlighted with a purple dashed arrow), 'Import' (a new instrument from the official REDCap Instrument Library), and 'Upload' (instrument ZIP file from another project/user or external libraries). Below these buttons is a table with a single row for 'My First Instrument'. The table has columns for 'Instrument name' (containing 'My First Instrument'), 'Fields' (containing '1'), 'View PDF' (with a link icon), and 'Instrument actions' (with a 'Choose action' dropdown).

REDCap Shared Instrument Library 2

REDCap Shared Library

The REDCap Shared Library is a repository for REDCap data collection instruments and forms that can be downloaded and used by researchers at REDCap partner institutions. Curated instruments highlighted with a star ★ have been approved for inclusion by the REDCap Library Oversight Committee (REDLOC) after review for research relevance, accuracy in function and coding (see guidelines), and copyright issues. Other instruments and forms are shared by individuals or groups from consortium institutions on "as-is" basis.

You may search below for any available data collection instruments. If you got to this site directly, you will not be able to view the actual shared instruments themselves. This public view listing is for reference only and helps protect the authors' copyright. You will also not see instruments that have been shared locally by REDCap end users if they have not gone through the formal REDLOC curation process. If you arrived here from the REDCap application, you will have the options to view instruments as a webpage, view instruments as a PDF, and import the instruments directly into REDCap. If you wish, you may download a list of all library instruments in Excel/CSV format. If you download and utilize an instrument from the REDCap Shared Library, please cite the RSL manuscript. If you have questions or are experiencing issues, please contact redcap@vumc.org.

[Return to REDCap](#)

Logged in as Raymond Balise (University of Miami)

Shared Library

Search

Library Metrics

My Activity
Institution Activity
Consortium Activity

REDLOC

Approval List
Approval History
Change Password
Logout

Keyword search: depression

Search options:

Language: All
Type: show all
Minimum downloads: 0
Recent additions: show all
Curated by REDLOC? show all

1 2 3 >>

Found 49 results matching your search

Title	Downloads
► Geriatric Depression Scale GDS Long Form ★	262
► Patient Health Questionnaire Depression Scale (PHQ) ★	728
► Patient Health Questionnaire Depression Scale (PHQ) Scored ★	986
► Geriatric Depression Scale GDS Short Form ★	582
▼ Hamilton Depression Rating Scale (HAM-D) ★	1183

Didn't find what you were looking for? [Suggest a validated instrument for library inclusion](#)

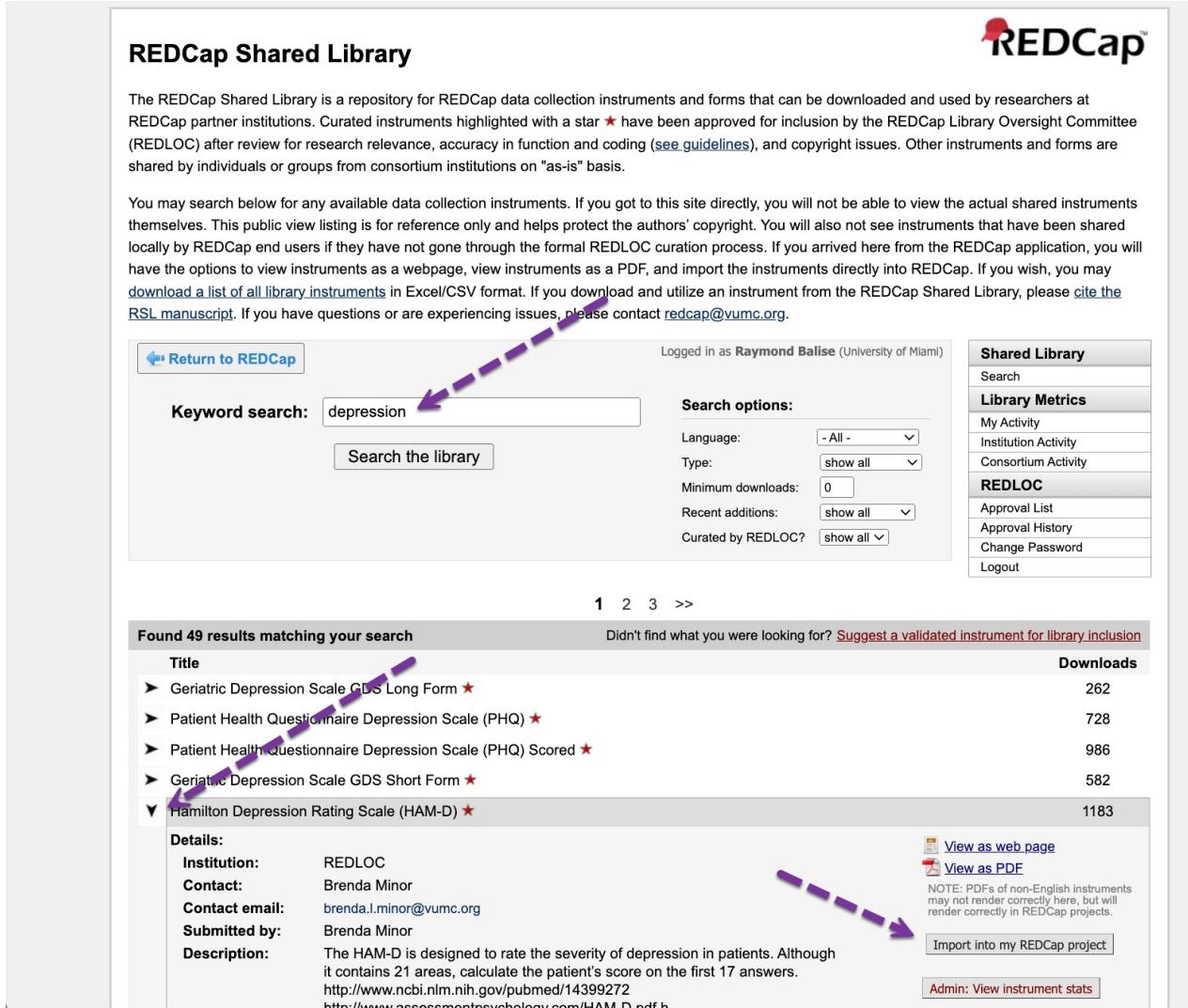
Details:

Institution: REDLOC
Contact: Brenda Minor
Contact email: brenda.l.minor@vumc.org
Submitted by: Brenda Minor
Description: The HAM-D is designed to rate the severity of depression in patients. Although it contains 21 areas, calculate the patient's score on the first 17 answers.
<http://www.ncbi.nlm.nih.gov/pubmed/14399272>
<http://www.assessmentspsychology.com/HAM-D.pdf>

[View as web page](#)
[View as PDF](#)
NOTE: PDFs of non-English instruments may not render correctly here, but will render correctly in REDCap projects.

[Import into my REDCap project](#)

[Admin: View instrument stats](#)



REDCap Shared Instrument Library 3

The screenshot shows the REDCap Online Designer interface for the project "R/Medicine 2023 Demo" (PID 6754). The left sidebar includes links for My Projects, REDCap Messenger, Project Home and Design, Data Collection, and Applications. The main content area displays the "Data Collection Instruments" table. The table has columns for "Instrument name", "Fields", "View PDF", and "Instrument actions". Two instruments are listed: "My First Instrument" (1 field) and "Hamilton Depression Rating Scale (HAM-D)" (26 fields). A context menu is open over the "Hamilton Depression Rating Scale" row, showing options: Choose action (Renaming, Copying, Deleting, Downloading as ZIP). Arrows point from the menu to the "Delete" and "Choose action" buttons.

Instrument name	Fields	View PDF	Instrument actions
My First Instrument	1		 Rename Copy Delete Download instrument ZIP
Hamilton Depression Rating Scale (HAM-D)	26		 Rename Copy Delete Download instrument ZIP

REDCap Shared Instrument Library 4

The screenshot shows the REDCap Online Designer interface. On the left, there is a sidebar with navigation links for Project Home and Design, Data Collection, and Applications. The main content area displays the 'Data Collection Instruments' page for the 'R/Medicine 2023 Demo' project (PID 6754). The page includes a summary of the instrument, options to Create, Import, or Upload a new instrument, and a table listing the current instruments. A purple dashed arrow points from the 'Create' button in the top-left of the main content area towards the 'Create' button in the sidebar.

REDCap®

Logged in as | Log out

My Projects REDCap Messenger

Project Home and Design

- Project Home · Project Setup
- Designer · Dictionary · Codebook
- Project status: Development

Data Collection

- Record Status Dashboard
- Add / Edit Records
- Show data collection instruments

Applications

- Project Dashboards
- Alerts & Notifications
- Multi-Language Management
- Calendar
- Data Exports, Reports, and Stats
- Data Import Tool
- Data Comparison Tool
- Logging and Email Logging
- Field Comment Log
- File Repository

University of Miami
University of Miami
Office of the Vice Provost for Research

R/Medicine 2023 Demo PID 6754

Project Home Project Setup Online Designer Data Dictionary Codebook

Create snapshot of instruments VIDEO: How to use this page Last snapshot: never [?]

The Online Designer will allow you to make project modifications to fields and data collection instruments very easily using only your web browser. NOTE: While in development status, all field changes will take effect immediately in real time.

Data Collection Instruments

Form options: Form Display Logic

Instrument name	Fields	View PDF	Instrument actions
Hamilton Depression Rating Scale (HAM-D)	26	[Edit]	Choose action

https://redcap.miami.edu/redcap_v12.0.23/design/online_designer.php?pid=6754&page=hamilton_depression_rating_scale_hamd

REDCap Shared Instrument Library 5

Current instrument: **Hamilton Depression Rating Scale (HAM-D)** Preview instrument

 Variable: record_id

Record ID

NOTE: The field above is the record ID field and thus cannot be deleted or moved. It can only be edited.

[Add Field](#) [Add Matrix of Fields](#) [Import from Field Bank](#)

 Variable: hamd_patient_name

Patient Name

[Add Field](#) [Add Matrix of Fields](#) [Import from Field Bank](#)

 Variable: hamd_todays_date

Today's Date  Today Y-M-D

[Add Field](#) [Add Matrix of Fields](#) [Import from Field Bank](#)

The HAM-D is designed to rate the severity of depression in patients. Although it contains 21 areas, calculate the patient's score on the first 17 answers.

[Add Field](#) [Add Matrix of Fields](#) [Import from Field Bank](#)

 Variable: hamd_1

1. DEPRESSED MOOD
(Gloomy attitude, pessimism about the future, feeling of sadness, tendency to weep)

0 = Absent
 1 = Sadness, etc.
 2 = Occasional weeping
 3 = Frequent weeping
 4 = Extreme symptoms

[reset](#)

[Add Field](#) [Add Matrix of Fields](#) [Import from Field Bank](#)

REDCap Shared Instrument Library 6

The license for the instruments bans meaningful changes but you can change the appearance and set details:

Edit Field

You may add a new project field to this data collection instrument by completing the fields below and clicking the Save button at the bottom. When you add a new field, it will be added to the form on this page. For an overview of the different field types available, you may view the [Field Types video \(4 min\)](#).

Field Type: Use the Rich Text Editor [\[?\]](#)

Field Label Use the Rich Text Editor [\[?\]](#)

Action Tags / Field Annotation (optional)
Learn about [@ Action Tags](#) or [using Field Annotation](#)

Variable Name (utilized in logic, calcs, and exports) Enable auto naming of variable based upon its Field Label?
ONLY letters, numbers, and underscores

How to use [\[+\] Smart Variables](#) [\[+\] Piping](#) [\[+\] Field Embedding](#)

Validation? (optional)

— OR —

-- select ontology service --

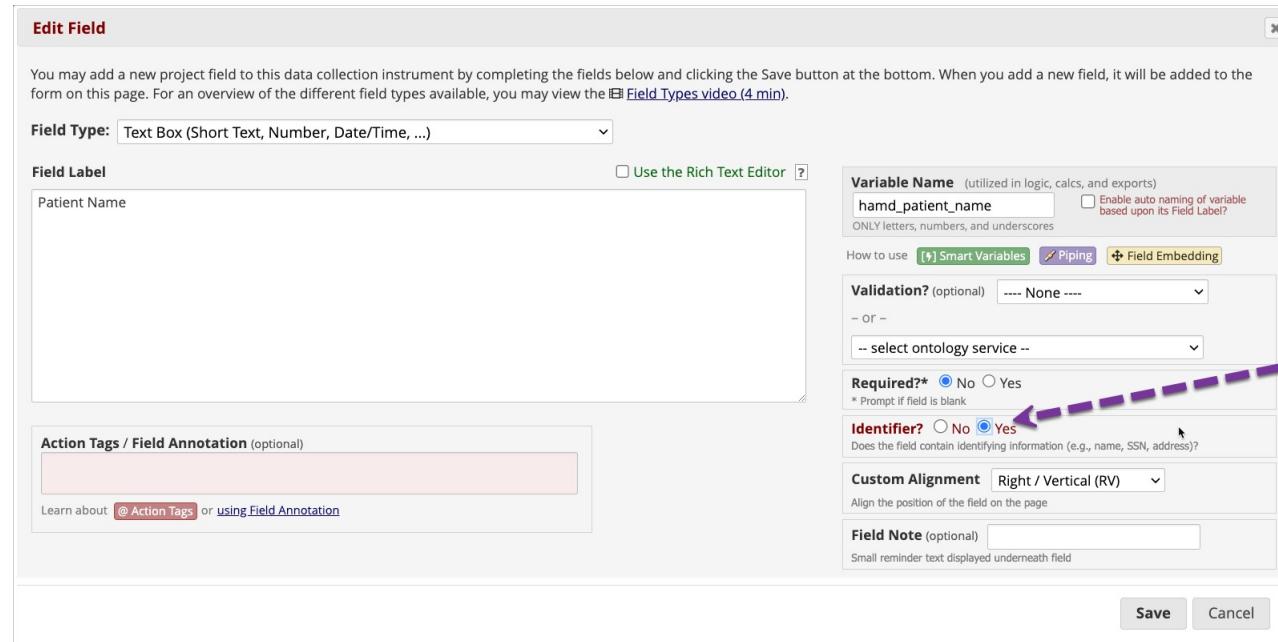
Required?* No Yes
* Prompt if field is blank

Identifier? No Yes
Does the field contain identifying information (e.g., name, SSN, address)?

Custom Alignment Align the position of the field on the page

Field Note (optional)
Small reminder text displayed underneath field

Save **Cancel**



Create a Form - Question/Field Bank 1

The screenshot shows the REDCap Online Designer interface. At the top, there are navigation tabs: Project Home, Project Setup, Online Designer (which is selected), Data Dictionary, and Codebook. Below the tabs, there are two buttons: 'Create snapshot of instruments' and 'VIDEO: How to use this page'. A note says 'Last snapshot: never ?'. The main content area is titled 'Data Collection Instruments'. It features three buttons: '+ Create' (highlighted with a purple callout '1'), 'Import', and 'Upload'. To the right, there's a 'Form options:' section with a 'Form Display Logic' link. Below these are tables for instruments. The first table has columns: 'Instrument name', 'Fields', 'View PDF', and 'Instrument actions'. It lists 'Hamilton Depression Rating Scale (HAM-D)' with 27 fields. The second table is a modal for creating a new instrument, with columns: 'New instrument name:', 'Fields', 'View PDF', and 'Instrument actions'. It shows 'Case Report Form' in the input field, and 'Create' and 'Cancel' buttons. A purple callout '2' points to the 'Case Report Form' input field.

Create a Form - Question/Field Bank 2

- The NIH Common Data Element Repository allows you to code questions consistently.

This page allows you to build and customize your data collection instruments one field at a time. You may add new fields or edit existing ones. New fields may be added by clicking the **Add Field** buttons. You can begin editing an existing field by clicking on the **Edit** icon. If you decide that you do not want to keep a field, you can delete it. To move fields, simply **drag and drop** a field to a different position within the instrument. Changes will take effect immediately in real time.

Questions from the NIH CDE Repository
(U.S. National Library of Medicine)

Project Home Project Setup Online Designer Data Dictionary Codebook

Create snapshot of instruments VIDEO: How to use this page

Last snapshot: never ?

Return to list of instruments

Current instrument: Case Report Form Preview instrument

Add Field Add Matrix of Fields Import from Field Bank

Create a Form - Question/Field Bank 3

Inside the NIH CDE Repository, the NCI variables are rich:

Import from Field Bank

Using the Field Bank, search for fields in various catalogs below by selecting a catalog and entering specific keyword. When reviewing the results up of your search, click the "Add Field" button for the field to add that field to the current data collection instrument.

Select a catalog to search: NCI National Cancer Institute

sex

22 fields found for Classification: NIH CDE Repository → NCI - Keyword: sex

1 - 20 of 22

+ Add Field

Person Biological Entity Or Sex Gender Code PCORnet CDM Sex Code

Default field label: Person Biological Entity Or Sex Gender Code PCORnet CDM Sex Code

Alternative field labels: Sex Assigned at Birth Code

Classification: NCI

Description: A single human being...Pertaining to biology or to life and living things...An independently existing thing (living or nonliving)...An article used to connect words, phrases, or clauses representing alternatives; used to connect alternative terms for the same thing; used in correlation; used to correct or rephrase what was previously said; otherwise...The assemblage of physical properties or qualities by which male is distinguished from female; the physical difference between male and female; the distinguishing peculiarity of male or female...The assemblage of properties that distinguish people on the basis of their societal roles...A symbol or combination of symbols which is given an arbitrary meaning within a systematized collection of concepts used for data representation...Sex assigned at birth.

Male
Female
Ambiguous
No Information Available
Unknown
Other

+ Add Field

Person Biological Entity Sexual Orientation Code PCORnet CDM Sexual Orientation Code

Default field label: Person Biological Entity Sexual Orientation Code PCORnet CDM Sexual Orientation Code

Alternative field labels: Sexual Orientation

Classification: NCI

Description: A human being...Pertaining to biology or to life and living things...An independently existing thing (living or nonliving)...The pattern of a person's emotional, romantic, and/or sexual attractions...A symbol or combination of symbols which is assigned to the members of a collection...Sexual orientation.

Something else
Bisexual
Questioning
Queer
Lesbian
Gay
Straight
Multiple Sexual Orientation
No Information Available
Other
Unknown
Response Declined
Asexual

Create a Form - Question/Field Bank 4

Edit Field

You may add a new project field to this data collection instrument by completing the fields below and clicking the Save button at the bottom. When you add a new field, it will be added to the form on this page. For an overview of the different field types available, you may view the [Field Types video \(4 min\)](#).

Field Type: Multiple Choice - Radio Buttons (Single Answer)

Field Label Use the Rich Text Editor ?

Sex Assigned at Birth Code

Choices (one choice per line) [Copy existing choices](#)

C20197, Male
C16576, Female
C98810, Ambiguous
C53269, No Information
C17998, Unknown
C17649, Other

How do I manually code the choices?

Variable Name (utilized in logic, calcs, and exports)
 Enable auto naming of variable based upon its Field Label?
ONLY letters, numbers, and underscores

How to use [Smart Variables](#) [Piping](#) [Field Embedding](#)

Required?* No Yes
* Prompt if field is blank

Identifier? No Yes
Does the field contain identifying information (e.g., name, SSN, address)?

Custom Alignment Right / Vertical (RV)
Align the position of the field on the page

Field Note (optional)
Small reminder text displayed underneath field

Action Tags / Field Annotation (optional)

Learn about [@ Action Tags](#) or [using Field Annotation](#)

NIH CDE:
<https://cde.nlm.nih.gov/cde/search>

Save **Cancel**

Create a Form - Custom Questions 1

This page allows you to build and customize your data collection instruments one field at a time. You may add new fields or edit existing ones. New fields may be added by clicking the **Add Field** buttons. You can begin editing an existing field by clicking on the **Edit** icon. If you decide that you do not want to keep a field, you can simply delete it by clicking on the **Delete** icon. To reorder the fields, simply **drag and drop** a field to a different position within the form below. NOTE: While in development status, all field changes will take effect immediately in real time.

Current instrument: **Case Report Form**

Create truly custom questions.

Add Field **Add Matrix of Fields** **Import from Field Bank**

Create a Form - Custom Questions 2

You can make truly custom forms by adding your own field:

Add New Field

You may add a new project field to this data collection instrument by completing the fields below and clicking the Save button at the bottom. When you add a new field, it will be added to the form on this page. For an overview of the different field types available, you may view the [Field Types video \(4 min\)](#).

---- Select a Type of Field ----

Field Type: Text Box (Short Text, Number, Date/Time, ...)

Field Label

Notes Box (Paragraph Text)
Calculated Field
Multiple Choice - Drop-down List (Single Answer)
Multiple Choice - Radio Buttons (Single Answer)
Checkboxes (Multiple Answers)
Yes - No
True - False
Signature (draw signature with mouse or finger)
File Upload (for users to upload files)
Slider / Visual Analog Scale
Descriptive Text (with optional Image/Video/Audio/File Attachment)
Begin New Section (with optional text)

Use the Rich Text Editor ?

Variable Name (utilized in logic, calcs, and exports)

 Enable auto naming of variable based upon its Field Label?
ONLY letters, numbers, and underscores

How to use [Smart Variables](#) [Piping](#) [Field Embedding](#)

Validation? (optional) ---- None ----
- OR -
 -- select ontology service --

Required?* No Yes
* Prompt if field is blank

Identifier? No Yes
Does the field contain identifying information (e.g., name, SSN, address)?

Custom Alignment Right / Vertical (RV)
Align the position of the field on the page

Field Note (optional)

Small reminder text displayed underneath field

Save **Cancel**

NOTICE: Text can/should have validation.

Create a Form - Custom Questions 3

Add New Field

You may add a new project field to this data collection instrument by completing the fields below and clicking the Save button at the bottom. When you add a new field, it will be added to the form on this page. For an overview of the different field types available, you may view the [Field Types video \(4 min\)](#).

Field Type: Multiple Choice - Drop-down List (Single Selection)

Field Label
What is your favorite language?

Choices (one choice per line) [Copy existing choices](#)

- 1, Julia
- 2, PERL
- 3, Python
- 4, R
- 5, SAS
- 6, STATA

Enable auto-complete for this drop-down [?](#)

Action Tags / Field Annotation (optional)
[Learn about Action Tags](#) or [using Field Annotation](#)

Raw values for choices were added automatically

The choices listed below did not appear to have a raw value listed but only had a label, so a raw value has been provided for them automatically. If you are not satisfied with these auto generated values, you may change them before saving your changes for this field. The choices in the 'Choices' text box have automatically been modified to reflect these changes.

- 1 was set as the raw value for **Julia**
- 2 was set as the raw value for **PERL**
- 3 was set as the raw value for **Python**
- 4 was set as the raw value for **R**
- 5 was set as the raw value for **SAS**
- 6 was set as the raw value for **STATA**

Name (utilized in logic, calcs, and exports) Enable auto naming of variable based upon its Field Label?

Smart Variables **Piping** **Field Embedding**

* No Yes
d is blank

* No Yes
contain identifying information (e.g., name, SSN, address)?

Alignment Right / Vertical (RV)
on of the field on the page

(optional) text displayed underneath field

Close

How do I manually code the choices?

Save **Cancel**

Create a Form - Custom Questions 4

Edit Field

You may add a new project field to this data collection instrument by completing the fields below and clicking the Save button at the bottom. When you add a new field, it will be added to the form on this page. For an overview of the different field types available, you may view the [Field Types video \(4 min\)](#).

Field Type: Multiple Choice - Drop-down List (Single Answer)

Field Label Use the Rich Text Editor ?

What is your favorite language?

Variable Name (utilized in logic, calcs, and exports)
language Enable auto naming of variable based upon its Field Label?
ONLY letters, numbers, and underscores

How to use [\[+\] Smart Variables](#) [\[+\] Piping](#) [\[+\] Field Embedding](#)

Required?* No Yes
* Prompt if field is blank

Identifier? No Yes
Does the field contain identifying information (e.g., name, SSN, address)?

Custom Alignment Right / Vertical (RV)
Align the position of the field on the page

Field Note (optional) There is a right answer.
Small reminder text displayed underneath field

Choices (one choice per line) [Copy existing choices](#)

1, Julia
2, PERL
3, Python
4, R
5, SAS
6, STATA

Enable auto-complete for this drop-down ?

How do I manually code the choices?

Action Tags / Field Annotation (optional)

Learn about [@ Action Tags](#) or [using Field Annotation](#)

Create a Form - Custom Questions 5

Current instrument: **Case Report Form**

[Preview instrument](#)

Add Field Add Matrix of Fields Import from Field Bank

    Variable: first_name

First name

Add Field Add Matrix of Fields Import from Field Bank

    Variable: last_name

Last name

Add Field Add Matrix of Fields Import from Field Bank

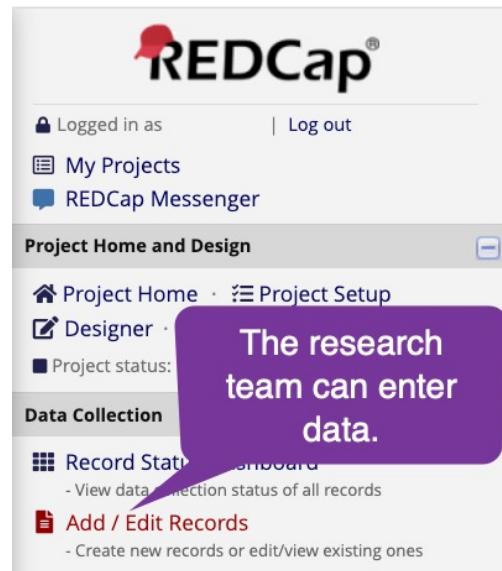
    Variable: language

What is your favorite language? ▾
There is a right answer.

Add Field Add Matrix of Fields Import from Field Bank

Collect/Enter Data 1

- After you have created your forms, the research team can enter data or you can turn the form into a survey.
- To use surveys, you need to enable them for a project, then tag an individual form as a survey.



This screenshot shows the 'Project Home and Design' interface with three numbered callouts:

- Callout 1 points to the 'Project Setup' tab in the top navigation bar.
- Callout 2 points to the 'Main project' section where survey settings are configured. It shows two checkboxes: 'Use surveys in this project?' and 'Use longitudinal data collection with defined events?'. The 'Use surveys...' checkbox is checked.
- Callout 3 points to the 'Optional' link located in the 'Data Collection' sidebar under the 'Add / Edit Records' section.

Collect/Enter Data 2

- The survey needs to be the first questionnaire/instrument.

Data Collection Instruments		Form options:		Automated Survey Invitation options:		
		<input checked="" type="checkbox"/> Form Display Logic		<input checked="" type="checkbox"/> Upload or download Auto Invitations ▾		
		<input checked="" type="checkbox"/> Survey Queue		<input checked="" type="checkbox"/> Survey Login		
		<input checked="" type="checkbox"/> Survey Notifications				
Instrument name	Fields	View PDF	Enabled as survey	Instrument actions	Survey-related options	
Hamilton Depression Rating Scale (HAM-D)	27		<input checked="" type="button"/> Enable	Choose action ▾		
Case Report Form	3		<input checked="" type="button"/> Enable	Choose action ▾		

Data Collection Instruments		Form options:		Automated Survey Invitation options:		
		<input checked="" type="checkbox"/> Form Display Logic		<input checked="" type="checkbox"/> Upload or download Auto Invitations ▾		
		<input checked="" type="checkbox"/> Survey Queue		<input checked="" type="checkbox"/> Survey Login		
		<input checked="" type="checkbox"/> Survey Notifications				
Instrument name	Fields	View PDF	Enabled as survey	Instrument actions	Survey-related options	
Case Report Form	4		<input checked="" type="button"/> Enable	Choose action ▾	<input checked="" type="button"/> Survey settings	+ Automated Invitations
Hamilton Depression Rating Scale Hamd	26		<input checked="" type="button"/> Enable	Choose action ▾		

Collect/Enter Data 3

The screenshot shows the 'Project Home and Design' interface. In the 'Data Collection' section, the 'Survey Distribution Tools' item is highlighted with a purple arrow pointing towards it. The 'Survey Distribution Tools' section contains three items: 'Create a public survey link or build a participant list for inviting respondents', 'Record Status Dashboard', and 'Add / Edit Records'. Below this section, there is a link to 'Show data collection instruments'. The 'Applications' section lists various tools like Project Dashboards, Alerts & Notifications, Multi-Language Management, Calendar, Data Exports, Reports, and Stats, Data Import Tool, Data Comparison Tool, Logging and Email Logging, Field Comment Log, File Repository, User Rights and DAGs, Customize & Manage Locking/E-signatures, and Data Quality.

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: <https://redcap.miami.edu/surveys/?s=HCXMHEKEWJXFWMH>

Protect the public survey using the Google reCAPTCHA feature

Link Actions: **reCAPTCHA is available.** [Customizations](#)

[Open public survey](#)

[Get Short Survey Link](#)

[Open public survey + Log out](#)

[Create Custom Survey Link](#)

[Send me URL via email](#)

[Get Embed Code](#)

[Survey Access Code or QR Code](#)

View/Summarize in REDCap

- You can easily make public/private:
 - dashboards with summary statistics and basic graphics
 - quick **Stats & Charts** reports
 - tabular reports

Dashboards 1

The screenshot shows the REDCap interface with the 'Project Dashboards' section selected. A purple callout '1' points to the 'Project Dashboards' link in the sidebar. The main content area displays a 'Wizard for creating Smart Functions, Smart Tables, and Smart Charts' dialog box. The dialog box has four steps:

- Step 1) Choose a Smart Variable to create:** A dropdown menu is set to 'bar-chart'. A purple callout '2' points to this dropdown.
- Step 2) Choose a field to utilize:** A dropdown menu is set to 'language "What is your favorite language?". A purple callout '2' also points to this dropdown.
- Step 3) Optional data filtering and other settings:** A note states that by default, Smart Functions, Smart Tables, and Smart Charts will utilize all the data from *all records* in the project. A dropdown menu is set to '-- no filtering by report --'. A purple callout '3' points to this dropdown.
- Step 4) Copy the generated Smart Variable syntax and paste it in your project dashboard:** A text input field contains '[bar-chart:language]' and a 'Copy to clipboard' button. A purple callout '3' also points to this area.

The sidebar on the left includes sections for Data Collection (Survey Distribution Tools, Record Status Dashboard, Add / Edit Records), Applications (Project Dashboards, Alerts & Notifications, Multi-Language Management, Calendar, Data Exports, Reports, and Stats, Data Import Tool, Data Comparison Tool, Logging and Email Logging, Field Comment Log, File Repository, User Rights and DAGs, Customize & Manage Locking/E-signatures, Data Quality, API and API Playground, External Modules), Project Dashboards (Language), Help & Information (Help & FAQ, Video Tutorials, Suggest a New Feature), and Contact REDCap administrator.

Dashboards 2

The screenshot shows the REDCap Project Dashboard creation interface. On the left, there's a sidebar with various project management and data collection tools. The 'Project Dashboard' section is highlighted with a purple arrow. The main area is a form for creating a new dashboard:

- Dashboard title:** Language
- User access:** Choose who sees this dashboard on their left-hand project menu.
(Note: Users with Setup/Design privileges can still access all dashboards via the Project Dashboards page.)
 All users - OR - Custom user access (Choose specific users, roles, or data access groups who will have access)
- Set as "public":** Enabling this feature below will auto-generate a public link for viewing the dashboard without needing to log in to REDCap.
 Dashboard is publicly viewable by anyone with the public link
- Dashboard content:** Add any static or dynamic text to be displayed, including Smart Functions, Smart Tables, and Smart Charts.
- Dashboard help:**
 - Use the Wizard
- Smart Functions Examples:**

```
[aggregate=mean:age]
[stats-table:height,weight,bmi,age]
[scatter-plot:weight,height]
[line-chart:weight,height,gender]
[donut-chart:race:enroll_arm_1,visit1_arm_1]
```

```
[aggregate=count:record_id]
[stats-table:weight,height:min,max,median]
[scatter-plot:weight,height,gender]
[line-chart:weight,height,gender]
[bar-chart:ethnicity=R-131EDWCJHN]
```

```
[aggregate=max:weight:R-319PCCFN87]
[stats-table:weight,height:user-dag-name]
[line-chart:weight,height:R-5898NNMYL4]
[pie-chart:education_level]
[bar-chart:race:vanderbilt_dag,duke_dag]
[bar-chart:race,gender:bar-vertical,bar-stacked]
```
- Buttons at the bottom:** Save Dashboard, Cancel

Dashboards 3

My Projects
REDCap Messenger

Project Home and Design

- Project Home · Project Setup
- Designer · Dictionary · Codebook
- Project status: Development

Data Collection

- Survey Distribution Tools
 - Get a public survey link or build a participant list for inviting respondents
- Record Status Dashboard
 - View data collection status of all records
- Add / Edit Records
 - Create new records or edit/view existing ones

Show data collection instruments

Applications

- Project Dashboards
- Alerts & Notifications
- Multi-Language Management
- Calendar
- Data Exports, Reports, and Stats
- Data Import Tool
- Data Comparison Tool
- Logging and Email Logging
- Field Comment Log
- File Repository
- User Rights and DAGs
- Customize & Manage Locking/E-signatures
- Data Quality
- API and API Playground
- External Modules

Project Dashboards

1) Language

Help & Information

R/Medicine 2023 Demo PID 6754

Language

I use the point and click tools to this label for my Bar Chart.

Then I used the Wizard button to write the code for the chart:

Language	Count
Julia	1
PERL	1
Python	1
R	6
SAS	1
STATA	1

Stats & Charts 1

R/Medicine 2023 Demo PID 6754

Data Exports, Reports, and Stats

VIDEO: How to use Data Exports, Reports, and Stats

+ 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, as well as export your data to Microsoft Excel, SAS, Stata, R, or SPSS for analysis (if you have such privileges). If you wish to export your *entire* data set or view it as a report, then Report A is the best and quickest way. However, if you want to view or export data from only specific instruments (or events) on the fly, then Report B is the best choice. You may also create your own custom reports below (if you have such privileges) in which you can filter the report to specific fields, records, or events using a vast array of filtering tools to make sure you get the exact data you want. Once you have created a report, you may view it as a webpage, export it out of REDCap in a specified format (Excel, SAS, Stata, SPSS, R), or view the plots and descriptive statistics for that report.

My Reports & Exports

	Report name	View/Export Options	Management Options	Report ID (auto-generated)	Unique report name (auto-generated)
A	All data (all records and fields)	View Report Export Data Stats & Charts			
B	Selected instruments (all records)	Make custom selections			
	Create New Report				

All data (all records and fields)

DISPLAY OPTIONS

Select a data collection instrument to view	Case Report Form
Optional: Select a record to overlay onto the plots below	
-- select record --	
Viewing options: Show plots & stats Show plots only Show stats only	

First name (*first_name*)

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

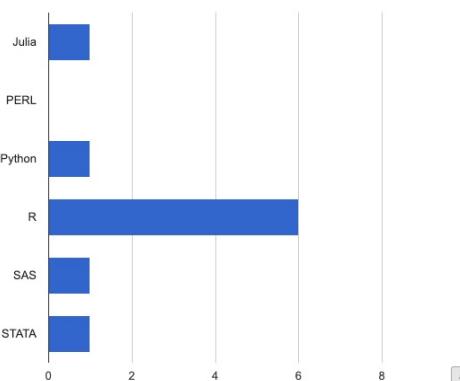
Last name (*last_name*)

Total Count (N)	Missing*
9	1 (10.0%)

What is your favorite language? (*language*) [Refresh Plot](#) | [View as Bar Chart](#)

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

Counts/frequency: [Julia](#) (1, 10.0%), [PERL](#) (0, 0.0%), [Python](#) (1, 10.0%), [R](#) (6, 60.0%), [SAS](#) (1, 10.0%), [STATA](#) (1, 10.0%)



[Download image](#)

Complete? (*case_report_form_complete*) [Refresh Plot](#) | [View as Bar Chart](#)

Total Count (N)	Missing*	Unique

Tabular Reports 1

The screenshot shows the REDCap interface for the R/Medicine 2023 Demo project (PID 6754). The left sidebar contains links for My Projects, REDCap Messenger, Project Home and Design (with options for Project Home, Project Setup, Designer, Dictionary, Codebook, and status Development), Data Collection (Survey Distribution Tools, Record Status Dashboard, Add / Edit Records), Applications (Project Dashboard, Alerts & Notifications, Multi-Language Management, Calendar, Data Exports, Reports, and Stats, Data Import Tool, Data Comparison Tool, Logging, and Email Logging), and a section for Logging.

The main content area displays the "Data Exports, Reports, and Stats" module. It includes a "VIDEO: How to use Data Exports, Reports, and Stats" link. Below it are three buttons: "+ Create New Report", "My Reports & Exports", and "Other Export Options".

The "My Reports & Exports" section lists two rows:

	Report name	View/Export Option	Management Options	Report ID (auto-generated)	Unique report name (auto-generated)
A	All data (all records and fields)	View Report Export Data Stats & Charts			
B	Selected instruments (all records)	Make custom selections			

A purple arrow points from the "Data Exports, Reports, and Stats" link in the sidebar to the "View/Export Option" section of the main content area. Another purple arrow points from the "View Report" button in the "All data" row to the "View Report" button in the "Selected instruments" row.

Tabular Reports 2

My Projects
REDCap Messenger

Project Home and Design
Project Home · Project Setup
Designer · Dictionary · Codebook
Project status: Development

Data Collection
Survey Distribution Tools
- Get a public survey link or build a participant list for inviting respondents
Record Status Dashboard
- View data collection status of all records
Add / Edit Records
- Create new records or edit/view existing ones
Show data collection instruments

Applications
Project Dashboards
Alerts & Notifications
Multi-Language Management
Calendar
Data Exports, Reports, and Stats
Data Import Tool
Data Comparison Tool
Logging and Email Logging
Field Comment Log
File Repository
User Rights and DAGs
Customize & Manage Locking/E-signatures
Data Quality
API and API Playground
External Modules

Project Dashboards

1) Language

Help & Information
Help & FAQ
Video Tutorials
Suggest a New Feature

Contact REDCap administrator

R/Medicine 2023 Demo PID 6754

Data Exports, Reports, and Stats

+ Create New Report

Number of results returned: 10 Total number of records queried: 10 Report execution time: 0.1 seconds

Live filters:

All data (all records and fields)

Record ID record_id	Survey Identifier redcap_survey_identifier	Survey Timestamp case_report_form_timestamp	First name first_name	Last name last_name	What is your favorite language? language	Complete? case_report_form_complete	Patient Name hamd_patient_name	Today's Date hamd_todays_date	1. DEPRESSED MOOD (Gloomy attitude, pessimism about the future, fee... of sadness, tendency to weep) hamd_1	2. FEELINGS OF GUILT hamd_2	3. SUICIDE hamd_3
1			Me	Balise	R (4)	Complete (2)					
2		04-02-2023 19:26	Julia	Balise	Julia (1)	Complete (2)					
3		04-02-2023 19:27	Old	Balise	SAS (5)	Complete (2)					
4		04-02-2023 19:27	RR	Balise	R (4)	Complete (2)					
5		04-02-2023 19:27	Texas	Balise	STATA (6)	Complete (2)					
6		04-02-2023 19:28	Slytherin	Balise	Python (3)	Complete (2)					
7		04-02-2023 19:29	R	Ihaka	R (4)	Complete (2)					
8		04-02-2023 19:29	R	Gentleman	R (4)	Complete (2)					
9		04-02-2023 19:30	R	Peng	R (4)	Complete (2)					
10		04-02-2023 19:31	Hadley		R (4)	Complete (2)					

Export for Additional Magic 1

- You can manually export any tabular report.

The screenshot shows the REDCap interface for the 'R/Medicine 2023 Demo' project (PID 6754). The left sidebar includes 'My Projects' and 'REDCap Messenger' sections, followed by 'Project Home and Design' and 'Data Collection' sections. The 'Data Collection' section contains links for 'Survey Distribution Tools' (with a note about public survey links), 'Record Status Dashboard' (with a note about viewing data collection status), and 'Add / Edit Records' (with a note about creating new records or editing existing ones). The main content area is titled 'Data Exports, Reports, and Stats'. It features a 'VIDEO: How to use Data Exports, Reports, and Stats' link. Below it are three buttons: '+ Create New Report', 'My Reports & Exports', and 'Other Export Options'. A detailed description follows: 'This module allows you to easily view reports of your data, inspect plots and descriptive statistics of your data, as well as export your data to Microsoft Excel, SAS, Stata, R, or SPSS for analysis (if you have such privileges). If you wish to export your *entire* data set or view it as a report, then Report A is the best and quickest way. However, if you want to view or export data from only specific instruments (or events) on the fly, then Report B is the best choice. You may also create your own custom reports below (if you have such privileges) in which you can filter the report to specific fields, records, or events using a vast array of filtering tools to make sure you get the exact data you want. Once you have created a report, you may view it as a webpage, export it out of REDCap in a specified format (Excel, SAS, Stata, SPSS, R), or view the plots and descriptive statistics for that report.' The 'My Reports & Exports' table has columns for 'Report name', 'View/Export Options', 'Management Options', 'Report ID (auto-generated)', and 'Unique report name (auto-generated)'. It lists two items: 'A All data (all records and fields)' and 'B Selected instruments (all records)'. For item 'A', the 'View/Export Options' column contains 'View Report', 'Export Data' (which is highlighted with a purple arrow), and 'Stats & Charts'. For item 'B', it contains 'Make custom selections'. A third button '+ Create New Report' is located at the bottom of the table.

Report name	View/Export Options	Management Options	Report ID (auto-generated)	Unique report name (auto-generated)
A All data (all records and fields)	View Report Export Data Stats & Charts			
B Selected instruments (all records)	Make custom selections			
+ Create New Report				

Export for Additional Magic 2

- Export a single form.

The screenshot shows the REDCap interface for 'R/Medicine 2023 Demo' (PID 6754). The left sidebar includes 'My Projects' (REDCap Messenger), 'Project Home and Design' (Project Home, Designer, Dictionary, Codebook, Project status: Development), 'Data Collection' (Survey Distribution Tools, Record Status Dashboard, Add / Edit Records), and 'Applications' (Project Dashboards, Alerts & Notifications, Multi-Language Management, Calendar, Data Exports, Reports, and Stats, Data Import Tool, Data Comparison Tool, Logging and Email Logging, Field Comment Log, File Repository, User Rights and DAGs, Customize & Manage Locking/E-signatures, Data Quality, API and API Playground, External Modules). The main content area is titled 'Data Exports, Reports, and Stats' with a 'VIDEO: How to use Data Exports, Reports, and Stats' link. It features tabs for '+ Create New Report', 'My Reports & Exports', and 'Other Export Options'. A descriptive text explains the module's purpose: viewing reports, inspecting plots, and exporting data to various formats. Below this is a table titled 'My Reports & Exports' with columns for Report name, View/Export Options, Management Options, Report ID (auto-generated), and Unique report name (auto-generated). Two rows are shown: Row A ('All data (all records and fields)') and Row B ('Selected instruments (all records)'). Both rows include 'View Report', 'Export Data', and 'Stats & Charts' buttons. Row B also includes a dropdown for selecting instruments, with 'Case Report Form' and 'Hamilton Depression Rating Scale Hand' listed. A note says 'Select one or more instruments below for all records.' A 'Create report' button is at the bottom of the table. The bottom of the page has 'Project Dashboards', 'Add/Edit', and a search bar.

Export for Additional Magic 3

The screenshot shows the REDCap interface with a modal dialog titled "Exporting 'All data (all records and fields)'".

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.

- 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

Additional export options:

- Export survey identifier field and survey timestamp field(s)?

Advanced data formatting options - Export blank values for gray Form Status:

All Form Status fields with a gray status icon can be exported either as a blank value or as "0" (Incomplete). Hint: Blank values are recommended if the data will be imported back into REDCap, in which this preserves the gray status icons for all the imported records.

Export gray Form Status fields with value of "0" ▾

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.

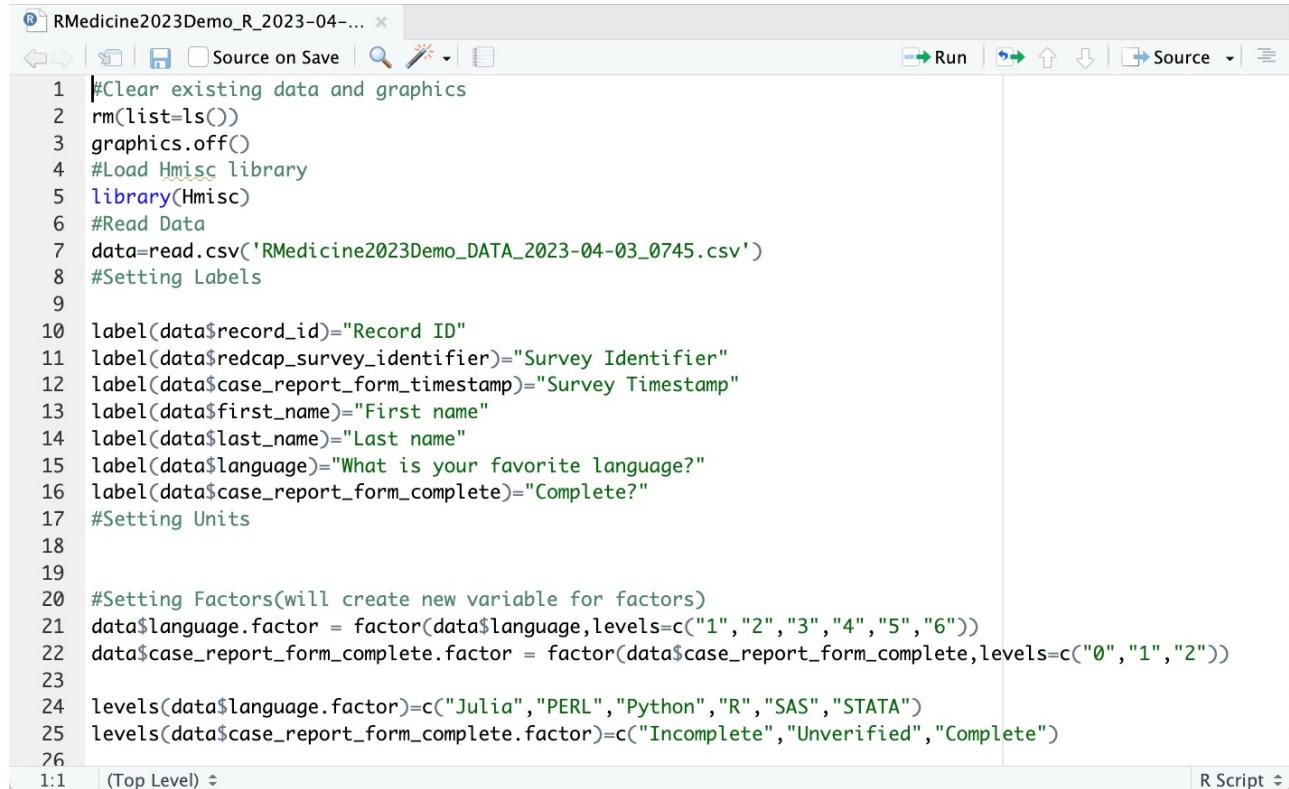
Buttons:

- Export Data
- Cancel

Export for Additional Magic 4

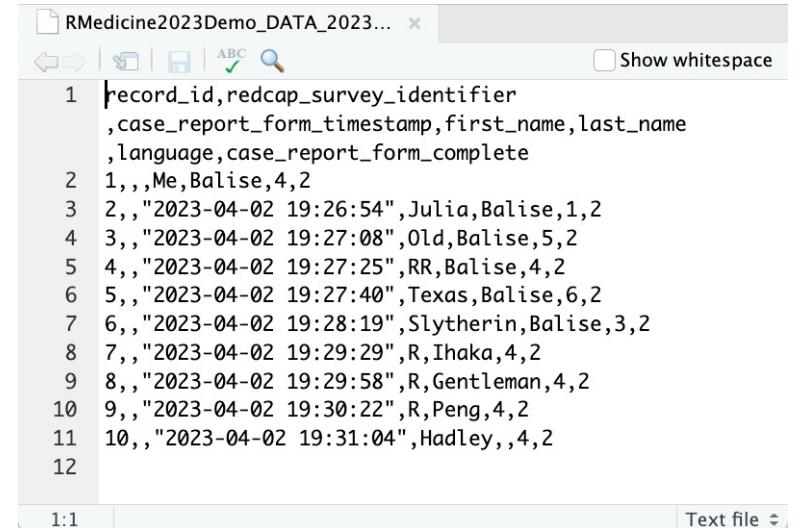
The screenshot shows the REDCap interface for the "R/Medicine 2023 Demo" project (PID 6754). The left sidebar contains navigation links for Project Home and Design, Data Collection, Applications, and Help & Information. The main content area displays the "Data Exports, Reports, and Stats" section. A modal window titled "Data export was successful!" is open, providing instructions on how to download the data file. It includes a note about citation requirements and information for R Statistical Software users. The background shows a table for creating reports, with one row visible for "Report A".

Export for Additional Magic 5



The screenshot shows an RStudio interface with an R script file open. The code is used to clear existing data and graphics, load the Hmisc library, read a CSV file, and set labels and units for various variables. It also creates factors for language and case report form complete status.

```
1 #Clear existing data and graphics
2 rm(list=ls())
3 graphics.off()
4 #Load Hmisc library
5 library(Hmisc)
6 #Read Data
7 data=read.csv('RMedicine2023Demo_DATA_2023-04-03_0745.csv')
8 #Setting Labels
9
10 label(data$record_id)="Record ID"
11 label(data$redcap_survey_identifier)="Survey Identifier"
12 label(data$case_report_form_timestamp)="Survey Timestamp"
13 label(data$first_name)="First name"
14 label(data$last_name)="Last name"
15 label(data$language)="What is your favorite language?"
16 label(data$case_report_form_complete)="Complete?"
17 #Setting Units
18
19
20 #Setting Factors(will create new variable for factors)
21 data$language.factor = factor(data$language,levels=c("1","2","3","4","5","6"))
22 data$case_report_form_complete.factor = factor(data$case_report_form_complete,levels=c("0","1","2"))
23
24 levels(data$language.factor)=c("Julia","PERL","Python","R","SAS","STATA")
25 levels(data$case_report_form_complete.factor)=c("Incomplete","Unverified","Complete")
26
```



The screenshot shows a text editor displaying a CSV file named 'RMedicine2023Demo_DATA_2023-04-03_0745.csv'. The file contains 12 rows of data, each with fields for record_id, redcap_survey_identifier, case_report_form_timestamp, first_name, last_name, language, and case_report_form_complete.

record_id	redcap_survey_identifier	case_report_form_timestamp	first_name	last_name	language	case_report_form_complete
1,,Me,Balise,4,2						
2,,,"2023-04-02 19:26:54",Julia,Balise,1,2						
3,,,"2023-04-02 19:27:08",Old,Balise,5,2						
4,,,"2023-04-02 19:27:25",RR,Balise,4,2						
5,,,"2023-04-02 19:27:40",Texas,Balise,6,2						
6,,,"2023-04-02 19:28:19",Slytherin,Balise,3,2						
7,,,"2023-04-02 19:29:29",R,Ihaka,4,2						
8,,,"2023-04-02 19:29:58",R,Gentleman,4,2						
9,,,"2023-04-02 19:30:22",R,Peng,4,2						
10,,,"2023-04-02 19:31:04",Hadley,,4,2						
11,,,"2023-04-02 19:31:04",Hadley,,4,2						
12,,,"2023-04-02 19:31:04",Hadley,,4,2						

API Export for Better Magic 1

The screenshot shows the REDCap API documentation page for the "R/Medicine 2023 Demo" project. The page includes a sidebar with navigation links for Project Home and Design, Data Collection, and Applications. The main content area displays the API documentation, which describes the interface for external applications to connect to REDCap. It includes a section on API Security Best Practices and a button to generate an API token.

University of Miami
Office of the Vice Provost for Research

R/Medicine 2023 Demo PID 6754

API

The REDCap API is an interface that allows external applications to connect to REDCap remotely, and is used for programmatically retrieving or modifying data or settings within REDCap, such as performing automated data imports/exports from a specified REDCap project. For details on the capabilities of the REDCap API and how to use it, please see the [REDCap API documentation](#).

API Security: Best Practices

It is important to remember that when making requests to the REDCap API, you should always validate the REDCap server's SSL certificate to ensure the highest level of security during communication with the API. For details on what this means and how to do it, see the 'API Security: Best Practices' section in the [REDCap API documentation](#).

Obtain API token for "R/Medicine 2023 Demo"

Use the button below to generate an API token for this project. You will need a different token for each project you would like to access.

Generate API token

Project Home · Project Setup · Designer · Dictionary · Codebook · Project status: Development

Survey Distribution Tools · Record Status Dashboard · Add / Edit Records · Show data collection instruments

Project Dashboards · Alerts & Notifications · Multi-Language Management · Calendar · Data Exports, Reports, and Stats · Data Import Tool · Data Comparison To · Logging and Email Logging · Field Comment Log · File Repository · User Rights and DAGs · Customize & Manage Locking/E-signatures · Data Quality · API and API Playground · External Modules