BASICS ON REDCAP

A Tool for Data Collection and Management in Clinical Research

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Learning Objectives

- Introduce basic REDCap terminology, settings, and functions
- Describe best practices for REDCap setup
- Demonstrate fundamental features in REDCap to manage study data

Outline

- What is REDCap
- Terminology
- Institutional Access to REDCap
- Creating a Project in REDCap
  - Project Settings
  - User Rights
  - Best Practices
  - Different Types of Fields
- Live Demonstration

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ⓘ Start presenting to display the joining instructions on this slide.

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How would you describe your experience in REDCap?

ⓘ Start presenting to display the poll results on this slide.

What is REDCap

- **R**esearch **E**lectronic **D**ata **C**apture
- REDCap is a secure, web-based application for building and managing online surveys and databases for research.
- REDCap provides:
  - Audit Trails to track data manipulation and User activity
  - Data Exports to Excel, PDF, and common statistical packages (SPSS, SAS, Stata, and R)
  - Numerous features for data management…we'll cover some of these in this presentation

Terminology

- **Data Collection Instrument** – A data collection tool that can be left as a form or enabled as a survey.
- **(Data Entry) Form** – An instrument in which data can only be entered or collected by a REDCap user. (viewing method)
- **Survey** – An instrument in which a research participant can enter data or answer questions without a REDCap account. Instrument is accessed through a URL. (viewing method)
- **Record** - A record contains all the information for a unique participant. One record may contain many instruments
- **Record ID** – A unique identifier for each record in a project.
- **Record Dashboard –** A table that lists all existing records and their status for every data collection instrument
- **Online Designer** – A way to build and edit instruments through a point-and-click interface.
- **Data Dictionary** – CSV file that holds the architecture of a project. An alternative to the Online Designer for building or editing projects. Mainly use to save the project for future reference or project duplication.
- **Piping** – Allows answers from previous questions to auto-populate or "pipe" into another place in a survey/form.

https://healthinstitute.illinois.edu/research-support-translation/redcap/glossary#form

https://www.vumc.org/nursingebp/sites/default/files/public_files/Vanderbilt%20Meharry%20REDCap%20User%20Guide%20v4.1.pdf

REDCap Access and Support

BU

- Access: https://www.bu.edu/ctsi/tools/
- REDCap Support: rchelp@bu.edu

FSU

- Access: https://med.fsu.edu/ncrt/redcap-access
- REDCap Support: redcap@med.fsu.edu

UF

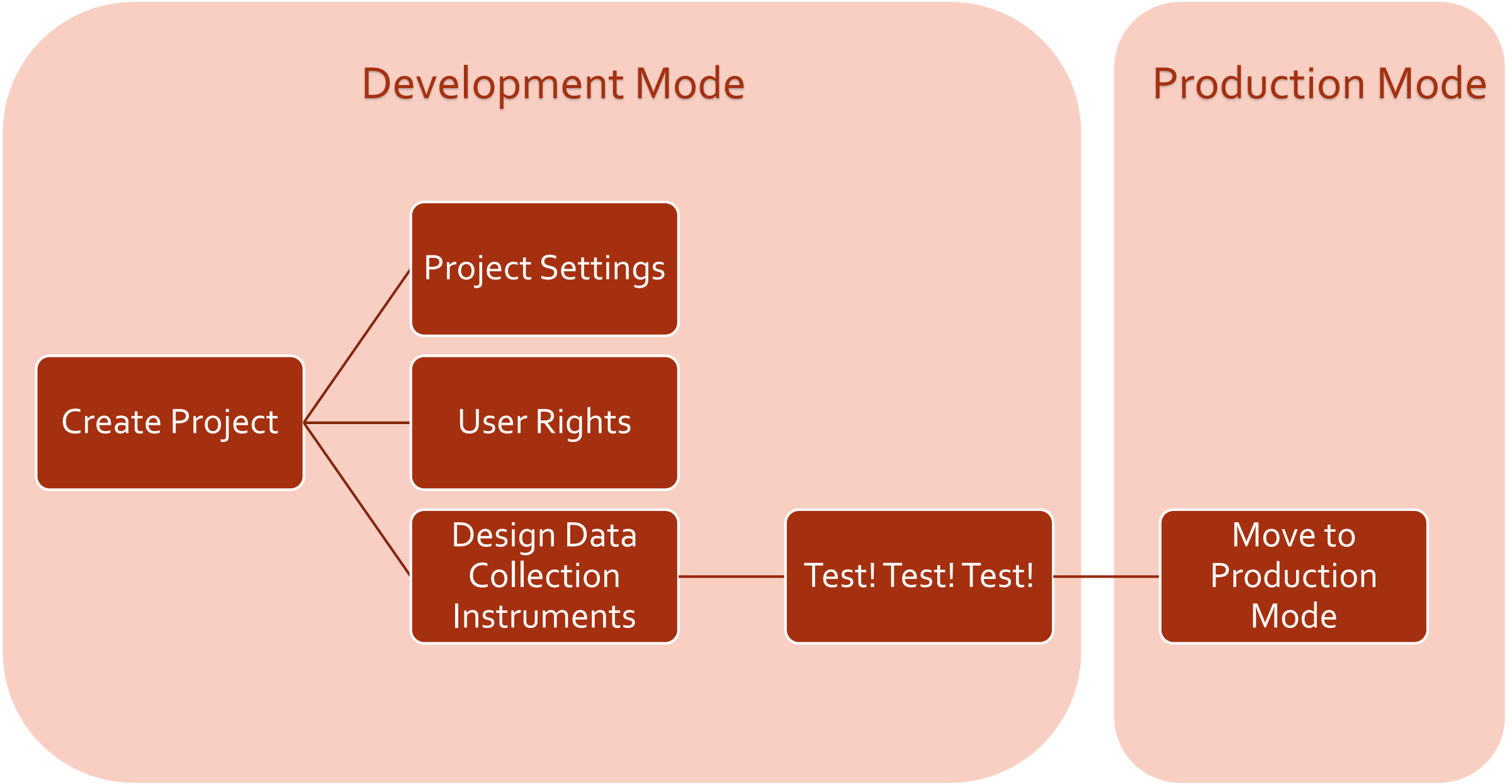
- Access: https://www.ctsi.ufl.edu/research/study-design-and-analysis/redcap/

UVM

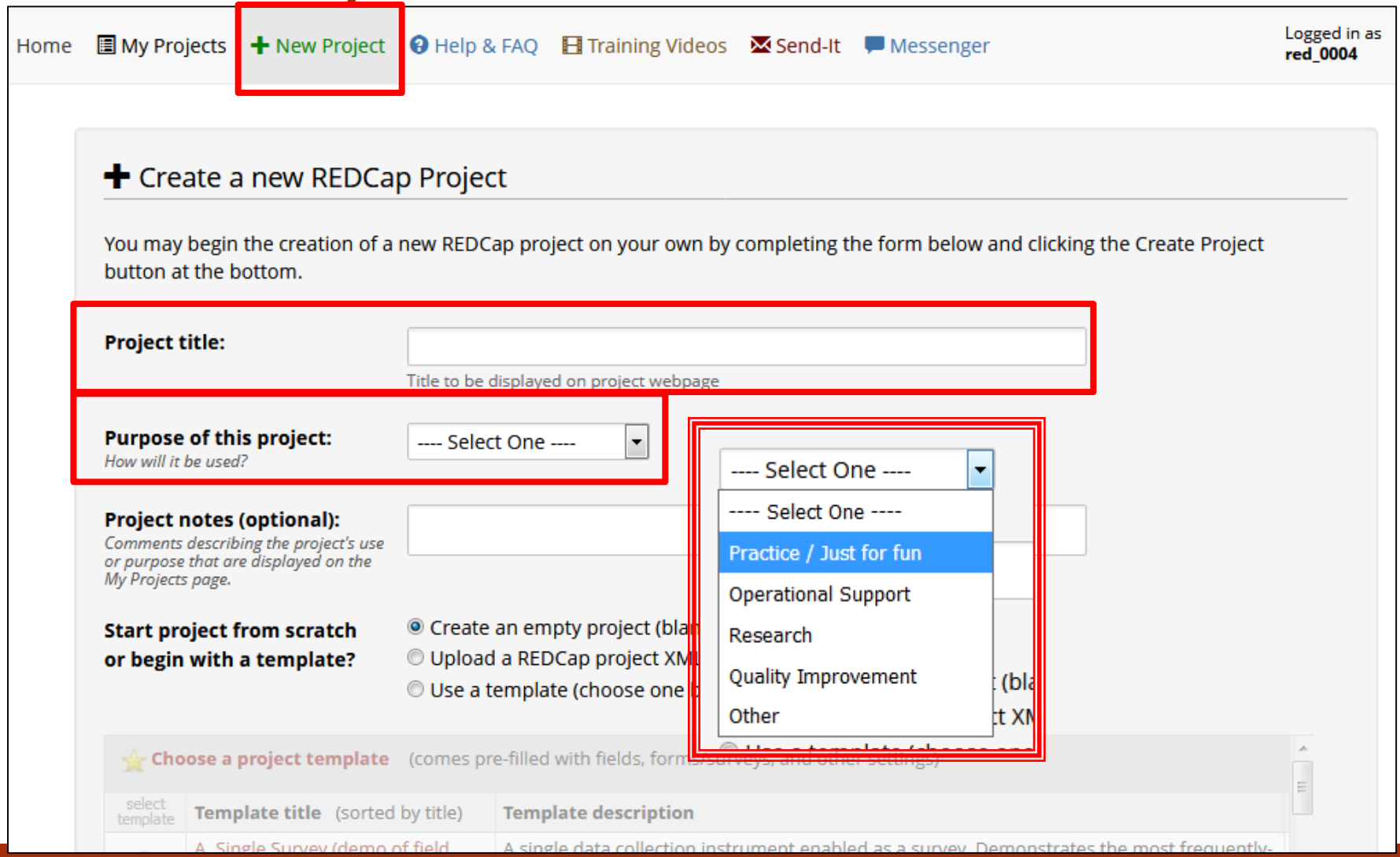
- Access: https://www.uvm.edu/biostatistics/redcap
- REDCap Support: redcap.administrator@med.uvm.edu

MUSC

- Access: https://medicine.musc.edu/departments/centers/bmic/projects/redcap
- REDCap Support: redcap@musc.edu


Development Mode
Production Mode
Create Project
Project Settings
User Rights
Design Data Collection Instruments
Test! Test! Test!
Move to Production Mode

Create a Project



Research Project

Research

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)

VUnetID of P.I. (if applicable):

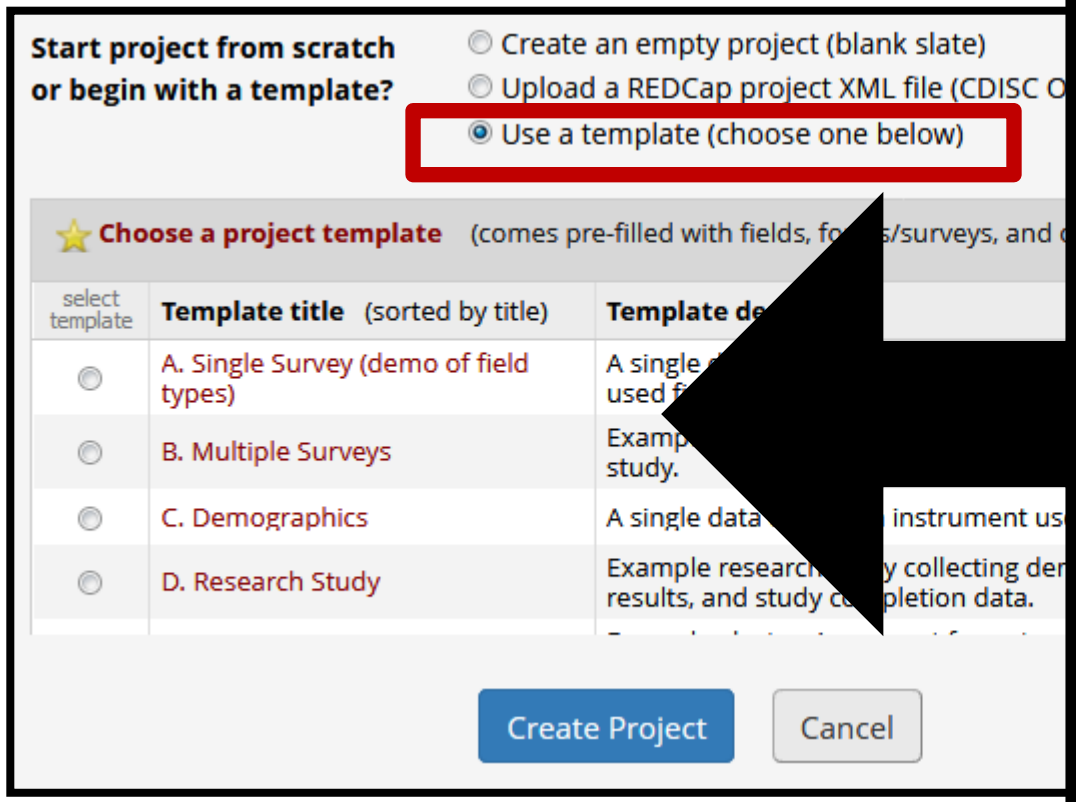
IRB number (if applicable):

Grant 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

Project Creation Options



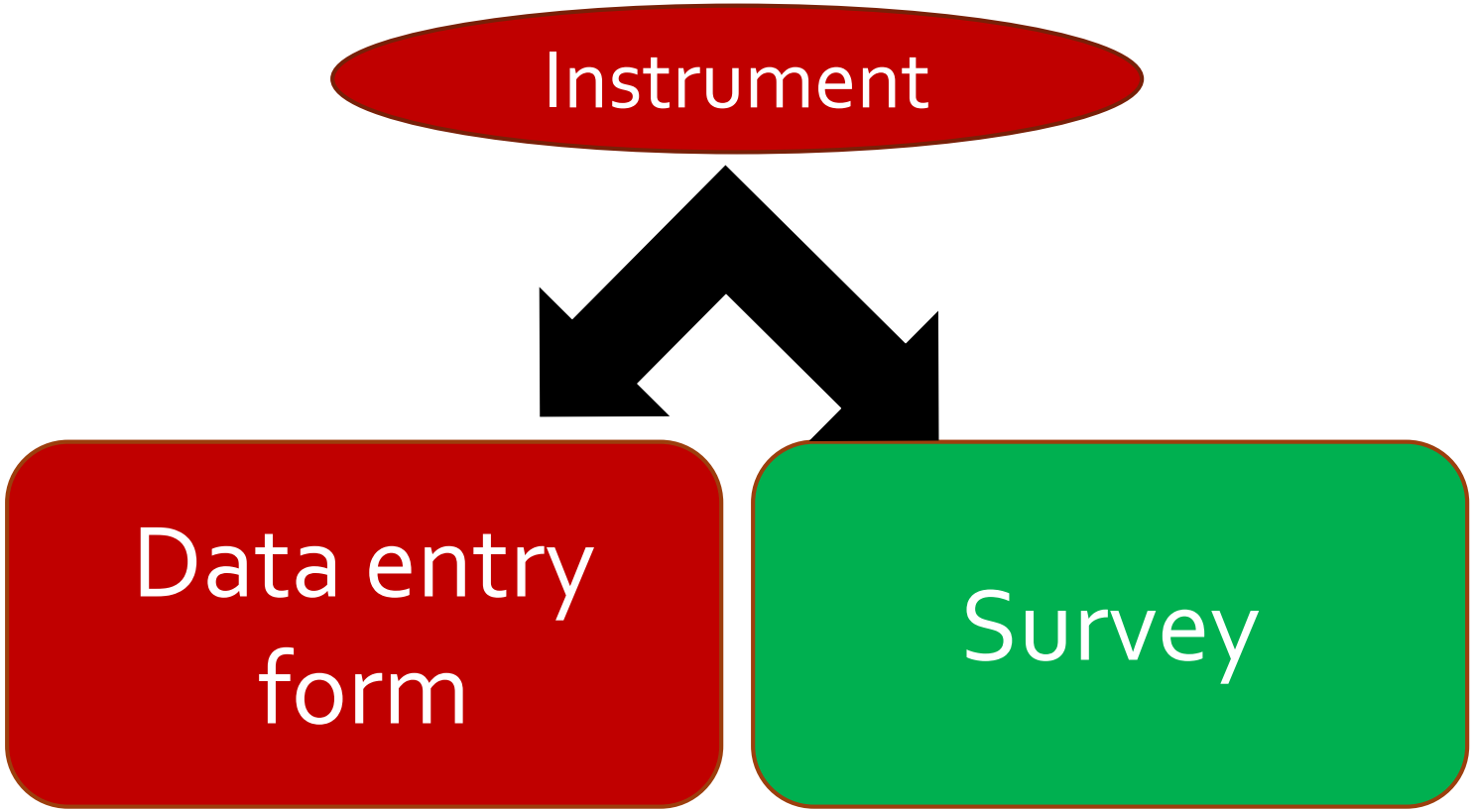
~20 templates:
Surveys
consent forms
regulatory binders
employee training
…

Instrument

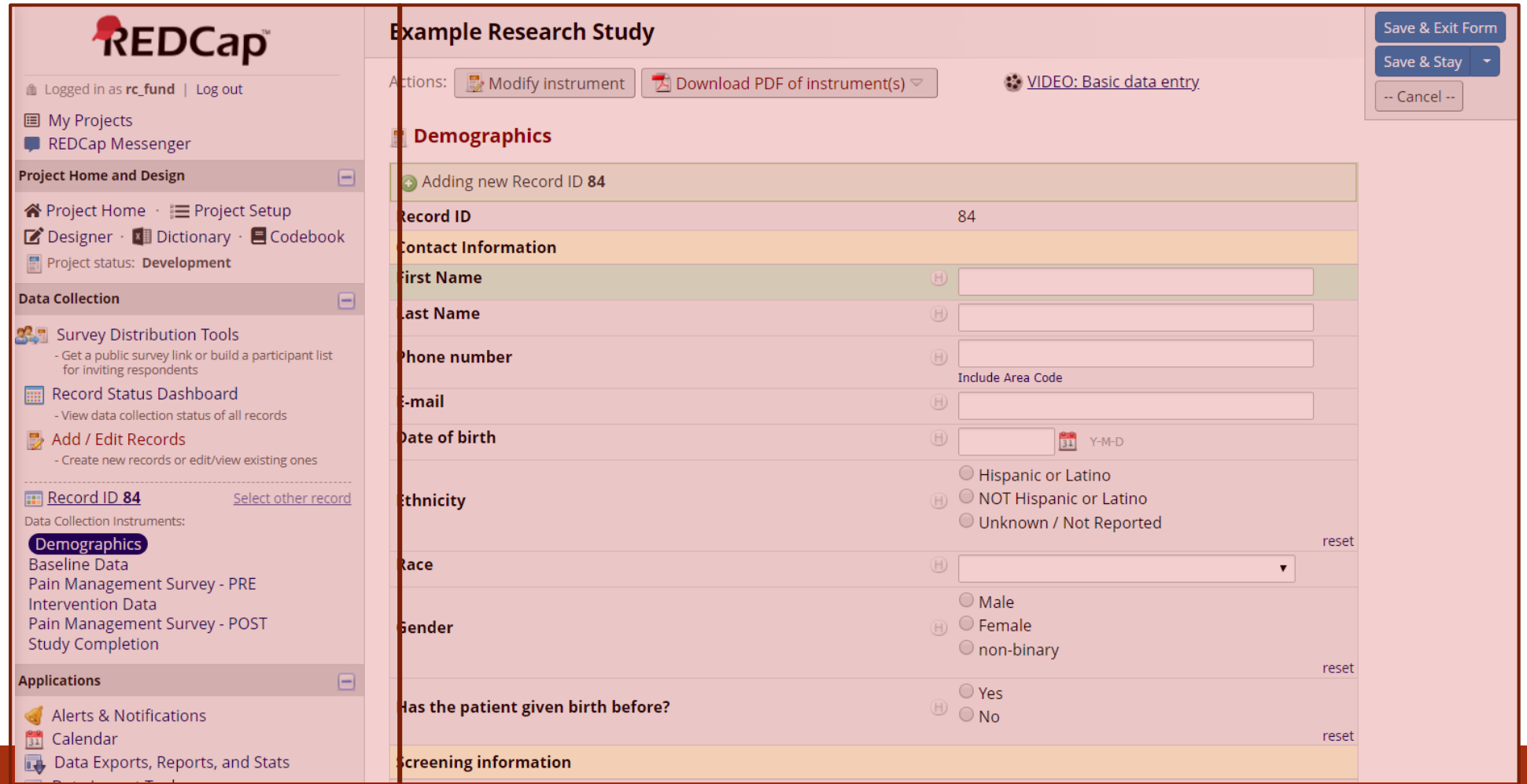
Demographics

Adding new Study ID **Test2**

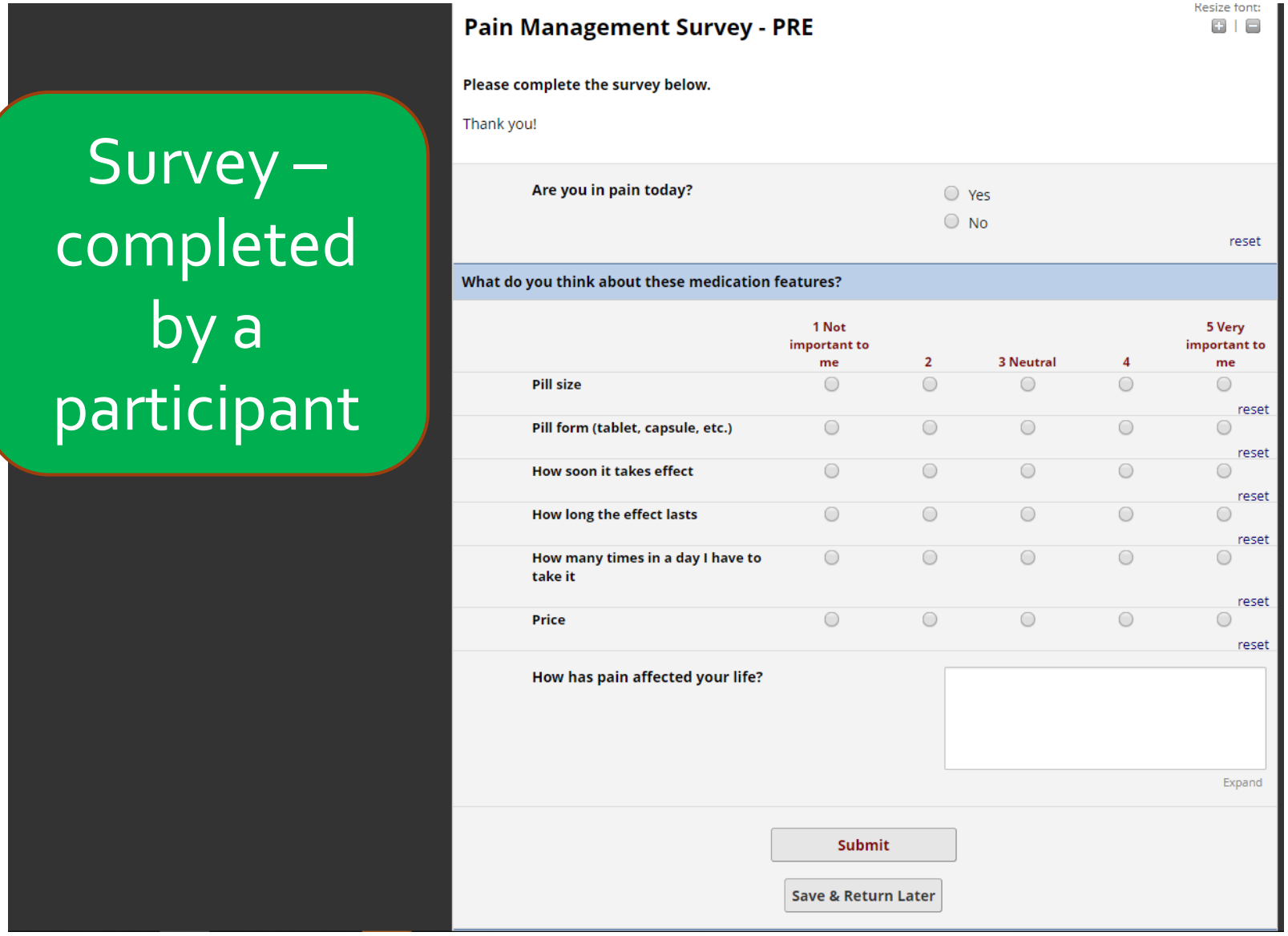
Study ID	Test2
Contact Information	
First Name	
Last Name	
Phone number	Include Area Code
E-mail	
Date of birth	Y-M-D


Instrument
Data entry form
Survey

Data Entry Form – accessed by REDCap Users



Survey – completed by a participant



Resize font:

Pain Management Survey - PRE

Please complete the survey below.

Thank you!

Are you in pain today?

- Yes
- No

reset

What do you think about these medication features?

	1 Not important to me	2	3 Neutral	4	5 Very important to me
Pill size					
Pill form (tablet, capsule, etc.)					
How soon it takes effect					
How long the effect lasts					
How many times in a day I have to take it					
Price					

reset

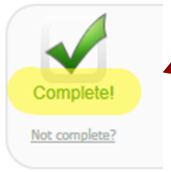
How has pain affected your life?

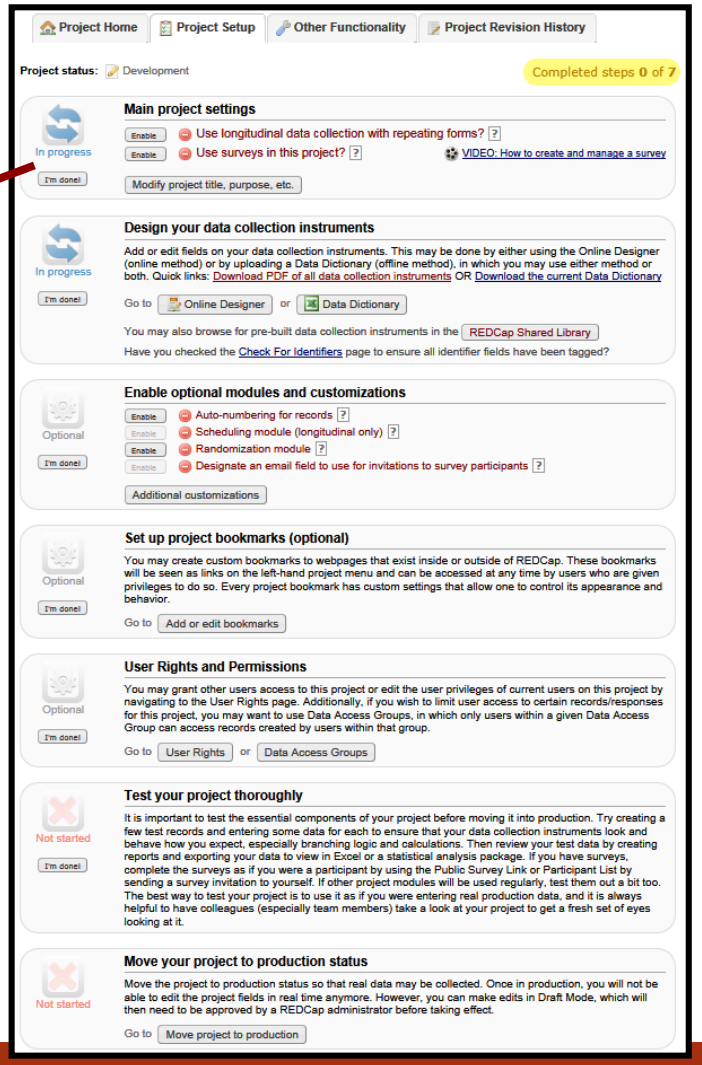
Expand

Submit

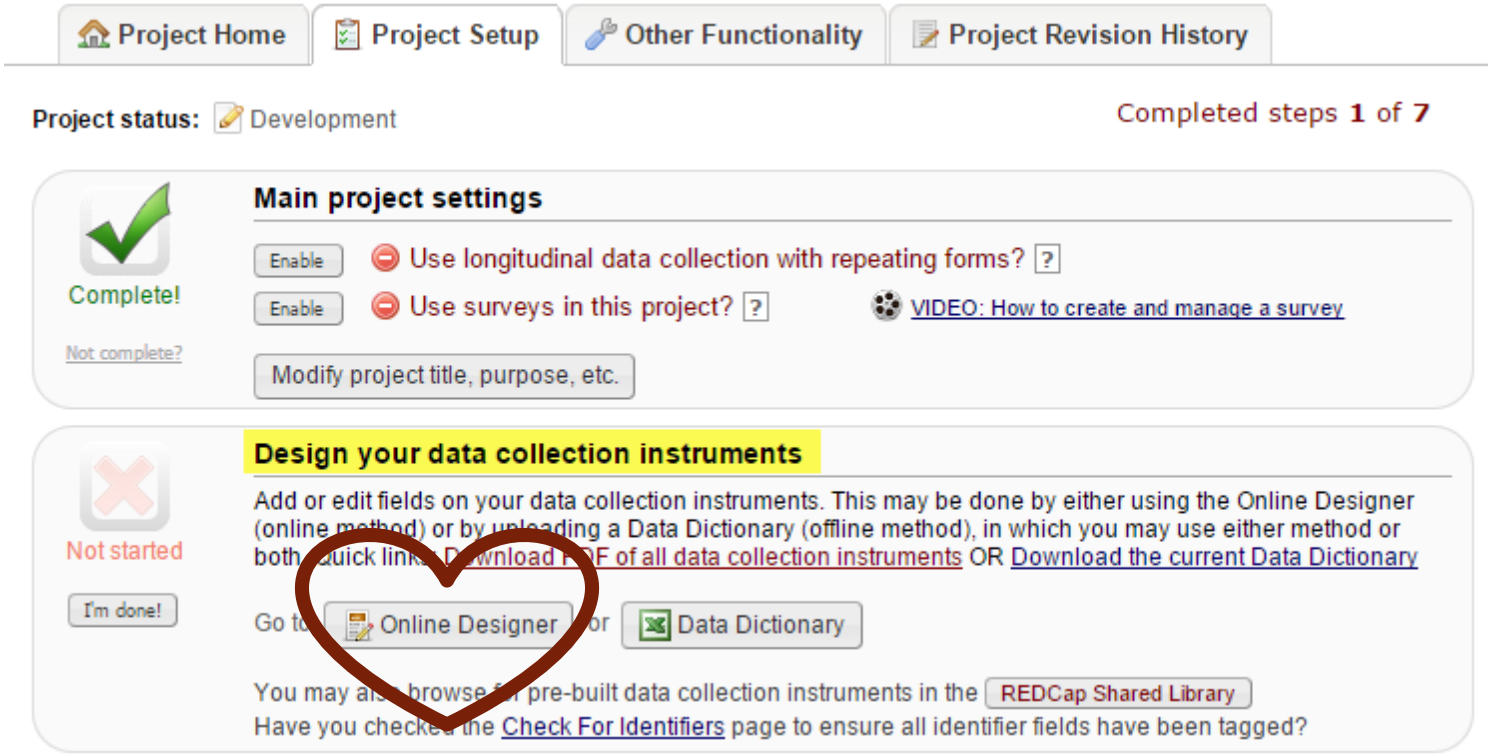
Save & Return Later

Project Setup Page

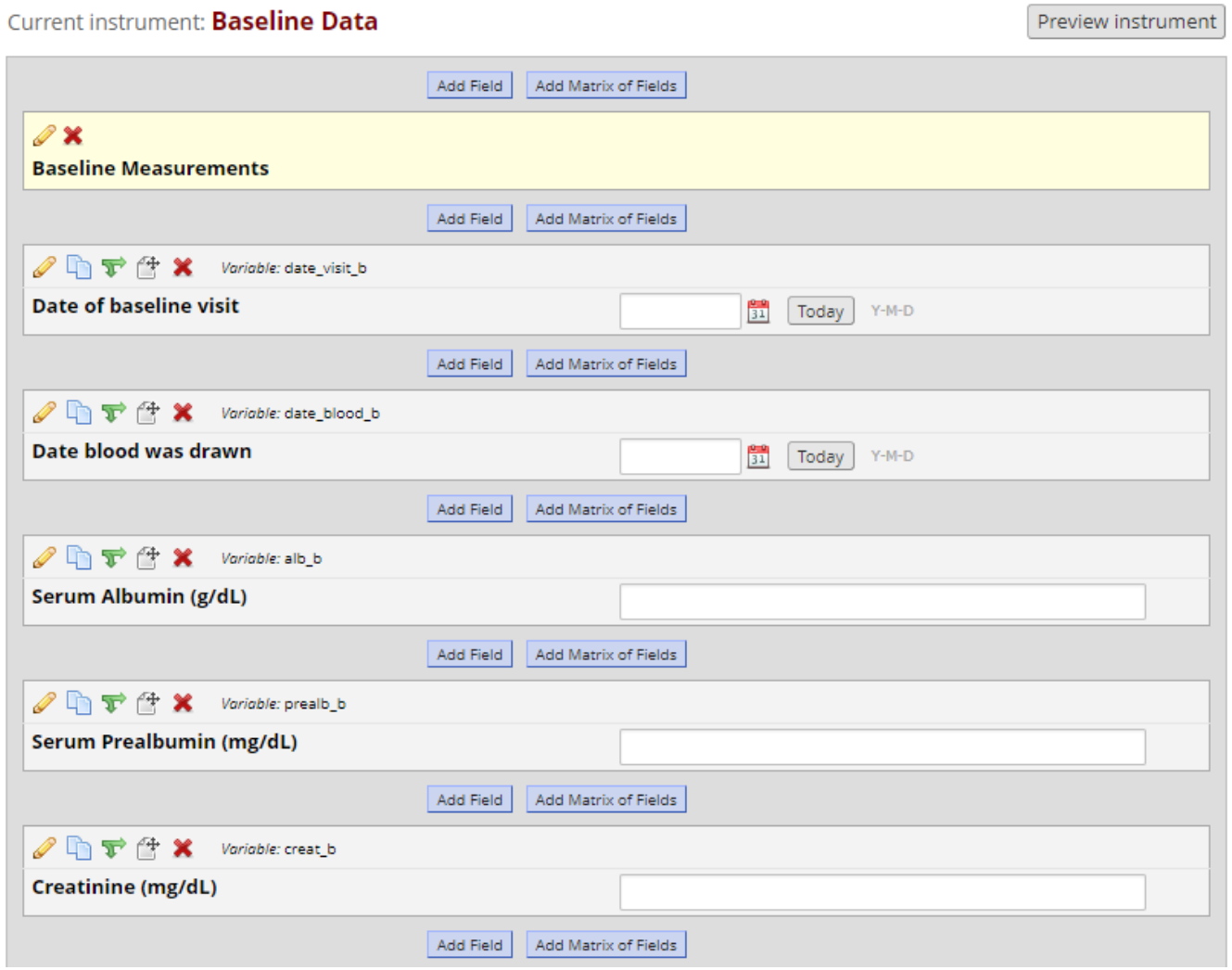




Design Data Collection Instruments

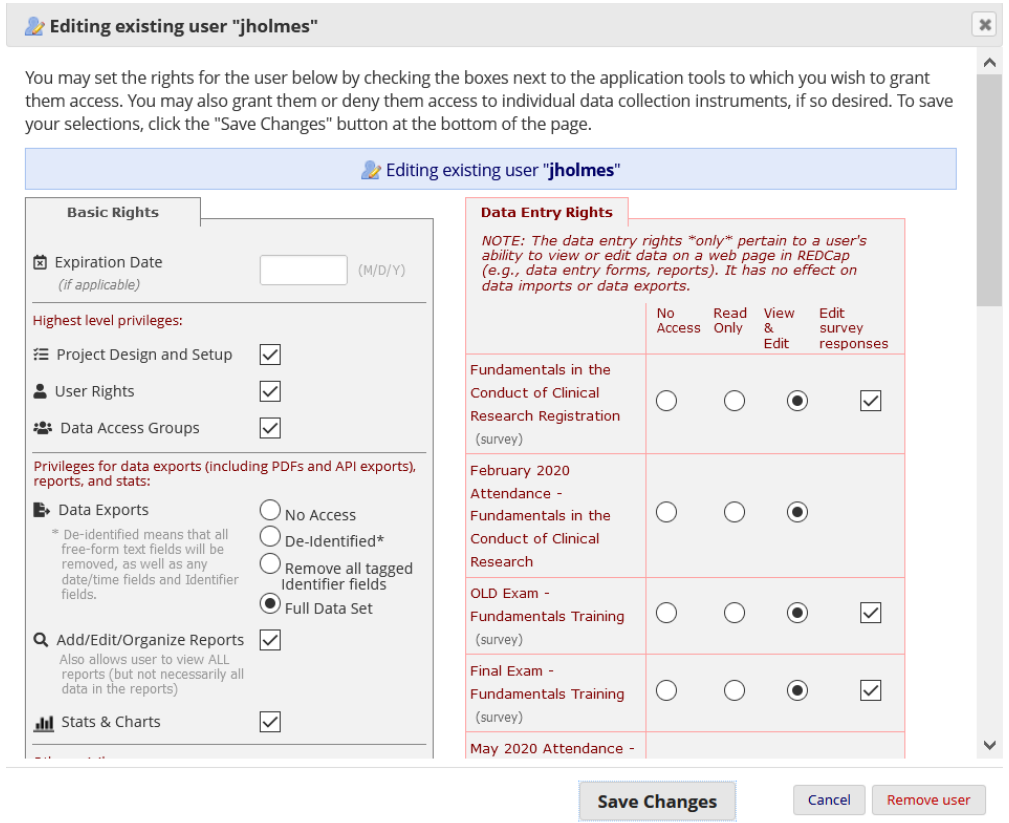


Online Designer



User Rights

- Add/remove users to your REDCap project
- Customize privileges each user can have in terms of project access:
  - Project Design
  - Record creation/deletion
  - Data entry
  - Data access
  - Data form modification

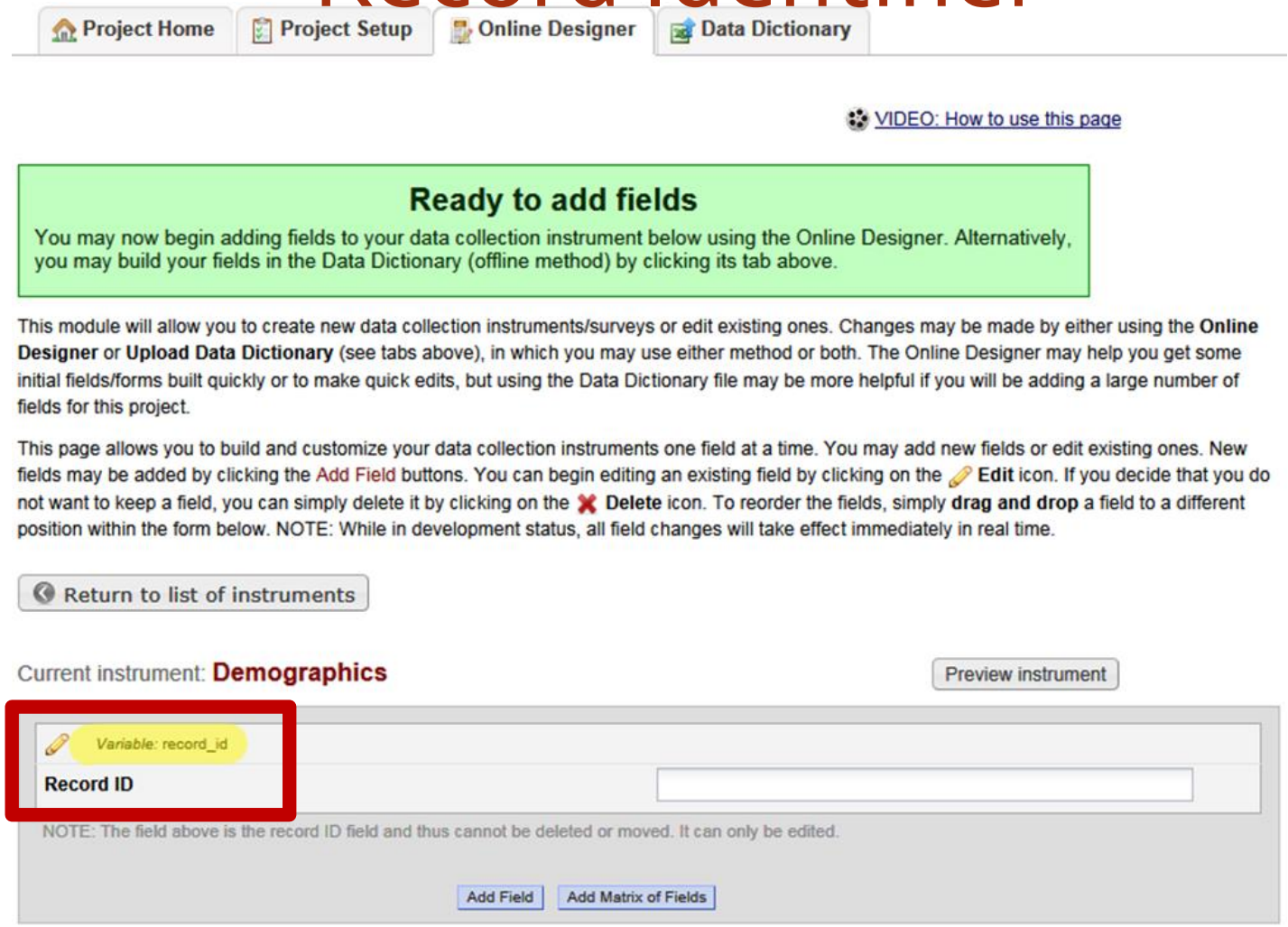


Best Practices…

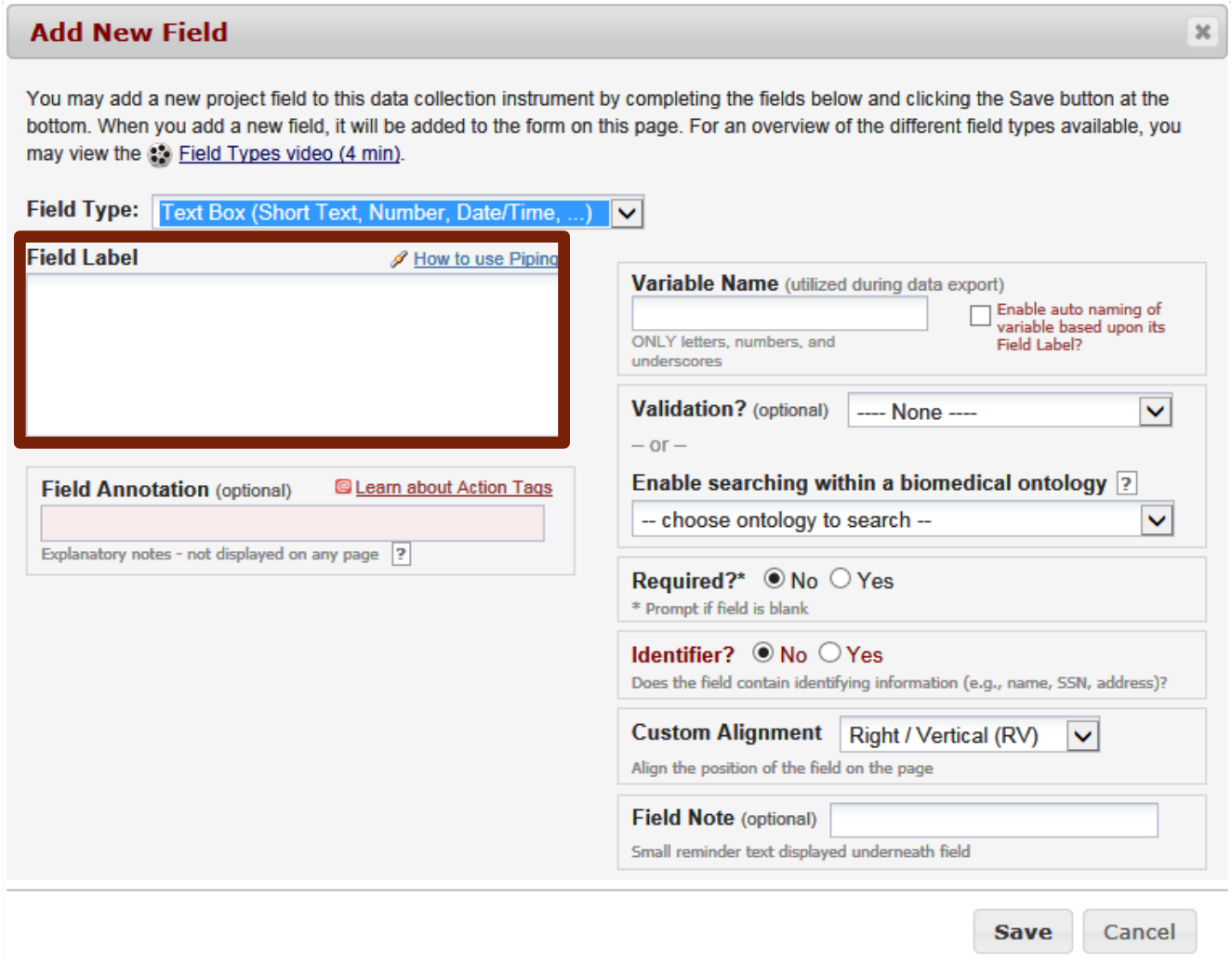
…To keep in mind when creating your variables/fields

- Keep your variable names short and easy to understand
- Code your answer choices with analysis in mind
- Flag fields that collect identifying information
- Utilize validation features when collecting text responses
- DO enter test data while in development mode.
- **DO <u>NOT</u> enter real data until you have moved your project to production.**

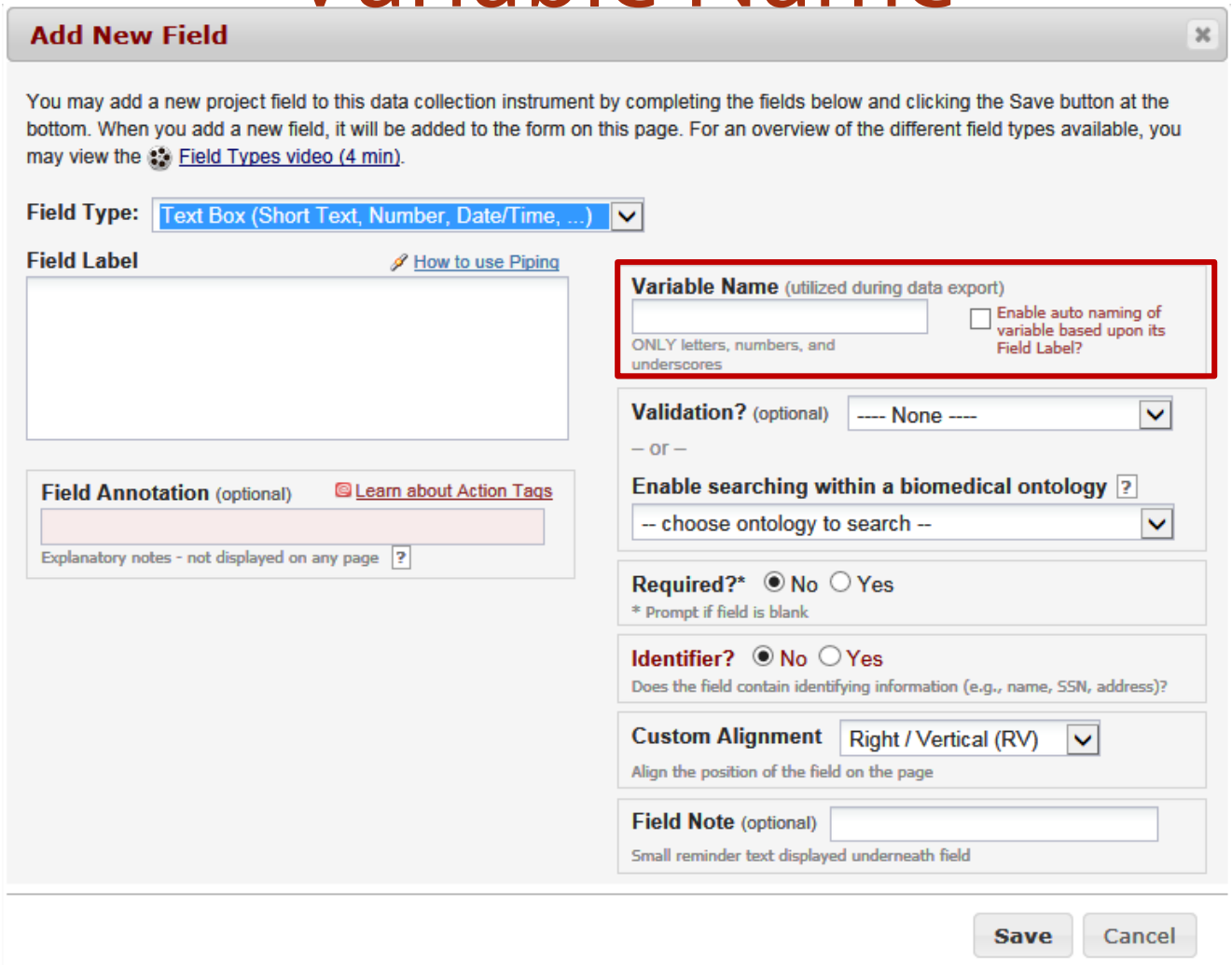
Record Identifier



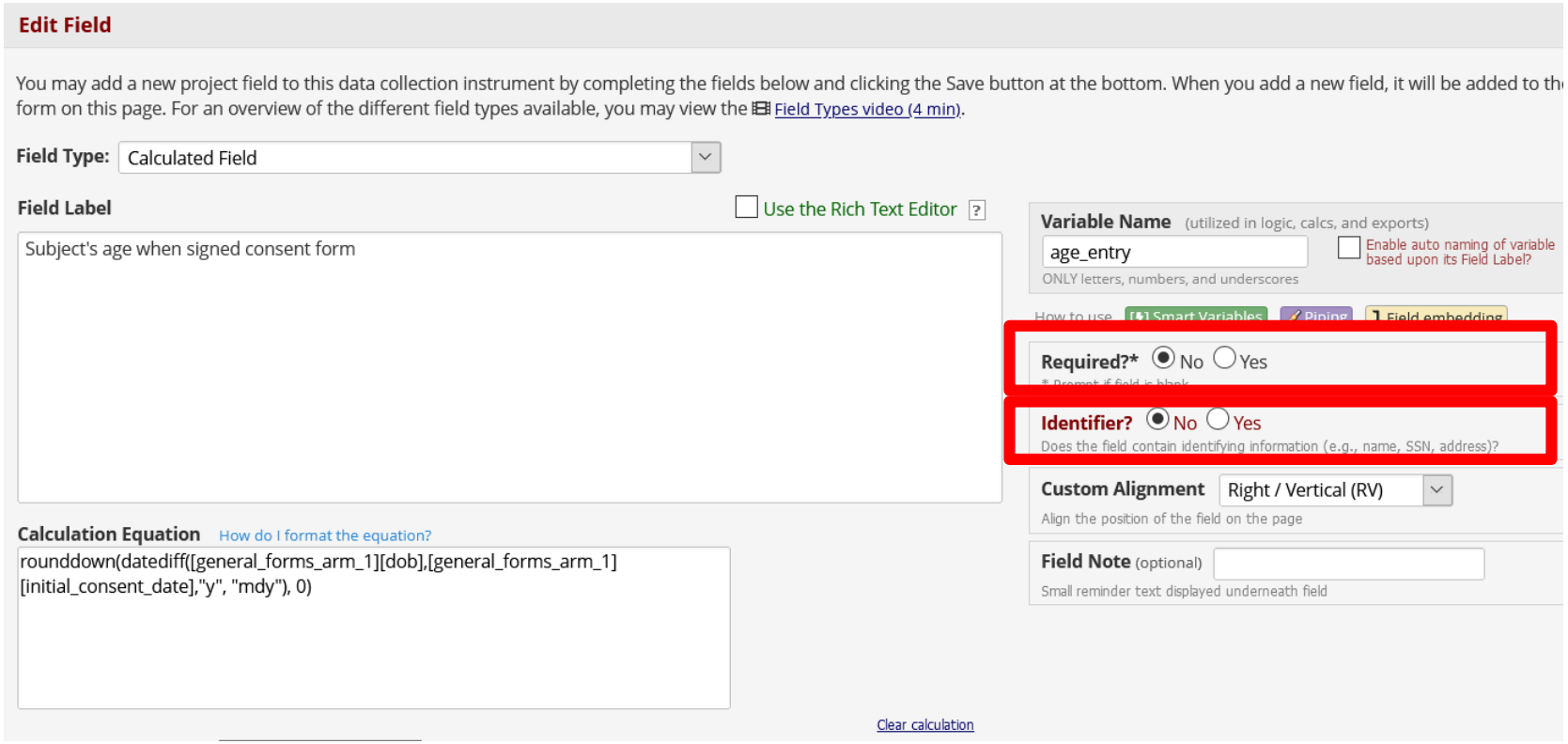
Field Label = Your Question



Variable Name



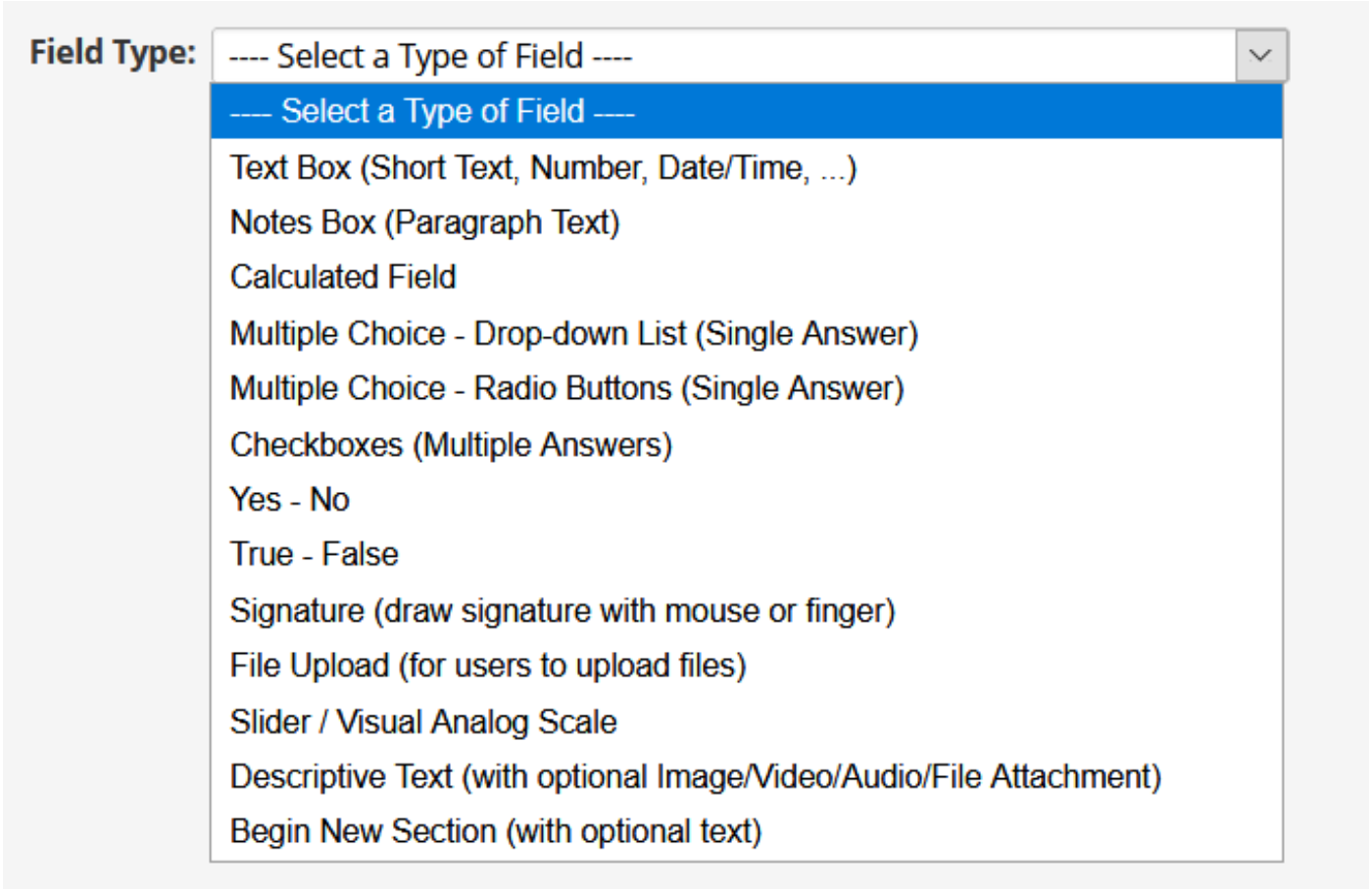
Electronic Database Development - Validation

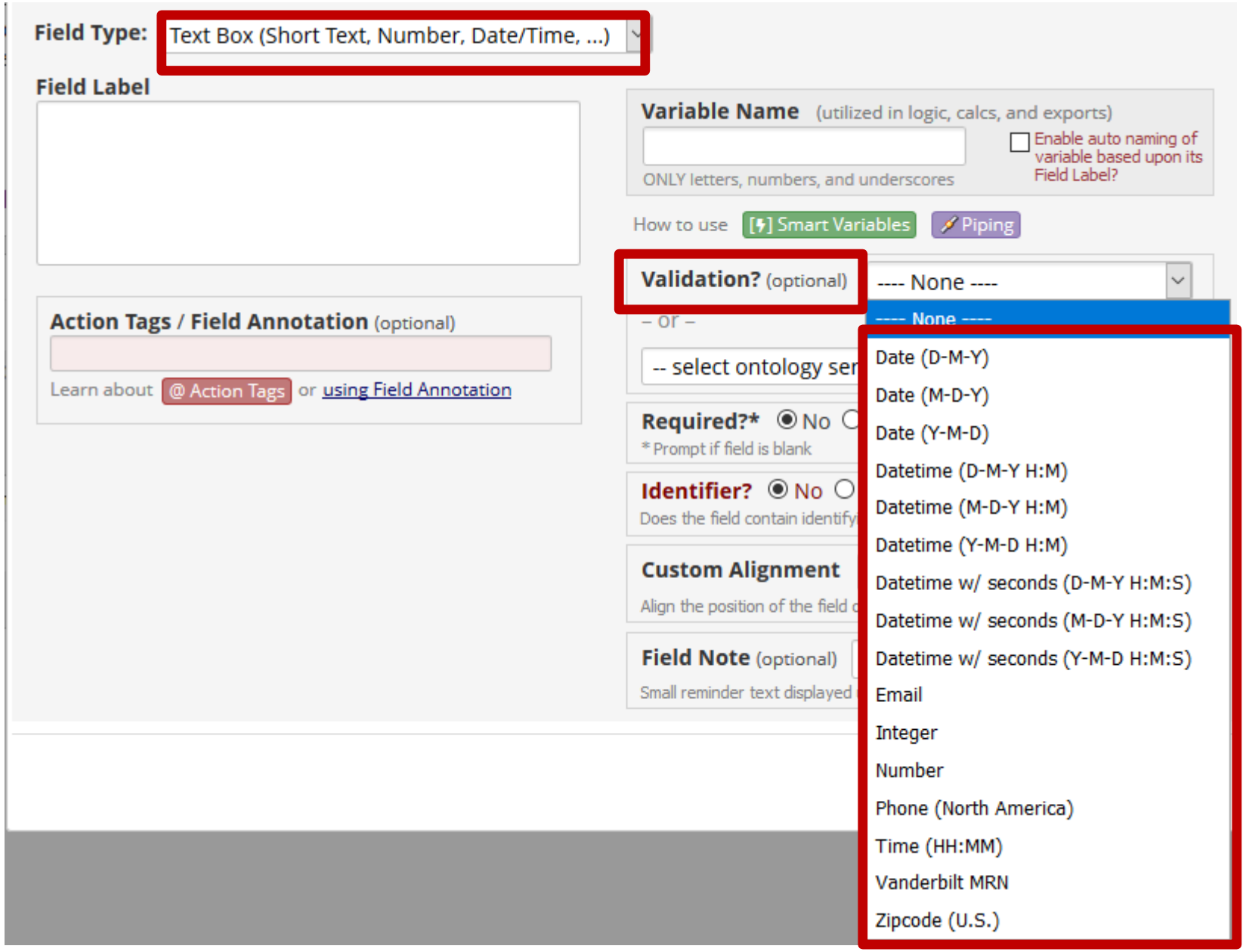


Different Types of Data Entry Fields

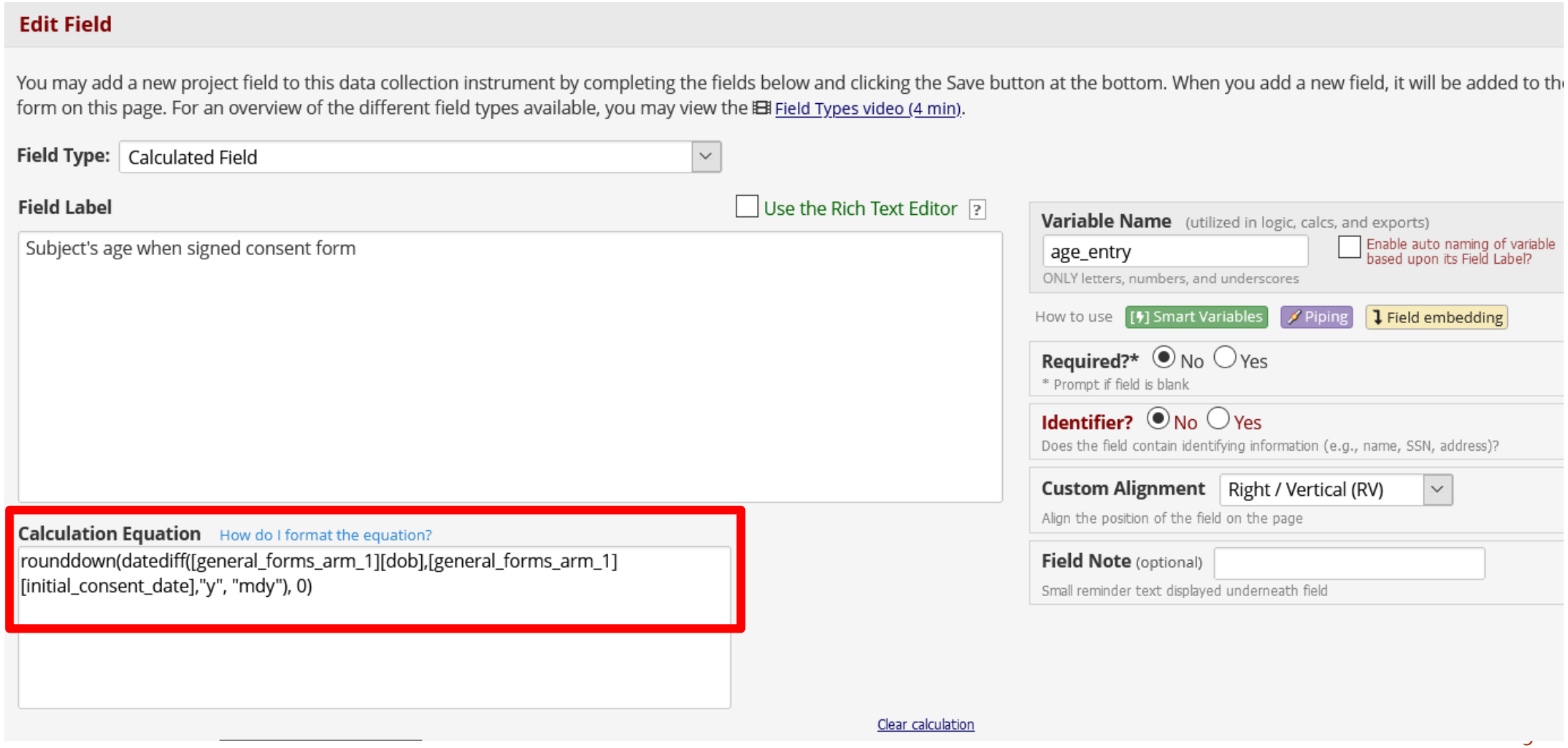
- Use the best type of field that suits the data you are trying to collect:
- Short text or numerical answers → Text Box
- Long descriptive/comment → Notes Box
- Perform real-time calculations based on previous field entries ex. BMI → Calculated Field
- Multiple choice questions → Drop-down List or Radio Buttons
- Multiple answer options → Checkboxes
- Etc.

Electronic Database Development - Field Type

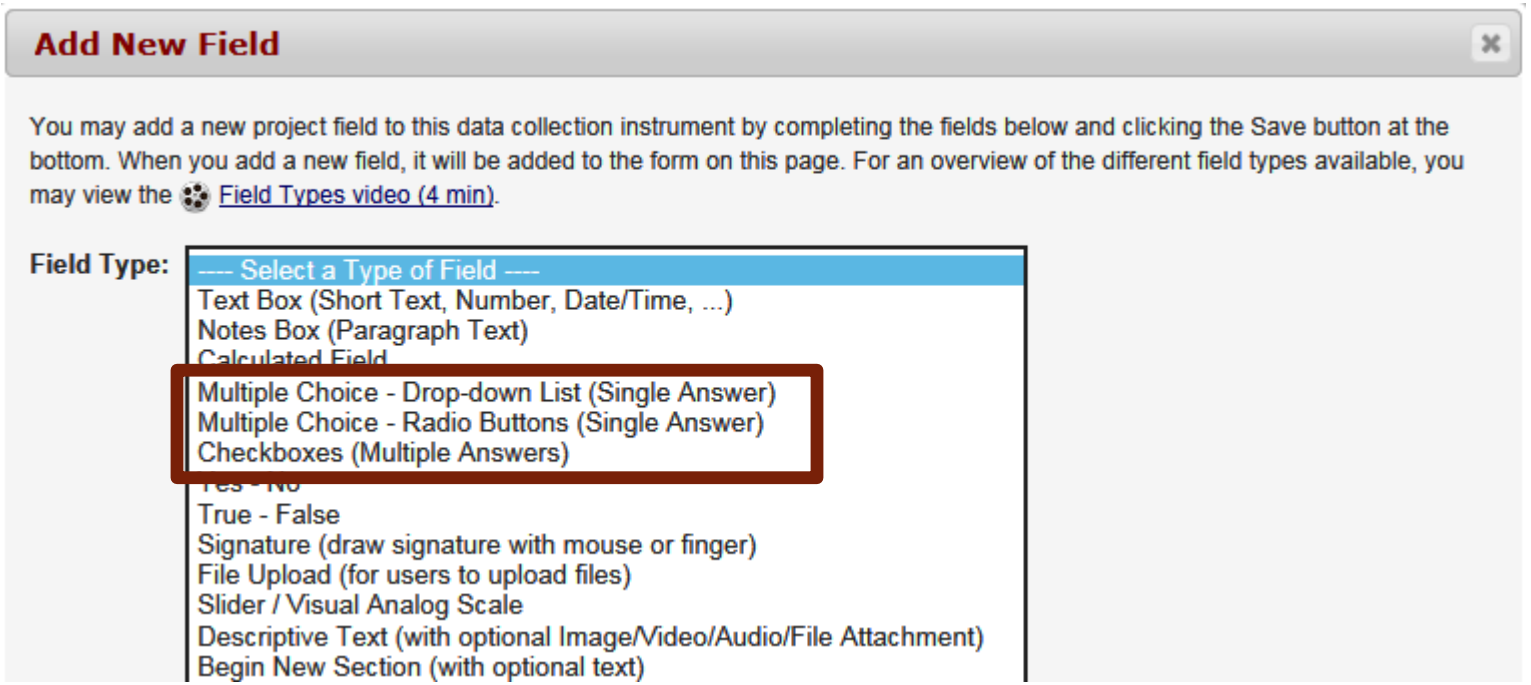



Field Type:
Text Box (Short Text, Number, Date/Time, ...)
Field Label
Variable Name (utilized in logic, calcs, and exports)
ONLY letters, numbers, and underscores
Enable auto naming of variable based upon its Field Label?
How to use
[ƒ] Smart Variables
Piping
Validation? (optional)
---- None ----
---- None ----
Date (D-M-Y)
Date (M-D-Y)
Date (Y-M-D)
Datetime (D-M-Y H:M)
Datetime (M-D-Y H:M)
Datetime (Y-M-D H:M)
Datetime w/ seconds (D-M-Y H:M:S)
Datetime w/ seconds (M-D-Y H:M:S)
Datetime w/ seconds (Y-M-D H:M:S)
Email
Integer
Number
Phone (North America)
Time (HH:MM)
Vanderbilt MRN
Zipcode (U.S.)
Action Tags / Field Annotation (optional)
Learn about @ Action Tags or using Field Annotation
– or –
-- select ontology ser
Required?* No
* Prompt if field is blank
Identifier? No
Does the field contain identify
Custom Alignment
Align the position of the field
Field Note (optional)
Small reminder text displayed

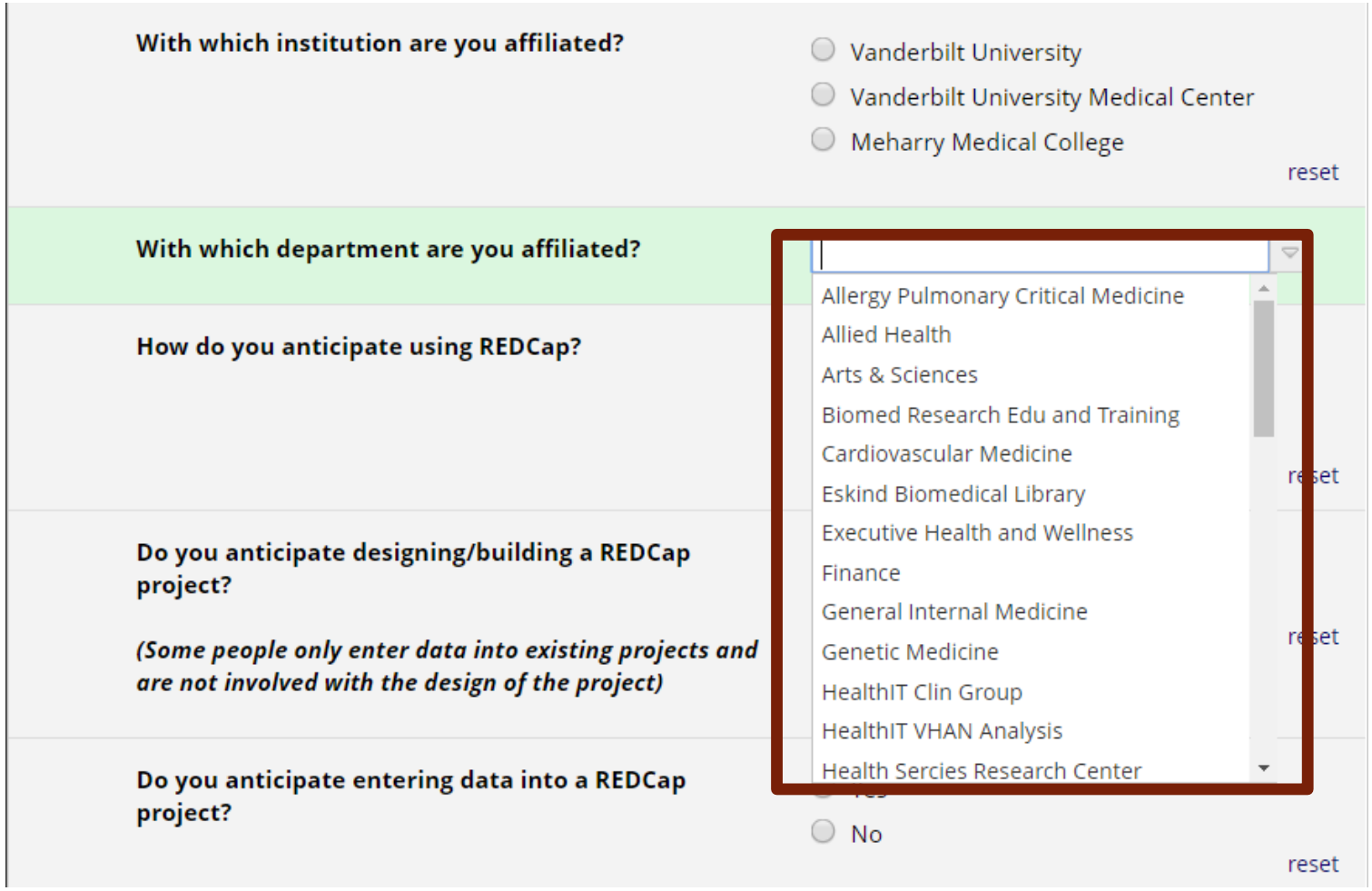
Electronic Database Development - Field Calculation



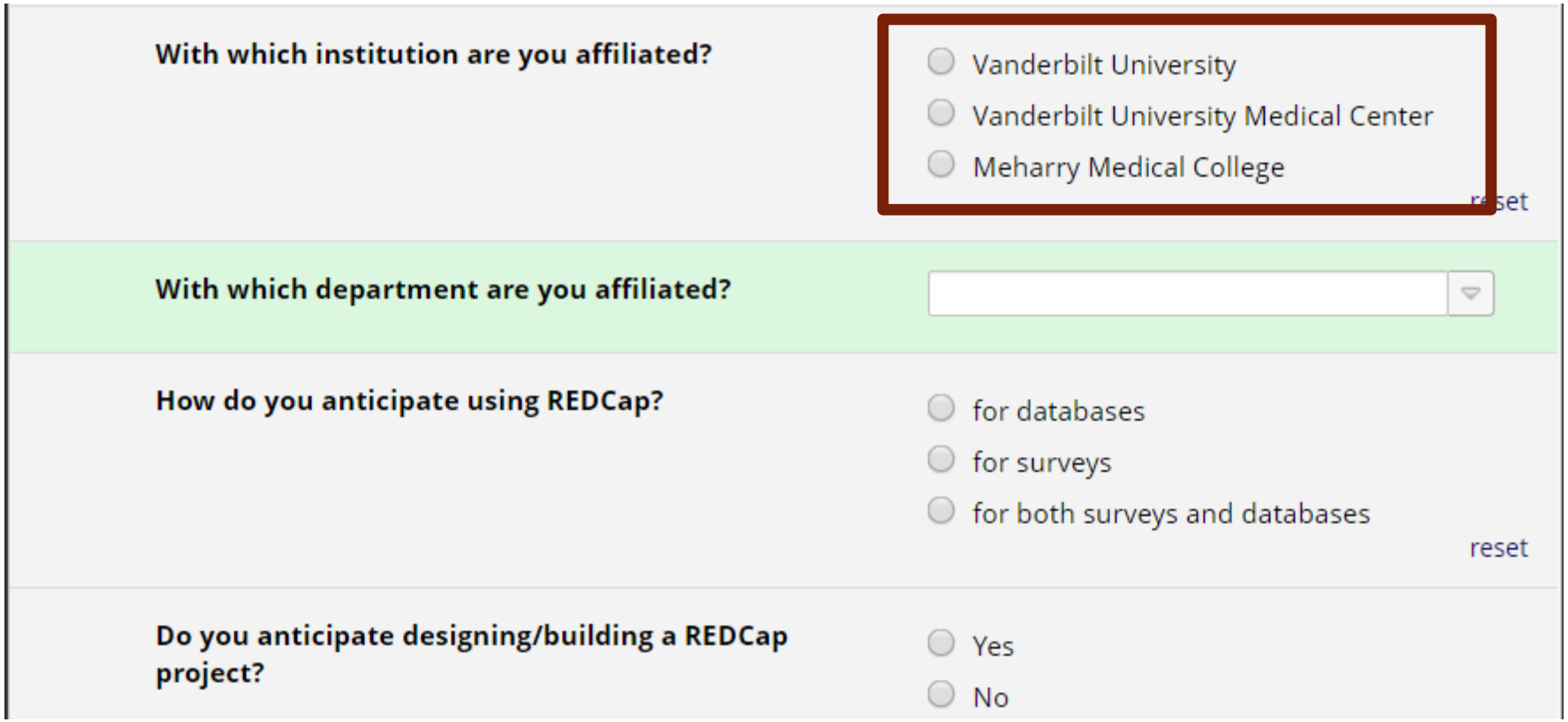
Multiple Choice Options



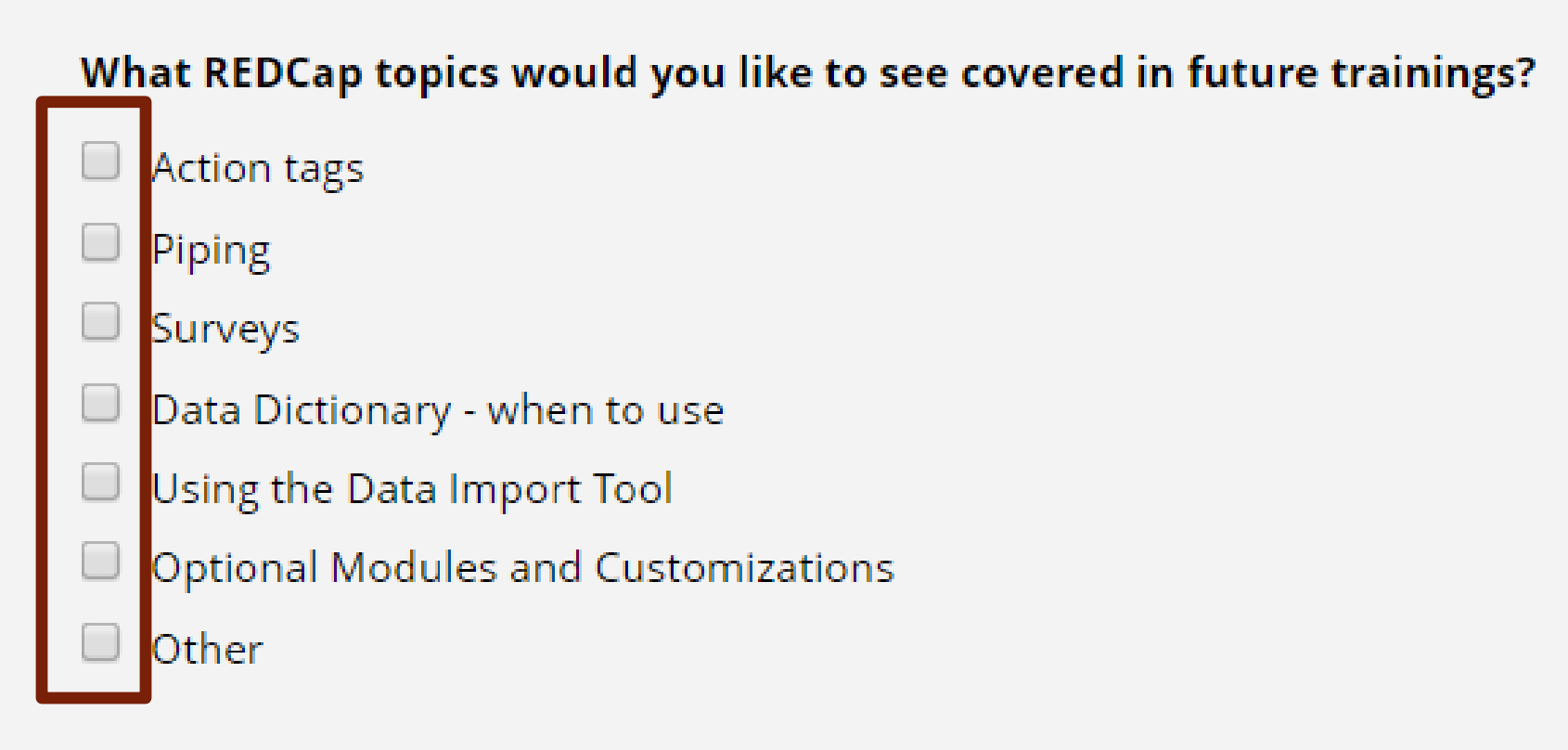
Drop-Down List: Long list of choices



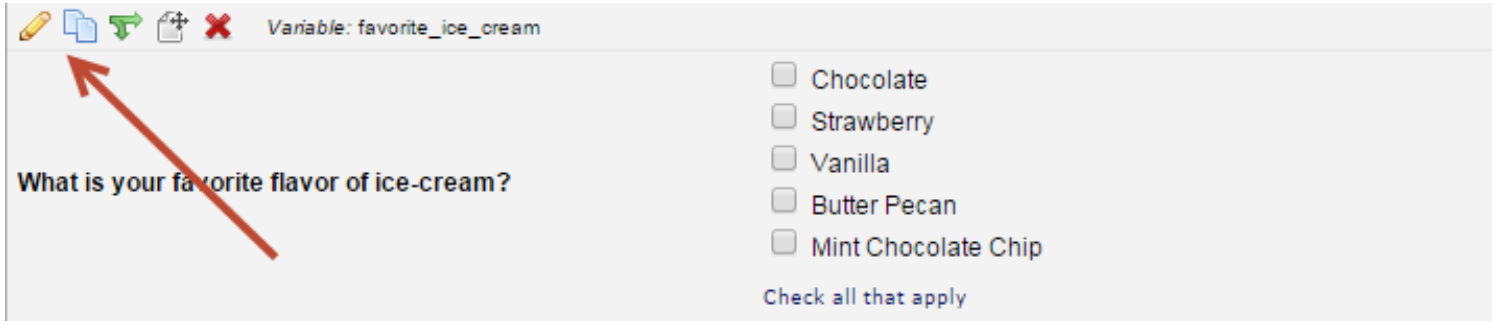
Radio Buttons: Short list of choices



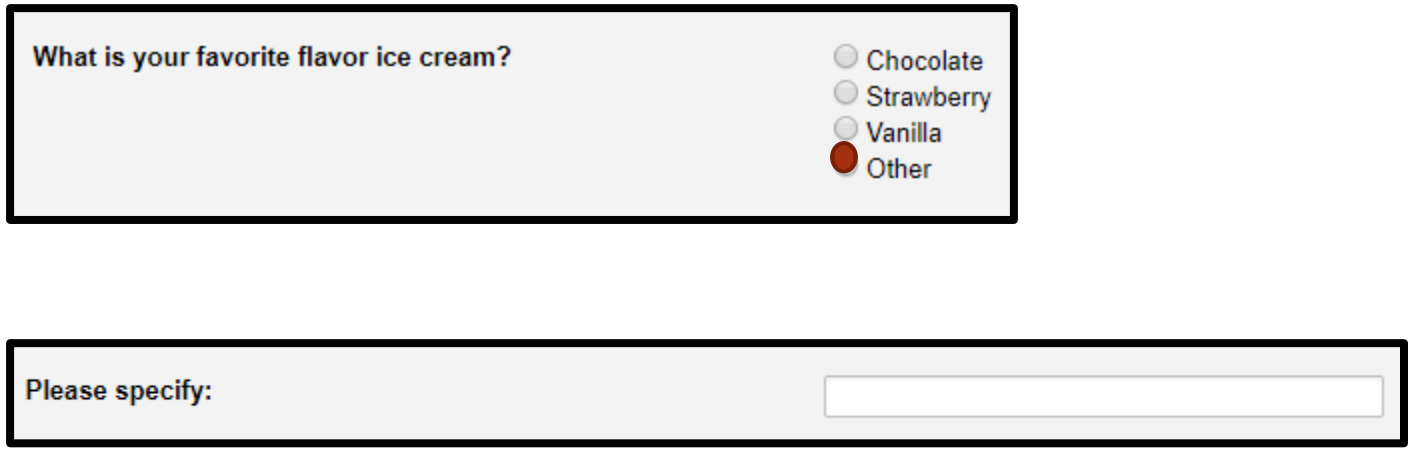
Checkboxes: To mark more than one choice



Edit/Copy/Move/Delete Fields

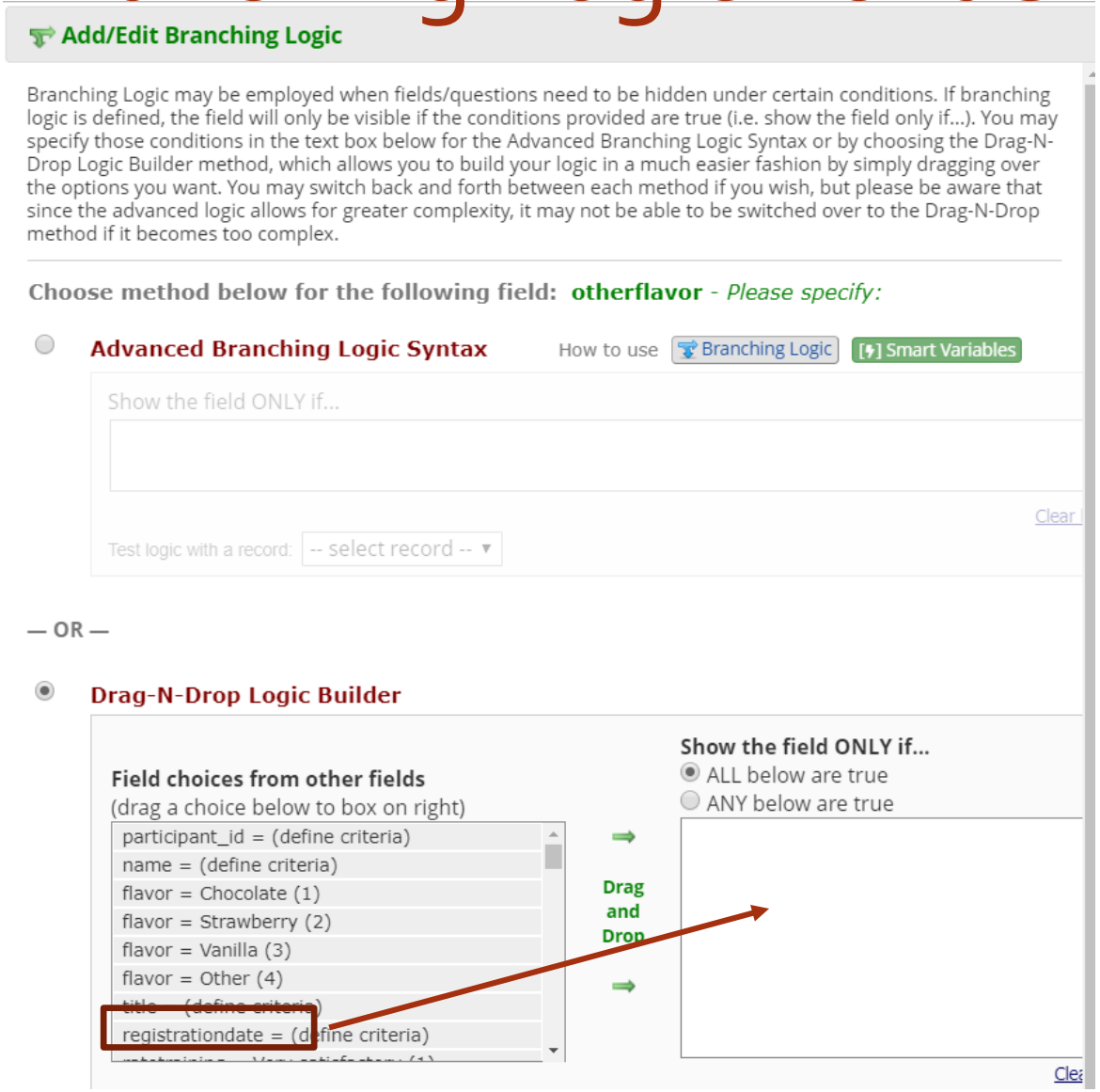


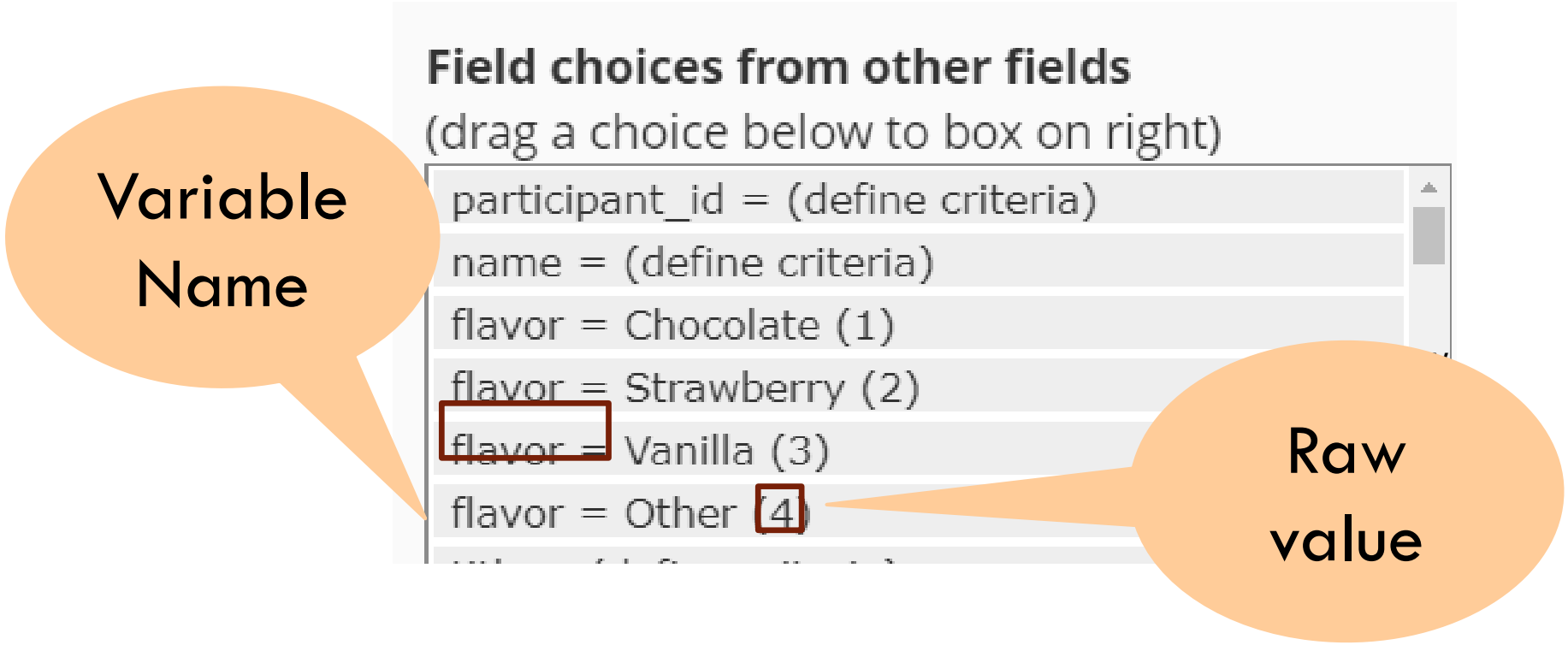
Branching Logic



Apply Branching Logic to the Follow-Up Question

Branching Logic Builder




Field choices from other fields
(drag a choice below to box on right)
participant_id = (define criteria)
name = (define criteria)
flavor = Chocolate (1)
flavor = Strawberry (2)
flavor = Vanilla (3)
flavor = Other (4)
Variable Name
Raw value
Variable: othericecream
Branching logic: [flavor] = '4'
Please specify:

Electronic Database Development – Logic

Have you traveled outside your state of residence in the last 14 days for non-essential travel?

(•) Yes
( ) No

Link to answers for travel questions and definitions of essential travel

* must provide value

According to the Vermont Department of Health (VDH) website does the county you traveled from require quarantining at this time?

( ) Yes
( ) No

Map of quarantine and non-quarantine counties throughout the Northeast

* must provide value

Have you traveled outside your state of residence in the last 14 days for non-essential travel?

( ) Yes
(•) No

Link to answers for travel questions and definitions of essential travel

* must provide value

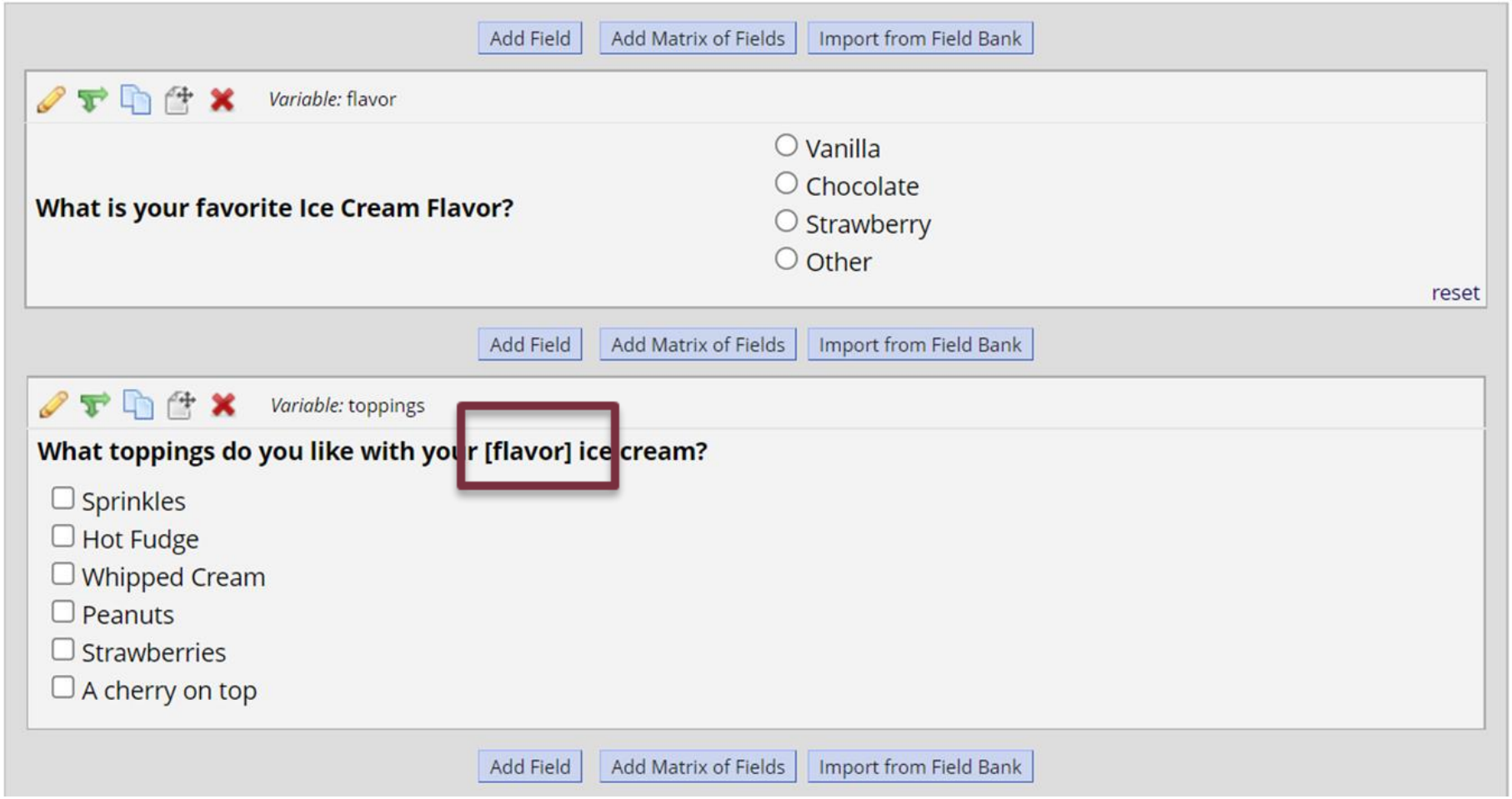
Please check the appropriate box (yes or no) to the following quest
COVID-19 symptoms that cannot be attributed to a pre-existing co

Have you had a fever (100.4°F/38°C or higher) in the last 14 days?

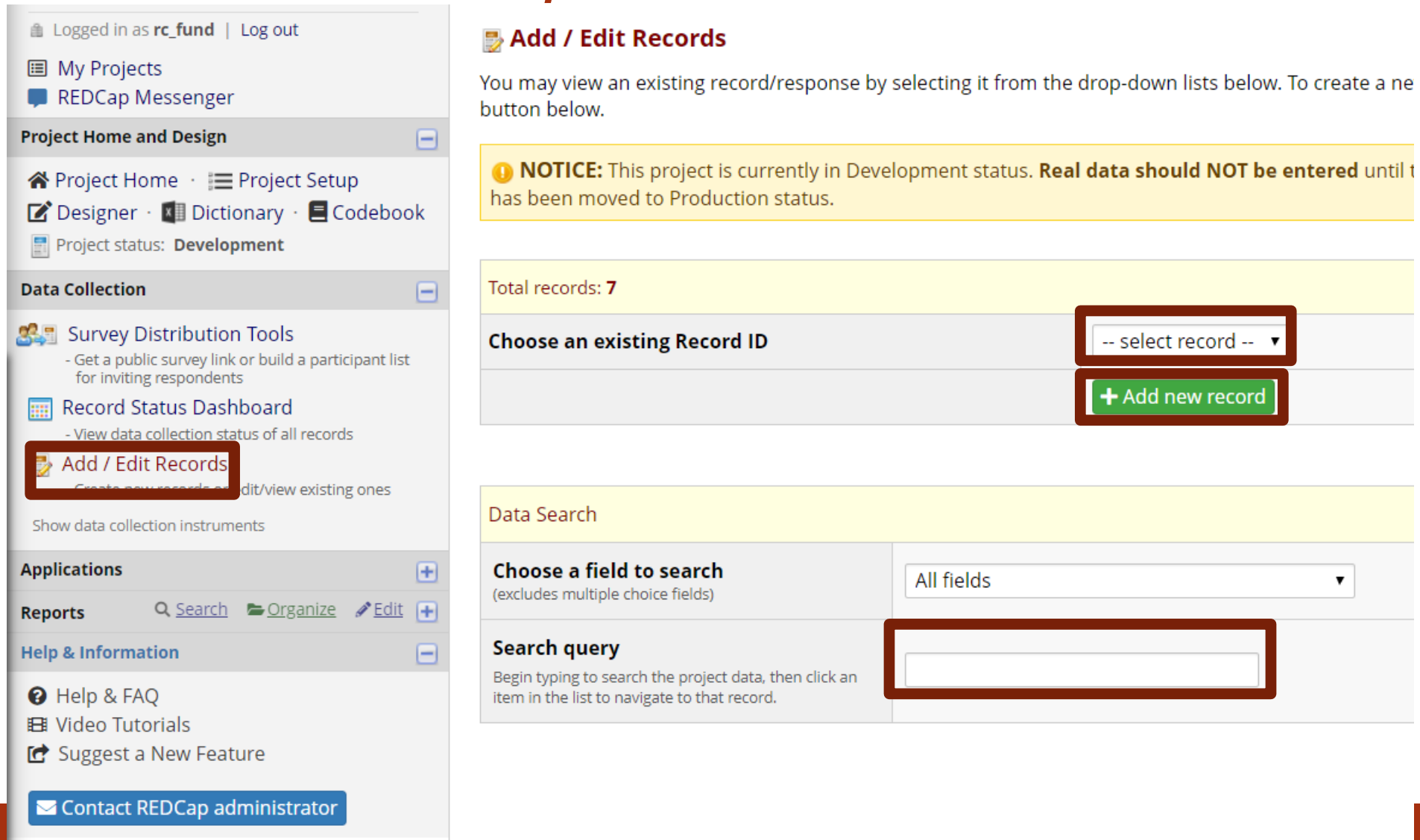
( ) Yes
( ) No

* must provide value

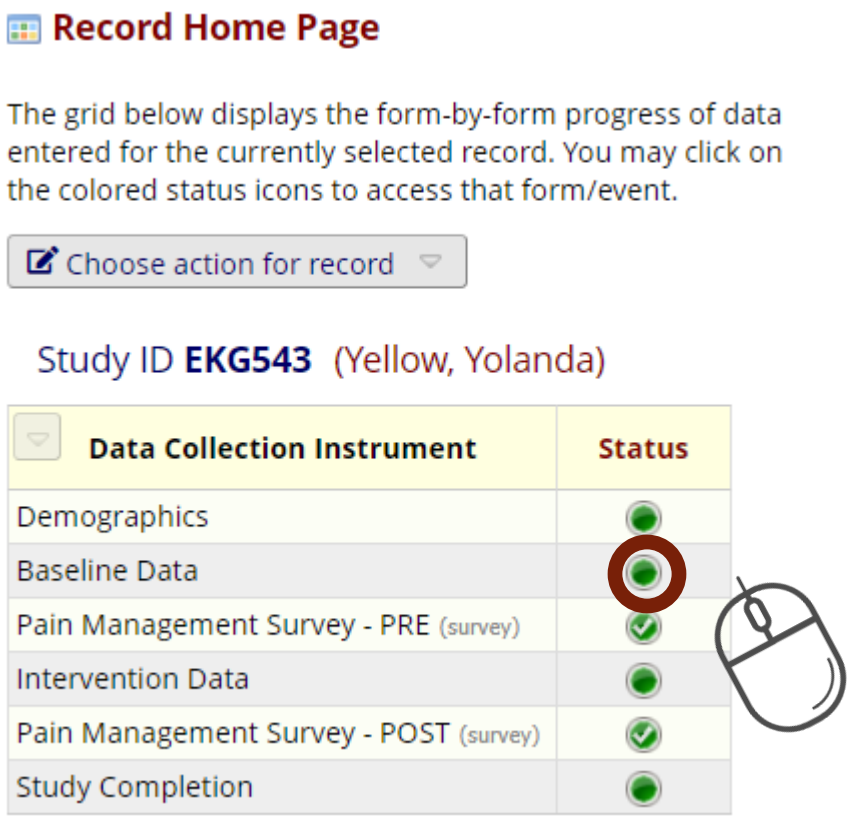
Electronic Database Development - Piping



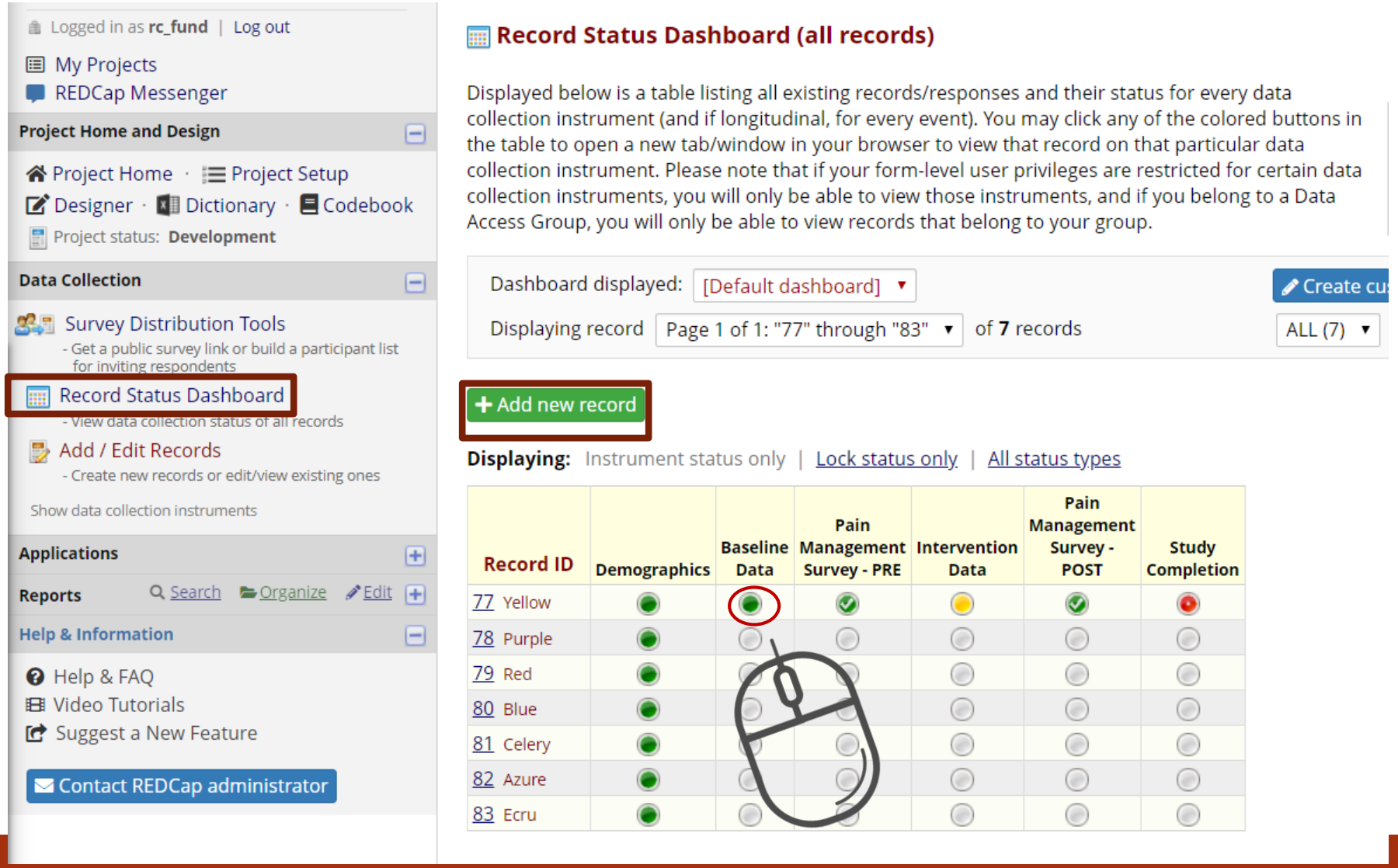
Add/Edit Records



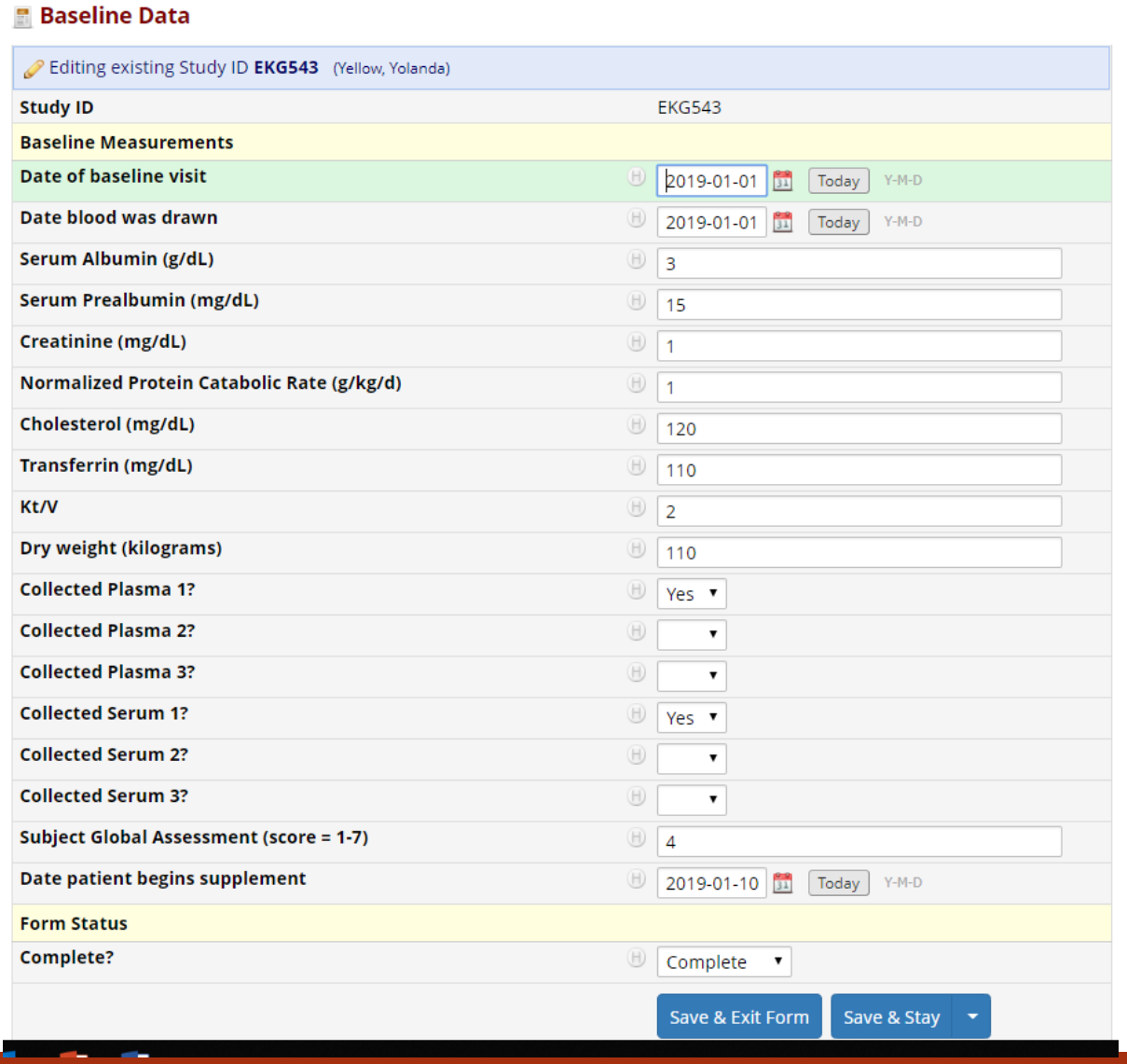
Record Home Page



Record Status Dashboard



Individual Record



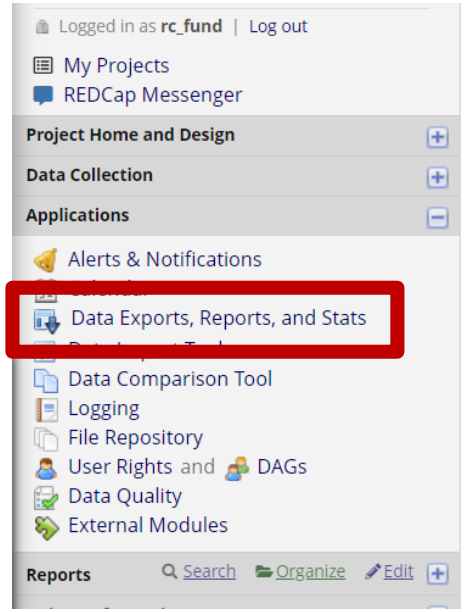
Baseline Data

Editing existing Study ID **EKG543** (Yellow, Yolanda)

Study ID	EKG543
Baseline Measurements	
Date of baseline visit	2019-01-01 Today Y-M-D
Date blood was drawn	2019-01-01 Today Y-M-D
Serum Albumin (g/dL)	3
Serum Prealbumin (mg/dL)	15
Creatinine (mg/dL)	1
Normalized Protein Catabolic Rate (g/kg/d)	1
Cholesterol (mg/dL)	120
Transferrin (mg/dL)	110
Kt/V	2
Dry weight (kilograms)	110
Collected Plasma 1?	Yes
Collected Plasma 2?	
Collected Plasma 3?	
Collected Serum 1?	Yes
Collected Serum 2?	
Collected Serum 3?	
Subject Global Assessment (score = 1-7)	4
Date patient begins supplement	2019-01-10 Today Y-M-D
Form Status	
Complete?	Complete

Save & Exit Form | Save & Stay

Viewing Multiple Records



Aggregate Data (all data)

Number of results returned: 11
Total number of records queried: 11

Stats & Charts | Export Report | Print Page

All data (all records and fields)

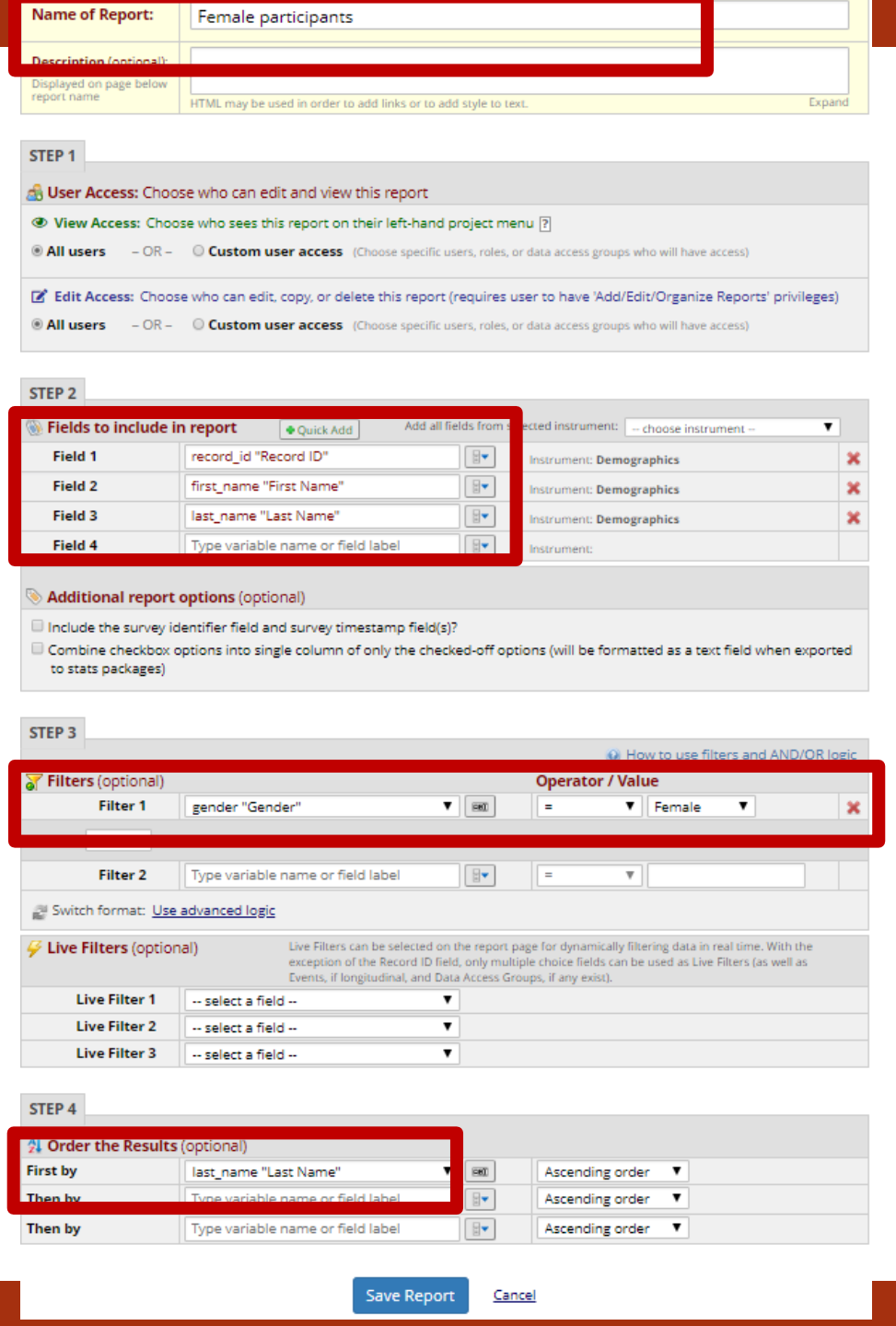
Study ID (study_id)	Survey Identifier (redcap_survey_identifier)	First Name (first_name)	Last Name (last_name)	Phone number (telephone_1)	E-mail (email)	Date of birth (dob)	Ethnicity (ethnicity)	Race (race)	Has the patient given birth before? (given_birth)	How many times has the patient given birth? (num_children)	Which of the following medications is being taken? (check all that apply)							What other meds are being taken? (meds_other)
											Lexapro (meds___1)	Celexa (meds___2)	Prozac (meds___3)	Paxil (meds___4)	Zoloft (meds___5)	Other (meds___7)	None of the above (meds___6)	
AIB242 (Red, Rudy)		Rudy	Red				Hispanic or Latino (0)	Asian (1)			Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	
EKG543 (Yellow, Yolanda)		Yolanda	Yellow				NOT Hispanic or Latino (1)	American Indian/Alaska Native (0)			Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	
FDA232 (Purple, Polly)		Polly	Purple				NOT Hispanic or Latino (1)	American Indian/Alaska Native (0)	Yes (1)	2	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	
HWI293 (Violet, Vicky)		Vicky	Violet				Hispanic or Latino (0)	American Indian/Alaska Native (0)			Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	
IKJ234 (Green, Grace)		Grace	Green	(615) 444-3232	gfds@fjdka.biz	1955-09-01	Hispanic or Latino (0)	American Indian/Alaska Native (0)	Yes (1)	2	Checked (1)	Checked (1)	Unchecked (0)	Unchecked (0)	Checked (1)	Unchecked (0)	Unchecked (0)	
IWE345 (Orange, Olivia)		Olivia	Orange				Unknown / Not Reported (2)	Native Hawaiian or Other Pacific Islander (2)			Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	Unchecked (0)	
KDH435							NOT Hispanic	Black or			Unchecked	Unchecked	Unchecked	Unchecked	Unchecked	Unchecked	Unchecked	

Subsets of Data

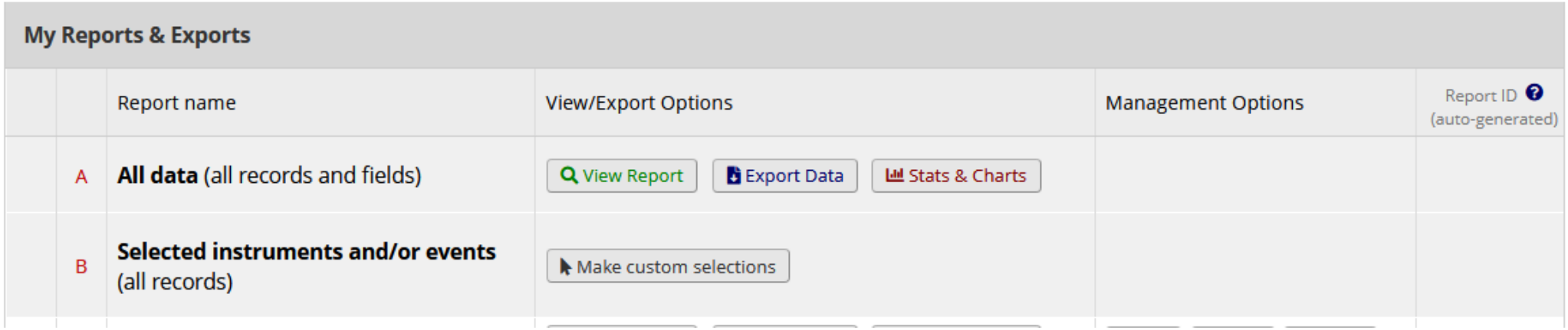
Live REDCap Building

1. Demographics – using a template
2. Informed Consent Checklist – upload from another project
3. Eligibility Criteria Checklist – interactive build from scratch

Create a custom report

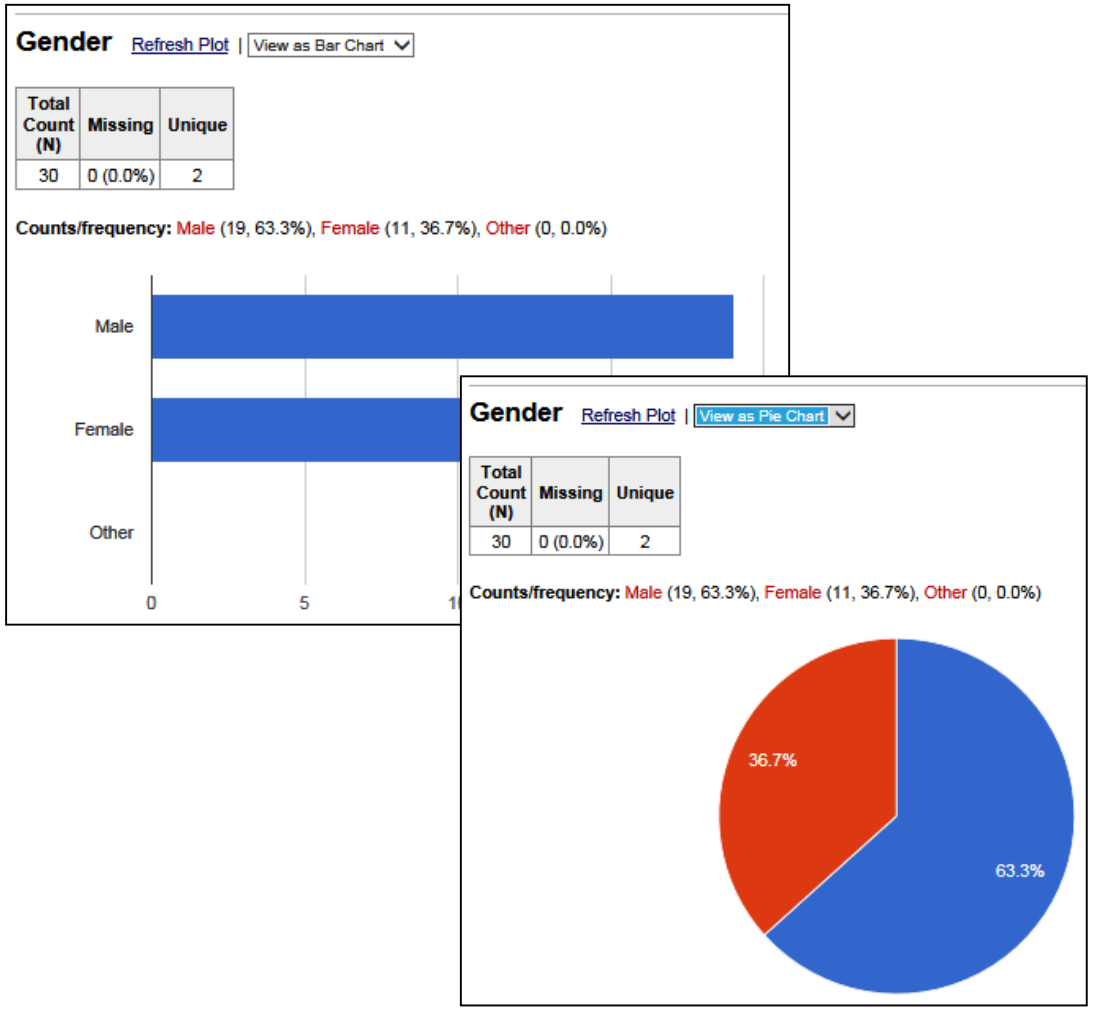


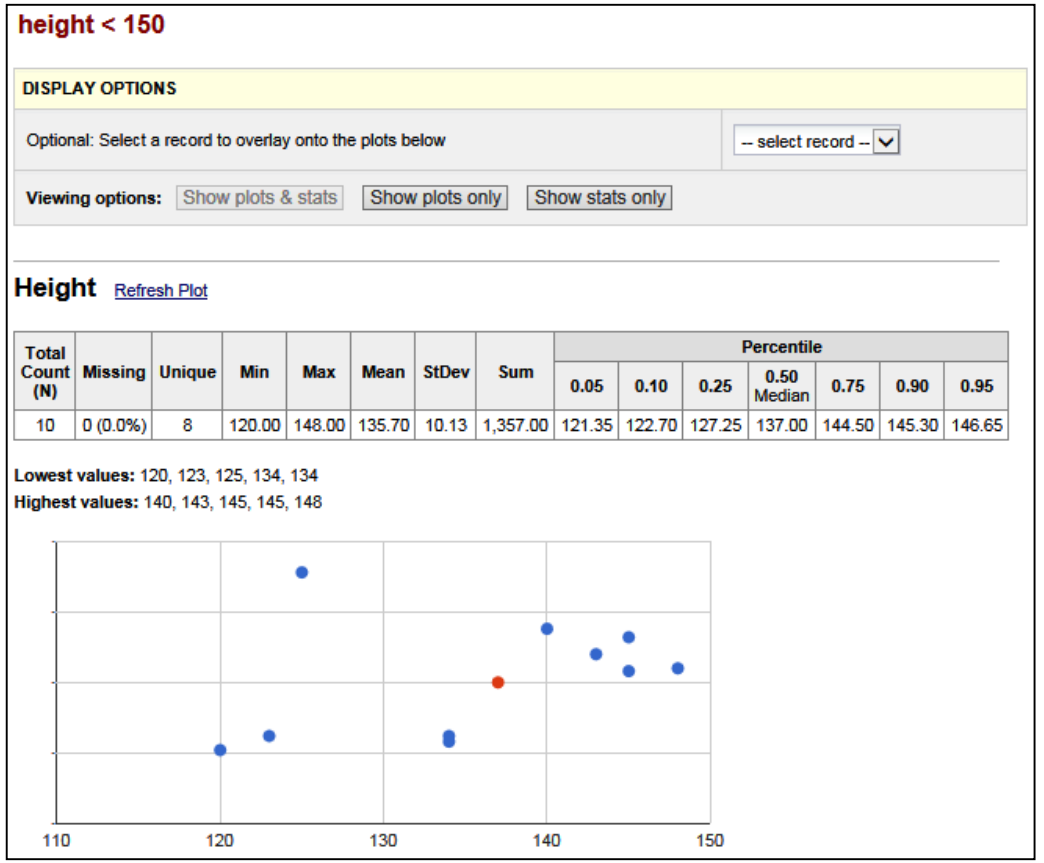
Electronic Database Development – Reports



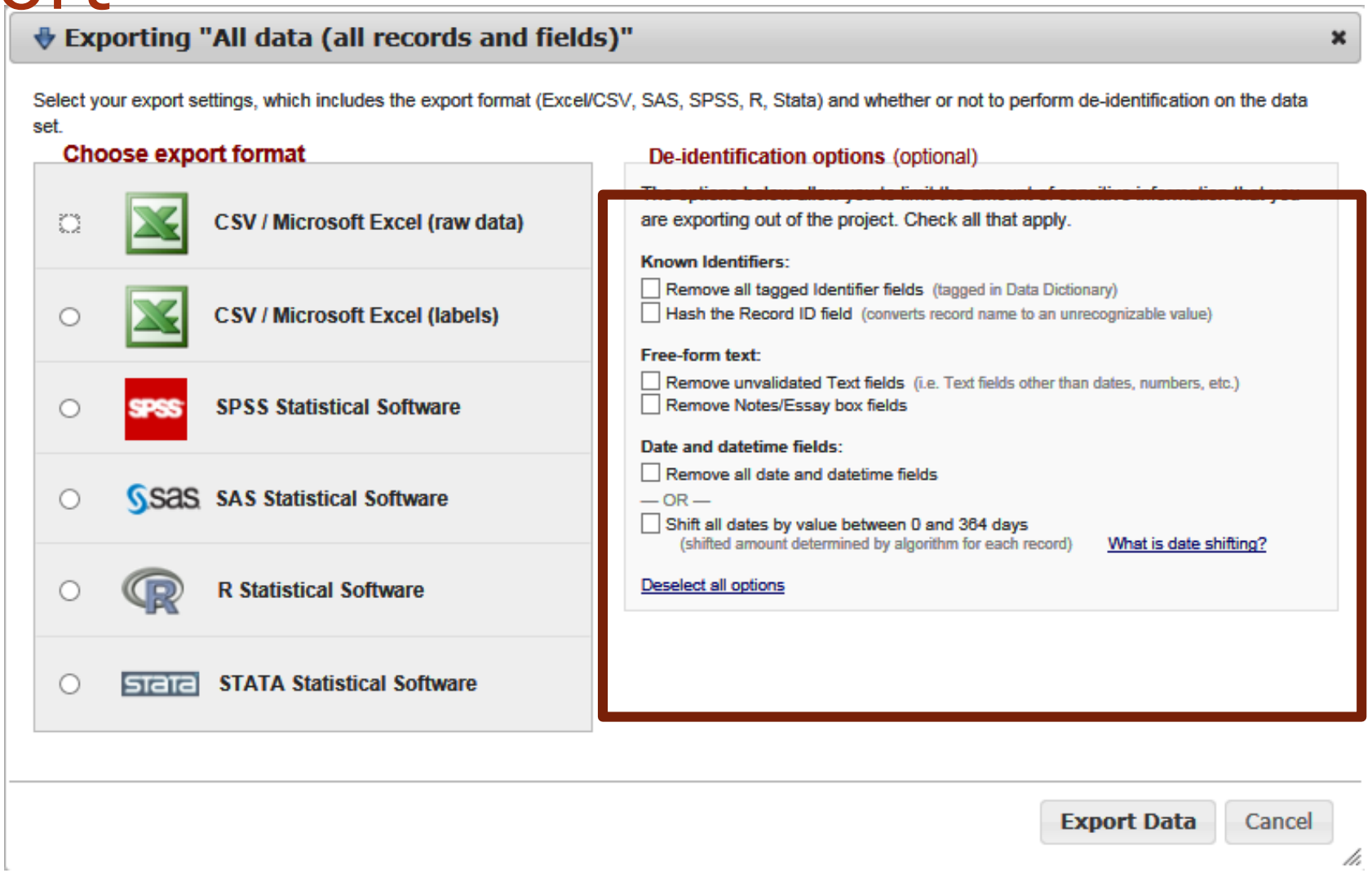
Reports are bookmarked on the navigation bar

Statistics and Graphs/Charts





Export


Exporting "All data (all records and fields)"
Select your export settings, which includes the export format (Excel/CSV, SAS, SPSS, R, Stata) and whether or not to perform de-identification on the data set.
Choose export format
CSV / Microsoft Excel (raw data)
CSV / Microsoft Excel (labels)
SPSS Statistical Software
SAS Statistical Software
R Statistical Software
STATA Statistical Software
De-identification options (optional)
are exporting out of the project. Check all that apply.
Known Identifiers:
Remove all tagged Identifier fields (tagged in Data Dictionary)
Hash the Record ID field (converts record name to an unrecognizable value)
Free-form text:
Remove unvalidated Text fields (i.e. Text fields other than dates, numbers, etc.)
Remove Notes/Essay box fields
Date and datetime fields:
Remove all date and datetime fields
— OR —
Shift all dates by value between 0 and 364 days
(shifted amount determined by algorithm for each record)
What is date shifting?
Deselect all options
Export Data
Cancel