REDCap Manual for OU

Training Material for REDCap Users

William H Beasley, Thomas Wilson (Eds.)

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Welcome

Welcome to *REDCap Manual for OU: Training Material for REDCap Users*. This collection of documents will help you learn how to use REDCap for research and operations.

Just as the REDCap software expands to meet the needs of more people, this book will grow to accommodate help more types of users learn these tools more efficiently. As you read the following chapters and sections, we hope you feel comfortable editing existing material or adding new lessons, in order to improve the quality of all our work.

Sincerely,
The Editorial Committee

How to Contribute

We welcome suggestions, edits, and larger contributions to this guide. This book is typeset in Markdown, rendered with Quarto, and hosted on GitHub. For errors or requests, please submit an Issue to the book's issue tracker. To make larger or direct contributions, please make a pull request using the standard GitHub workflow.

If you would like to contribute but are unfamiliar with any of these technologies, please feel free to email <to be created: redcap@ou.edu> with comments and suggestions for changes. If you would like to discuss the content or receive further help, see the Help and Support Chapter.

How to Cite this Work

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Editorial Committee:

- William H. Beasley: October 2024 - present
- Thomas Wilson: October 2024 - present

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1. Help and Support

OU offers many paths for researchers seeking support to make the most of their projects.

Chapter Leads: Thomas Wilson

1.1 Support Tickets

1.2 Office Hours

The OU REDCap teams hosts online office hours on Tuesday (10:30-11:30am) and Thursday (10:30-11:30am) most weeks. But this is subject to change, so check with Thomas if it is important. Please contact Thomas for the Zoom link.

All are welcome to join, from experienced project admins wanting to tweak an existing feature, to newly-hired data entry personnel wanting to be more comfortable with an unfamiliar assignment. Experienced vets are willing to help with most questions.

No PHI is shared during office hours, because people from different projects won't necessarily be permitted to see your participant data. If possible, create a test record to your project for the sake of the meeting. This will allow attendees to see and learn from your question.

1.3 Embedded Resources

The REDCap interface itself offers links to documentation...

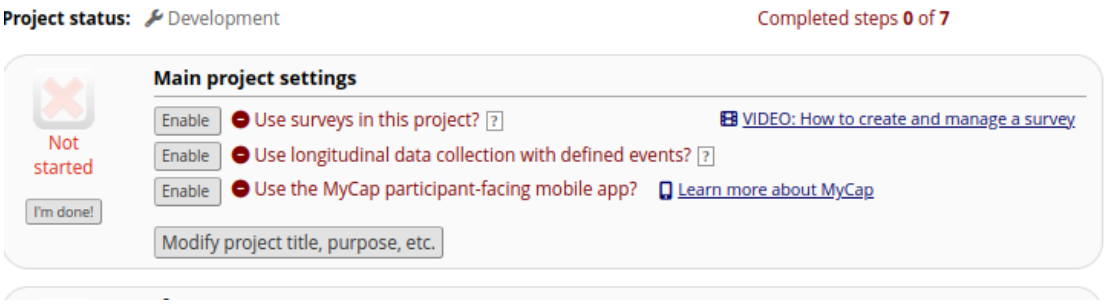


Figure 1.1: Embedded Resource.

1.4 Training Resources

1.4.1 Training (Training Portal)

1.4.2 Self Guided Tours (Academy)

> Callout -tip
>
> Knowledge of biomedical, translational, and clinical data standards is essential for appropriate use of the coded RWD when curating concept sets to apply to the data. Ultimately, that in combination with data availability and data limitations will determine project feasibility.

> **i** Additional Chapter Details
>
> This chapter was started in October 2024. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

2. Accessing REDCap

Accessing REDCap for the first time.

Chapter Leads: Thomas Wilson

> **i** Additional Chapter Details
>
> This chapter was started in October 2024. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

3. Vocabulary

Vocabulary that will help beginning users.

Chapter Leads: Thomas Wilson

3.1 General

These general terms for beginners reading Chapters 1. through 7..

3.1.1 Username

The credential required to login to REDCap. This username will be one of three things: OUHSC username, OU username, or a table-based username for non-OUHSC collaborators. Tabled-based accounts are created and maintained by OUHSC REDCap admins.

3.1.2 Project

A REDCap project is a self-contained entity used for collecting and managing data. Many people use the term, database, interchangeably. REDCap users may have access to or may have created multiple REDCap projects.

3.1.3 Server

A REDCap *server* hosts a collection of projects. Identifying the correct server is the first step to navigating to your desired project.

At OU, the two production servers are https://bbmc.ouhsc.edu and https://redcap.ouhsc.edu.

The first is the newer and larger instance, while the second one (sometimes called the "CoPH server") is being phased out and no longer accepting new projects.

Beginning users will rarely encounter OU's "development" server, which is https://redcap-dev-2.ouhsc.edu.

3.1.4 Record

... distinguish w/ event and participant ...

3.1.5 Participant

A *participant* is sometimes synonymous with record, but not always...

3.1.6 Data Collection Instrument (DCI or Instrument)

An electronic form used to collect data. An instrument can have one of two configurations: an data collection form or a survey.

3.1.7 Data Collection Form

Instrument used to collect data from behind the REDCap login. To enter data using a data collection form, individuals must login to REDCap using their username and password.

3.1.8 Survey

Instrument used to collect data without a REDCap login. Surveys are most often used to collect data from research participants and/or patients. Surveys can have a unique link for each participant or a generic public survey link.

3.1.9 Event

A REDCap *event* is a nested inside a record, typically to facilitate longitudinal data collection within the same participant.

3.1.10 User

Many types of REDCap *user*s can be interact with a single project. See Section 14.2.1 for a list of common roles, ranging from a participant responding to a public survey to a project administrator.

> **i** Additional Chapter Details
>
> This chapter was started in October 2024. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

4. Creating Records

Creating records in an established project.

Chapter Leads: Lise DeShea & Thomas Wilson

4.1 What is a record?

Creating records is analogous to taking out a copy of a form and starting to fill it out. In REDCap, forms (also called instruments) are nested within projects. A record is all the information in REDCap about one entity, like one participant in a study or one person who completed a survey. Someone filling out an online survey that was created in REDCap would create a record by completing the survey. You might create a record while testing a project while the project is being developed. Or you might create a record after the project has been put into production and data collection has begun for a study or investigation.

This chapter will show screenshots from a REDCap project that was created for the purpose of letting data entry people practice. It is an exact copy of another REDCap project that was used by people entering data from a multi-site randomized controlled trial. The screenshots will not show any protected health information (PHI); all information you may see is pretend data made up by the people learning how to use the practice REDCap project. After they had practiced, their access to the practice project was turned off, and they were allowed access to the study's actual REDCap for entering patient data.

4.2 Creating a record

After you have opened a REDCap project, you will see several links on the left side of the screen. One of them is labeled *Add/Edit Records*:



Figure 4.1: Add or edit records

Clicking the Add/Edit Records link typically opens a screen where the new record is created. This screen also assigns a unique identifying number to each record. Look for a green button labeled *Add new record*:

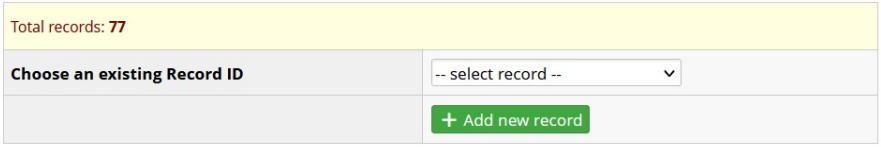


Figure 4.2: Add new record

After clicking that button, we see the *Record Home Page* for the new record:

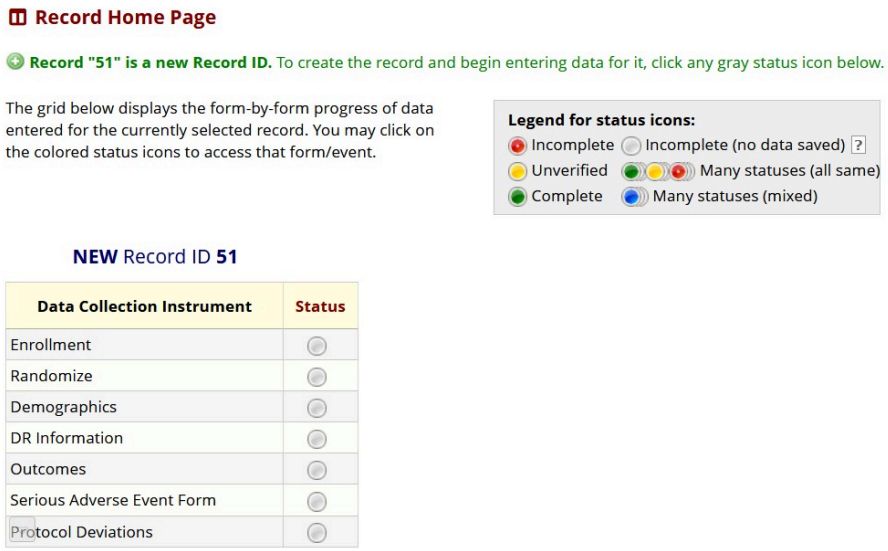


Figure 4.3: Record home page

This page summarizes the status of the forms for Record ID 51. We see a list of 7 instruments. The gray circles to the right of each instrument is a link to that instrument. Notice the *Legend for status icons* box. It shows different colors of circles. A gray circle means the form has no data saved in it.

4.3 Entering a record

The Record Home Page is like a folder in which a clinic would keep all the forms for a given patient – except everything is blank, and all we have is a patient number (Record ID 51). We have created a record, but we need to go into each instrument to enter data. When we click on the gray dot next to the first instrument under *Data Collection Instrument*, we are taken to the Enrollment form for this project.

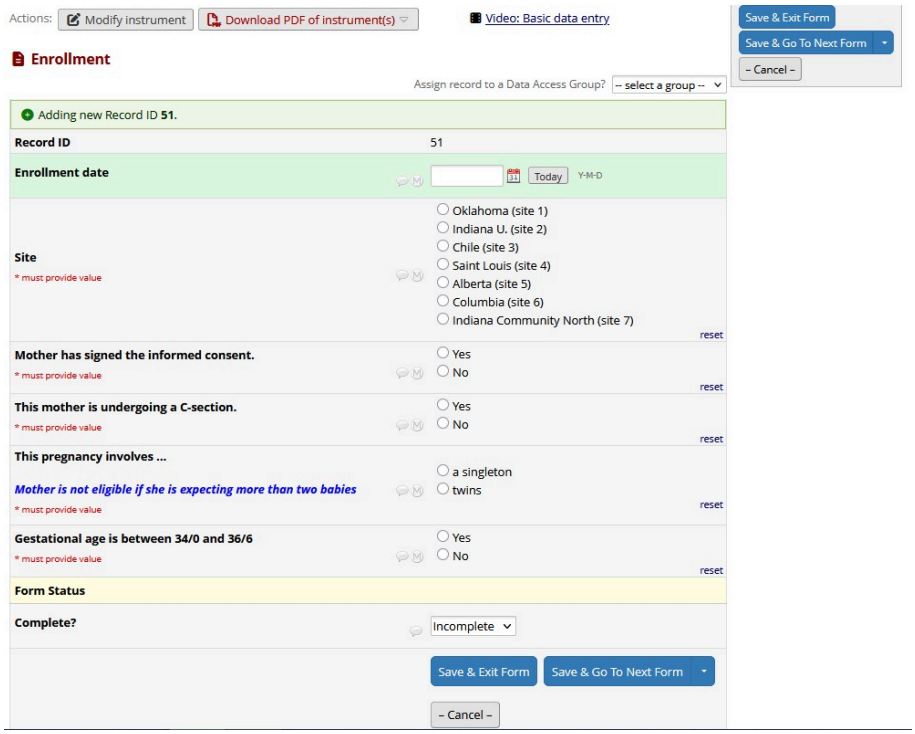


Figure 4.4: Example enrollment form

After filling out the form for the 51st mother in this study, we come to the *Form Status* section:

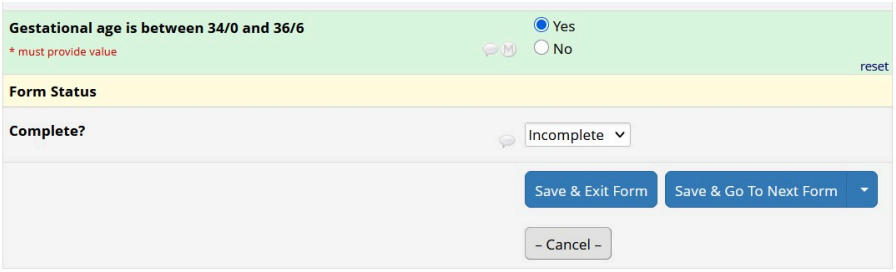


Figure 4.5: Form status

This field has a drop-down menu. By clicking on the downward-pointing arrowhead next to the Incomplete, we see the menu of options:

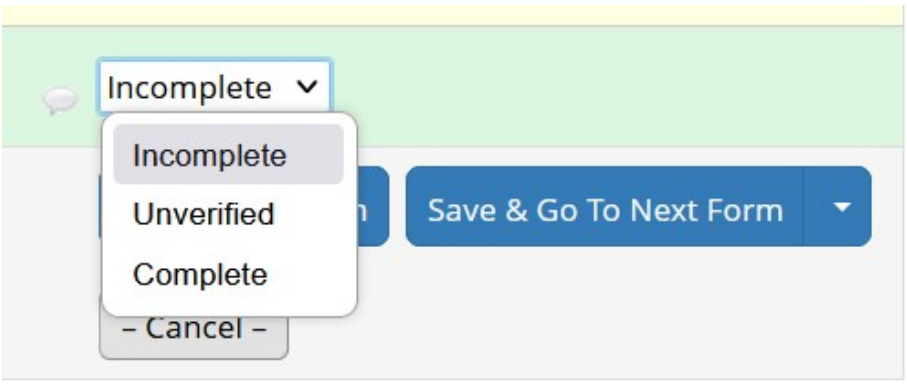


Figure 4.6: Options for saving data

If all the information has been included in this form, you will select Complete. The Incomplete option is good for situations where the form has fields for information that has to be entered later. Unverified can be used for special situations in a study, such as an investigator needing to check a data entry person's interpretation of an X-ray. Whatever status you choose will determine which color of button will be shown on the Record Status Dashboard. For this example, we will select Complete and click the blue button for *Save & Exit Form.* REDCap next will return you to the *Record Home Page.*

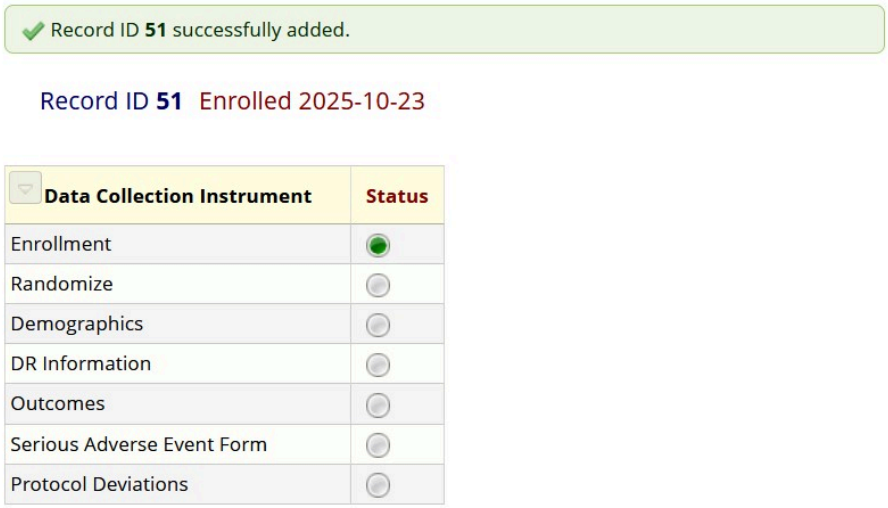


Figure 4.7: Return to record home page

Now the button next to Enrollment is green, which the Legend for status icons tells us is Complete. We can repeat this process for each of the other forms. In fact, we can go from saving one form directly into the next form.

4.4 Navigate from one record to another

By clicking the green button next to Enrollment, we go back into Record ID 51's Enrollment form. At the bottom of the page, the blue button labeled *Save & Go To Next Form* has a drop-down menu with three options:

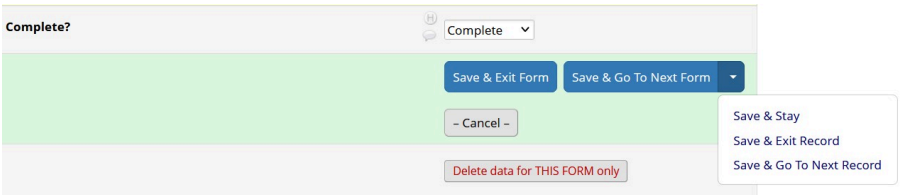


Figure 4.8: Go to next form

Save & Stay stores the entered data but leaves the form open on your screen. *Save & Exit Record* does the same thing as the blue *Save & Exit* button: it returns us to the Record Home Page. *Save & Go To Next Record* would take us to Record 52, if it existed in this project. Clicking on the blue *Save & Go To Next Form* button keeps us in Record 51 and opens the next instrument in the project.

4.5 Repeating instances of a form

Sometimes forms are set up as repeating instruments, meaning it can be completed more than one for the same person. In this practice project, the study allowed twins to be enrolled. The initial Enrollment form pertained to the mother, but the DR (Delivery Room) Information form is a repeating instrument, which the data entry person completes once for each twin. After all, the twins will have different birth weights and may receive different kinds of respiratory support.

Let's look at a list of the records already created for this project. We will click the Record Status Dashboard link on the left side of the page, shown in the first screenshot in this chapter. This dashboard shows different forms with different statuses, and to the right of some of the circles, there is a plus sign in a little gray box. We have drawn a box around three of these plus signs.

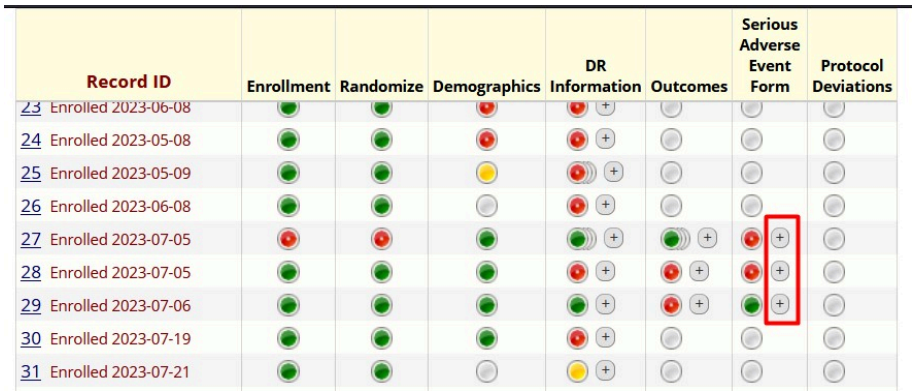


Figure 4.9: Plus signs for adding instances

The plus sign is a link to create another instance (copy) of that form. We might want to do that if the form has been filled out for one twin and we were ready to complete the instrument for the other twin.

4.6 Other ways to add records

New records can be created at least two other ways. The Record Status Dashboard has a green button labeled *Add new record*. That is another avenue for creating a record.

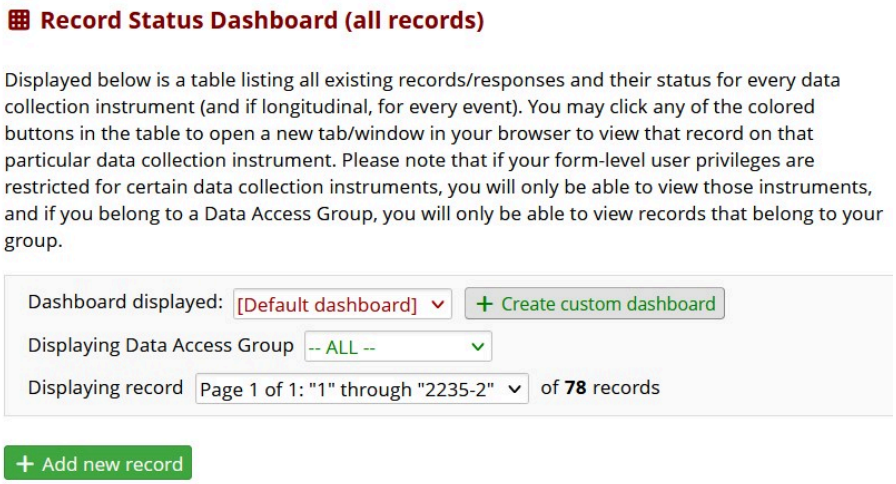


Figure 4.10: Add new record button

A new record also can be created when someone completes a REDCap survey. Those records would appear under the Record Status Dashboard. Our example project does not involve surveys.

> **i** Additional Chapter Details
>
> This chapter was last edited in October 2025. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

5. Record Status Dashboard

Learn about the Record Status Dashboard helps you to find and edit records in a REDCap project.

Chapter Leads: Lise DeShea and Thomas Wilson

5.1 Purpose

Imagine you are in a building with several floors. You want to know about all the offices in the building. Where might you look? One place you could look is near the elevator, where you often will find a directory listing everyone with offices in the building.

That directory is similar to the Record Status Dashboard within a REDCap project. When you want to find all the records in a project, you can navigate to the Record Status Dashboard by going into the project and following the link on the left side of your screen.

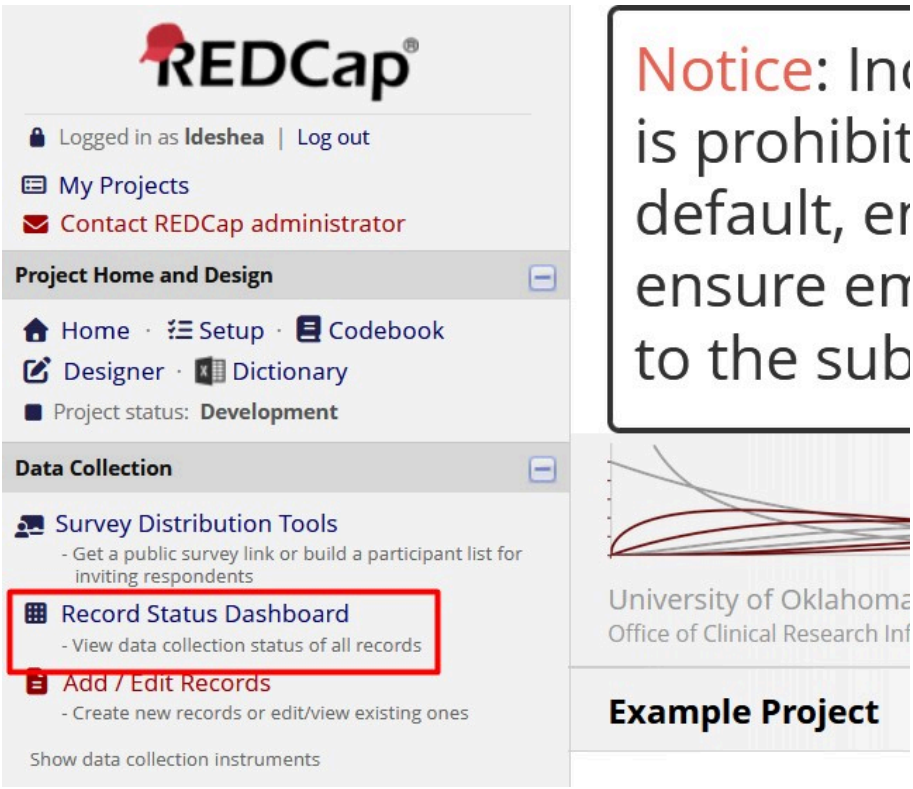


Figure 5.1: Navigating to the dashboard

When you click the link, you see a summary of all the records in the project. What is a record? It's where all the information is kept about a specific person or entity on which data are collected. For our example project illustrated here, there are only three records and three forms:

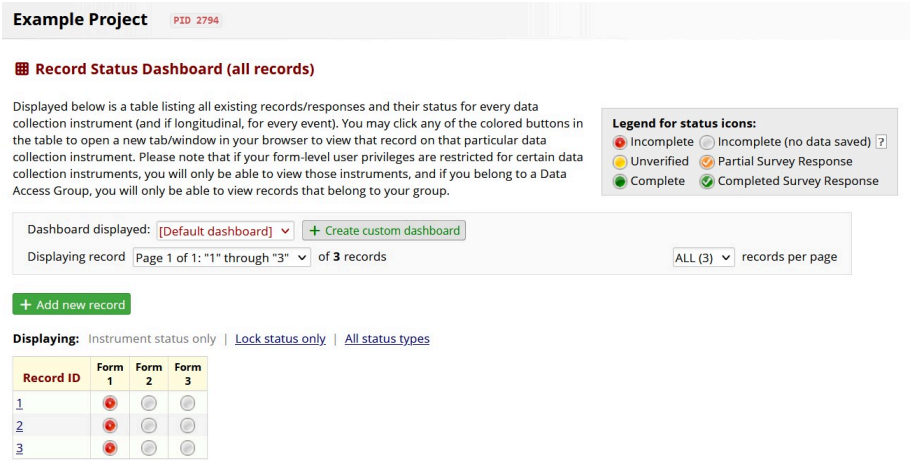


Figure 5.2: Initial view of the dashboard

5.2 A more complex dashboard

Let's look at a dashboard with many more records. Will all of them show up on one page? It depends. Take a look at the screenshot below. (FYI, no private health information, PHI, will appear in these screenshots.)

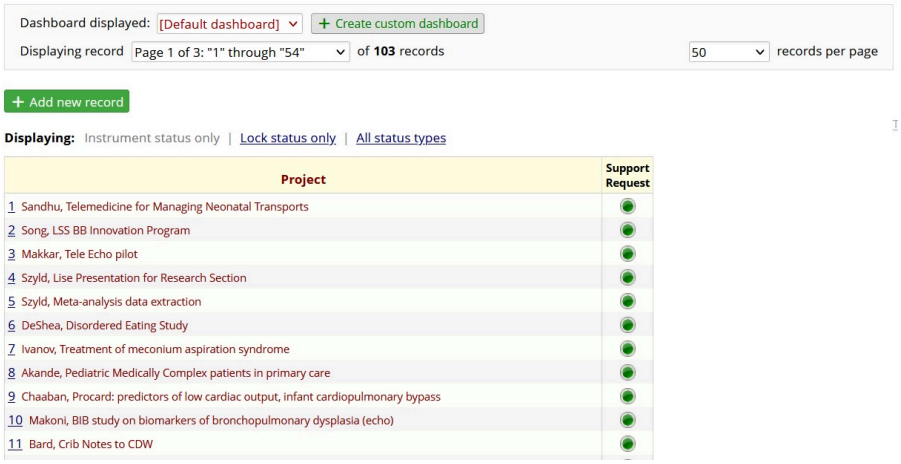


Figure 5.3: Paged view of a dashboard with many records

It appears there are 103 records in the project, and this screen is showing the first of three pages of records. The drop-down menu at the right shows the page was set to display 50 records at a time. But the "Displaying record" field shows the records are numbered 1 through 54. That is because the creator of this project deleted a few records. The drop-down menu on the right can be set to show all records in the project.

5.3 Parsing the dashboard

What else can we learn from this page? Well, the first column of the table is labeled Project. The purpose of this REDCap project is to track the status of all research projects that involve a specific statistician at OUHC; she created the REDCap to make notes on the status of all active projects. The column label, Project, is the label on the record number. As you recall, a record is where we save all the information about a specific person or entity. Here, the entity is the name of the project. So "Record ID" was changed to "Project" to be more descriptive for the user who is tracking many research projects.

By default, nothing is shown but the number, as we see in the second screenshot on this page. With this study tracking REDCap, the first column has the number assigned to each research project, as well

as the name of the research project. Displaying the name of the research project is a customization of this REDCap project. On another project, you might want the customization to show the date that a patient enrolled in a study, or some other data point that was collected.

5.4 Customizing Records

Here is how to customize what is shown next to the record ID. On the left side of the screen, look for the link called *Setup*.



Figure 5.4: Navigating to Project Setup

Then look for the button that says *Additional customizations*.

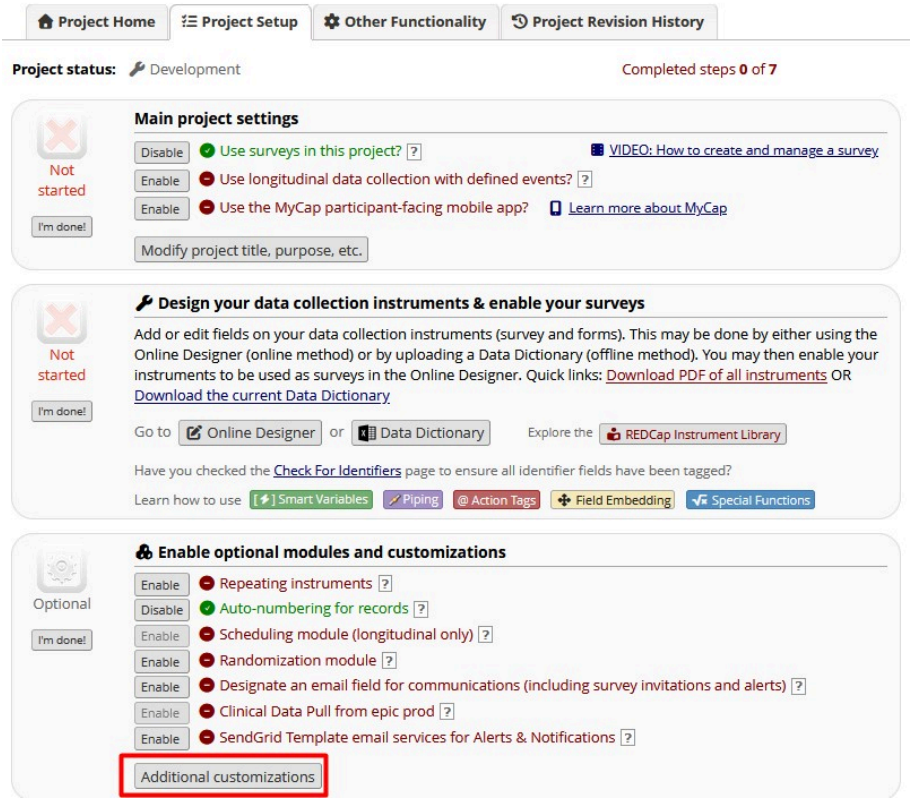


Figure 5.5: Navigating to Additional Customizations

Clicking that button opens a window, with the first customization option being *Set a Custom Record Label*.

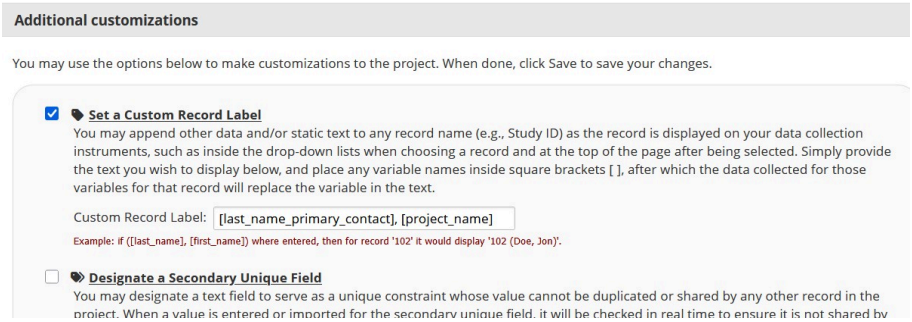


Figure 5.6: Editing Additional Customizations

In the box labeled Custom Record Label, you can see that two variable names have been listed inside square brackets, `[last_name_primary_contact]` and `[project_name]`, with a comma and a space between the variable names. Any words typed that are not variable names inside square brackets also can be typed there. After you have decided on your custom label for each record, click Save and go back to the Record Status Dashboard to see how the custom label looks.

Each record on the Dashboard has a Record ID, usually a number automatically assigned by REDCap. Each number is a link to that record. The REDCap that tracks research studies has another link on the same row. Look for the column labeled Support Request. That is the only instrument in this project. As researchers request the statistician's services, information is collected about that request. The green circles in the Support Request column are links to each project.

5.5 Navigating a record's homepage

Clicking the record number takes you to the *Record Home Page*.

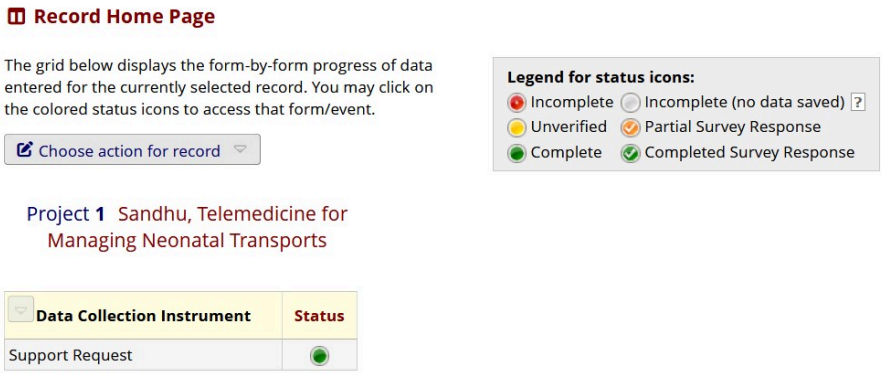


Figure 5.7: A record's home page

The legend in the top right of the following screenshot tells us the meaning of the Status circle's color. A green circle, or button, means the record has been saved as complete. Clicking the green button takes us into the form for this research project. Let's look at where the button's color was determined. Look for the word Complete at the bottom of the form; that setting is responsible for the button's color.

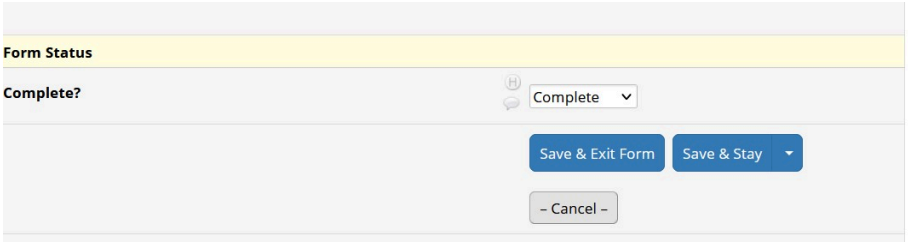


Figure 5.8: Complete the data entry for a record

5.6 Buttons on a dashboard

Let's take a look at a more complicated REDCap project with many instruments. The project we will examine was created for data entry people in a certain research study to practice entering data in a REDCap project identical to the one that was going to be used to collect actual data from patients. This practice project has made-up data.

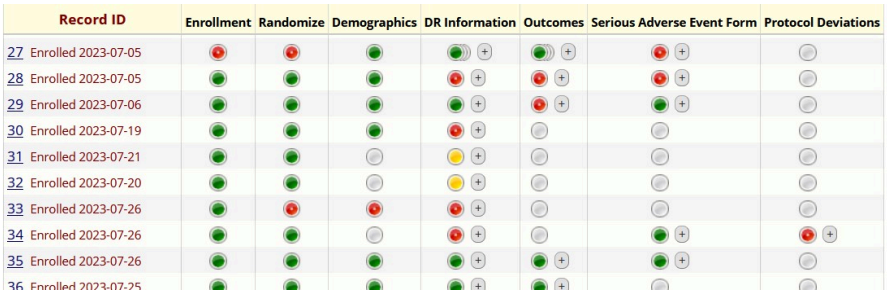


Figure 5.9: A dashboard with many instruments

The first column of this dashboard is labeled Record ID, the default name used by REDCap for assigning unique record numbers to each patient or entity for data collection. This column also has the word "Enrolled" followed by a date. This information was specified as an additional customization. This study had seven instruments: Enrollment, Randomize, Demographics, DR Information, Outcomes, Serious Adverse Event Form, and Protocol Deviations. Now we see many colors of buttons. The legend tells use red means Incomplete, yellow means Unverified, green means Complete, gray means no data was saved on that form for that patient, and overlapping buttons mean there is more than one copy of that form saved in the project. Blue overlapping buttons mean the multiple copies of the form have different statuses. If the overlapping buttons are red, yellow, or green, the multiple copies have the same status, as indicated by the color.

5.7 Repeated instances of a form

When would you have multiple copies of the same form? Let's use this REDCap project as an example. The study involved enrolling those who were about to have a baby. Those expecting twins could participate in the study. Once the twins were born, data were collected about each twin separately – birth weight, kind of respiratory support given immediately after birth, etc.

Suppose you have entered the data on the first twin and you need to enter data about the second twin. You would find the row for that mother, go to a form you needed to complete about what happened to the second twin in the delivery room (the DR Information form), and look for the plus sign in the gray box.

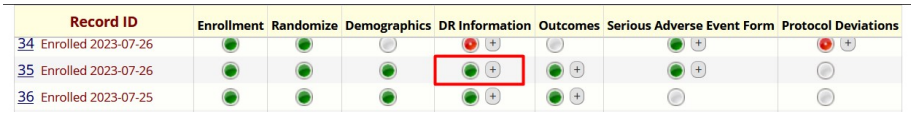


Figure 5.10: Plus sign for adding an repeated instance

Clicking that plus sign creates another copy of the same DR Information form and is a link to that copy. Data entry can proceed from there.

5.8 Customizing the dashboard

The Record Status Dashboard can be used to create custom dashboards as well. Look for the box toward the top of the page.

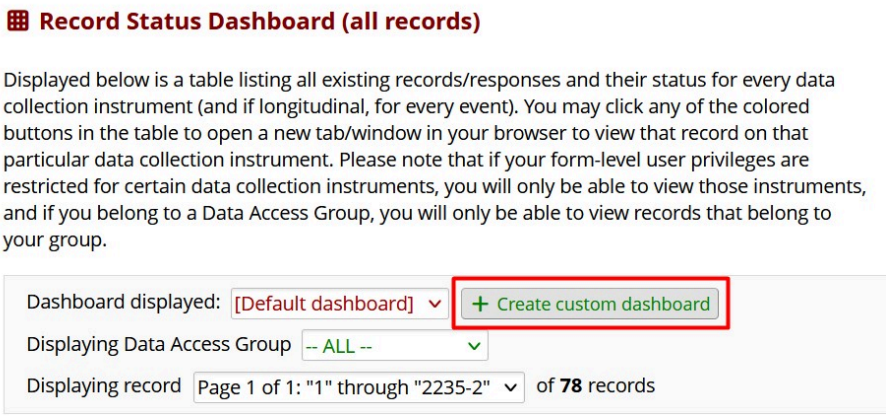


Figure 5.11: Navigating to create a Custom Dashboard

Clicking that box opens a form for creating the custom dashboard.

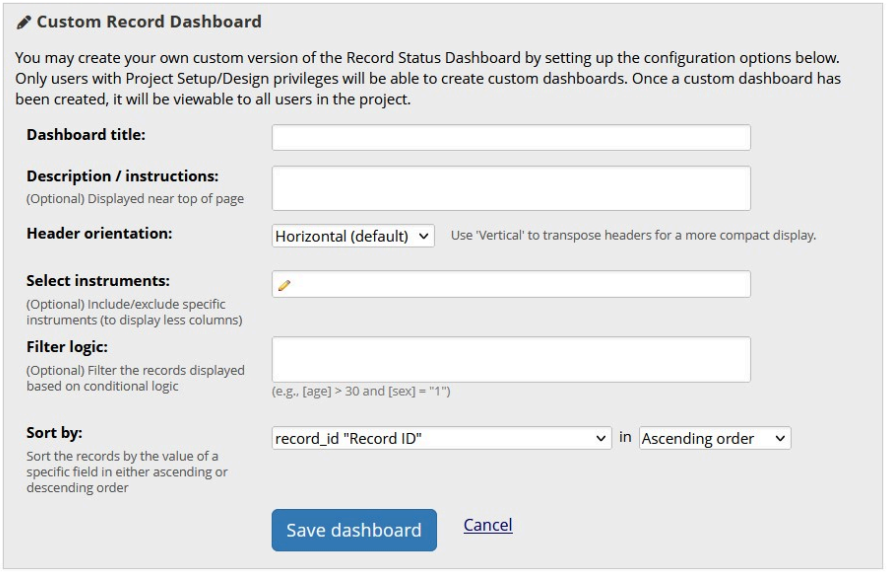


Figure 5.12: A Custom Dashboard, before modifying

Suppose we want to create a dashboard that shows data only for the mothers who signed up in Oklahoma for this multi-site study. We will need the record number, plus the instruments called Enrollment and Demographics. We can click on the little pencil icon next to *Select instruments* and specify those instruments.

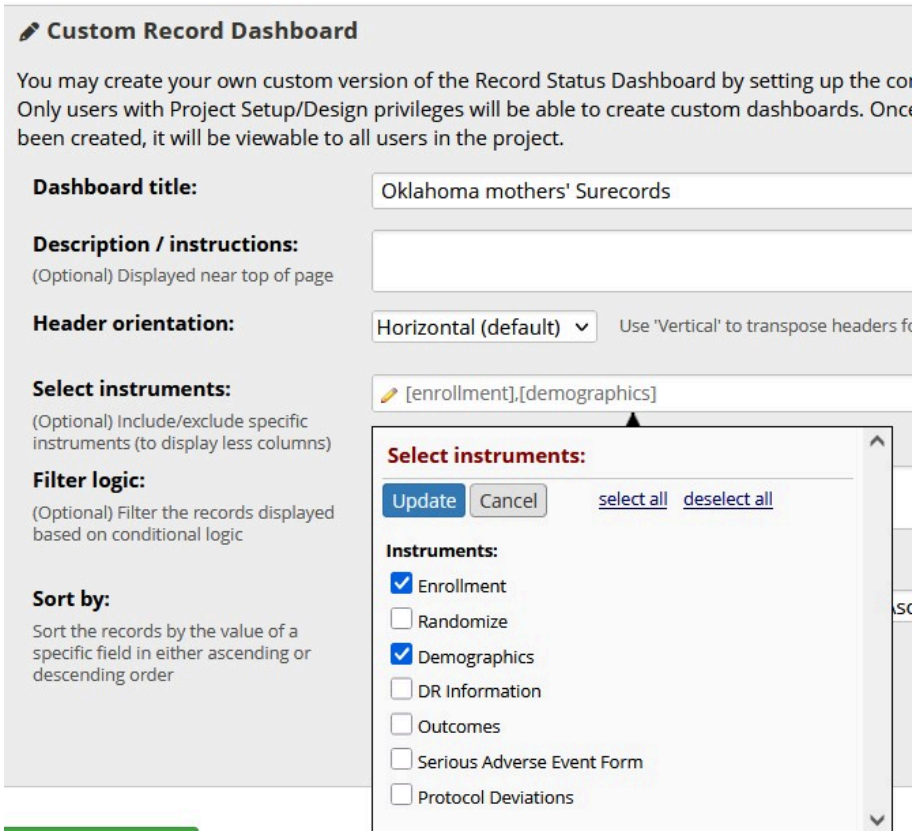


Figure 5.13: Selecting instruments in a dashboard

Then we can create filter logic that gives a statement that must be true in order to get only the records we want. In this example, we need the variable called site to equal Oklahoma. When we click in the *Filter logic* box, we get a *Logic Editor* window where the logical statement is written.

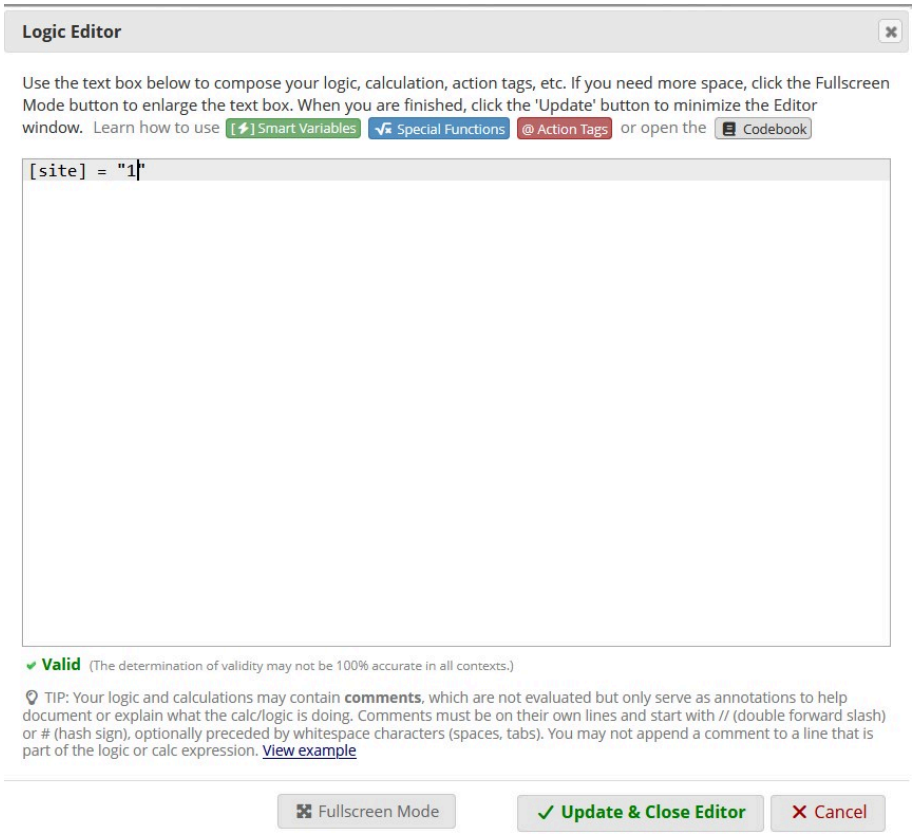


Figure 5.14: Logic editor in a dashboard

The name of the variable is in square brackets, then there is an equals sign, then the value that we want site to equal: Oklahoma. But notice: in this project, Oklahoma is the *label* for the site; it is not the data point that is saved in REDCap. In this project, the label Oklahoma was assigned to the number 1. The logic editor must give the data value, not the label Oklahoma. We click "Update & Close Editor," then we click the blue button that says *Save dashboard*.

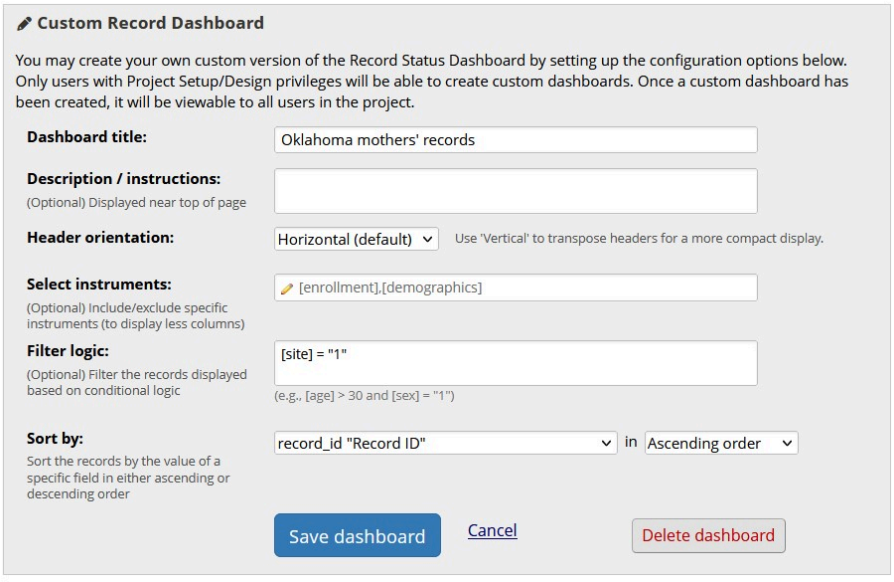


Figure 5.15: A Custom Dashboard, after modifying

We get a message that the custom dashboard was saved, and we can click the gray button that says *View dashboard*.

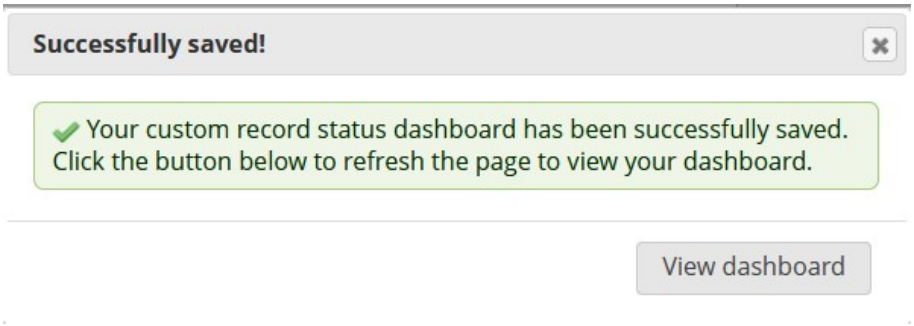


Figure 5.16: Confirmation after customizing a dashboard

Then we will see the custom dashboard that we created.

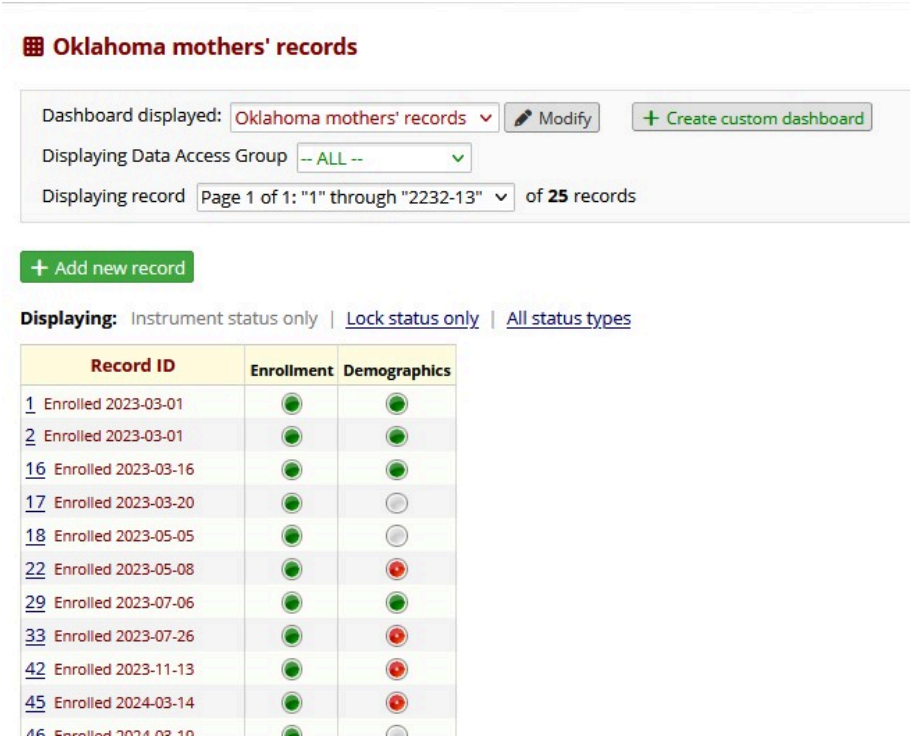


Figure 5.17: Viewing our customizing a dashboard

5.9 Troubleshooting

5.9.1 Can’t see all your records?

If you ever look in your REDCap project and can’t see all your records, check the settings at the top of the Record Status Dashboard and see if you have navigated to a custom dashboard that shows only some of the records. You can switch dashboards by using the drop-down menu toward the top of the page and selecting *Default dashboard*.

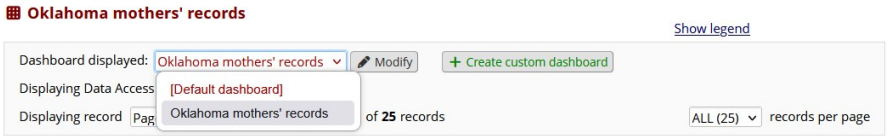


Figure 5.18: Switching to default dashboard

i Additional Chapter Details

This chapter was last edited in October 2025. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

6. Randomizing Participants

Randomizing Participants to support causal inference in the eventual statistical analysis.

Chapter Leads: Thomas Wilson

> **i** Additional Chapter Details
>
> This chapter was started in October 2024. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

7. Security Consideration for Beginners

Security considerations for beginners to protect your participants.

Chapter Leads: Thomas Wilson

> **i** Additional Chapter Details
>
> This chapter was started in October 2024. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

II

Project Design (Basic)

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8. Variable Decisions

Design variables to increase data quality and fidelity.

Chapter Leads: Lise DeShea & Thomas Wilson

8.1 Variable decisions

When you are creating and managing a database, many decisions must be made about variables. A variable is a quantity or property that can take on different values. "Name" is a variable. "Age" is a variable. These are two kinds of variables. Data are stored in variables. REDCap accepts many kinds of data, including file uploads and signatures. But you have to tell REDCap what to expect when you create variables. Further, you need to think about what to name a variable. If you named everything "item_1," "item_2," "item_3," etc., whoever analyzes the data will have a hard time understanding what the variables mean. This chapter will lead you through many decisions about variables.

8.2 Variable names

The most basic detail to decide about a variable is what to call it: the variable name. That decision often is tied up in what kind of variable it is. We will show you how to create a variable inside an existing form in a practice project. We also will explain the difference between a variable *name* and its *label*.

We need to go into the Online Designer. When you log into REDCap and click on a project name, you will have two ways to get into Designer. One is in the top left corner of your screen, with a link called *Designer*.



Figure 8.1: Enter Designer

The other way is on the same screen in the middle of the page with a box labeled *Online Designer*.

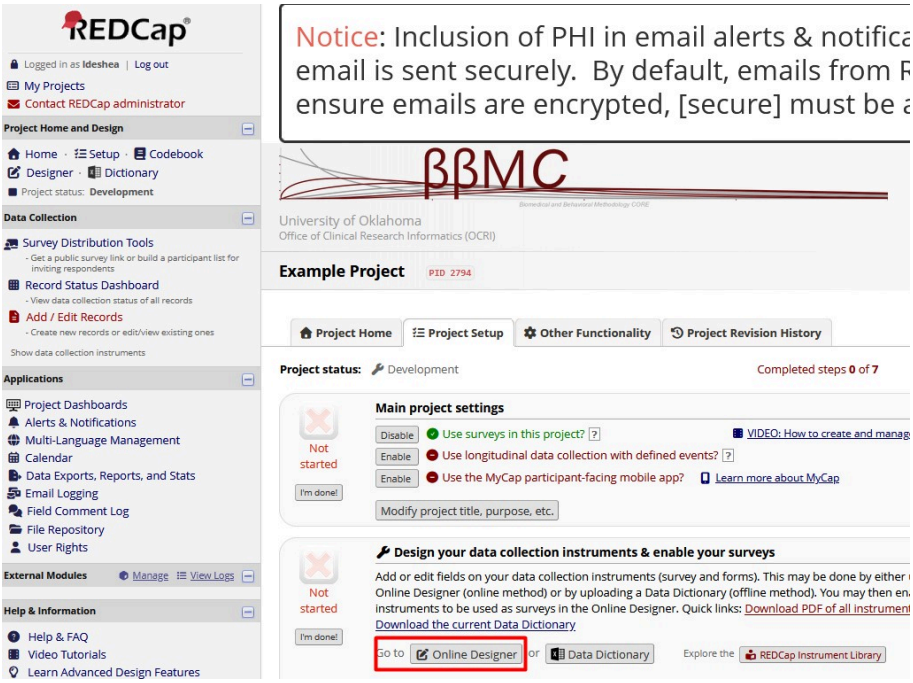


Figure 8.2: Enter Online Designer

Either way, you end up on the same page, which lists the forms in the project.

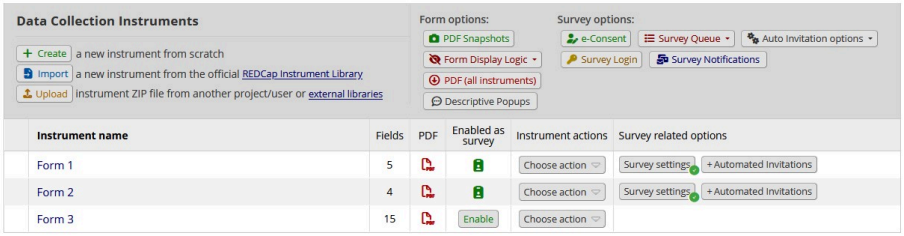


Figure 8.3: List of forms

Clicking on any form name will open it. Form 1 in this project already has variables in it. The Record ID is automatically created by REDCap and cannot be deleted. It is a unique identifier for each record entered in the project. It can be renamed, but we will leave ours alone.

8.3 Variable names vs. labels

To edit a variable, click on the little pencil icon.



Figure 8.4: Pencil icon

We get a new window labeled *Edit Field*. We can learn several things about this variable from this window. First, it is a *Notes Box* (Paragraph Text) field. That means it could be used to enter a description of a clinic visit, for example.

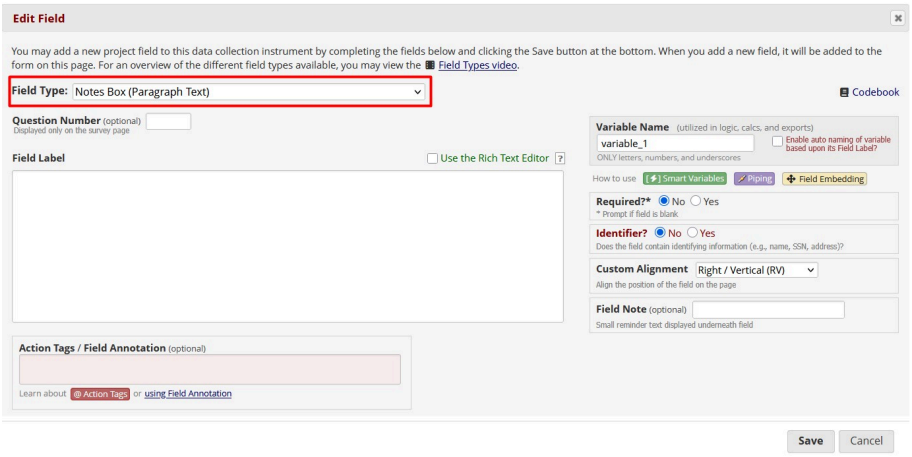


Figure 8.5: Edit Field

You see that the large box under *Field Label* is blank. No label has been created for this variable. Further, on the right side of the window is the *Variable Name*. The Field Label is what shows up to the person filling out the form. The Variable Name is used to store the data inside REDCap. An analyst will use the variable name.

variable_1 is a poor name for a variable because an analyst would not know anything about the data simply by looking at that variable name. Let's change it to *visit_note* and add a label to match, then click Save.

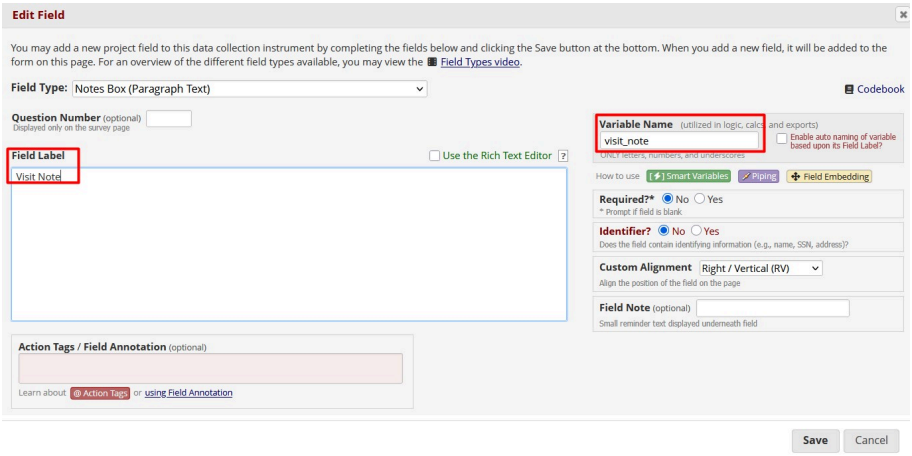


Figure 8.6: Change variable name

Let's look at *variable_2*. This variable was created as a *Text Box (Short Text, Number, Date/Time, ...)*. Let's change the variable name to capture a participant's first name

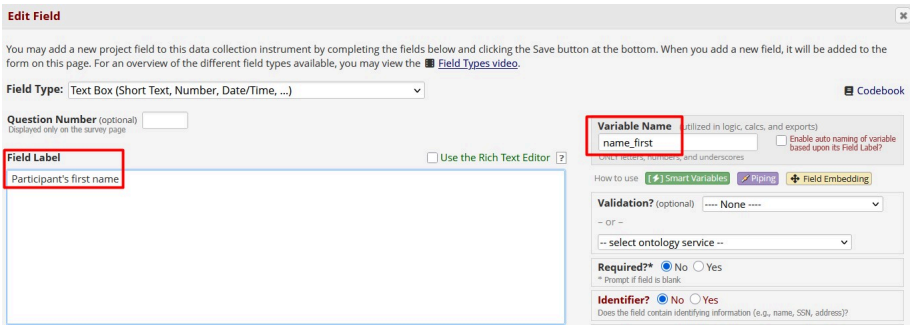


Figure 8.7: Change variable name

Note that we did not name the variable *first_name*. We recommend starting the variable name with something general, then getting more specific. Then the analyst could see all the variables involving someone's name and distinguish among them. When you are creating variables in REDCap, it's a good idea for you to be quite familiar with the study, survey, or investigation *before* you start creating variable names. If this study collected data for a parent and a child, then *name_first* would be a poor choice. A better choice might be *name_parent_first*.

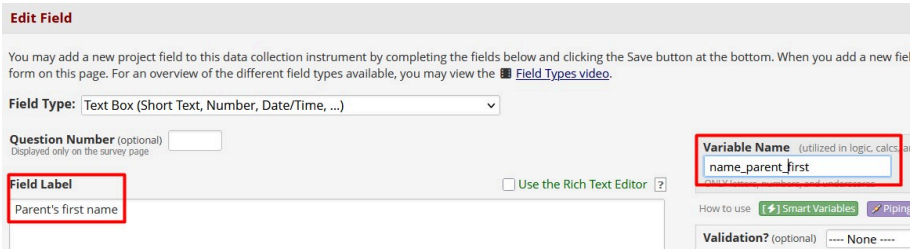


Figure 8.8: Parent's first name

8.4 Field Types

As mentioned above, REDCap can capture many kinds of data. Let's look at variable_3 and see what kinds of variables are available. Next to the words *Field Type* is a drop-down menu of kinds of variables.

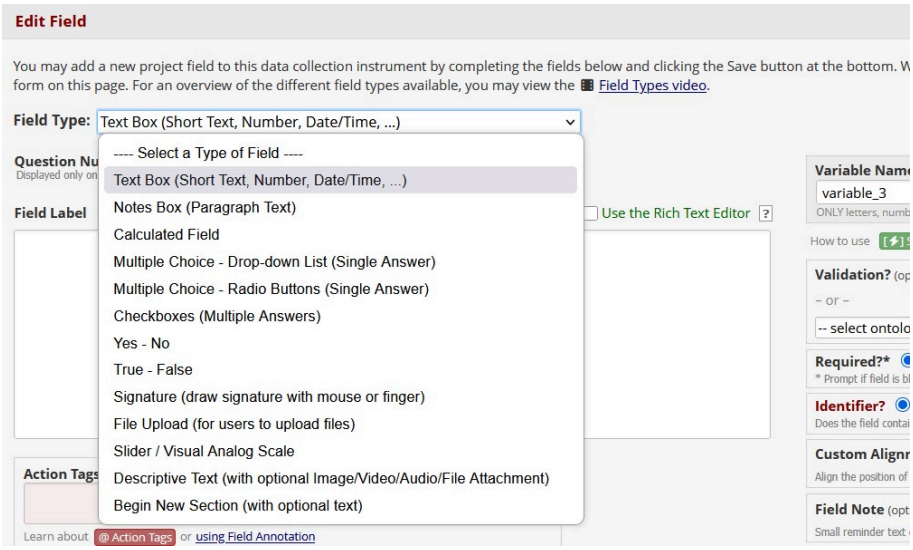


Figure 8.9: Field type dropdown

As the creator of a REDCap project, you are on the front line of ensuring data quality. The specifications you enter for each variable can make a world of difference. Your specifications can force a data entry person to enter a number with two decimal places or ensure that an email address is in a valid format. The specs also can set limits on numbers so a data entry person could not accidentally enter a person's age as 150 years old, instead of 15.

8.4.1 Text Box

A *Text Box* field can handle many kinds of data. How do we specify which kind of entries will be valid? Suppose we want the data entry person to enter a child's age for a study involving only children ages 2 through 8 years. Further, two children from the same family could be involved in the study. We will name the variable to specify we are talking about the first child, and we will use a setting called *Validation*, which has a drop-down menu beside it.

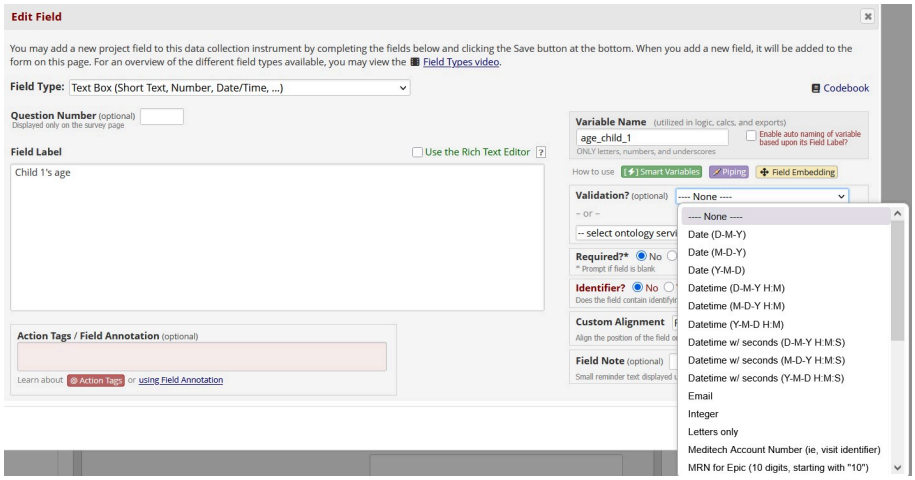


Figure 8.10: Validation settings

You can see a scroll bar on the right side of the drop-down menu. There are many validation types from which to choose. For child's age in years, we will choose Integer. After we do that, we see options pop up for *Minimum* and *Maximum*. We will enter the minimum and maximum ages possible for this study.

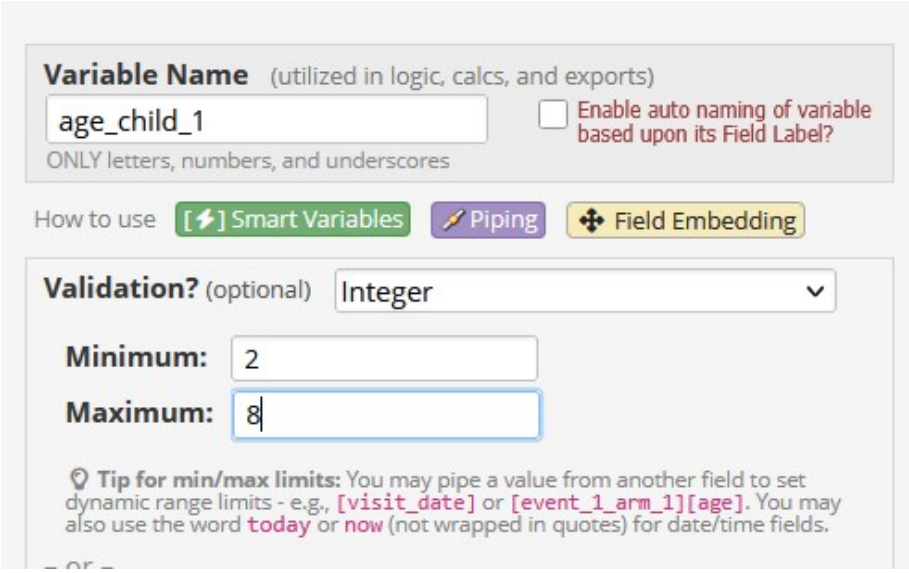


Figure 8.11: Validation range

If someone entering data typed an age outside that range, an error message will appear, saying the number is beyond the limits you set.

8.4.2 Calculated Field

A Calculated Field can take a number from a previously entered variable and perform a calculation. For example, the project already may have two variables capturing a newborn infant's number of weeks and number of days of gestation. A data analyst might prefer to have one variable for analyzing gestational age, such as total days of gestation. A formula can be written to take the previously entered weeks of gestation, multiply it by 7, then add the days (partial week) of gestation to get total days of gestation. First, create a new variable and select Calculated Field as the field type.

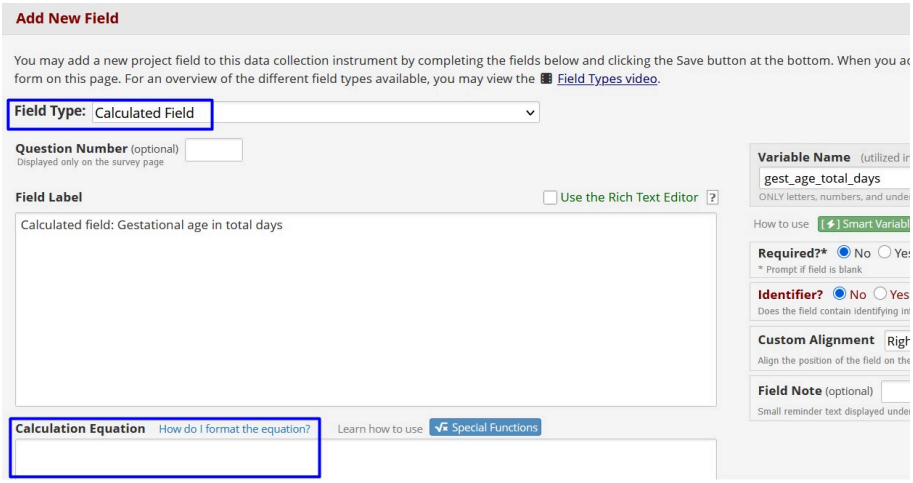


Figure 8.12: Create a calculated variable

We have drawn a blue box around the field type and another one around the Calculation Equation box. Notice there is a link beside the words "Calculation Equation" to instructions for formatting equations. Click on the Calculation Equation box and enter your equation as shown in the example below.

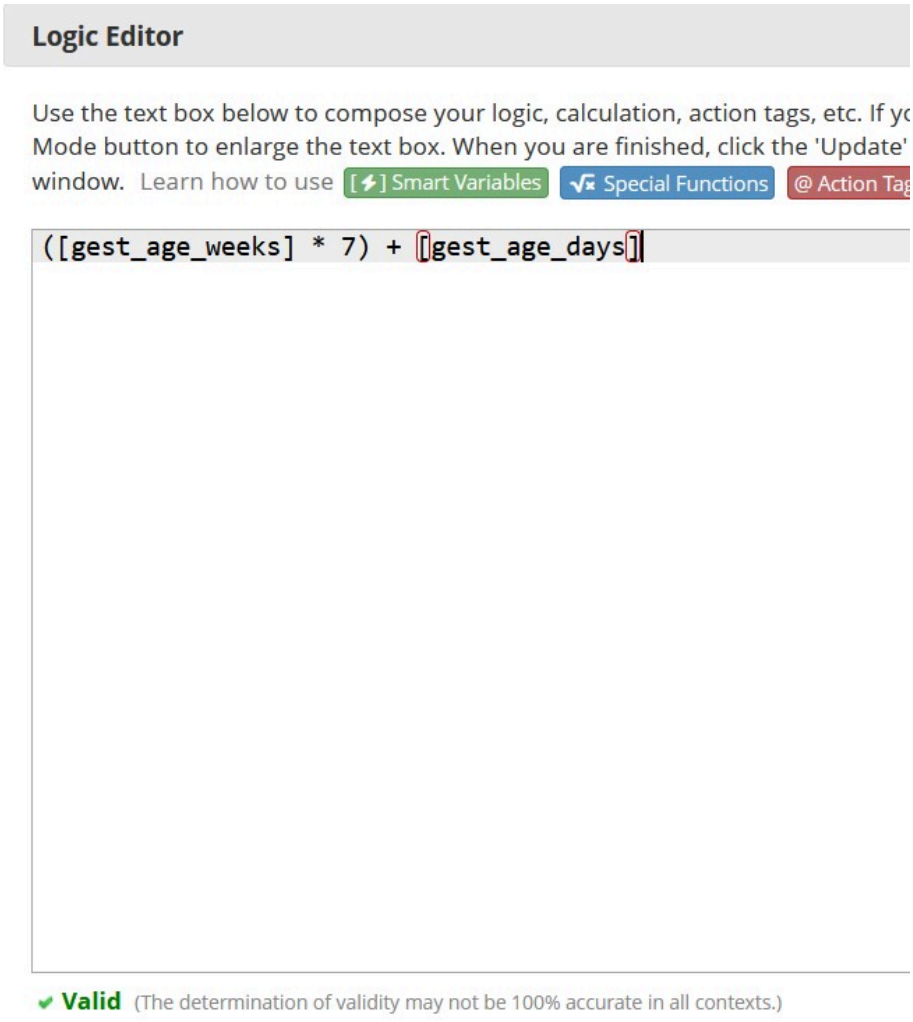


Figure 8.13: Write your equation

Notice the use of square brackets around both variable names used in the equation. You can use parentheses liberally to make sure the order of mathematical operations is correct. The spaces in this formula could be removed and make no difference to the Logic Editor.

8.4.3 Multiple Choice - Drop-down list

Now we will explain the three kinds of multiple-choice fields available in REDCap. A drop-down list of response options is helpful when you have a long list of options, such as state of residence, because it saves space. It also is helpful when the project has specified values for missing values, which can automatically appear as options in the list. The image below shows a variable with the Field Type: Multiple Choice - Drop-down List (Single Answer).

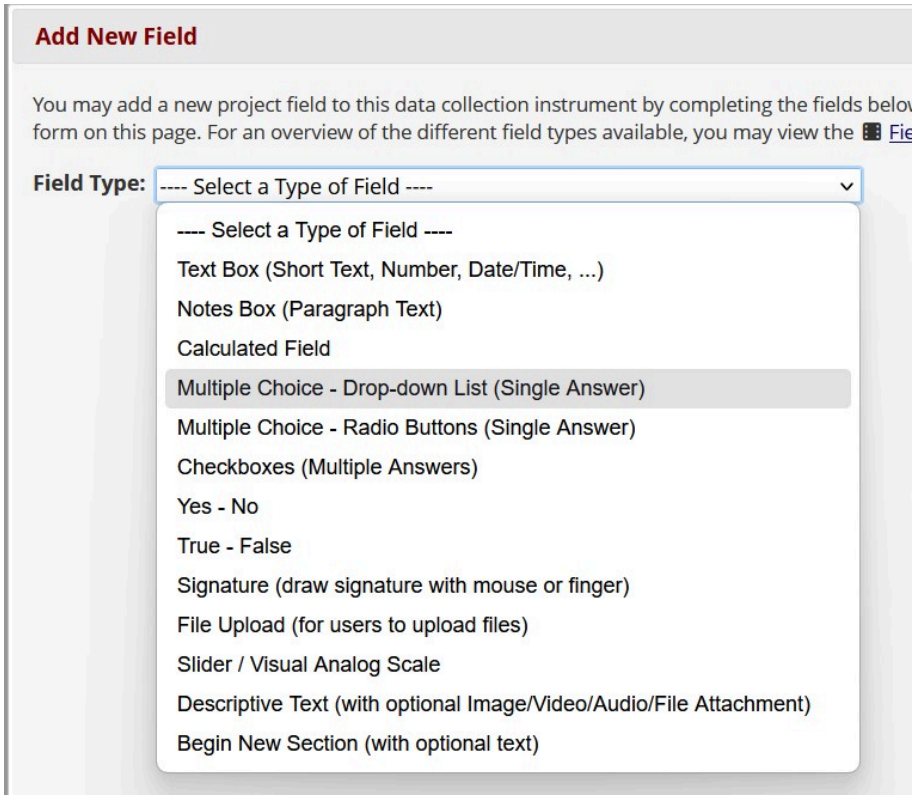


Figure 8.14: Drop-down list variable

In the space at the bottom of the window, called "Choices (one choice per line)," you will see below that this field has the state abbreviation, followed by a comma, then the state name, with one state per line.

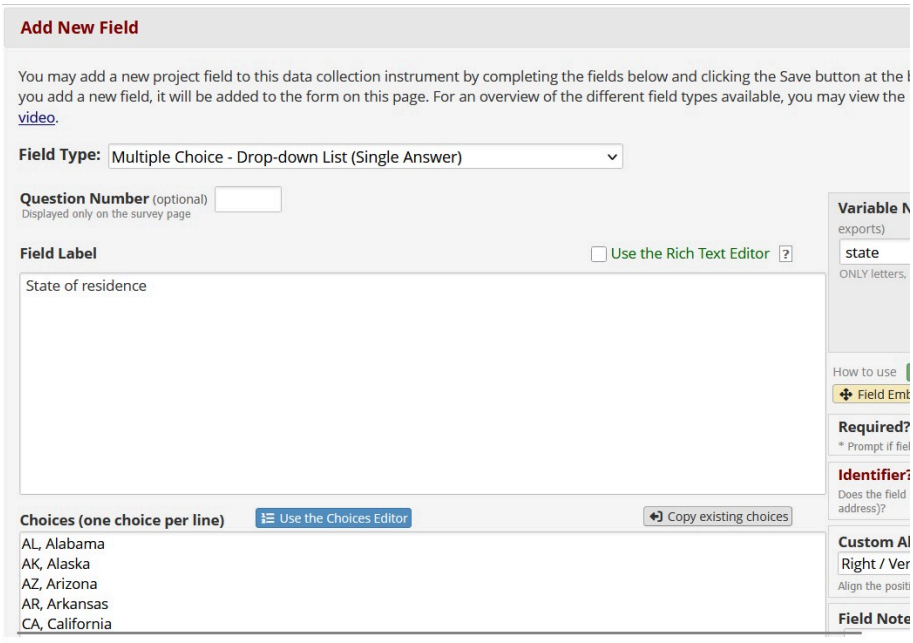


Figure 8.15: Enter drop-down values

8.4.4 Multiple Choice - Radio Buttons

When you need fewer multiple-choice options, you can choose a Multiple Choice - Radio Buttons field. Everything else about that field is the same as the drop-down list option.

8.4.5 Multiple Choice - Checkboxes

Checkboxes for a multiple choice item are different. Checkboxes allow for multiple responses, such as you would need for an item saying, “Check all that apply.” Other than specifying “Checkboxes (Multiple Answers)” for the Field Type, this kind of multiple-choice item is just like the other multiple-choice items.

8.4.6 Date variables

Let’s look at a date field. We will change variable_4 in our example project to the date of birth for the first child in our study.

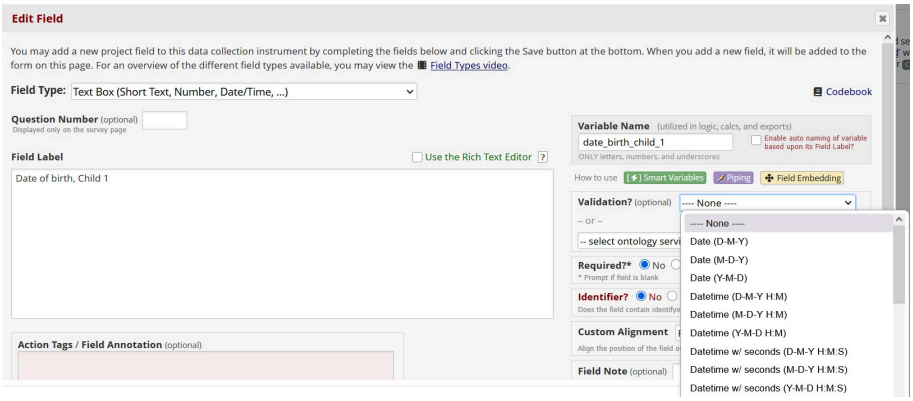


Figure 8.16: Kinds of date variables

Date validation can be as general as a date or as specific as the date and time down to the second. For a birth date, we usually only need the date. We have 3 format options available to us: day-month-year, month-day-year, or year-month-day. Keeping with our recommendation of going from general to specific, we will choose Y-M-D. (This recommendation is in keeping with the International Organization for Standardization 8601, which you can find online. This format eases sorting data by earliest to latest date.)

8.4.7 True/False and Yes/No variables

These two kinds of variables are like multiple-choice items, except REDCap creates the response options for you. Examples are shown below.

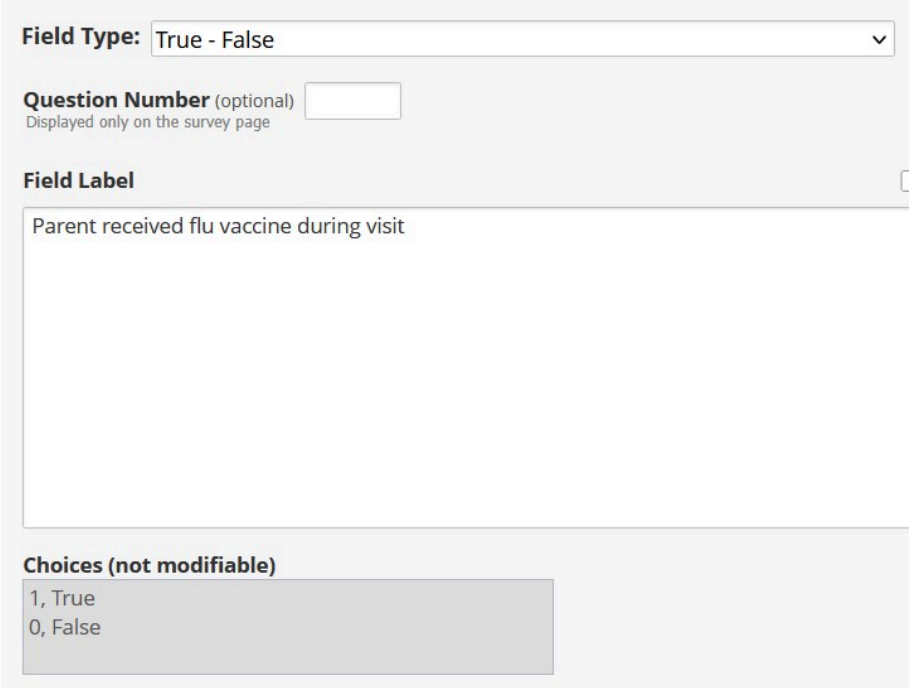


Figure 8.17: True/False item

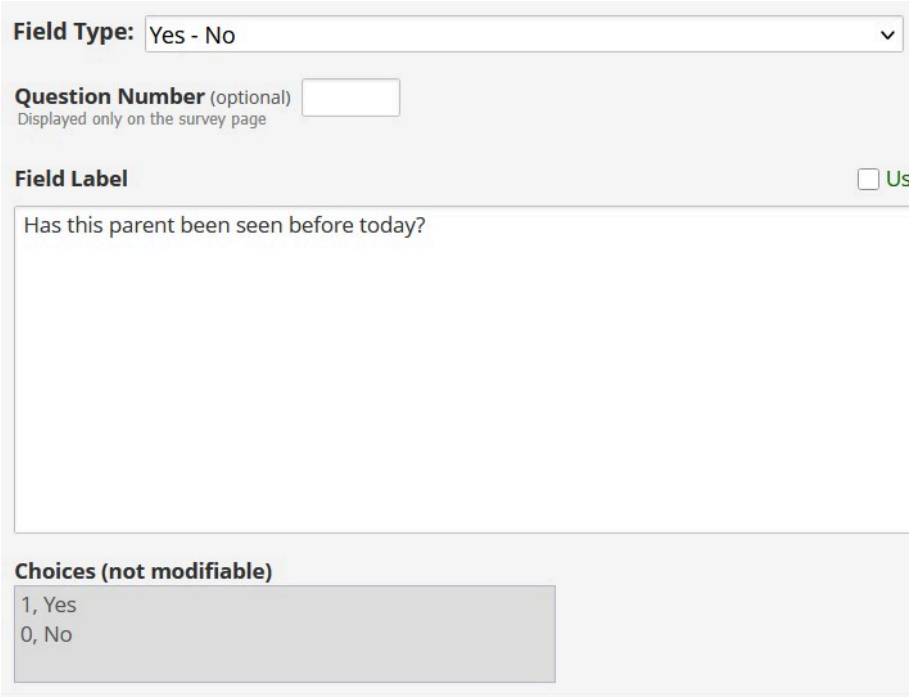


Figure 8.18: Yes/No item

8.4.8 Signature variable

Sometimes an online survey will require a signature from the person completing it. REDCap allows you to do that. Here is a signature field as it appears in the Online Designer. There is a link at the bottom right that will be active when a survey is created.

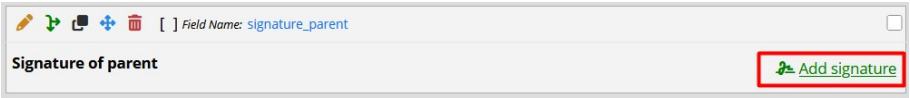


Figure 8.19: Signature field in Designer

Here is what the field looks like when you click the pencil icon to edit it. You will see there are few specifications. You could specify whether it is a required field, whether it contains personal identifying information, where it appears relative to the variable name on a survey.

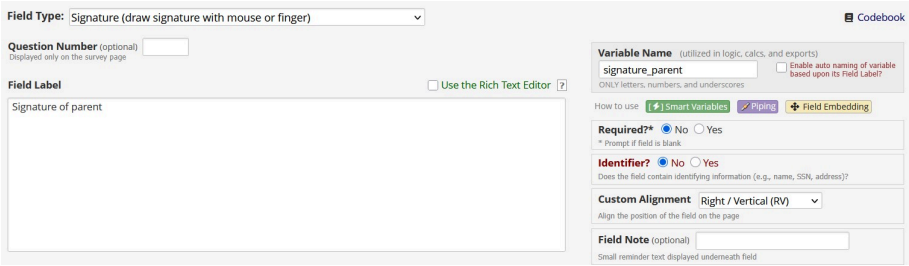


Figure 8.20: Signature field in editor

8.4.9 File upload

Surveys sometimes require an image or document to be uploaded. Either kind of file can be uploaded with a File Upload field. It looks a lot like a signature field when you are in the Online Designer. There is an upload link at the bottom right that will be active when a survey is created.



Figure 8.21: File upload field in Designer

It also looks like a signature field when you are in the Edit Variable window, with similar options available.

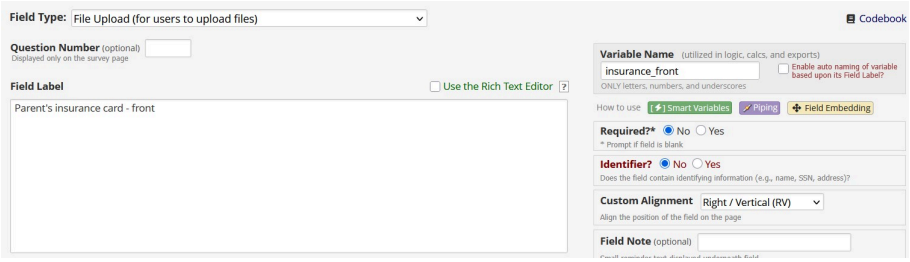


Figure 8.22: File upload field in editor

8.4.10 Slider/Visual Analog Scale

Sometimes investigators like to ask questions on a survey that ask respondents to rate how they feel on a scale, such as 1 = Very unsatisfied to 7 = Very satisfied. A Slider/Visual Analog Scale item allows the respondent to move a button on a slider from left to right and choose an answer. Here is what this kind of variable looks like in the Edit Field window.

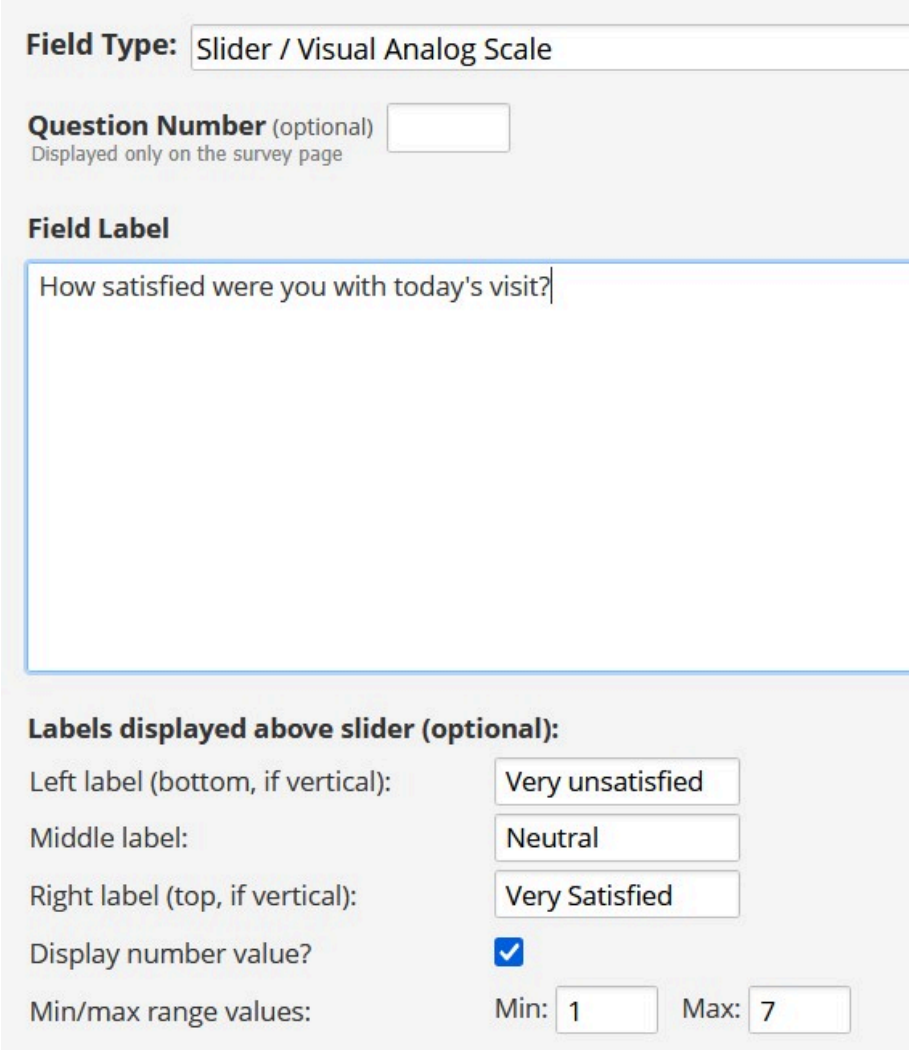


Figure 8.23: Slider field in editor

We have specified the lowest possible value is 1, and the highest possible value is 7, and we have provided anchors for the ends and the middle of the scale. We also have selected the option allowing the respondent to see the number associated with the place on the scale where they move the button. We can see the slider in Online Designer.

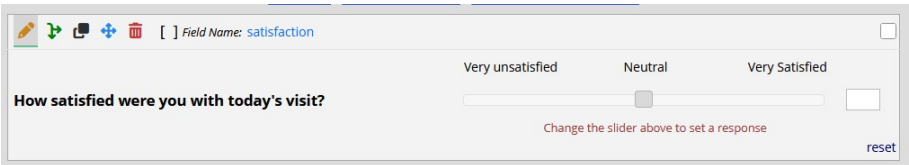


Figure 8.24: Slider field in editor

8.4.11 Descriptive Text

A Descriptive Text field allows the REDCap project designer to add notes or images that do not collect any data. This kind of field can use HTML coding or rich-text editing (with the HTML hidden from you). It also allows you to upload an image to appear in a survey. Here is what an example Descriptive Text field looks like in Online Designer.

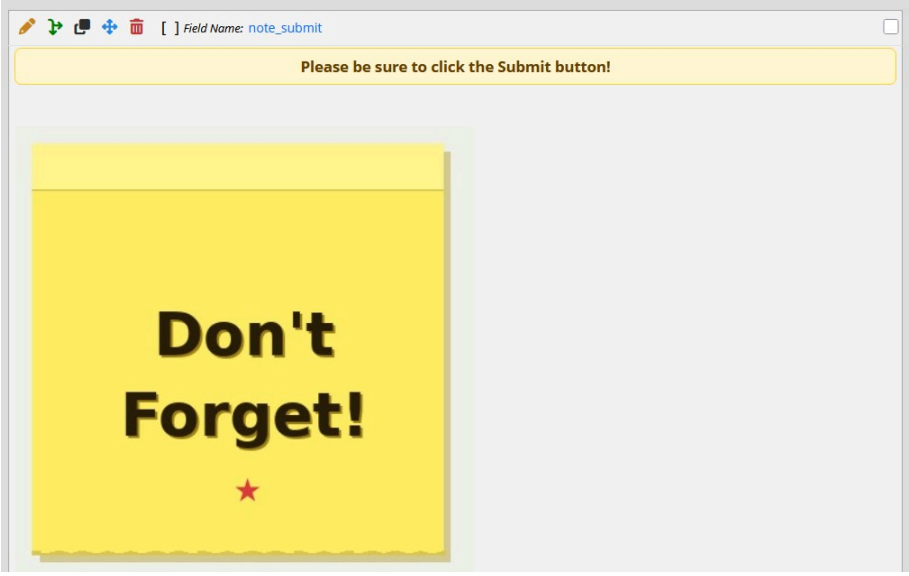


Figure 8.25: Descriptive text field in Designer

In the Edit Field window, you will see this item was created using HTML and image upload, with "inline" display chosen so that the image appears with the note written in HTML.

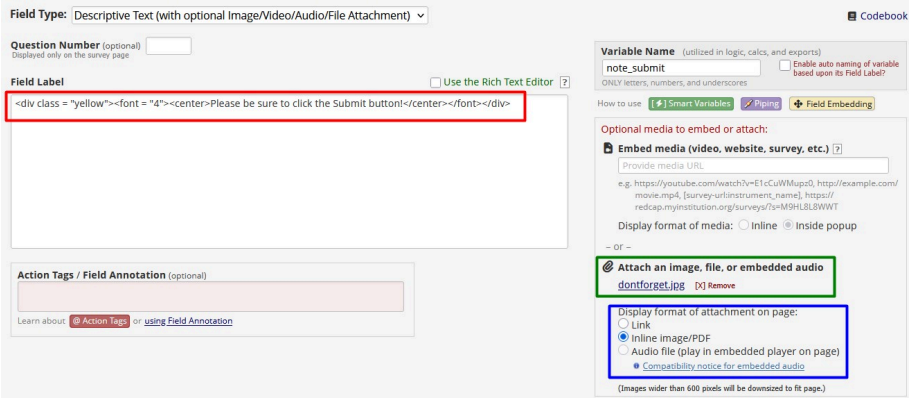


Figure 8.26: Descriptive text field in editor

The image above shows a red box around the HTML, a green box where the image, file, or audio was attached, and the blood box shows we have selected "Inline image/PDF" so that the uploaded image appears with the HTML note.

8.4.12 Begin New Section

The last option in the drop-down menu in the Edit Field window is Begin New Section. This option is available for REDCap users who are implementing a long online survey that needs to break occasionally and carry over to subsequent webpages. We will not illustrate this option, as it is rarely used.

8.5 Creating a new variable

Our examples so far have shown variables that already existed in a REDCap project. Let's create a new variable. Look for the buttons that say "Add Field":

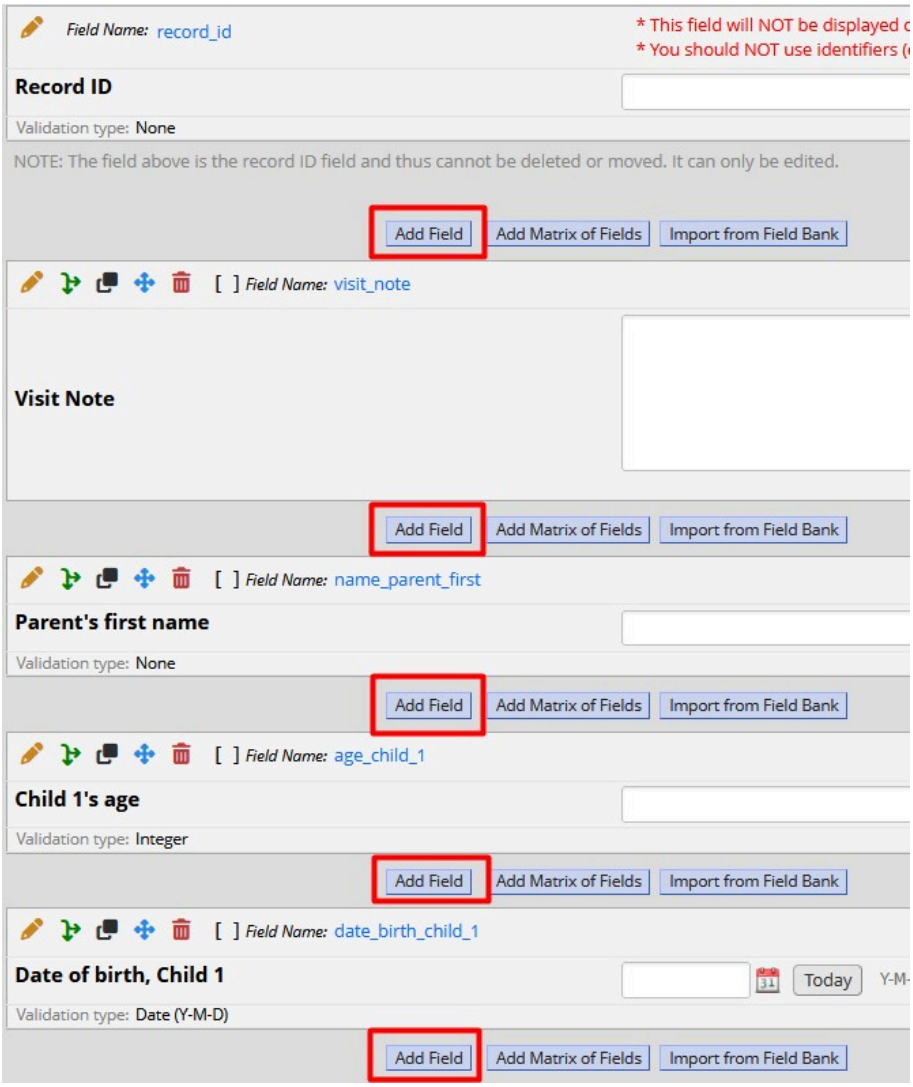


Figure 8.27: The Add Field button

We can insert a field after any of the existing fields in the project by clicking one of those buttons. Doing so opens a window called Add New Field. Let's create a field for the best contact phone number:

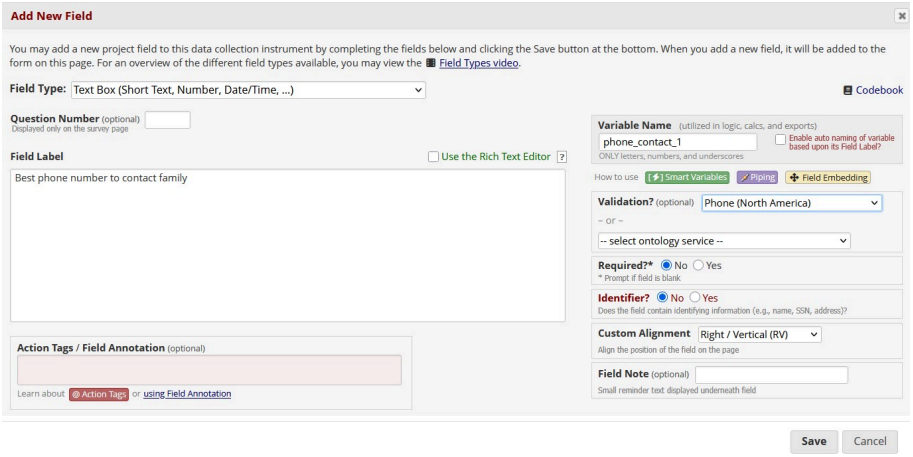


Figure 8.28: Creating a new variable

We named it phone_contact_1 to indicate it is the best number for contacting the family. Then we click Save, and the new variable now appears on the form. Note that we chose Phone (North America) as the Validation standard. If someone enters a phone number without an area code, an error message will say an invalid number was entered.

8.5.1 Matrix of Fields

REDCap allows you to create a table that will hold many items similar to the slider field, except it has buttons and labels are possible for each rating. This is called a *Matrix of Fields*. It is created in a different way from the Add Variable button. You click the "Add Matrix of Fields" button. You get a window that asks you to name your table (matrix) of items. Here is a matrix of fields as it appears in Online Designer.

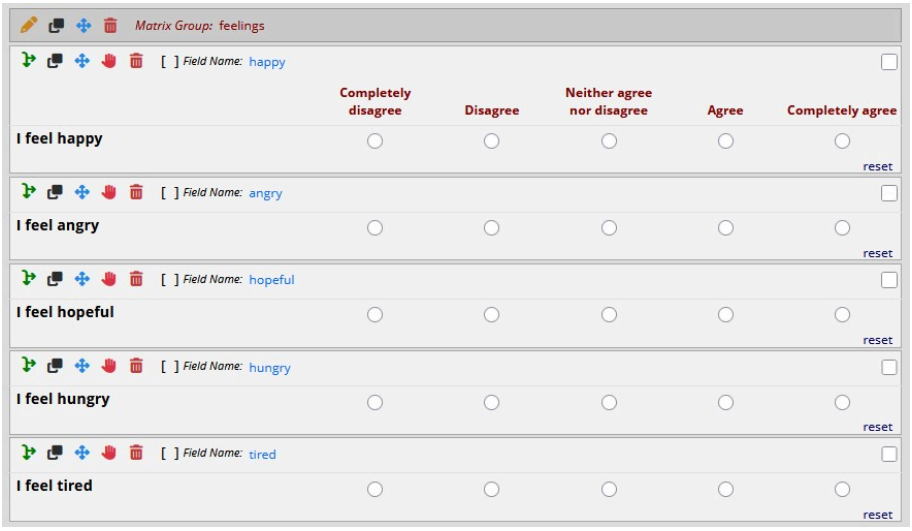


Figure 8.29: Matrix of fields in Designer

The matrix group is called feelings. This group contains five items, each of which has a field name showing. This is how the group will appear on a survey. It requires entering the five response options as you would on a multiple-choice item, but the same response options are used for all items in the group. You cannot have items in the same group requiring different labels on the scale. Here is what the matrix group looks like in the Edit Field window. The window had to be scrolled, so the screenshot is broken into two parts.

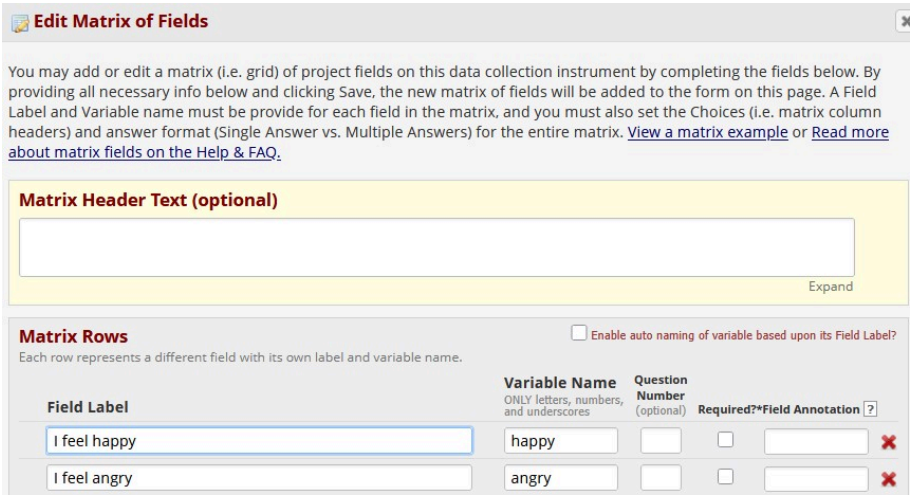


Figure 8.30: Matrix of fields in Editor, top half

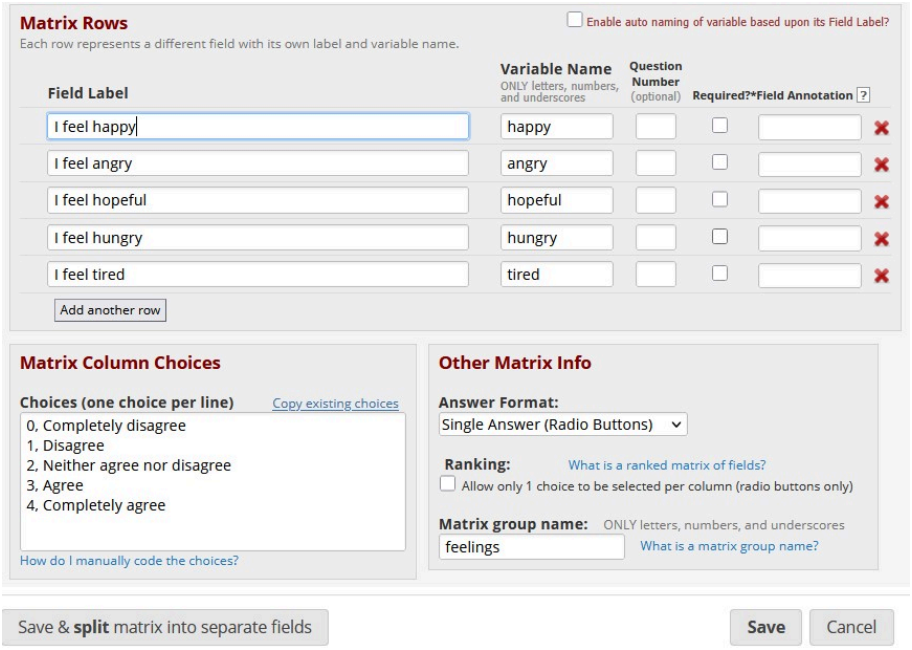


Figure 8.31: Matrix of fields in Editor, bottom half

You can click on the *Add another row* button to add another item to the matrix. Each item's responses will be saved in its own variable.

8.6 Best Way to Learn

We recommend when you are learning about REDCap, request a practice project, then go into Form 1, which gets created automatically. A practice project is the best way to learn by doing. Play around with creating different kinds of variables. To request a practice project, click on My Projects in the top left corner of the page, then click on the link at the top of the next page that says "+ New Project." Fill out the form and a REDCap administrator will create a "Practice/Just For Fun" project for you. You will get an email when the project has been created and is available to you.



Figure 8.32: Go to My Projects

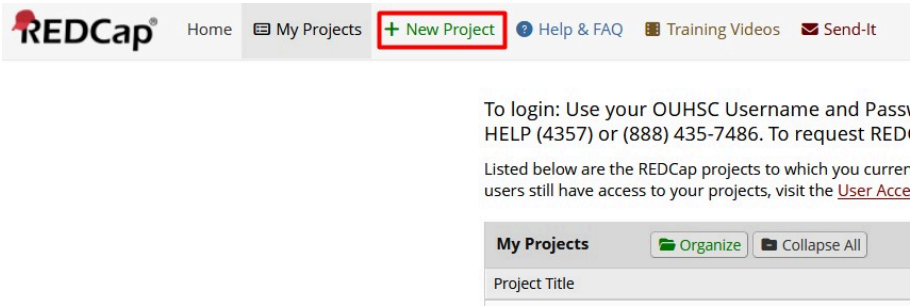


Figure 8.33: Go to New Project

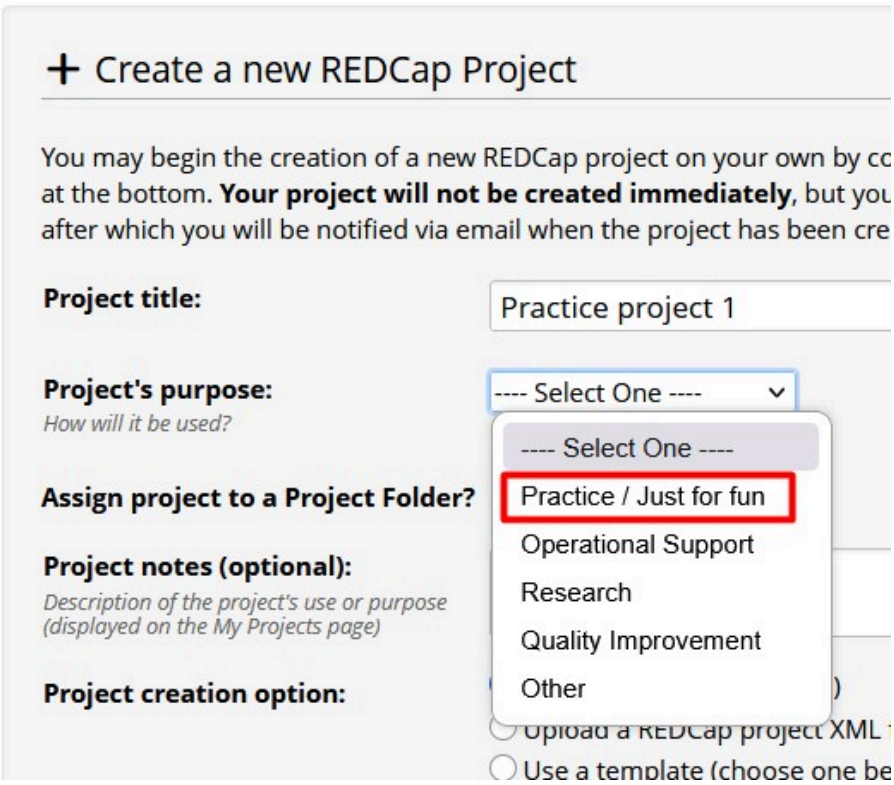


Figure 8.34: Request practice project

i Additional Chapter Details

This chapter was last edited in April 2026. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

III Project Design (Intermediate)

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9. Action Tags

Action tags

Chapter Leads: Lise DeShea & Thomas Wilson

9.1 Purpose

Action tags are used in REDCap to modify the appearance or behavior of items in a project. They are added to the *Action Tags/Field Annotation* box under the Field Label in the Edit Field window for each variable.

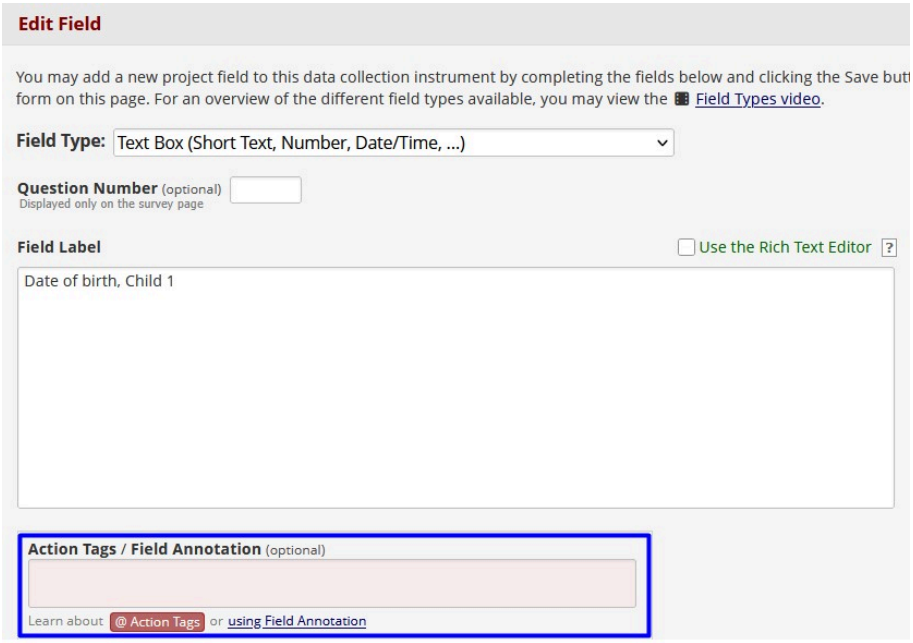


Figure 9.1: Action Tags box

9.2 Common

We will explain some of the more common action tags, then we will cover a few of the less common ones. We will start with a simple example.

9.2.1 `@HIDEBUTTON`

> Hides the 'Now' or 'Today' button that is typically displayed to the right of date, time, and date/time fields. (Official definition from REDCap 17.6.2.)

By default, date fields appear with a button labeled Today. Clicking that button fills in today's date. Sometimes a project designer does not want that button available. A designer might want to force people reviewing past years' medical records to enter that date's year. Every action tag begins with an at-sign, @. The action tag to hide the Today button is `@HIDEBUTTON`. When you click inside the Action Tags/Field Annotation box, it then opens another window, called the *Logic Editor.*

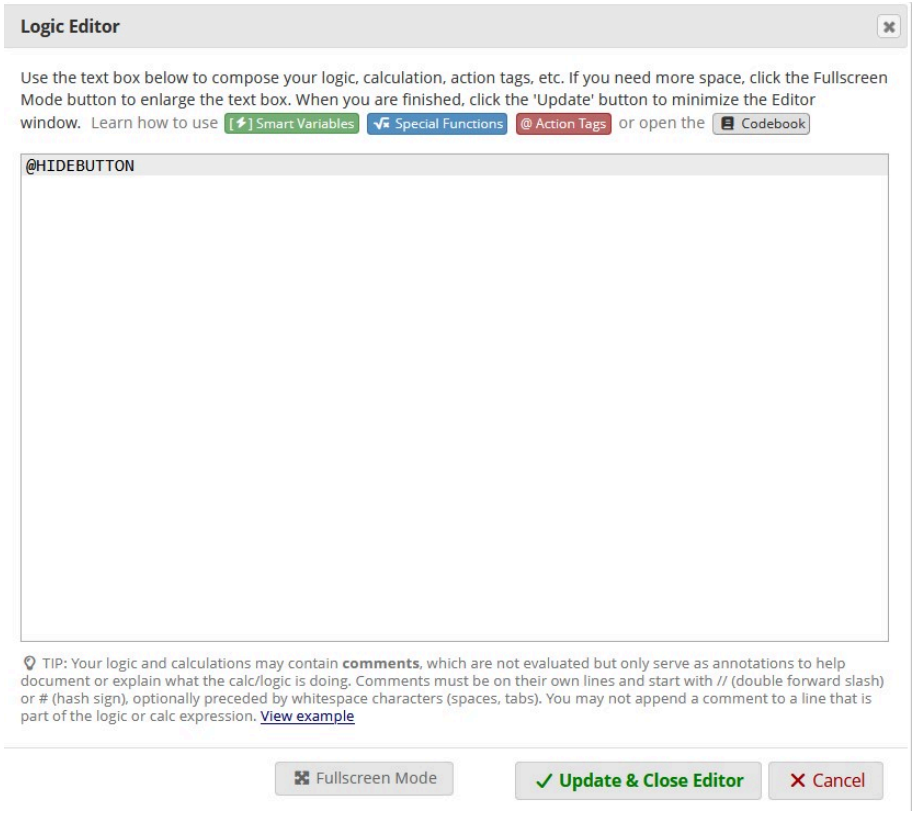


Figure 9.2: Logic Editor

You can see that we have typed `@HIDEBUTTON` in the Logic Editor. What if you cannot remember if this action tag has a hyphen in the middle? You can click the red "@ Action Tags" button at the top of the Logic Editor and see a list of action tags and explanations. To save this action tag, you click *Update & Close Editor*, then click the *Save* button on the Edit Field window. Now the Today button no longer appears next to the date field.

9.2.2 @DEFAULT

Sets a field's initial value. This allows a field to have a specified default value when viewing the field on a survey or data entry form that has not yet had any data saved for it (i.e., when the form status icon is gray or when a survey page has not had any data entered yet). The format must follow the pattern `@DEFAULT="????"`, in which the desired default value should be inside single or double quotes. For checkbox fields, simply separate multiple checkbox values with commas - e.g., `@DEFAULT='1,3,6'`. For text fields, you may even perform Piping inside the default value to pipe data from another field in the project - e.g., `@DEFAULT='Name: [first_name] [last_name], DOB: [dob]'`.

- NOTE: The default value does *not* get applied during any data imports (via API or Data Import Tool) but only operates when viewing survey pages and data entry forms.
- NOTE: If being used on a date or datetime field, the date value inside the quotes must be in Y-M-D format - e.g., `@DEFAULT='2007-12-25'` - regardless of the field's set date format. TIP: To pipe the value of one multiple choice field into another multiple choice field, make sure you append `':value'` to the variable being piped - e.g., `@DEFAULT='[my_dropdown:value]'`.

(Official definition from REDCap 17.6.2.)

Sometimes a project designer can use an action tag to make things easier for the people doing data entry inside REDCap. The action tag `@DEFAULT = '____'` can be used to set the starting value for a variable. In this example, you would put a default value in the blank. Let's say we expect most of the people in a

study to be residents of Oklahoma. We could set `@DEFAULT = 'OK'` so that Oklahoma shows up as the default state when a new record is created in REDCap.

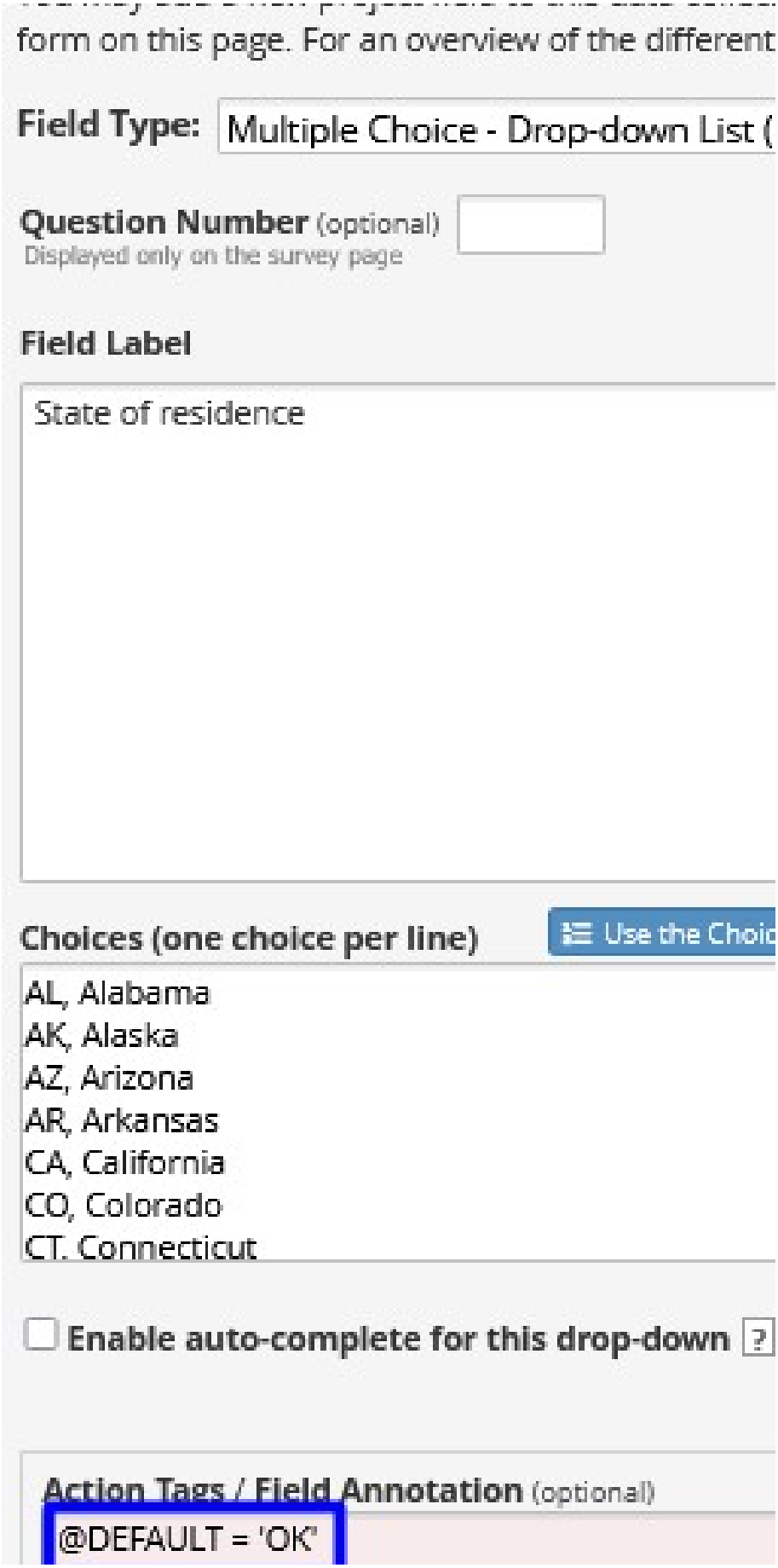


Figure 9.3: DEFAULT action tag

Notice that the value recorded in the data, OK, is the default value, not “Oklahoma,” which is the label. This action tag works only once, when the record is created. If the data entry people or survey respondent needed to change it to Texas, they can use the drop-down menu to do so. Their entry will not be overwritten with Oklahoma at a later time. The default does not appear on the form you are creating in Online Designer. It appears in a record, if you click the *Add/Edit Record* link on the left side of the screen and create a new record (see Creating Records).

9.2.3 @NONEOFTHEABOVE

Allows for the designation of a checkbox choice to be a ‘none of the above’ option, thus ensuring that no other choices are checked if that one choice is selected. This means that if that particular option is selected, it will alert the user that all other checked-off choices will be unchecked. And if the ‘none of the above’ option is already checked when the user checks off another choice, it will automatically uncheck the ‘none of the above’ option. This action tag makes it possible to have a ‘none of the above’ option without the risk of users mistakenly having other choices selected at the same time. The format must follow the pattern `@NONEOFTHEABOVE=??`, in which ?? is the coded value of the ‘none of the above’ checkbox choice - e.g., `@NONEOFTHEABOVE=98`. Alternatively, it is possible to set multiple options as a ‘none of the above’ option at the same time, in which the coded values must be comma delimited inside single or double quotes - e.g., `@NONEOFTHEABOVE='45,99'`. This is useful for certain situations, such as if you have a ‘none of the above’ option and also have a ‘refuse to answer’ option, thus allowing either of those to be the only option that can be selected at a time.

- NOTE: This action tag can only be utilized by Checkbox fields.

(Official definition from REDCap 17.6.2.)

Let’s say we have a REDCap project that allows people signing up for a conference to indicate their preferences for lunch. We create a checkbox multiple-choice item where the respondents can indicate all of the acceptable options for lunch. One option is none of the above.

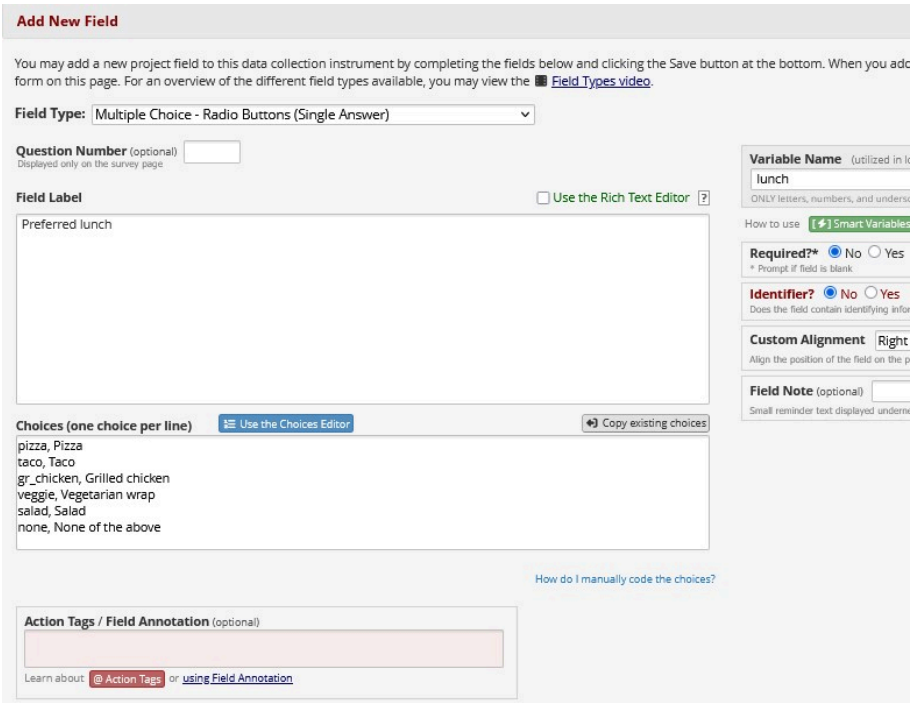


Figure 9.4: Action tag for checkbox field

The `@NONEOFTHEABOVE` action tag will prevent a respondent who answers “None of the above” from checking any other lunch item.

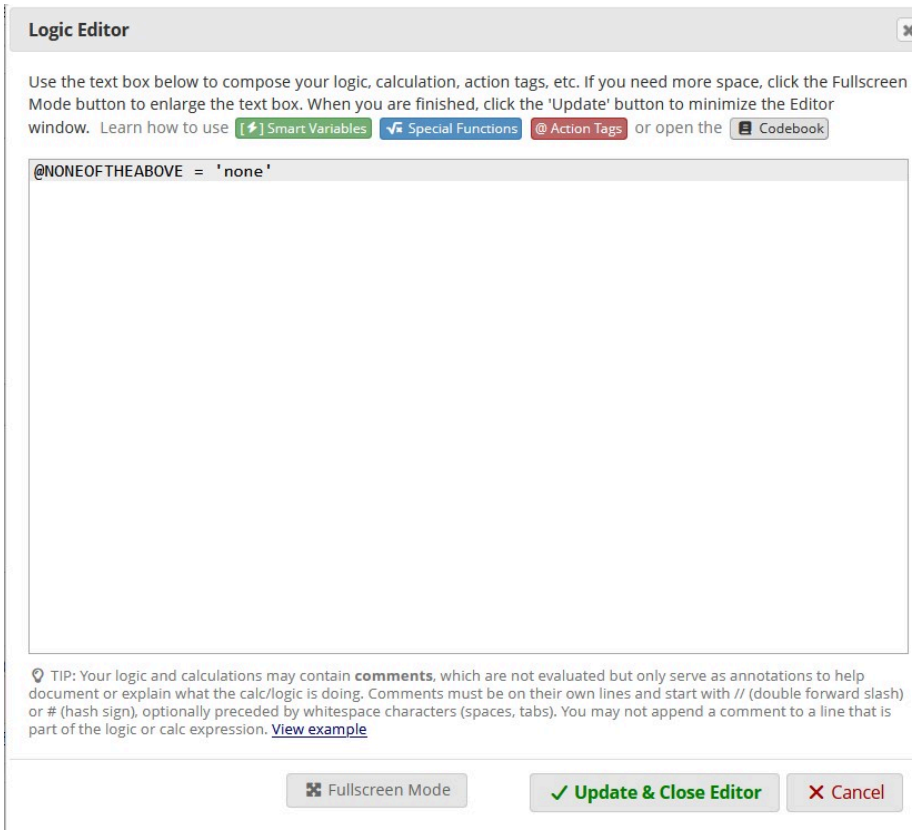


Figure 9.5: NONEOFTHEABOVE action tag

As we saw for the `@DEFAULT` action tag, the `@NONEOFTHEABOVE` action tag is followed by an equals sign, then the value recorded in the data, 'none' – not the label "None of the above." Generally speaking, when REDCap refers to character values like 'none,' the value is enclosed in single or double quotation marks. When a numeric value is used to indicate "None of the above," then the number recorded in the data would follow the equals sign, without quotation marks.

9.2.4 @MAXCHECKED

Allows a checkbox field to have a maximum number of checkboxes that can be checked. If other checkbox options are clicked after the maximum has been reached, those choices will not be able to be checked. The format must be `@MAXCHECKED=#`, in which # is a positive integer. For example, `@MAXCHECKED=3` will allow a maximum of 3 checkbox choices to be checked.

- NOTE: This action tag can only be utilized by Checkbox fields, and it does not get enforced during data imports.

(Official definition from REDCap 17.6.2.)

Suppose we do not want everyone to check every option in our list of lunch choices in this checkbox field. We can use the `@MAXCHECKED` action tag to limit everyone to their top 2 or 3 preferences. We can change the Field label to "Indicate your top 3 preferences for lunch." Then we click on the Action Tags/ Field Annotation box to open the Logic Editor, where we list this action tag.

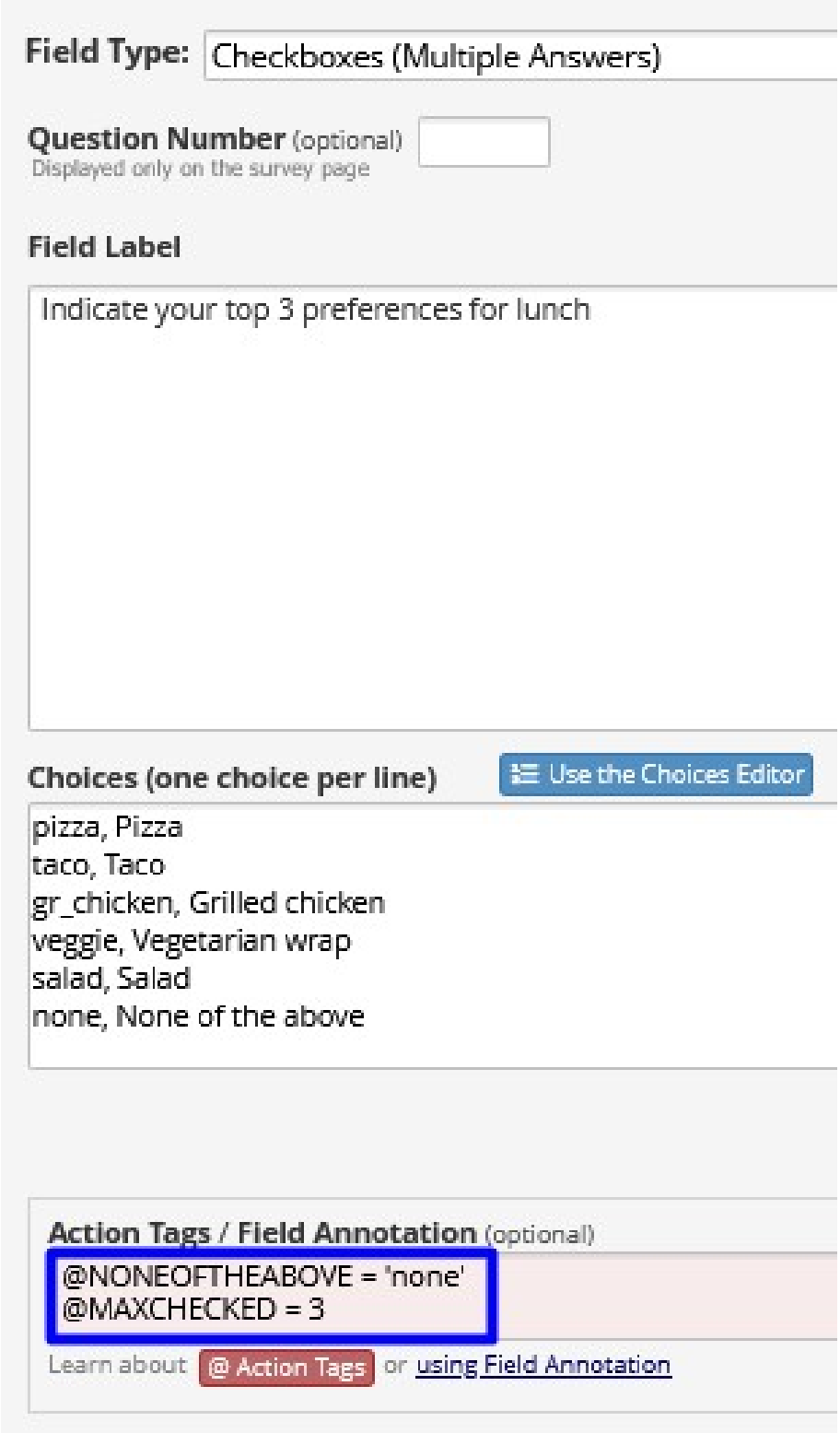


Figure 9.6: MAXCHECKED action tag

9.2.5 @HIDDEN

Hides the field on the survey page, the data entry form, and in the REDCap mobile app. Field will stay hidden even if branching logic attempts to make it visible. (Official definition from REDCap 17.6.2.)

Hiding an entire variable is useful in two scenarios: retiring an existing variable and concealing a calculated variable.

9.2.5.1 Retire an existing variable

As a production project evolves over time, some variables are added, while some variables become irrelevant to future respondents. It's encouraged to "remove" irrelevant variables so your instrument remains as stream-lined as possible, for the sake of the respondents' time and the dataset's quality.

For most carefully-designed projects, these obsolete variables contain information that is still relevant during later analysis. In this case, use the `@HIDDEN` action tag to simply conceal the variable from the respondent, while retaining its data values in the database.

9.2.5.2 Conceal a calculated variable

Calculated variables/fields are described in Section 8.4.2. Sometimes these derived values are useful to (to something like the branching logic or to an analyst), but could confuse a respondent. So use the `@HIDDEN` action tag to conceal it.

9.2.6 @HIDECHOICE

Hides one or more choices of a multiple choice field. This action tag is useful if you wish to retire a particular choice after utilizing it for a while in data collection, thus allowing you to hide the choice from that point afterward without orphaning any of the choice's data, which would happen if you simply deleted the choice. The format must follow the pattern `@HIDECHOICE='??'`, in which the coded values should be inside single or double quotes for the choice(s) you wish to hide. If more than one choice needs to be hidden, then provide all the coded values separated by commas. For example, to hide the choice `'Monday (1)'`, you would have `@HIDECHOICE='1'`, but if you wanted to additionally hide `'Tuesday (2)'`, you would have `@HIDECHOICE='1,2'`.

- NOTE: If the hidden choice has already been selected for a given record, then the choice will not be hidden on the survey or form for that record/event.
- NOTE: Hidden choices will still appear in reports and data exports.
- NOTE: This action tag can only be utilized for the following field types: Checkbox, Radio, Drop-down, Yes-No, and True-False.
- NOTE: This action tag works only in limited fashion with a matrix of fields, in which it will simply hide the checkbox/radio for a field in the matrix but still display the column for that choice in the matrix.
- NOTE: This action tag supports piping into its argument.

(Official definition from REDCap 17.6.2.)

Similar to retiring an obsolete variable, sometimes its best to remove an obsolete option from a multiple choice field. Imagine a variable where a respondent selects their preferred training workshop: they should no longer be able to select a workshop that already occurred. The `@HIDECHOICE` action tag will conceal it from view, while retaining its values in the underlying database, so it can be analyzed later.

(Also see the `@MAXCHECKED` action tag to prevent too many respondents from selecting the same choice.)

9.3 Less Common

9.3.1 @SETVALUE

Sets a field's value to static text or dynamic/piped text whenever a data entry form or survey page is loaded, in which it will always overwrite an existing value of the field. The format must follow the pattern `@SETVALUE="????"`, in which the desired value should be inside single or double quotes. For text fields, you may pipe and concatenate values from other fields in the project - e.g., `@SETVALUE='Name: [first_name] [last_name], DOB: [dob]'`. For checkbox fields, simply separate multiple checkbox values with commas - e.g., `@SETVALUE='1,3,[other_field:value]'`.

- NOTE: The piped value does *not* get applied during any data imports (via API or Data Import Tool) but only operates when viewing survey pages and data entry forms.
- NOTE: A field with `@SETVALUE` will have its value updated ONLY when the page loads, which means that its value will not be updated in real-time if you modify other fields on the same page that are piped into the `@SETVALUE` tag.
- NOTE: If being used on a date or datetime field, the date value inside the quotes must be in Y-M-D format - e.g., `@SETVALUE='2007-12-25'` - regardless of the field's set date format.
- NOTE: The only difference between `@SETVALUE` and `@DEFAULT` is that `@DEFAULT` is only applied when an instrument has no data yet, whereas `@SETVALU`E will always be applied on an instrument, meaning that `@SETVALUE` will ALWAYS overwrite the value if a field value already exists.
- TIP: To pipe the value of one multiple choice field into another multiple choice field, make sure you append ':value' to the variable being piped - e.g., `@SETVALUE='[my_dropdown:value]'`. (In earlier versions of REDCap, the `@SETVALUE` action tag went by the name `@PREFILL`, which still works equivalently to `@SETVALUE` for backward compatibility purposes.)

(Official definition from REDCap 17.6.2.)

Sometimes we want to help out the data entry people by setting the value of a field. A project may have a form especially for interviewing the first child in a family. We can use `@SETVALUE` to specify the child being interviewed.

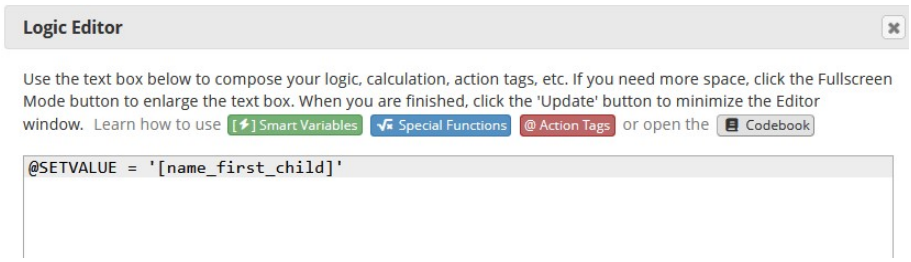


Figure 9.7: SETVALUE action tag

Let's say we have created a record for a family, and we have used Form 1 to enter some family information. Now we want the first child's name to appear on the next form, which is being used to record data from interviewing Child 1. We go into the family's record and click on the form for interviewing Child 1. We will find Child 1's name, which was entered in the first form, automatically has been piped into this new form.

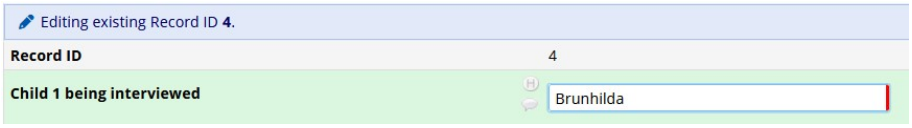


Figure 9.8: SETVALUE piped value

One caution: If you change the name that is piped into this field, it will revert to the piped-in value every time the record is opened. If you want to keep the data entry people from changing this value, you can use the next action tag.

9.3.2 @READONLY

Makes the field read-only (i.e., disabled) on the survey page, the data entry form, and in the REDCap mobile app so that its value cannot be changed.
(Official definition from REDCap 17.6.2.)

Adding the `@READONLY` action tag on the next line after `@SETVALUE = '[variablename]'` will make the field read-only for the data entry people.



Figure 9.9: READONLY action tag

The child's name piped into the family's record will be in slightly gray font and cannot be edited.

9.3.3 @PLACEHOLDER

> Is used to specify a short hint that describes the expected value of a Text field or Notes field (e.g. a sample value or a short description of the expected format). The placeholder is displayed inside the field before a value is entered. The format must follow the pattern `@PLACEHOLDER='????'`, in which the text to be displayed should be inside single or double quotes.
>
> (Official definition from REDCap 17.6.2.)

The `@PLACEHOLDER` action tag will not record any data. It is used as a hint to the person filling out the form. We might have a multiple-choice item with "Other" as one of the options. If someone chooses Other, we may add a follow-up item asking for details. We can create gray text to appear in the box for their answer, giving a hint about what to put in the box. The words we want to appear in gray will be typed inside quotation marks after `@PLACEHOLDER =` as shown below.



Figure 9.10: PLACEHOLDER action tag

And here is what the result will look like. The words in this action tag are not saved as data.

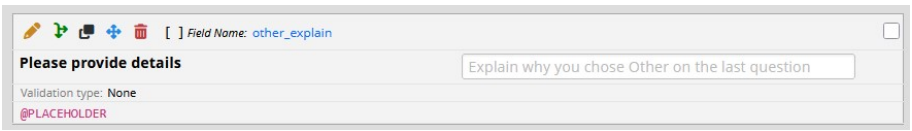


Figure 9.11: Grayed-out hint as PLACEHOLDER

9.4 Many Other Action Tags

If you have a specification that you would like to make in a form, there may be an action tag to help. Just look through the available action tags by clicking on the red button inside the Logic Editor for action tags, clicking the link on the left side of the page in a REDCap project for *Help & FAQ*, or searching online.

> **i** Additional Chapter Details
>
> This chapter was last edited in April 2026. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

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10. Automated Invitations

Distribute private surveys efficiently.

Chapter Leads: Connor Garbe, Thomas Wilson

> **i** Additional Chapter Details
>
> This chapter was started in October 2024. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

11. Electronic Consent

Use e-consents to reduce paperwork and increase compliance.

Chapter Leads: Lise DeShea, Vignesh Murugan, Thomas Wilson

11.1 What is the Purpose of e-Consent?

Many research studies conducted at the University of Oklahoma Health Campus involve obtaining participant consent. The Institutional Review Board (IRB) examines and approves the protocol for research studies involving people. This approval includes a careful review of consent forms, which inform potential participants of their rights as well as the risks and benefits of participating in the study. After receiving IRB approval, researchers increasingly are using electronic consent forms. The e-consent capability of REDCap provides the environment for collecting participants' informed consent via electronic forms. This chapter will lead you through the process of setting up an e-consent project.

11.2 Request a New Project

For most studies we recommend having the e-consent process separate from any REDCap project created for the purpose of collecting participant data. Data collection often is de-identified or has limited identifiers, such as a participant ID that the researchers link to the participants' identities in a secure file outside of REDCap. Because participants are identified in consent forms, the e-consent should be in its own project.

To learn how to request a new project, see Best Way to Learn.

11.3 Preparing to Build the e-Consent

You will need pdf copies of the researchers' *current* IRB-approved consent form and HIPAA form, which notifies potential participants of their rights to the privacy of their personal health information. You can check whether the form is current by looking at the date in the IRB seal at the bottom of the form. It may be a good idea to obtain a copy of the IRB-approved protocol as well, so that you are familiar with the study and the role of e-consent within the study. You also will need to know who is approved by the IRB as key personnel to collect consent from participants so you can add them to this completed project.

To understand how the e-consent project will work, you should know that researchers typically email a link to an online survey containing the consent and HIPAA forms. There is a field for the signature of the person obtaining the consent. But the form is completed by the participant. The person obtaining consent will have access to the REDCap project and will add his/her signature inside REDCap after the participant submits the online forms.

11.4 Starting an e-Consent Project

- Click on your list of projects at the top of the landing page for REDCap.
- Click on the e-consent project name.
- Navigate to the **Online Designer** by clicking on either link shown in the blue boxes in the image below.
- Clicking one of those links will take you to a screen that looks somewhat like the one in the second image below.

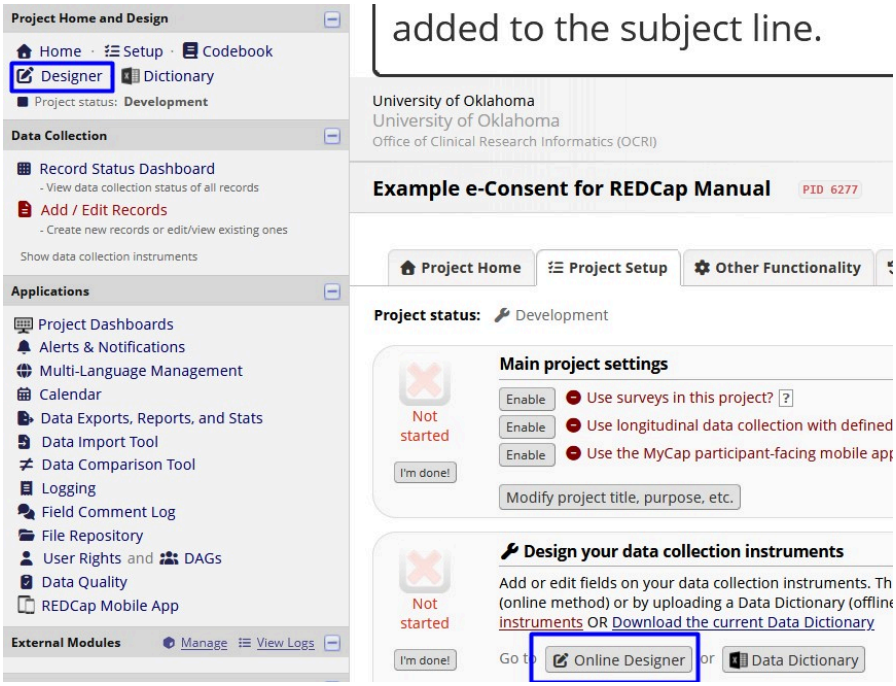


Figure 11.1: Online Designer

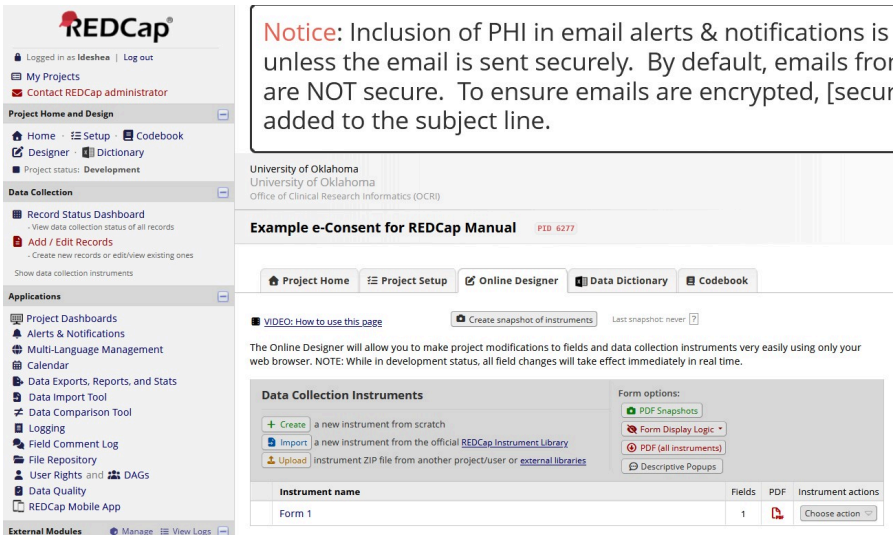


Figure 11.2: View of existing project in Designer

You will need to create two instruments: one for the consent form and one for the HIPAA form.

- Change the name of Form 1 to Consent by clicking on the gray button labeled *Choose actions“ to the right of Form 1.
- Select *Rename.*
- Modify the information in the window that pops up, as shown below.
- The first box is the name that will appear in Designer, and the second box is how the form will be referenced inside the REDCap data collection.
- Once these changes are made, click *Apply.*

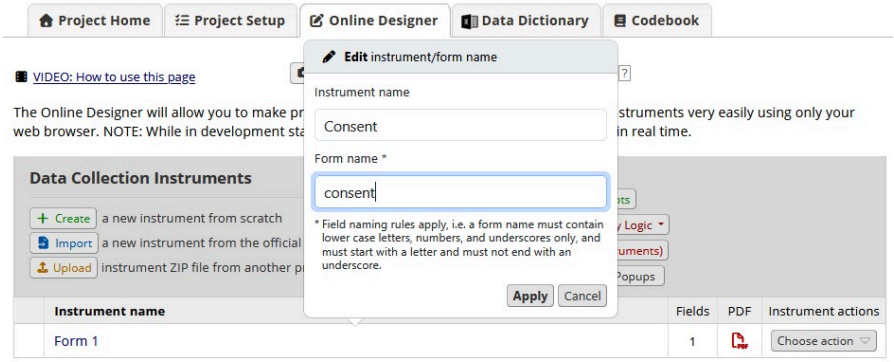


Figure 11.3: Rename the default Form 1

Now create a new instrument called HIPAA by clicking on the button that says *Create.*

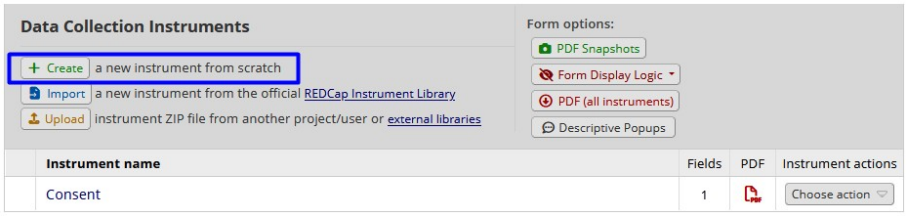


Figure 11.4: Creating a new form

A green button will appear, as shown below. Click that button and enter *HIPAA* as the form name (and *hipaa* in the second box).

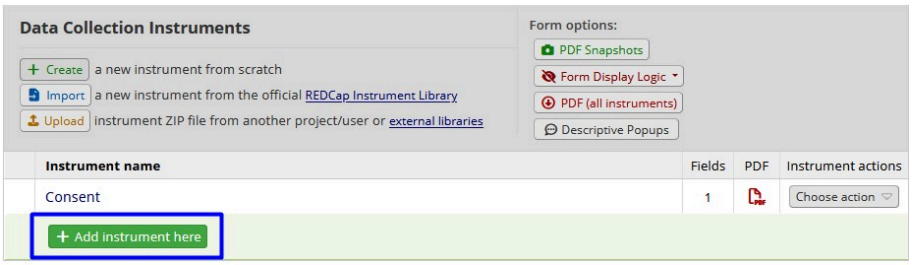


Figure 11.5: Click the green button

These two REDCap instruments will contain pdfs for the consent and HIPAA forms. Next we will create the fields needed for these forms to allow completion within REDCap.

11.5 Modifying the REDCap Instruments for Consent and HIPAA

We will be collecting signatures electronically for the consent and HIPAA forms, which participants previously would sign on paper. We need to create fields in REDCap that the participants would have filled out on paper. The consent and HIPAA forms shown below are templates from the OUHC IRB. Please ignore the old dates.

11.5.1 Consent Form

Read the consent form and identify every field that a participant or researcher would have to complete. Often the only fields to be completed appear at the end of the document, although occasionally researchers will list medical tests in the middle of the document that require the participant's initials.

Let's say participants in our example need to fill out only the fields shown below.

I agree to participate in this study:

PARTICIPANT SIGNATURE (age ≥18)	**Printed Name**	**Date**
(*Or Legally Authorized Representative*) ← *delete LAR if study will not be approved for LAR to provide consent*		
SIGNATURE OF PERSON OBTAINING CONSENT	**Printed Name**	**Date**

Figure 11.6: Consent Fields in pdf

In REDCap, click on the *Consent* form in Online Designer to get to the screen where we will create variables to replicate the fields shown above. We will have the following fields and variable types:

- If you will be using multiple languages, a multiple-choice language selection field. For example, you might have English recorded as en and Español recorded as es. **Important note:** You will need to add the action tag `@LANGUAGE-SET` when creating this field.
- A signature field for the participant's signature
- The participant's name. The e-Consent Framework in REDCap will ask for first and last name, but if it is one field, you can put it in place of first name in the e-Consent Framework.
- A date variable for the date of signature
- A signature field for the person obtaining consent. REDCap now has a field type *Enhanced Signature,* which allows the person completing the e-consent form to either sign their name with their finger/ mouse or to type their name, which will be displayed in script.
- A text variable for the typed name of the person obtaining consent
- A date variable for the consent obtainer's date of signature.

Other consent forms may have other fields for you to create. For example, there may be fields for a witness to sign and for a child to sign indicating his or her assent. (Children cannot sign a legal form granting consent; the parent or guardian must grant consent. But obtaining assent from a child old enough to understand that s/he will be participating in a study is the ethical choice.)

Create the needed consent fields listed above. Make sure the participant's signature is a **required** field by clicking the button shown below.

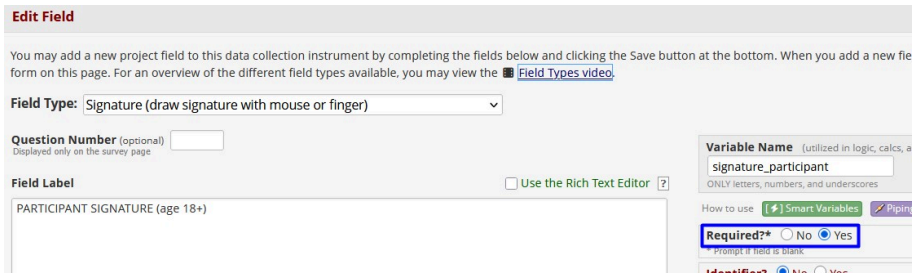


Figure 11.7: Signature is required

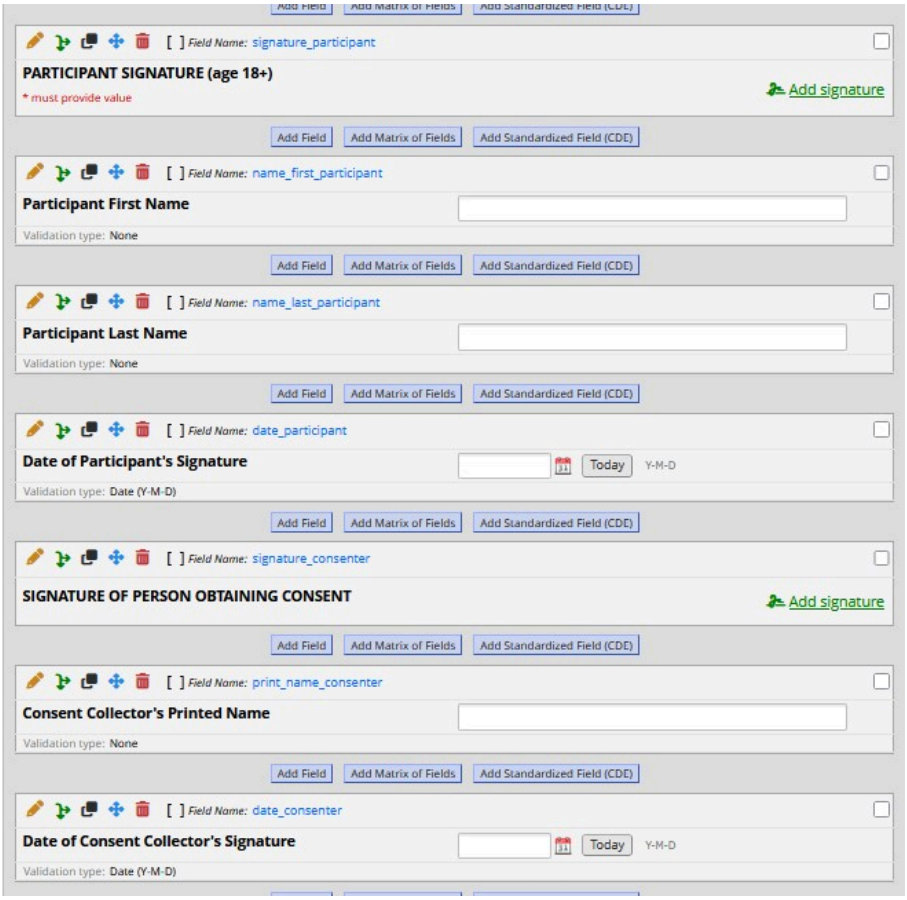


Figure 11.8: Consent Fields in REDCap

If you create a table using a descriptive field and Rich Text Editor to organize these fields visually, please note that the signature field *cannot* be in a table. The project now has the parts of the consent form that need to be filled out. But our REDCap project needs to provide the potential participant with the pdf of the consent form.

Create a new *Descriptive Text* variable at the top of the Consent instrument (after Record ID and, if applicable, the language field) by clicking the *Add Field* button, shown below.

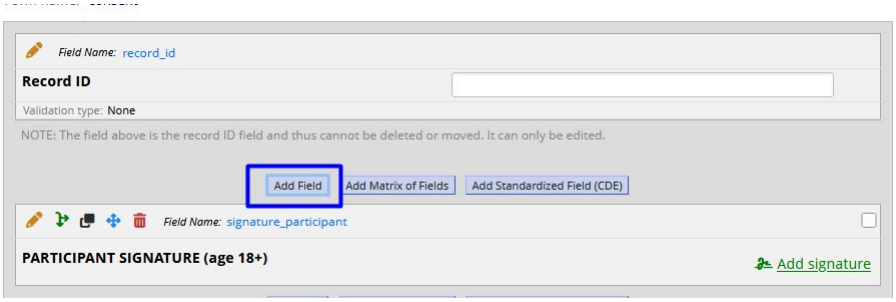


Figure 11.9: Add a Descriptive Text field

You won't put anything in the box called *Field Label.* And you will not upload the consent form to this field. In fact, the only specifications for you to make in this field is to name the variable *consent* and make it a Descriptive Text field. This field is a placeholder for the pdf of the consent form, which we will upload later.

11.5.2 HIPAA Form

Now follow the same process for the HIPAA form:

- Identify all elements that would be filled out on a printed HIPAA form
- Go into the HIPAA instrument on REDCap and create those fields
- In place of the Descriptive Field called *consent*, you will have one called *hipaa*

11.6 Enabling Surveys

Before the consent form can be designated as such in the e-Consent Framework (that is, the REDCap module for electronic consent), we must specify that the forms are on a survey.

11.6.1 Tell REDCap to Allow Surveys

On the Project Setup tab, click the *Enable* button next to the words "Use surveys in this project."

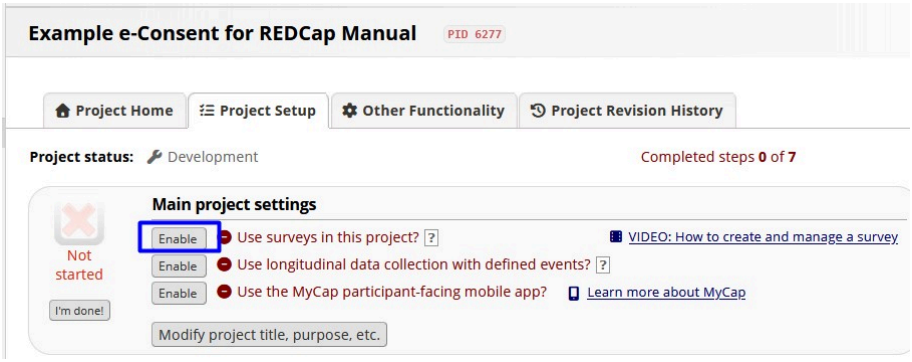


Figure 11.10: Enable surveys on the project

Return to Online Designer and click on the *Enable* button on the line showing the Consent instrument.

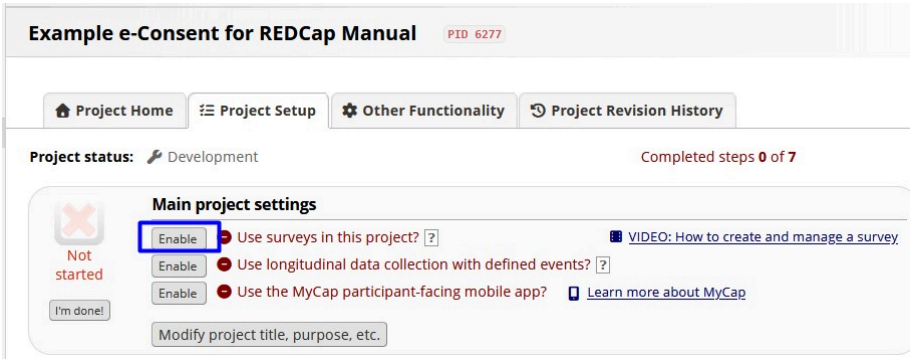


Figure 11.11: Enable Consent as a survey

You will be taken to a new screen, shown below, where you will specify how the survey will look and perform. We will illustrate only the most important details.

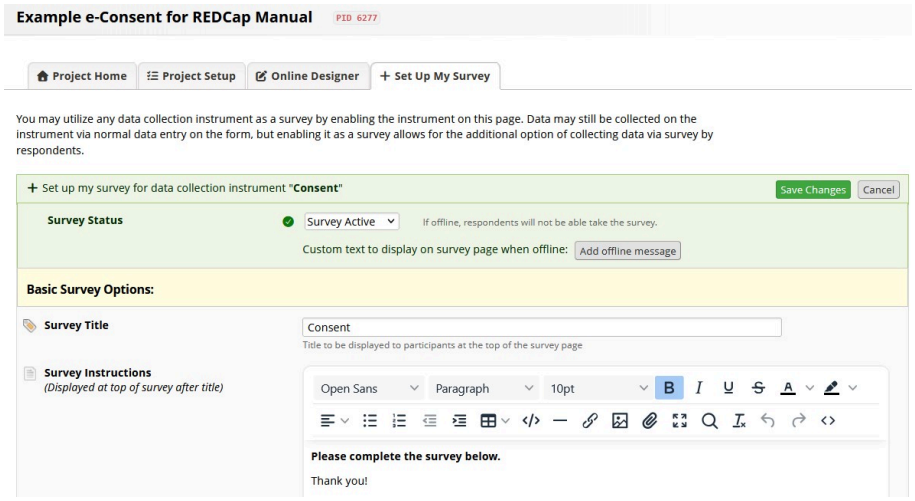


Figure 11.12: Editing survey details

Choose Enhanced radios and checkboxes, which will make those objects appear larger for easier use on a smartphone.

Scroll down to Survey Theme. The default theme is black, white, and light blue. A common choice for a theme at OU is Red Brick because the colors are similar to those of the university. The investigators running your study may have a preference, and they might even have a logo to include on the survey, which could be uploaded on this screen.

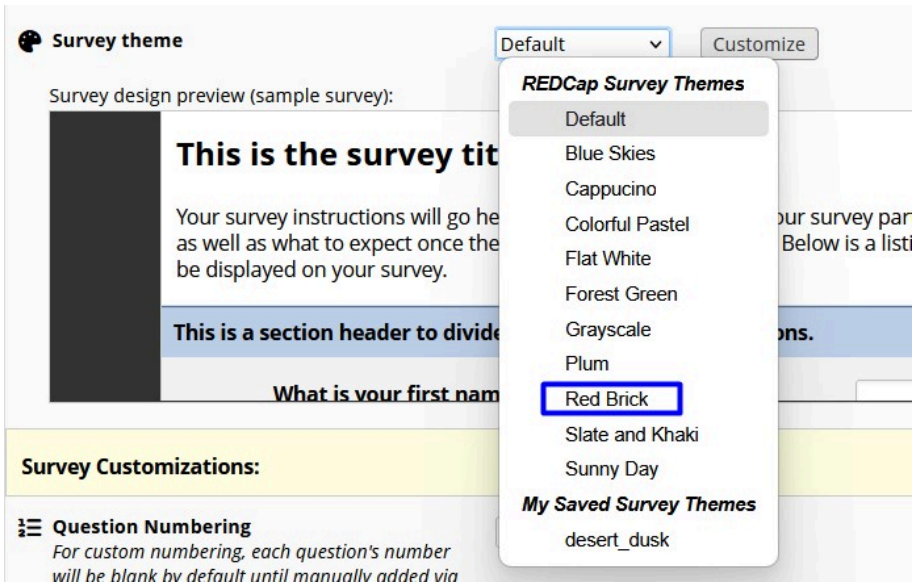


Figure 11.13: Setting survey theme

Scroll down to *Survey Termination Options*. Place a checkmark in the box *Auto-continue to the next survey* because we want the person to sign the Consent form, then the HIPAA form.

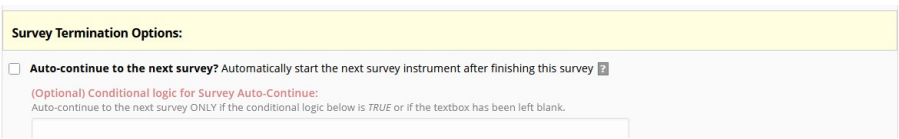


Figure 11.14: Choose auto-continue

- Click the *Save Changes* button at the bottom of the page.
- You will be taken back to Online Designer.
- Now click the *Enable* button on the HIPAA line.
- Select the *Survey Theme* to match the one you used on the consent form, then click *Save Changes.*

11.7 Decide If You Need Multiple Languages

Before you enable to e-Consent Framework, which is the REDcap module for this kind of project, check with the study team on whether multiple languages will be needed. If so, Multi-Language Management must be enabled **before** the e-Consent Framework. If you need to have multiple languages in your e-consent, go to our chapter on this process, which will pick up at this point in your work. Chapter 12.

11.8 Enable e-Consent Framework

Finally we can enable the e-Consent Framework, the REDCap module that was designed to handle electronic consenting processes. This step must occur after the surveys (Consent and HIPAA) are created (and, if applicable, Multilanguage Management settings have been saved). In Online Designer click the *Enable* button under Survey Options, shown above the list of instruments.

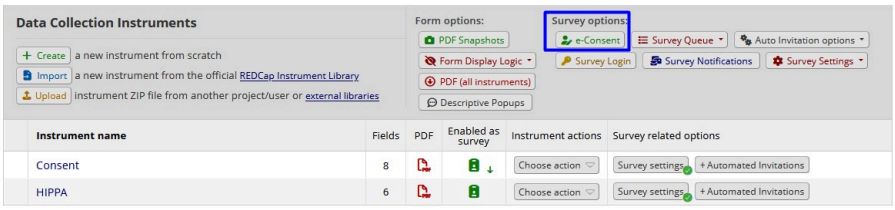


Figure 11.15: Enable e-consent

You will be taken to a page called *Settings for e-Consent & PDF Snapshots.*

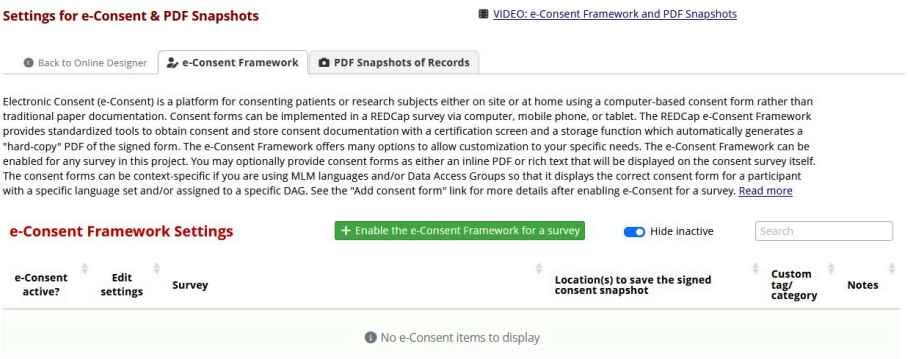


Figure 11.16: E-consent settings

Click the big green button that says *Enable the e-Consent Framework for a survey.* You will get a window that says *Enable e-Consent for a Survey.* You will select Consent from the drop-down menu.

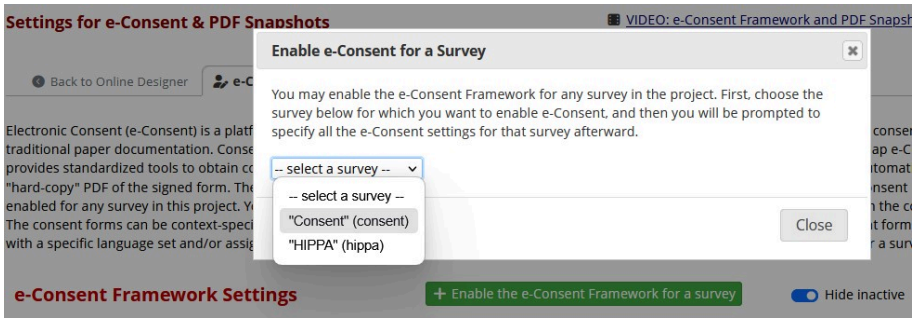


Figure 11.17: Select consent form

Another window will open, called *Enable e-Consent.*

- Under *Primary settings,* the first two fields ask you to specify the variables for the first and last names of the participant. If your consent form has only one field for the participant's name, put it in the first name field.
- Scroll down to *Force signature field(s) to be erased if participant clicks Previous Page button while on the certification page?* section. Use the drop-down menu for *Signature field #1* to select the participant's signature, as shown below.

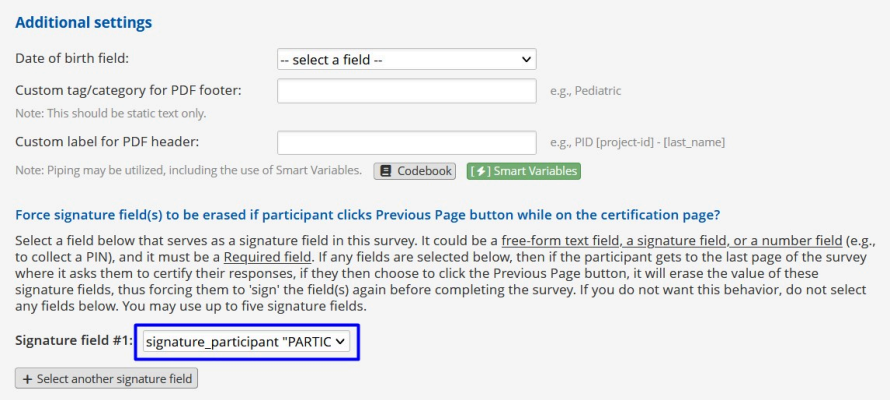


Figure 11.18: Select participant's signature field

- Scroll down to *Location(s) to save the signed consent snapshot.*
- A copy of the signed form should be saved in the File Repository because the IRB sometimes audits these e-consent REDCaps to make sure the study's protocol is being followed and patients' rights have been respected.



Figure 11.19: Save consent snapshot

Save those settings to close the window. You will return to the page that says *e-Consent Framework Settings.* This is where you will upload the pdf of the consent form. Click on the link that says *Add consent form.*



Figure 11.20: Add consent form

- Number the consent form (e.g., 1.0) next to *Consent form version.* If you have used Multi-Language Management, you should type "1.0 en" to indicate the English version of the form.
- Use the dropdown menu next to *Placement of consent form* to choose the placeholder variable you called *consent.*
- Click on the tab for *Consent Form (Inline PDF).
- Click *Browse* and find the pdf on your computer. Open it.
- Click *Add new consent form* to save your work

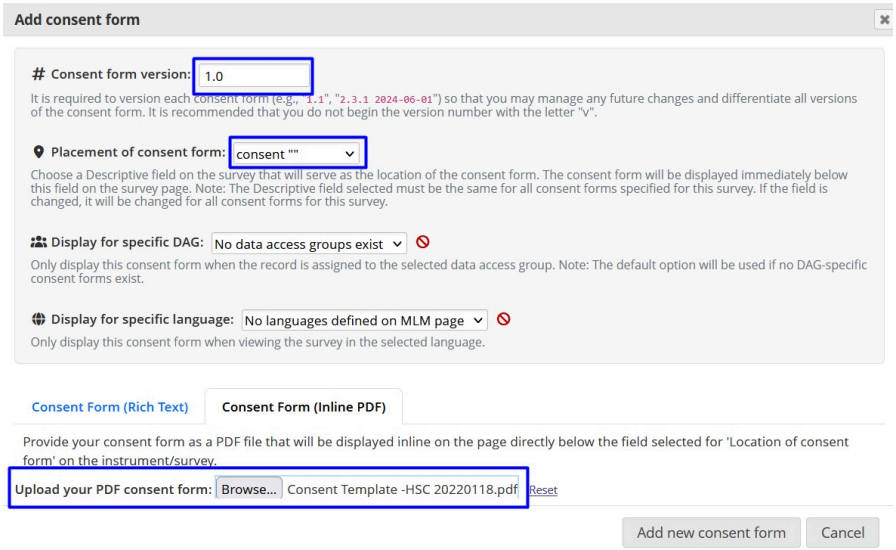


Figure 11.21: Upload consent form

Next, we will upload the HIPAA form on the same screen where we uploaded the consent form. Click on the green box that says *+Enable the e-Consent Framework for a survey.*

Next we need to get a snapshot pdf of the signed HIPAA form.

- Click on the tab for *PDF Snapshots of Records.*
- Click on the button that says *Add new trigger.*

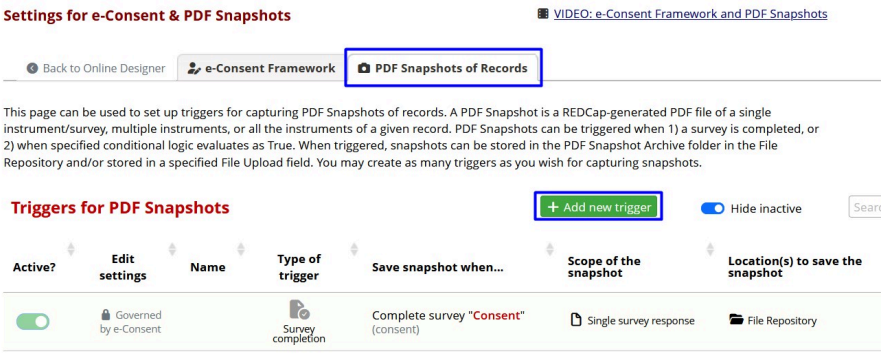


Figure 11.22: Add trigger for HIPAA snapshot

- Under *STEP 1: Trigger conditions,* name the trigger (e.g.,*HIPAA en*) and select the HIPAA survey from the drop-down menu
- Under *STEP 2: Scope of the snapshot,* click the pencil in the box
- Deselect the consent form, leaving only the HIPAA form as a trigger; the consent form is being saved separately
- Click Update, then Save

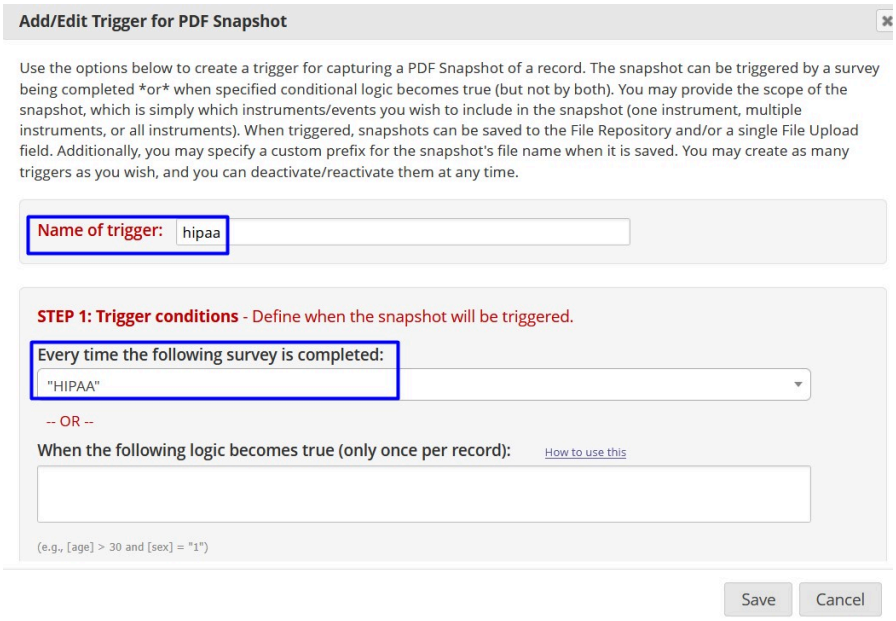


Figure 11.23: Name trigger, select HIPAA survey

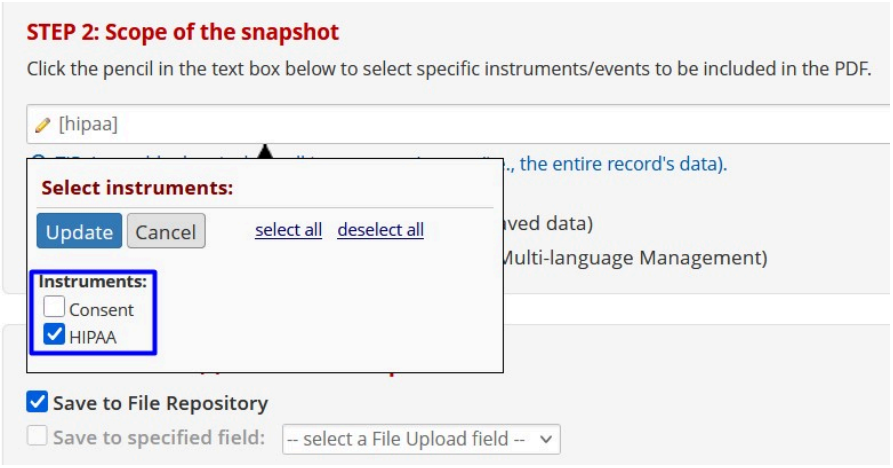


Figure 11.24: Limit snapshot to HIPAA

11.9 Test the e-Consent

Before putting any REDCap project into production, it is important to test it and make sure everything is working right and looks correct. It is a good idea to enlist the researchers and those who will collect e-consent in the testing process.

In the REDCap project, click on *Survey Distribution Tools* in the left column

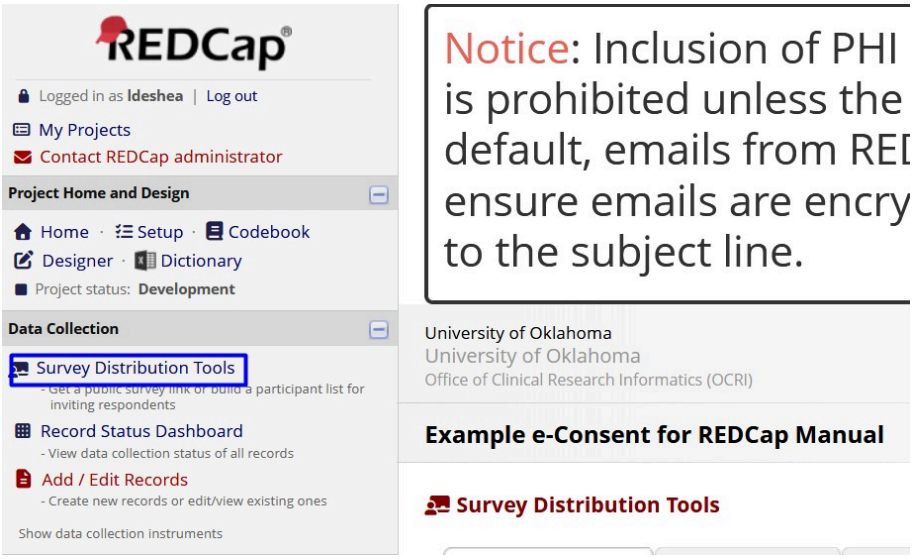


Figure 11.25: Survey Distribution Tools

This page will provide you with a public survey link that you can email to the researchers and consent collectors. To test the project yourself, click *Open public survey.*

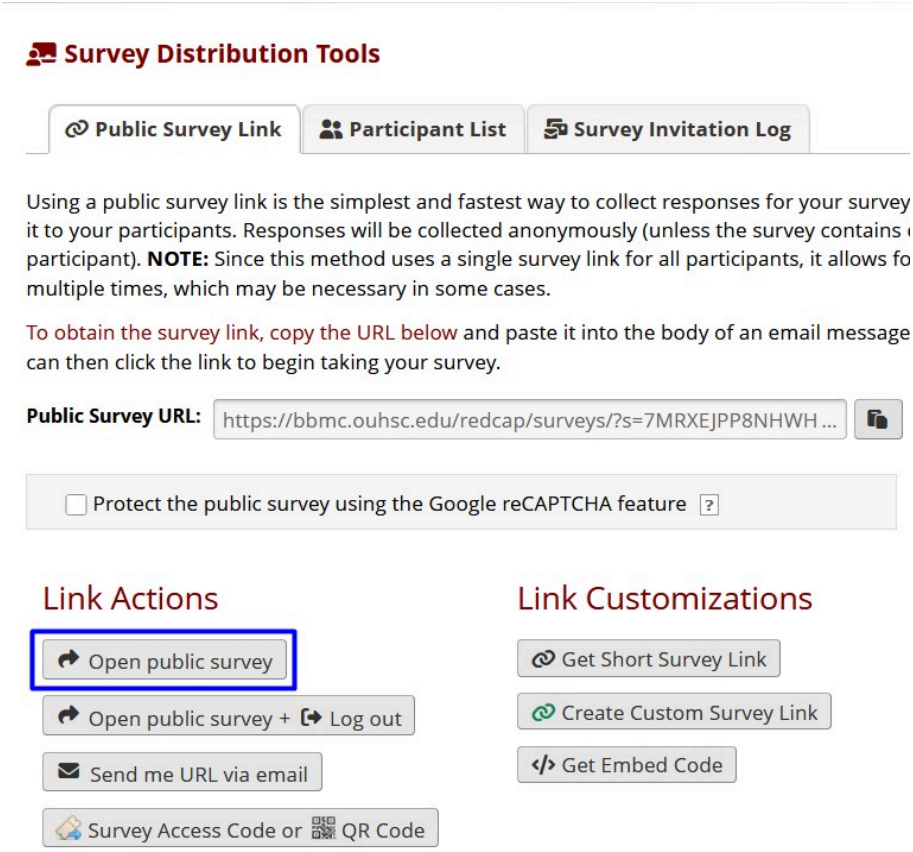


Figure 11.26: Link to the consent survey

You will be taken to the e-consent as it will appear to participants.

- Scroll through pages, fill out the pertinent fields with names like *Test Subject,* and sign it.
- After you submit the HIPAA form, you will get an "end of survey" message.
- Go back into the REDCap project.
- On the left side you will see a link for *File Repository,* which you will click.

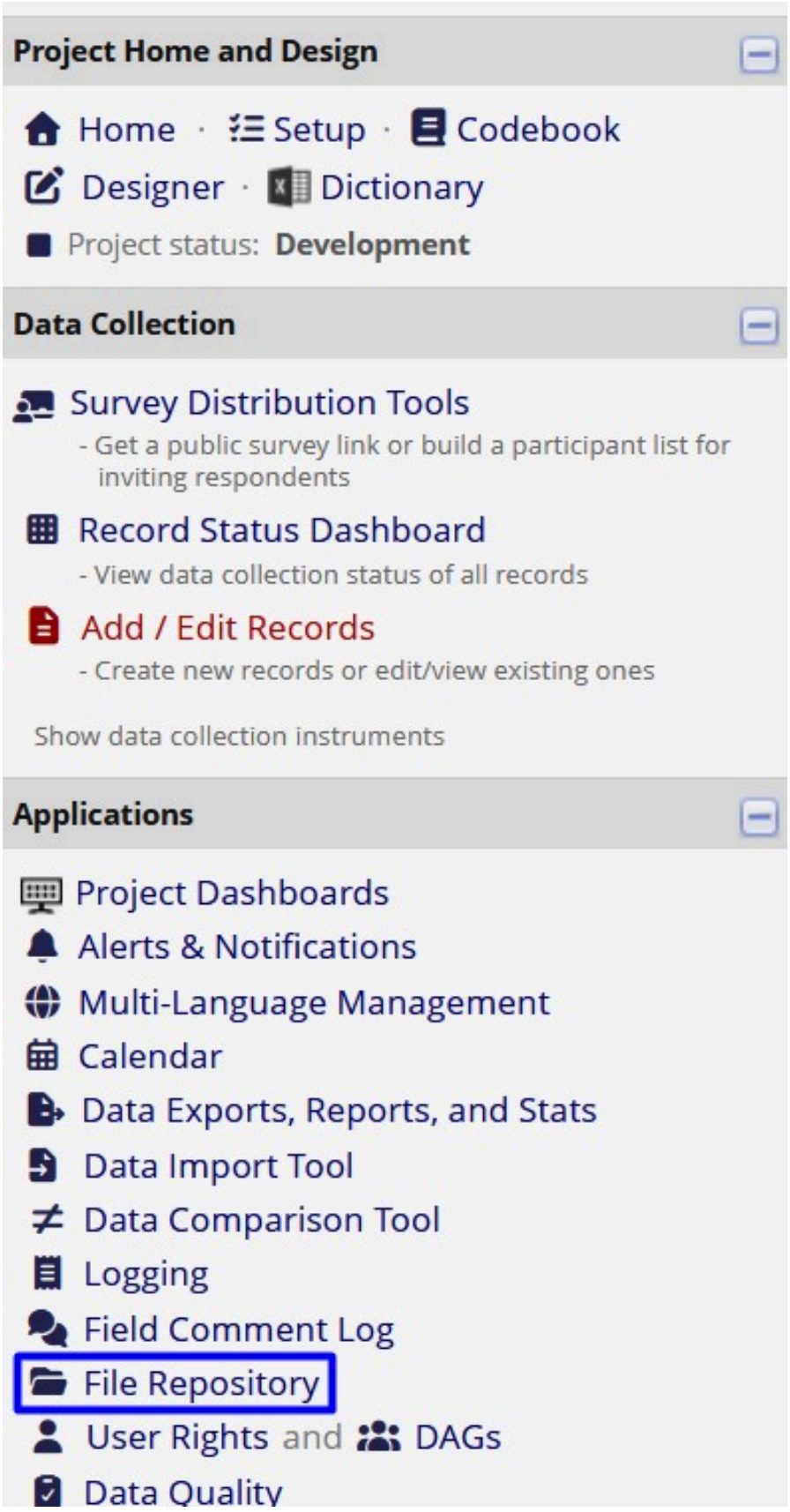


Figure 11.27: Link to File Repository

- Click on the folder labeled *PDF Snapshot Archive.*

- You will see a list of pdfs that were automatically created for the test records.
- Click on any of those pdfs and see how REDCap saved the original pdf, plus the fields you created in REDCap, and the data and signature added by the participant or test subject.

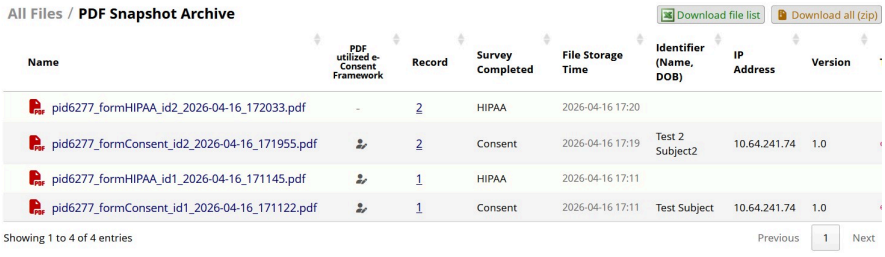


Figure 11.28: PDF Snapshots in File Repository

11.10 Updating Consent Forms

Studies with IRB oversight must check in annually and update the IRB about the study's status. Among other tasks the researchers must obtain re-approval of their consent form. When you create an e-consent project, it is a good idea to put a note on your Outlook calendar reminding you to check with the researchers before their consent form expires. Then you will be ready to replace the consent and HIPAA forms with the latest versions, with the new expiration date given.

When it is time to replace the consent form with a new one:

1. Notify the people who will be collecting the study's informed consent that you will be working on the e-consent in REDCap and that they should pause using the e-consent until you inform them the new forms have been uploaded
2. In Online Designer, there will be a yellow box at the top saying the project is in production status and asking if you want to enter draft mode to make changes; click the *Enter Draft Mode* button.
3. Where the Data Collection Instruments are listed in Designer, click on the e-Consent button under Survey Options.
4. Click *Add Consent Form*
5. Specify the version number and upload the consent form
6. Save the new version
7. Ask for the project to be moved back into Production Mode
8. After being notified that the project is in production, go to the survey and create a test record by completing the forms, using a name like *Testing REDCap*
9. If everything is working correctly, notify those collecting informed consent that the e-consent REDCap is back in production with the new forms, and they may see a test record in REDCap
10. Congratulate yourself, because it is no small accomplishment to complete an e-consent REDCap project!

> **i** Additional Chapter Details
>
> This chapter was last edited in September 2026. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

12. Multi-Language Management

Use multi-language management to extend projects to more populations.

Chapter Leads: Lise DeShea, Thomas Wilson

12.1 What is the Purpose of Multi-Language Management?

Researchers often need to recruit study participants from a variety of backgrounds. A study with greater variability in participants may be more generalizable to a larger population. Language can be a barrier to some participants joining a study. When researchers can offer a survey in the participants' languages, there is a better chance of expanding the patient pool, which might be crucial if the researchers are studying a rare condition.

The first step toward enrolling patients in most studies is obtaining informed consent. Electronic consent is possible in REDCap, and we have provided a chapter on that topic. Chapter 11.

Creating an e-consent process that also allows multiple languages means the e-consent chapter must go hand-in-hand with this one. This chapter will assume you are at a spot in creating an e-consent where you need to enable Multi-Language Management (MLM) and will lead you through the process. MLM also can be used with surveys and other uses. The information presented here can be generalized beyond the e-consent process.

12.2 When to Enable MLM in an e-Consent

We will start at the point in an e-consent project where you already have created the instruments for Consent and HIPAA; uploaded pdf files of those forms; created fields for every spot where the patients will need to enter information or sign their names; and designated the forms as surveys.

The e-Consent Framework is the REDCap module that was designed to handle electronic consenting processes. **Before** you enable e-Consent Framework, you must enable Multi-Language Management (MLM). If you do these two steps in the wrong order, you will have to re-create a lot of the work you already completed.

12.3 Enabling MLM

The left-hand column in your project has the REDCap logo. Under the second **Applications** you will see Multi-Language Management (MLM). Click that link.

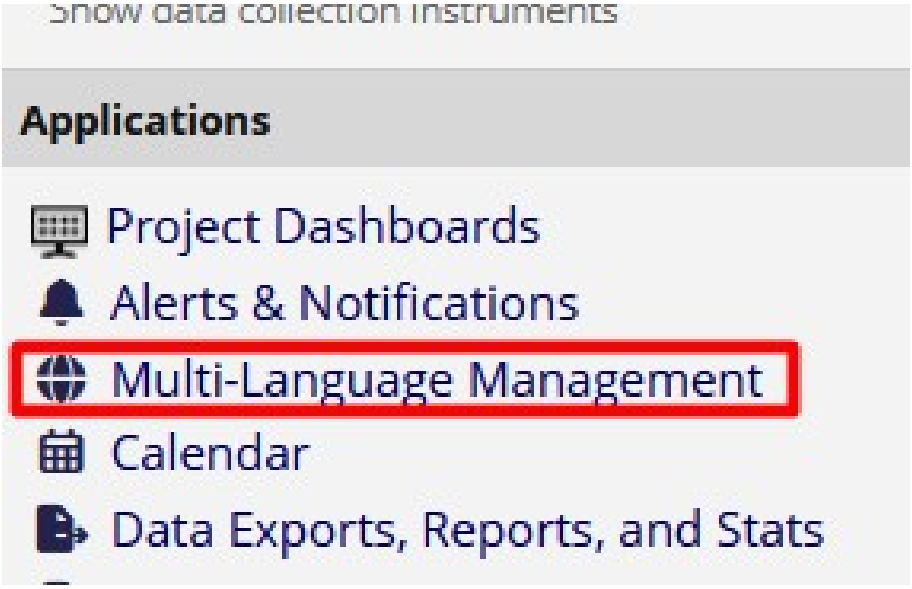


Figure 12.1: Multi-Language Management

Follow the instructions in the Languages tab of the page, as shown below.

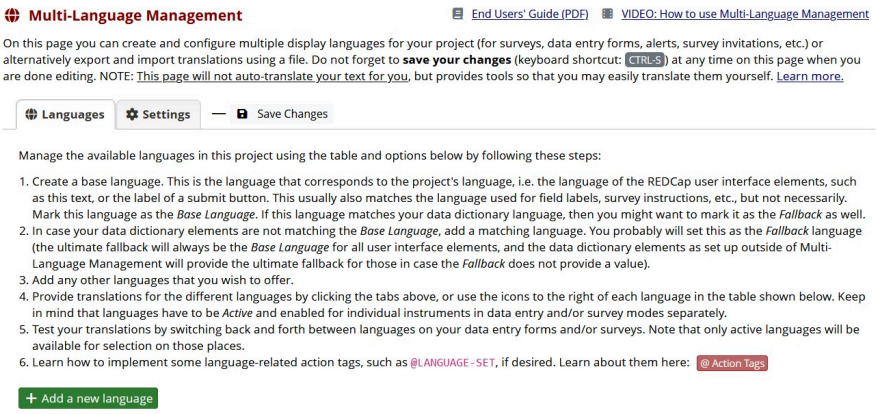


Figure 12.2: REDCap MLM Instructions

You see the above instructions because no languages have been specified in the MLM. Read those instructions carefully. MLM is picky and has a lot of details. We will be following those steps: specifying the languages being used in the e-consent (or survey), providing translations of REDCap features, and testing the project. We will start by specifying a base language, which usually is English. Click the green button that says, "+ Add a new language." You will see the window shown below.

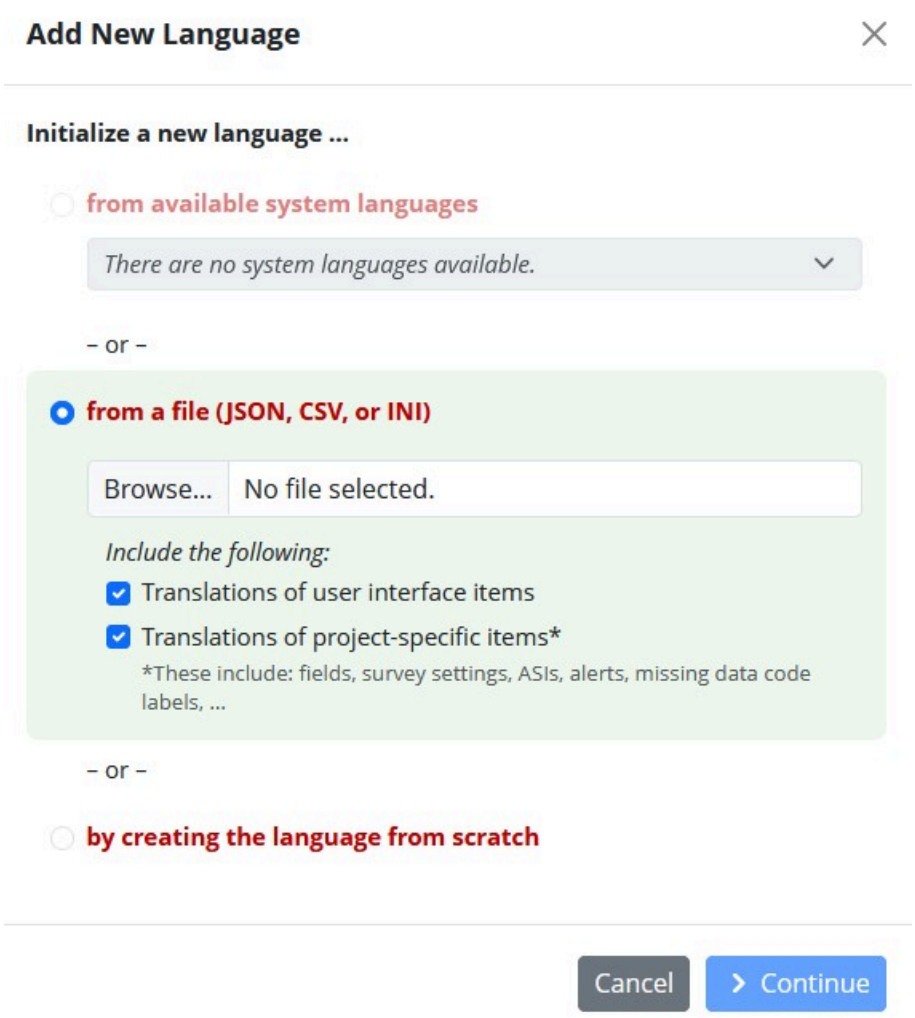


Figure 12.3: Add New Language

There is a white button that is barely visible next to the red words “by creating the language from scratch.” Click there, then Continue. We are starting with English as the base language. Type the Language ID for English, which is en. “Language Display Name” is what will appear to people who will be asked to sign the e-consent. Type English there. So the window now looks like this.

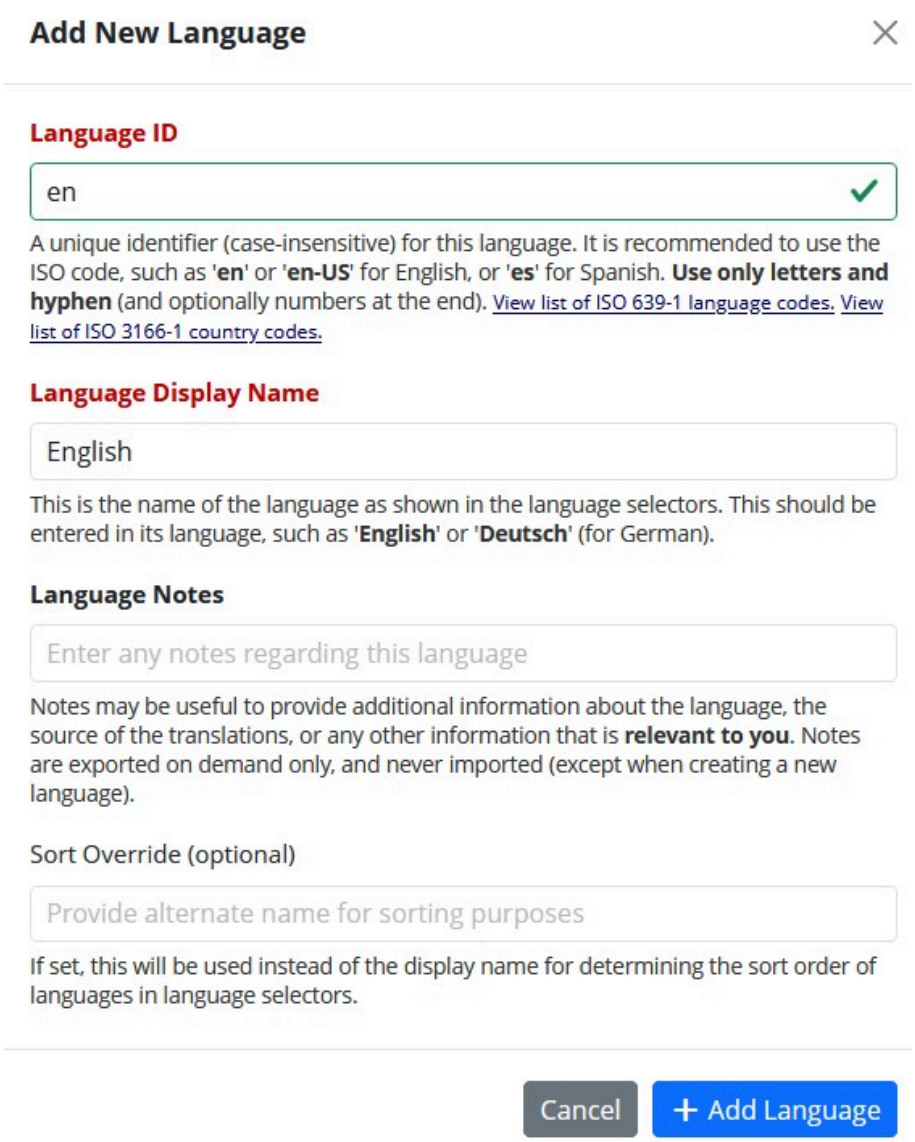


Figure 12.4: Adding English

Click the blue "+ Add Language" button. The window will close, and now the page shows English as the base language. Let's add Spanish as the next language. Click the green "+ Add a new language" button again. Again, click the nearly invisible button next to "by creating the language from scratch," then Continue. We will use es as the Language ID. For Language Display Name, we need it in Spanish for those who will select that language: Español. To get the tilde over the n in this word, you can google Espanol and copy it from a webpage and paste it in this box. Then click the blue "+ Add Language" button.

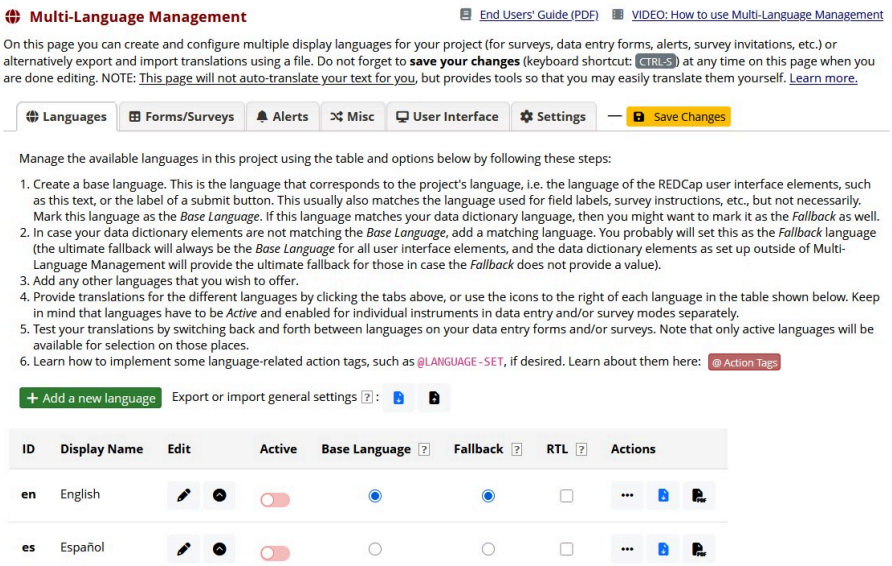


Figure 12.5: Updated MLM Page

You may notice the yellow-orange button that says Save Changes. Unlike many functions in REDCap, this module has the save function at the top of the page, not the bottom. This same button will be used for changing any of the tabs to its left. If it is yellow-orange, then changes have not been saved. Click it now to save the changes made so far. You should see the button change to gray font.

12.4 Touring the MLM Tabs

MLM has tabs embedded in tabs – and tabs embedded within those tabs! It is easy to get lost and sometimes hard to find certain functions. Let's click through these tabs and familiarize ourselves with them.

The **Forms/Surveys** tab has two tabs embedded within it: English and Español. First you see the base language with a blue tab that says "*English." When you click on the word Español, you are switched to that tab, which now is the blue tab.

We will not cover the next two tabs, **Alerts** and **Misc** because they usually are not used in e-consent projects.

Click on the **User Interface** tab. If you left the Forms/Surveys tab on its embedded Español tab, then that's the tab in blue here. The purpose of the User Interface tab is to translate some text that the user of the e-consent will see from the base language (English) to our second language (Spanish). Notice that this page has a third layer of embedded tabs, shown in the blue box below.

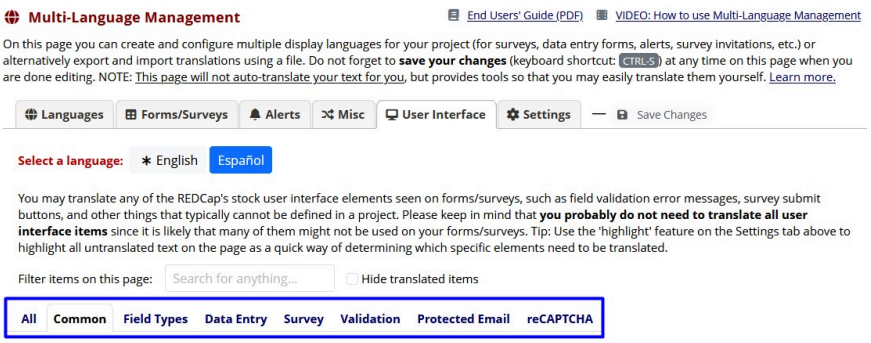


Figure 12.6: Embedded tabs

Let's click through those tabs.

- We could look at everything option under the All tab, but that can be overwhelming.

- By default the Common tab is selected. You can scroll down to see the kinds of notifications to the user that you could translate. For an e-consent project, you often have only a few of these notifications that need to be translated.
- Now click on the Field Types tab. If your project has Yes/No fields, then you would need to translate "Yes/No" on this tab. If your project has a Date field that uses a "Today" button, you will need to translate that word. There are far more options on this tab than you are likely to need to translate.
- Let's click next on the Settings tab. You might wish to click the slider next to "Discourage browser-based translation of survey pages," because you are providing the translations.

At this point we have put English as the base language and Spanish as the second language. But we have not activated them. On the Languages tab, toggle the sliders to Active.

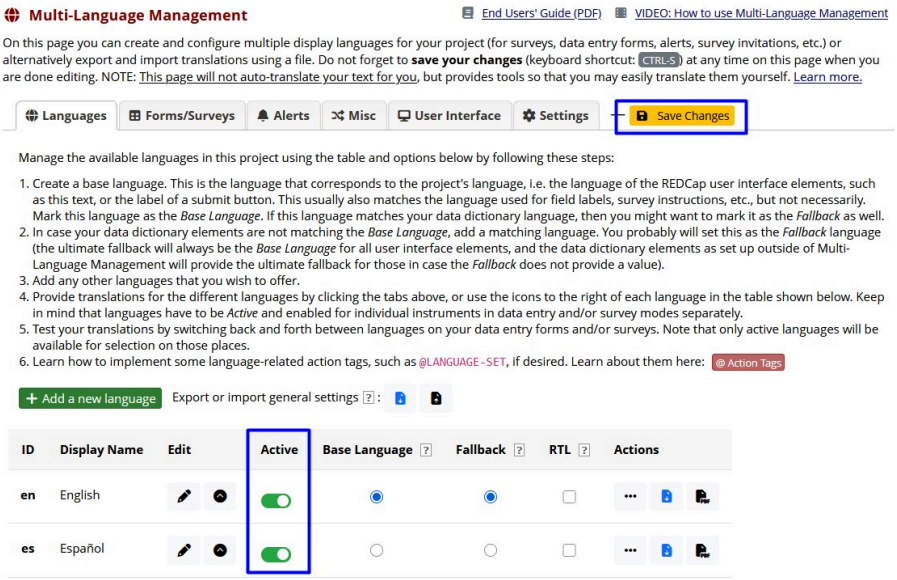


Figure 12.7: Activate the languages

Notice the Save Changes button is yellow-orange again. Click it to save your current settings.

12.5 Creating Translations

Go to the Forms/Surveys tab and select the Español tab. Toggle the sliders in the column under Data Entry and Survey. These sliders will enable the e-consent user to view the translated version of the instruments. Be sure to click the yellow-orange Save Changes button. It doesn't hurt to click that button after every change you make! At any point when you make a change and the Save Changes button stays gray, click outside of the field you just changed to make it turn yellow-orange.

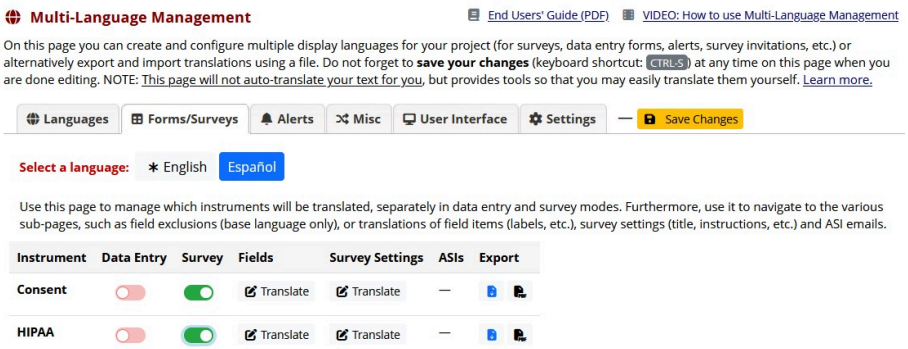


Figure 12.8: Save Changes Often

Notice in the above screenshot that the word Translate appears next to each instrument in the Fields and Survey Settings columns. There are more functions to access by clicking each place that it says Translate. Let's start with Translate under the Fields column on the Consent row. This page shows the variable names inside REDCap. The Spanish-speaking participant using the e-consent survey will never see those variable names. Unless you have staff needing translation inside the REDCap project, we don't have to make any changes here. This Fields page will show a link to the Survey Settings for this instrument. Click that link.

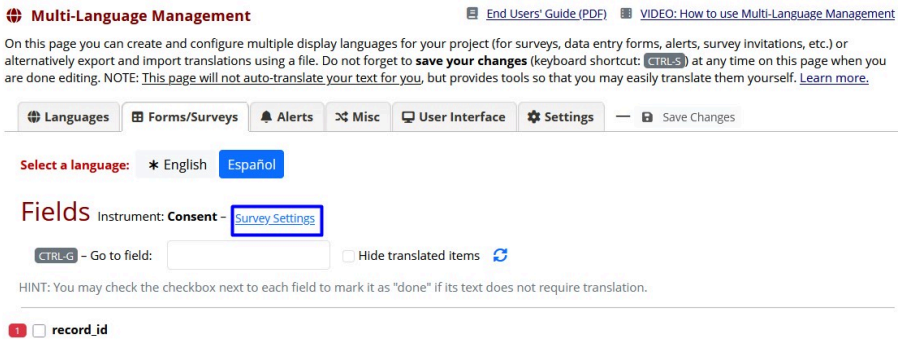


Figure 12.9: Inside the Forms/Surveys Tab

This is where you can translate the survey title and prompts that users will see as they go through the e-consent process. For example, the e-consent used as an example in this chapter is set up so that upon completing the e-consent, the user sees a message, "Thank you!" Below is shown the translation of that message.



Figure 12.10: Translating Survey Completion Text

Notice on the top row of text in the above screenshot, there is a link to Fields. Click that link. Now you will see the Field Labels that correspond to the variables in your e-consent. You will need to translate those Field Labels. For example, if you have "PARTICIPANT NAME (printed)" as the label for a field called participant_name_printed, you would need to enter the translation "NOMBRE DEL PARTICIPANTE (en letra imprenta)." As always, click the yellow-orange Save Changes button.

To look at translations needed on the HIPAA form, click the Languages tab and back to the Forms/ Surveys tab.

- Now you will see the two rows marked Consent and HIPAA again.
- Click Translate in the Fields column to make any changes needed there.
- Then click Translate in the Survey Settings column to make any changes needed on the HIPAA instrument.
- If the Save Changes button has not turned yellow-orange, then click outside of the field your cursor was on, and the color will change.

Now let's do translations in the User Interface tab. Again, staying on Español next to **Select a language**, click the Common tab. Make any translations needed, then click Save Changes.

The next tab inside User Interface is Field Types. Look for any fields your e-consent or survey will need translated, enter the translations, and click Save Changes.

We will skip the Data Entry tab inside User Interface. In the Survey tab of User Interface, you may find several items that need to be translated. Here are some messages listed under the eConsent section of the Survey tab:

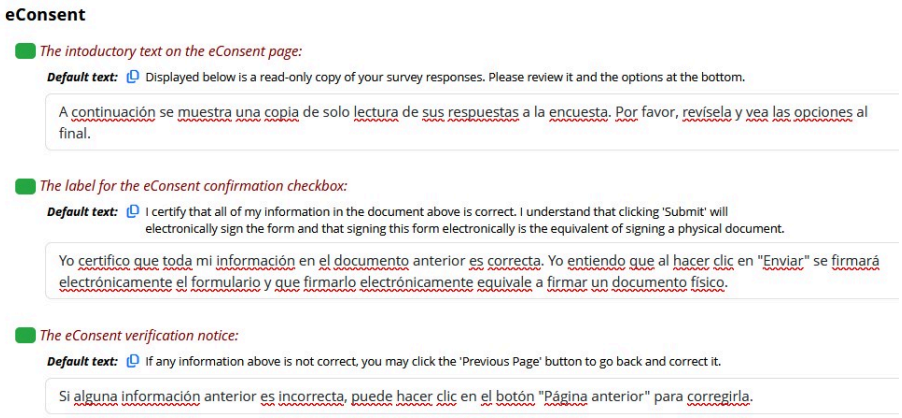


Figure 12.11: Messages to user of e-consent

Look for any fields that you need to translate. Here are a couple of common ones.

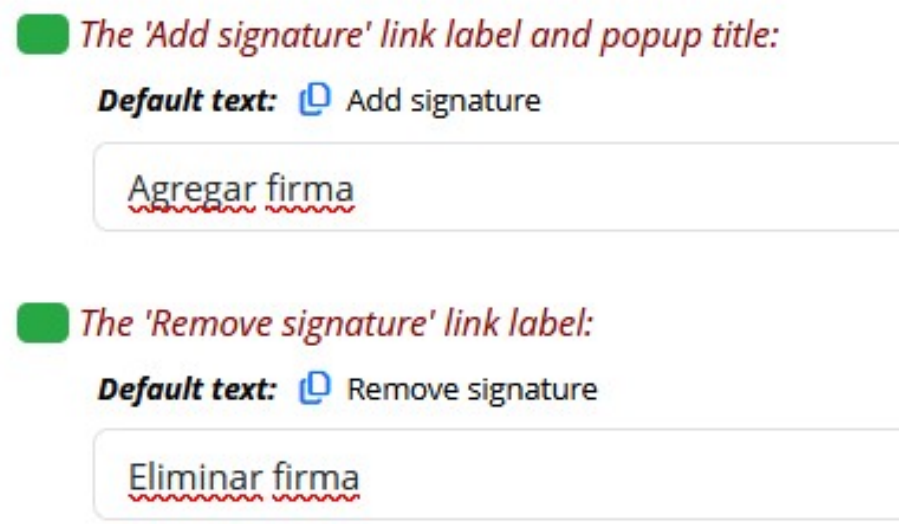


Figure 12.12: Translation for “Add signature”

12.6 Enable e-Consent Framework

Finally we can enable the e-Consent Framework, the REDCap module that was designed to handle electronic consenting processes. Go back to that chapter to complete the e-consent project. Chapter 11.

i Common fields requiring translation into Spanish

Spanish is the most common language used in the OU REDCap's MLM. Investigators will have to arrange for their own consent and HIPAA forms to be translated. Here are some commonly used User Interface words/phrases in English that we have translated into Spanish:

- Must provide value: debe aportar valor
- PARTICIPANT NAME (printed): NOMBRE DEL PARTICIPANTE (en letra imprenta)
- PARENT SIGNATURE: FIRMA DEL PADRE/MADRE
- Date: Fecha
- SIGNATURE OF PERSON OBTAINING CONSENT: FIRMA DE LA PERSONA OBTENCION DEL CONSENTIMIENTO
- Printed name: Nombre impreso
- Initials: Iniciales
- Today: Hoy
- Signature of Legal Representative: Firma del Representante legal**
- Next page: Página siguiente
- Previous page: Página anterior
- Submit: Enviar
- The M-D-Y date format indicator: Mes-Día-Año
- Add signature: Agregar firma
- Remove signature: Eliminar firma
- Use a mouse, finger, or stylus to draw your signature in the area below: Utilice el ratón, el dedo o un lápiz óptico para dibujar su firma en el área de abajo
- Type signature: Firma de tipo
- Type your signature: Escribe tu firma
- Draw signature: Dibujar firma
- I certify that all of my information in the document above is correct. I understand that clicking 'Submit' will electronically sign the form and that signing this form electronically is the equivalent of signing a physical document: Yo certifico que toda mi información en el documento anterior es correcta. Yo entiendo que al hacer clic en "Enviar" se firmará electrónicamente el formulario y que firmarlo electrónicamente equivale a firmar un documento físico.
- If any information above is not correct, you may click the 'Previous Page' button to go back and correct it: Si alguna información anterior es incorrecta, puede hacer clic en el botón "Página anterior" para corregirla.

12.7 Additional Chapter Details

This chapter was last edited in September 2026. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

13. Static Randomization of Patients

Use the basic/static randomization features to assign patients to research groups, in order to increase the internal validity of a study. Static (as opposed to dynamic) randomization accommodates...

Chapter Leads: Steven Fowler

> ⚠ Chapter Draft
>
> This chapter is being written currently, as is available during development in case the preliminary version is helpful to someone.
>
> If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

13.1 What is the Purpose of Randomization?

To learn how to request a new project, see Best Way to Learn.

13.2 Preparing to Build the e-Consent

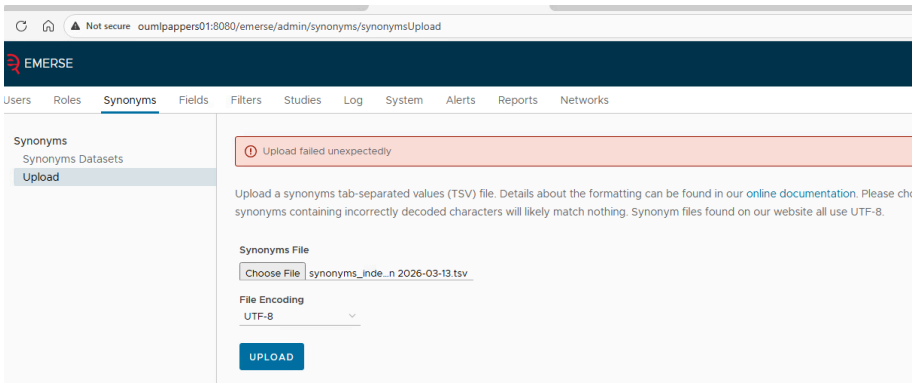


Figure 13.1: This is an example screenshot

Table 7

Cox Regression Analysis Exploring the Relationship Between CAP Abuse Scale Scores and Ethnicity on Child Maltreatment Re-report Risk (N = 1,739)

Variable	Parameter Estimate	SE	Wald χ^2	*Exp (B)*	Exp (B) 95% C.I.	*df*	*p*
CAP Abuse Scale	0.001	0	11.393	1.001	1.001 - 1.002	1	0.001
African Am.	-0.134	0.15	0.795	0.875	0.651 - 1.174	1	0.372
Native Am.	-0.035	0.101	0.121	0.965	0.792 - 1.177	1	0.727
Hispanic	-0.58	0.202	8.253	0.56	0.377 - 0.832	1	0.004
PSSF Study	-0.096	0.107	0.807	0.908	0.736 - 1.121	1	0.369
AGE	-0.009	0.005	3.039	0.991	0.982 - 1.001	1	0.081
Gender	-0.154	0.123	1.573	0.857	0.674 - 1.090	1	0.21
# Children	-0.081	0.131	0.384	0.922	0.714 - 1.192	1	0.536
# Child < 5 years	0.04	0.046	0.778	1.041	0.952 - 1.139	1	0.378
# Prior referrals	0.276	0.018	237.601	1.318	1.273 - 1.365	1	<0.001
Income	-0.129	0.037	12.035	0.879	0.818 - 0.946	1	0.001
Married	-0.557	0.146	14.599	0.573	0.431 - 0.763	1	<0.001
Edu level	-0.087	0.047	3.361	0.917	0.836 - 1.006	1	0.067
HH Size	0.189	0.128	2.202	1.209	0.941 - 1.552	1	0.138

Figure 13.2: Here is another example

i Additional Chapter Details

This chapter was last edited in April 2026. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

V

Project Admin

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14. User Admin

Manage users to increase productivity while protecting data.

Chapter Leads: Thomas Wilson

14.1 Life cycle of user

14.2 User role

14.2.1 Research Team

- *principal investigator (PI)*:
- *project coordinator*:
- *analyst*:
- *nurse*:
- *data entry*:
- *budget*:
- *project admin*:
- *audit*:

14.2.2 Participants

- *public*:
- *private*:

14.2.3 OCRI

- *REDCap Administrator*:
- *graduate research assistant (GRA)*:

14.2.4 Campus IT

This group of people is vital to the operation of a REDCap instance, but distinguishing their roles probably isn't helpful to most readers of this manual. The group is composed of experts in security, databases, operating systems, web servers, networking, storage, and virtual machines.

14.3 Data Access Group (DAG)

14.4 Principle of least privilege

> **i** Additional Chapter Details
>
> This chapter was started in October 2024. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

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15. Mosio

Mosio is a leading text messaging software designed primarily for clinical research. It helps improve participant engagement and adherence in studies through automated text messages. Researchers can use Mosio to send reminders, alerts, and surveys, making it easier to collect data and keep participants on track.

Chapter Leads: Thomas Wilson

15.1 Motivation & Overview

In recent years, many researchers have found that texting is a productive channel for keeping in touch with participants, either by itself or as a supplement to conventional communication. Mosio is a company that develops, supports, and licenses a product called REDCap Direct.

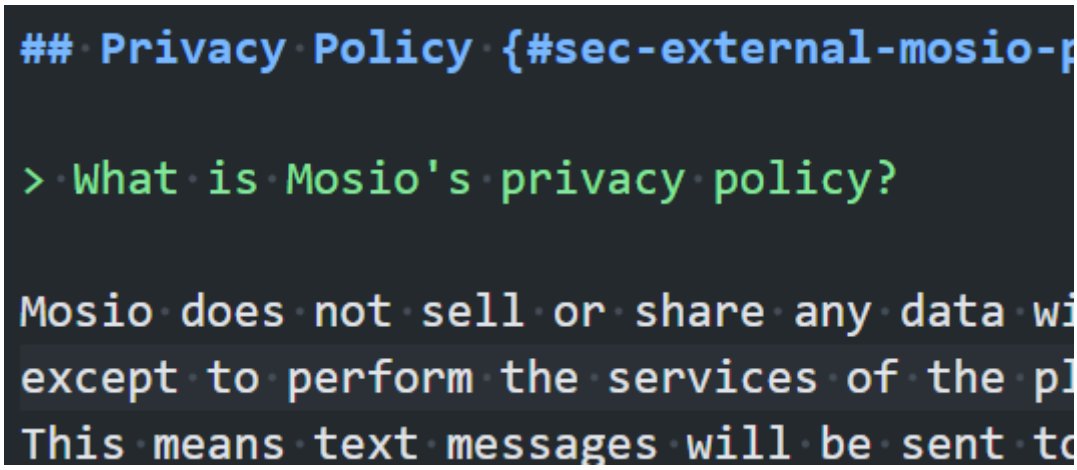


Figure 15.1: Caption of Test Figure.

The REDCap Direct website provides a lot of current information that we won't try to replicate in this manual. Instead we'll outline when you might consider it, and how to ask OU's Server Administrators for help establishing for your project.

15.2 Pricing

How much does Mosio Cost?

Mosio offers several pricing plans tailored to different needs. Outbound messages beyond what is listed below can be purchased at an addition price. For exact pricing and to get a quote tailored to your specific needs, it's best to contact Mosio directly through their website.

Here is a list of some of the details:

15.2.1 Basic Plan

- Projects: Up to 4
- Outbound Messages: 1,000 per month

15.2.2 Plus Plan

- Projects: Up to 10
- Outbound Messages: 3,000 per month

15.2.3 Pro Plan

- Projects: Up to 30
- Outbound Messages: 7,500 per month

15.3 Access

How do I get access to Mosio?

To connect Mosio with REDCap, follow these steps:

1. Set Up Your REDCap Project:
   - Log into REDCap and create a new project.
   - Define your variables using the Data Dictionary or Online Designer.
   - Design your survey and enable surveys under the 'Project Setup' tab.
2. Mosio Account Setup:
   - Ensure you have a Mosio account.
   - Log into your Mosio dashboard and navigate to the integration settings.
3. API Configuration:
   - In REDCap, go to the 'External Modules' section and enable the Mosio module.
   - Enter your Mosio API credentials to link the two platforms.
4. Configure Messaging:
   - Define the messaging parameters within Mosio.
   - Set up various types of messages, such as survey invitations, reminders, and follow-ups

This integration allows you to send automated text messages to participants, improving engagement and data collection. If you need more detailed instructions, you can refer to the Mosio REDCap Direct guide.

15.4 Limitations

What are the limitations of using Mosio?

Using Mosio for text messaging in clinical trials and other applications has several limitations:

1. Message Length: Text messages are limited to 160 characters, which can restrict the amount of information that can be conveyed in a single message.
2. User Engagement: Not all participants may be comfortable or familiar with text messaging, potentially leading to lower engagement rates.
3. Data Privacy: Ensuring the privacy and security of sensitive information transmitted via text messages can be challenging. While the transmission utilizing Mosio with REDCap is secure, you cannot ensure the security of the message when it reaches the recipient's phone.
4. Cost: Depending on the volume of messages sent, the cost of using Mosio can add up, especially for large-scale studies.

Despite these limitations, Mosio remains a valuable tool for improving participant engagement and data collection in various settings. If you have any specific concerns or need help with a particular aspect, feel free to ask!

15.5 Message Types

What types of messages can I send with Mosio?

With Mosio, you can send a variety of messages to enhance participant engagement and data collection. Here are some types of messages you can send:

1. Survey Invitations: Send links to surveys or questionnaires directly to participants' mobile phones.
2. Reminders: Schedule automated reminders for appointments, medication adherence, or survey completions.
3. Alerts and Notifications: Notify participants about important updates or actions they need to take.
4. Compliance Confirmations: Request participants to confirm they have completed a specific action.
5. Automated Messaging (Storylines): Set up automated sequences of messages for interventions, follow-ups, and engagement.
6. Incentives and Gift Codes: Send participants incentives or gift codes as part of your study.

15.6 After Approval

I have approval and am ready to use Mosio. What is the next step?

{Thomas will write this paragraph, and will be bugged by Vignesh & James every two weeks until he does.}

15.7 Sending Messages

How do I send Mosio messages in REDCap?

To send Mosio messages in REDCap, follow these steps:

1. Enable Mosio Module in REDCap:
   - Go to the 'External Modules' section in your REDCap project.
   - Find and enable the Mosio module.
2. Configure Mosio Settings:
   - Enter your Mosio API credentials in the module settings. (This is done by the REDCap admin.)
   - Configure the messaging parameters, such as sender ID and message templates.
3. Set Up Survey Invitations:
   - In the 'Survey Distribution Tools' section, select 'SMS' as the distribution method.
   - Enter the participants' phone numbers and customize the invitation message.
4. Schedule Alerts and Notifications:
   - Use the 'Alerts & Notifications' feature to schedule automated messages.
   - Define the conditions under which messages should be sent (e.g., survey completion reminders).
5. Automated Messaging:
   - Set up automated messaging sequences. (Storylines) for interventions or follow-ups.
   - Configure the timing and content of each message in the sequence.

For detailed instructions, you can refer to the Mosio REDCap Direct guide
If you encounter any specific issues or need further assistance, feel free to ask!

15.8 Monitoring Usage

How can I monitor my Mosio usage?

To monitor your Mosio usage, you can use the following methods:

1. Dashboard Overview:
   - Log into your Mosio account and access the dashboard.
   - The dashboard provides a summary of your messaging activity, including the number of messages sent, received, and scheduled.

2. Storylines Monitoring:
   - Use the Storylines module to track the progress of automated messaging sequences.
   - In the Monitor section, you can view the real-time status of message history, survey completions, and participant engagement.
3. Message History:
   - Access the message history to see detailed logs of all messages sent and received.
   - This includes timestamps, message content, and participant responses.
4. Usage Reports:
   - Generate usage reports to get a comprehensive view of your messaging activity over a specific period.
   - These reports can help you analyze trends and optimize your communication strategy.
5. Alerts and Notifications:
   - Set up alerts and notifications to receive updates on key metrics, such as message delivery rates and participant responses

For more detailed instructions, you can refer to the Mosio Training Guides.

15.9 Usage Examples

What are some examples of using Mosio?

People are using Mosio in REDCap for various purposes to enhance their research projects. Here are some common uses:

1. Survey Distribution:
   - Researchers send survey invitations via text message, ensuring participants receive timely reminders and links to complete surveys.
2. Automated Reminders:
   - Automated reminders are set up to nudge participants to complete surveys, attend appointments, or adhere to study protocols.
3. Data Collection:
   - Text messages are used to collect data directly from participants, which can then be automatically imported into REDCap.
4. Intervention Campaigns:
   - Researchers deploy text-based interventions, such as health tips or motivational messages, to improve participant outcomes.
5. Incentives and Rewards:
   - Participants receive gift codes or other incentives via text message for completing surveys or other study tasks.

These features help streamline communication, improve participant engagement, and enhance data collection efficiency. If you have a specific use case in mind, feel free to share, and I can provide more detailed guidance!

15.10 Privacy Policy

What is Mosio's privacy policy?

Mosio does not sell or share any data with third parties, except to perform the services of the platform. This means text messages will be sent to mobile carriers so they can be delivered to the participants' phones. Emails will also route through our email providers. Mosio only works with vendors who also do not resell any information. The full details are in the Mosio privacy policy.

Additional Chapter Details

This chapter was started in October 2024. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

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16. Security Considerations

Security Considerations

Chapter Leads: Will Beasley

> ⚠ Chapter Draft
>
> This chapter is being written currently, as is available during development in case the preliminary version is helpful to someone.
>
> If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

16.1 Motivations

Security is one of the most important roles as a REDCap administrator. The server is a target because most installations are a public-facing website that can access PHI. In recent years, as REDCap has become essential to medical research projects and institutions, it is a target for its potential for user credentials it might have in common with other institutional assets (e.g., Beyond the Battlefield: Threats to the Defense Industrial Base, Google Threat Intelligence Group, 2026).

16.2 Involve Others

- Involve the IT's security and operational teams
- Read the installation manual carefully
- Review community posts for relevant question
- Ask if in doubt
- Document the installation steps

> ℹ Additional Chapter Details
>
> This chapter was started in March 2026. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

17. Upgrade REDCap Version

This chapter discusses important decisions during the planning process, as well as the specific steps to regularly update REDCap efficiently.

Chapter Leads: Will Beasley

17.1 Preparation

17.1.1 Release Cadence

For the reasons explained in Chapter 16., REDCap should be upgraded soon after versions are released.

A notification that a new version has been released will appear in the control center. So as the server administrator is attending to the TODO list periodically in the day, they should check for updates as well.

However most regular releases occur Friday afternoons, so your admin team should schedule time to upgrade the server during this window.

Allowing for a minimal regiment of testing and validation (say, 15 minutes), the following procedure should take about 30 minutes per server after you've performed for it a few weeks. It can be completed faster if you rush, but we suggest blocking off at least 30 minutes so you can be more observant and patient if something doesn't look right.

17.1.2 Avoid Easy Upgrade Feature

As of February 2026, best practices recommended *not* using the "Easy Upgrade" procedure. See Community Post 272424 for further details.

17.1.3 Offline vs Online Upgrade

Most upgrades require minor changes to the underlying MariaDB database, and the developers do not recommend taking the server offline during the process. However occasional upgrades are substantial enough, and the Upgrade Module will recommend the administrator take the instance offline. The warning appears in the "Obtain SQL Update Code" section.

In these cases, consider upgrading the nonproduction instance during the week, and the production instance during the weekends or nights to minimize

17.1.4 Version Skipping

17.1.4.1 Little Skips

If you upgrade every week, there won't be much opportunity to skip over versions, say from 10.2.3 to 10.2.6. Go ahead and make a small jump like this, especially if the versions were released quickly in succession to address bugs.

17.1.4.2 Big Hops

However if your installation is months behind, say from 10.2.3 to 12.4.2, the chance of an unhappy upgrade increases. Not only is more PHP code changing, which is interacting with external components like LDAP or FHIR, but the MariaDB database structure is changing more too.

So given the larger risks of big hops we recommend:

1. Upgrading and validating the non-production instances first.
2. Taking the production instance offline.
3. Upgrading only ~3 months of versions at a time.
4. Snapshotting before each jump (and don't delete them until the entire upgrade process is complete)
5. Validating after each jump.

17.1.5 OS Updates

Consider checking if your OS and related packages are up-to-date. On RHEL, use the `dnf` command.

```
sudo dnf upgrade
```

17.2 Test and Production Instances

The steps above pertain to updating a single instance of REDCap. In addition to your *production* instance, we strongly suggest you host a *test* or *development* too.[1] If so, perform these steps on the non-production server and verify things operate correctly to minimize the chance the research will be disrupted when you upgrade the production instance.

17.3 Steps

17.3.1 Snapshot VM

In addition to any MariaDB-level backup, we recommend taking a snapshot immediately before upgrading. This should involve a snapshot of both the database server and the web server.

For cost and performance considerations, we typically retain only the most recent snapshot of each server.

17.3.2 Download

Log into the REDCap Community site and download the latest version. Make sure you select the correct value among these three dimensions: (i) LTS vs Standard, (ii) "Update" (as opposed to the "Fresh Installation"), and (iii) version number.

17.3.3 Transfer file

Transfer the zipped file from your client machine to the web server, using a tool like WinSCP. For this scenario, say it's transferred to the "Downloads/upgrades" directory of the user's home directory.

17.3.4 Update Web Server

The first component to be upgraded is the PHP code residing on the web server, so log into the web server.

Decompressed the files and move them to the appropriate REDCap folder where they are visible and available to users.

On a Linux distribution like RHEL, the code is:

```
# Delete any 'redcap' directory unzipped from previous upgrades
cd ~/Downloads/upgrades
rm -rf redcap

# Unzip the file into a directory.
# If sudo is required, you're probably in the wrong directory
# If you unzipped previous versions, you'll be asked to override
# * Upgrade_Instructions.txt and
# * REDCap_License.txt.
unzip ~/Downloads/upgrades/redcap*_upgrade.zip

# Move the directory to a redcap subdirectory.
sudo mv ~/Downloads/upgrades/redcap/redcap_v*/ /var/www/html/redcap/

# Verify it was moved to the correct location.
cd /var/www/html/redcap/
```

[1] The distinction between a test instance and development instance is important to some aspects of server administration, but not to this aspect. Update all the nonproduction servers you have before your production servers.

```
# Should see the new directory, as well as the existing one
ls
```

17.3.5 Obtain SQL Update Code

The second component to upgrade is the database, which involves executing SQL code that REDCap's installation process provides you.

After moving the PHP code, go to `<redcap-installation>/<redcap_version>/ControlCenter/`, from your desktop. Near the top of the page, click a green banner proclaiming something like, "Ready to upgrade to REDCap 12.3.4! Click here to navigate to the REDCap upgrade page."

This will take you to the "Upgrade Module", which should indicate that the previous step was successful and provide SQL code. Choose "Option C: Download the SQL upgrade script as a file" to save the code as a sql file to your desktop machine along the lines of "redcap_upgrade_120304.sql".

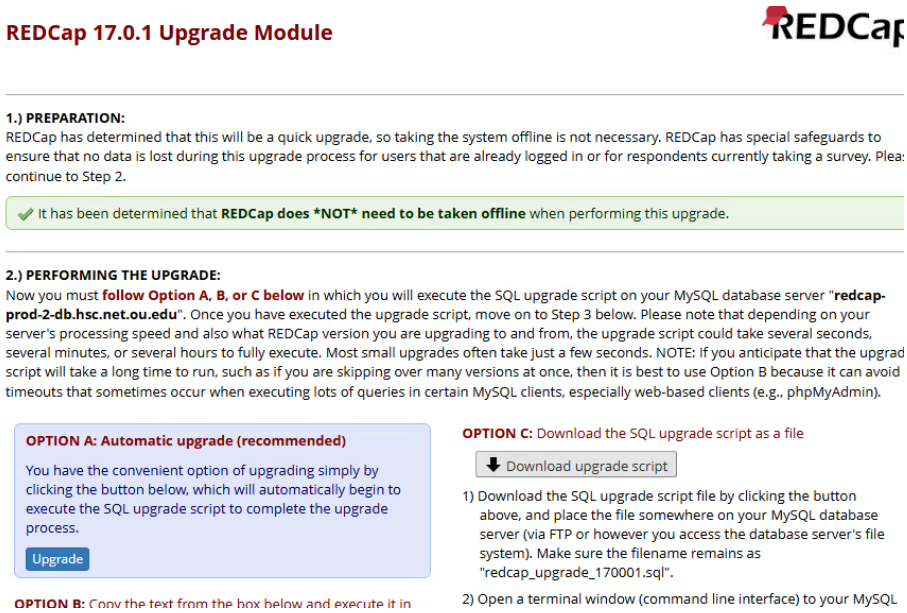


Figure 17.1: Upgrade Module

Transfer the file from your desktop to the *database* server, specifically `~/redcap-upgrades`. For the sake of consistency, use the same approach as you transferred the PHP code to the web server in the previous step.[2]

17.3.6 Update Database Server

Log into the database server and open a database IDE. Open the new upgrade sql file.[3] Execute the entire file.

Although the entire file should be executed eventually, but you can chose either line-by-line or all-at-once. If it's a small hop between versions and the upgrade went smoothly on the non-production instance, consider making your life easier and hitting the Run button just once.

However if there were previous problems, we recommend a more conservative approach. Possibly there were problems upgrading the non-production instance. Or perhaps that ran smoothly, but the production upgrade failed, so you rolled back to your VM snapshot. Run small snippets of the code individually. This

[2]It may be possible to copy the code from the web page and paste it into the database IDE, but we prefer the proposed approach for two reasons:

1. The sql file helps document changes if you need to reconstruct something.
2. It's tricky moving the code across machines if the Linux server-client protocol doesn't support copy-paste operations.

[3]MySQL Workbench and phpMyAdmin are popular tools for MariaDB/MySQL databases. Our slight preference is DBeaver.

incremental approach will help you identify where the code failed, and therefore be more suggestive how to solve the problem.

> **Database Context**
>
> You don't need to learn SQL to upgrade REDCap, but a little understanding of the process could help if the process doesn't go smoothly.
>
> All upgrades will involve a least one line of DML SQL code that adjust configuration values, like the one that increases `redcap_version`.
>
> More substantial upgrades involve DDL SQL code that modifies the structure of the database, like adding a table to support a new feature.

17.3.7 Verify Installation

17.3.7.1 Configuration Check

After updating the database, the Upgrade Module will redirect to the Configuration Check. Inspect that all the "Basic" and "Secondary" tests pass.

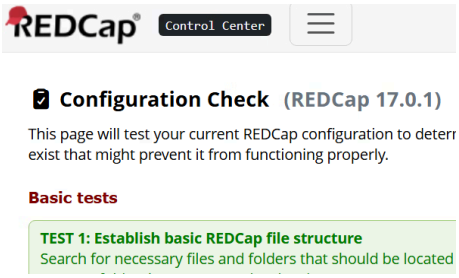


Figure 17.2: Configuration Check

17.3.7.2 Test and Validate

The next step should be to follow your institution's procedure for testing the instance again. Furthermore, we recommend reading the ChangeLog on the Community site, and focusing on any new features within the release.

For example, if some features or fixes involve the Clinical Data Interoperability Services (CDIS), check that the basic FHIR operations are performing as you expect.

17.3.8 Clean Up

1. Delete Previous Versions

```
# Be very careful that you specify the *previous/old* version correctly.
sudo rm -rf /var/www/html/redcap/redcap_v12.1.2
```

Alternatively, create a directory to contain old versions[4], such as `mkdir ~/old-versions`. Then move the old version of REDCap to that directory:

```
sudo mv redcap_v12.1.2/ ~/old-versions
```

Periodically, clean out that directory, because each version consumes around 200MB of disk space.

2. Update OS and packages

Upgrading REDCap may also be a good time to ensure that other layers of the software stack are up-to-date. This includes things like MariaDB, PHP, and the OS.

[4] A bash utility like `gio trash` works only on mounts that have a trash folder; server paths like `/var/www/html` do not have a trash folder.

a. Create the file `/usr/local/sbin/update-and-reboot-if-required.sh` with the following contents. It updates OS files, and if necessary, reboots the server at 3am the next morning.

```
#!/bin/bash
# Cleans packages, upgrades the server, and schedules a reboot if needed.

# Variable for reboot time
REBOOTTIME="3am tomorrow"

# Cleaning up the files
echo "Cleaning files..."
sudo dnf clean all

# Doing the upgrade
echo "Upgrading..."
sudo dnf update -y

# Making sure atq is up and running.
echo "Scheduling a reboot, if needed..."

# Logic check for rebooting, setting the exit code. Zero means no reboot required.
Exit code 1 means required.
sudo dnf needs-restarting -r
NEEDSREBOOT=$(echo $?)

# If statement to check if reboot is required
if [[  $NEEDSREBOOT -eq 1  ]]; then
        sudo systemctl enable --now atd
    echo "INFO - Reboot is required!"
    echo "sudo reboot" | at $REBOOTTIME
else
    echo "INFO - Reboot is not required, moving on..."
fi

echo "All done!"
exit 0
```

b. Run weekly, or after each REDCap upgrade.

```
bash update-and-reboot-if-required.sh

# Close the terminal (which is useful if you're juggling multiple instances).
exit 0
```

If you happen to run this twice in the same day, it might create a second cronjob to reboot. Avoid this, because the results can be unpredictable.

- If a reboot is *not* scheduled, it's fine to run the script again.
- If a reboot is *already* scheduled, but you want to update again, simply run `sudo dnf upgrade -y`.
- To check if two reboots are scheduled, execute `atq`.
  If two entries are present (say, '24' and '25'), remove the last one like `atrm 25`.

> **i** Additional Chapter Details
>
> This chapter was started in March 2026. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

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18. Checklist for Testing a REDCap Project

Before Moving the Project to Production and Beginning Data Collection.

Chapter Leads: Lise DeShea

Congratulations on completing your REDCap project! When someone requests a REDCap project to be moved into production (*i.e., to go live for data collection*) the REDCap Administrator must ask: Has this project been adequately tested? Just as a company will test a new product and all of its parts before going into mass production, your REDCap project needs to be well-tested before going live.

Thoroughly testing your REDCap project before going live is important **because you can lose data** if you make changes to the survey/form after data collection has begun. If skip patterns are not correct, necessary questions can be skipped or data may be collected that is not required. If the question format is not correct, it may be difficult to analyze after data collection ends.

Why do we tell project developers to try to break their REDCap project?

Breaking a project means testing your survey from a perspective of a naïve user who knows nothing about the project's purpose or the data being collected. You need to think of all the ways the project could fail or be misunderstood, and try to make that happen. We created this checklist to guide your REDCap testing:

18.1 Before Testing

Before sending your instruments or survey for testing, the designer (you) will need to:

18.1.1 Field Type

Check the field type for every variable

Make sure the field type is what you had meant to select. For instance, is the date field using the correct validation, such as YYYY-MM-DD? Does a multiple-choice item allow only one response? If so, then it needs to be a radio button or a drop-down menu. In contrast, a checkbox field allows multiple responses to be chosen on a multiple-choice item.

18.1.2 Use clear language

- Many surveys/instruments are completed or used by people of different literacy levels or for whom English is a second language, so it is crucial to be as clear as possible.
- Make sure labels are clear and the logic between items is easy to follow. Vague labels and difficult-to-follow logic can lead to items being skipped and data to be missing, or incorrect responses may be entered. Example:

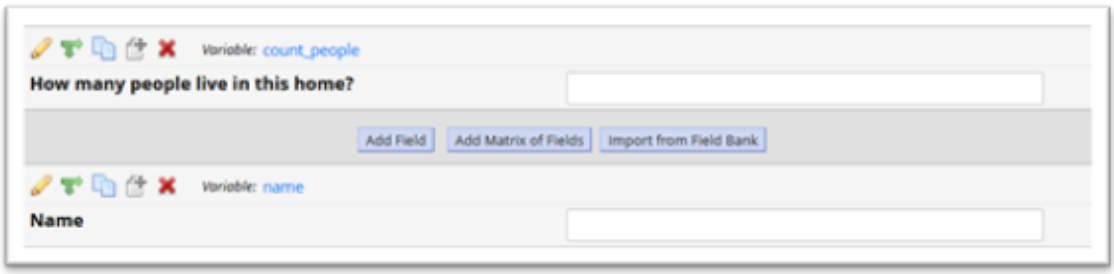


Figure 18.1: Ambiguous "Name".

Whose name? The person filling out the form? Their first name? Last name? The last name of a family in the home? What if they have different last names? The survey might be clear to the person creating the project, but a second or third set of eyes may catch items that are unclear.

18.1.3 Anticipate Analysis

Inspect each field and think about what the data will look like for the person eventually analyzing the data

Example:

With a fill-in-the-blank text field like the one above, here are some of the ways that someone may report a birthday:

```
January 8, 1999    08 January 1999    Jan 8, 99   1-8-1999
Jan. 8, 1999      jan 8 1999          1999-1-8    8 Jan '99
```

A subsequent analysis would report there were 8 different dates entered, instead of 8 people with the same birth date. And forget about being able to calculate someone's current age based on these data! Use REDCap's built-in data validation capability whenever possible. Go through your items and figure out if you can validate each field in some way. Even something like "Child's age" could be entered numerous ways in a free-text field:

```
Seven    7 years old        Don't know      8 on his next birthday
7        7 years, 4 months  I don't know
```

You might modify your item to specify "Child's age (in years)" and use data validation to require the person to enter an integer greater than 0 and less than 18.

18.1.4 Necessary Data

Check whether your project is failing to collect necessary data, either by fields not being completed or fields being left off the form

- Go back to the original plan for the project and check your work.
- What was the purpose of the project? Did every needed field get included in your instruments/survey?
- Will the fields in your instruments/survey collect the information required to to fulfill the needs that motivated the project?

18.1.5 Test the survey yourself

Test the survey yourself

- Many times, omissions or errors can be found by testing the survey/instrument yourself.
- Enter test data. If you are testing a survey, follow along with the paper survey and see if it matches with what is in REDCap.
- Review the data you just entered and see if the information is what you expected.
- Check all branching logic and make sure the fields that are supposed to become available to the respondent actually open up for data entry.

18.2 Select Testers

When you decide you are ready to have individuals enter test data on your instrument or survey, select the individual(s) whom you want to test your project

18.2.1 First Tester

Ask at least one other person to enter test data in your instruments or survey_

- Sometimes the person creating the project is too close to it and can't see its limitations. A second, third or fourth set of eyes is crucial, and they can enter many test records with different scenarios in mind.
- Could any of the items be misunderstood by a naïve user?
- Check the data entered to see if the questions meet the goals of the project? Example:
  - If people with diabetes need to answer extra questions, has the branching logic been set up correctly so that those items only appear when someone says they have diabetes? Your tester(s) should enter

data for different kinds of study participants. This step is important to complete before a project is moved into production because you may not be able to test changes in branching logic at a later point.
- Does the survey work equally well on a cell phone vs. a computer? Having multiple testers will allow you to have them test the project on different platforms.
- Is there enough room in the text box for answers or do you need to change it to a notes box?

Testing a public survey

- Public surveys can be distributed from the REDCap email system or through an OU email with an embedded link. The tester's email address is required.
- If there is a paper survey, send selected individuals a copy and have them check to see if it matches what they see in REDCap. Other testers can test the survey without using the paper survey.

Testing data collection forms that are not surveys

- Testing data collection forms used only within REDCap (i.e., it is not a public survey) will need to be done by individuals within your group or by individuals who will have temporary access to the project for testing only. They will need to be removed from the project prior to pushing the project to production and prior to starting actual data collection.

18.2.2 Compared to Printed Versions

Have at least one other person who is familiar with the study or investigation check whether the REDCap project matches any printed documents, like IRB protocols and approved procedures

- Is the project accurate and staying within the bounds of what has been intended or IRB-approved?
- Is the wording correct on all instruments?
- Is everything spelled correctly?
- Is the skip logic correct? Does the skip logic match what is in the printed survey?
- Are all the items present?
- Have any items been added that were not approved by the IRB (and therefore should be deleted)?
- Are calculated variables producing correct answers?
- Can the investigators confirm who has been approved as key personnel by the IRB so only those people are given access to the REDCap project?

18.2.3 User-Friendly Appearance

Ask the individuals testing your instruments/survey if the forms/surveys are user-friendly in its appearance

- Are the colors easy on the eyes?
- Are colors acceptable for people who are color-blind?
- If a team will be entering data directly into REDCap (i.e., it is not a public survey), are the instruments too long? Could the instrument be broken up into shorter instruments so the data entry person doesn't feel like they're working on the Great Wall of China?
- Could some items be put into a table using the rich text editor in a descriptive field? These tables can save space and require less scrolling by the data entry person. Ask your REDCap Administrator how to do that.

18.3 After testing

When the testers have completed their testing

18.3.1 Necessary Changes

Make any necessary changes to the survey or data instrument

18.3.2 Respond to Feedback

Review suggested changes and make changes based on their feedback

18.3.3 Inspect Test Data

Look at the data that the testers entered into REDCap

- Click on Data Exports, Reports and Stats on the left side of your screen, then click on the View Report button to see the entered data.
- Does any of the information look like it would be unusable or is not as expected?
- Can the field be modified with data validation settings?
- Make corrections to the field if necessary. These corrections need to be done before the project is in production for actual data collection because you can lose data by changing the variables after the project is in production.

18.3.4 Convert to Notes

Are there any text boxes that need to be turned into notes fields?

18.4 Once Satisfied for Production

When you are satisfied that everything is ready for collecting high-quality research data, move your project from "development" status to "production" status:

We will lead you through this step below. First we will explain how you gain several important protections when a project is in production.

18.4.1 Production Advantages:

1. Data Integrity Protection: Production mode prevents direct, unrestricted changes to field names, dropdown choices, and form structures that could accidentally invalidate or delete already collected data.

   If a mistake is made, your chances of recovering lost data are vastly improved if the project was protected in production status.

2. Controlled Modifications via Draft Mode: The production status allows you to make form updates safely using Draft Mode, where critical changes require an administrator review.

   Each institution can choose their own threshold for "critical change." Currently OU allows new fields to be added automatically; because no existing data can be corrupted, we argue that the admin oversight is unnecessary.

3. Revision Tracking: When in production, REDCap audits project modifications and history and who made them, so you can document changes and review past data dictionary versions.

4. Enhanced Security and Compliance: The oversight strengthens the project's compliance during live research. This helps ensure proper data retention, long-term security, and adherence to institutional review requirements.

18.4.2 Move to Production

Move your project to production status by following these steps:

1. Click on "Project Setup" tab.

2. Click on the button "Move project to production."

3. Decide if you want to Keep ALL data saved so far.

   - If you have real data entered and don't want to lose it, click "Keep ALL data saved so far."
   - Alternatively, if everything is test data, you'll want to delete the fake data, so click "Delete ALL data in the project (including any survey responses), calendar events, documents uploaded onto forms/surveys, and all archived data export files stored in the File Repository, and any logged events that pertain to data collection."

4. Finally, request that the REDCap Administrator approve your proposal. Click on the button, "Yes, Request Admin to Move to Production Status."

18.4.3 Modify while in Production

Of course, some projects will need to be modified, particularly if the investigation continues for years. We to try to strike a balance that affords both (a) agility to researchers to adapt to unforeseen circumstances and (b) protection against accidental data corruption.

Here are the steps that OU (and many other institutions) require to change a project in production:

1. Place the designer in "Draft Mode"
2. Edit or add variables in the designer
3. "Submit" the changes for review

At this point, your proposal appears on the REDCap server admin's "To-Do List". The admin then will review the proposed changes before they are "committed" to the live version that respondents are interacting with.

The server admins at most REDCap institutions attend lots of training, calls, and conferences. We have managed hundreds of projects, which allows us to spot possible problems in your draft. If we do suspect a potential problem, we'll likely contact you and describe the concern, and verify that it matches your intent. So if you are submitting changes, please monitor your work email until it's approved. OU admins typically review the changes at least hourly during weekdays, and periodically over weekends and holidays.

18.4.4 Further Reading

For more information, see Bas de Veer's REDCap Knowledge Base regarding Production Status, and its place in the overall life cycle of a project.

19. 21 CFR Part 11 Requirements of the Researcher

21 CFR Part 11 is required of some OU REDCap projects, notably the projects containing data from clinical trials. This chapter describes the elements that a research team (RT; *i.e.*, not Vanderbilt or OU's OCRI) is responsible for.

Chapter Leads: Thomas Wilson and William H. Beasley

19.1 Background

19.1.1 Overview

21 CFR Part 11 (frequently shortened to just "Part 11") compliance is much more than just demonstrating a REDCap *instance* is compliant. Your specific REDCap *project* must be compliant too, as well as surrounding components like your procedures for data collections and training for the research team.

This chapter helps walk you through the process.

Begin by contacting IT security to receive their most recent Part 11 compliance document. Some parts will be completed by REDCap admin team, and other parts will be completed by your research team.

See below for example responses by researchers using the OU REDCap instance. Of course, review each entry carefully, and tailor it to your specific research protocol.

19.1.2 Glossary

- *RA*: REDCap Administrators. OU employees who are responsible for the overall instance on campus. This includes some OCRI employees (like Thomas Wilson) who train users and manage the back-end servers. It also includes OU IT employees who are experts in virtual servers and Linux.
- *RD*: REDCap Developer. Vandy {Come back to this.}
- *RT*: Research Team. These are the people managing the research project. Their typical duties include designing the study, collecting data, analyzing the results, and publishing the findings.

  These are the individuals who are responsible for the daily operations of the study, and how a study is reflected in a REDCap project.

  The RT is different from the people who design the REDCap software (at Vanderbilt University) and from the people who administer the local REDCap instance (in OCRI and OU IT).

19.2 System Validation And Change Control (Sec A)

RTs are not responsible for content in this section.

19.3 Access Control And Security (Sec B)

19.3.1 User Authentication (Subsec B1)

RTs are not responsible for content in this section.

19.3.2 Role-Based Permissions (Subsec B2)

19.3.2.1 Are roles and permissions in REDCap configured to ensure that users only have the minimum necessary access to perform their job functions?

REDCap allows fine-grained permissions to users and groups within each project.

It is the RT's responsibility to assign other study team members the appropriate permissions, while following the principles of least privilege.

19.3.2.2 Are permission sets periodically reviewed to confirm they still align with user job functions?

Yes, the REDCap dashboard to allow someone to quickly review the study's users, groups, and permissions. It is the RT's responsibility to periodically review this dashboard.

19.3.2.3 Do you enforce the principle of least privilege (admins vs. data entry vs. monitors)?

The RT works with their team members and should be aware of their roles approved by the IRB.

It is the RT's responsibility to assign the appropriate levels of privileges.

19.3.3 Account Provisioning and Deprovisioning (Subsec B3)

19.3.3.1 Is there a clear process to grant, modify, or revoke system access when personnel changes roles or leave the organization?

Yes, the REDCap user rights dashboard allows RT staff to easily grant, modify, or revoke system access when personnel changes occur.

It is the RT's responsibility to monitor staff changes and make the appropriate system access modifications when necessary.

19.3.3.2 Must accounts be removed within a certain time frame (e.g., 24 hours) after staff departure

Yes, REDCap allows for the expedient removal of staff from the appropriate REDCap projects.

It is the RT's responsibility to monitor staff changes and remove accounts from the projects.

19.3.3.3 Do new users undergo formal training or competency checks before access is granted?

Yes, the RA team provides general REDCap training on how to operate the system. The RT will be responsible for training and competency check for the specific project that new staff will be using.

19.3.4 Audit Trail Review (Subsec C3)

19.3.4.1 Is there a process for periodically reviewing audit trails and investigating any anomalies?

Yes, REDCap maintains an audit log for all transactions within a specific project. It is easily accessible and downloadable as a .csv file.

It is the responsibility of the RT to review the audit logs and investigate any anomalies.

19.3.4.2 Is there a routine schedule (monthly, quarterly) for audit trail reviews?

With the accessibility of the REDCap audit log, scheduling of reviews can be done at any appropriate schedule.

It is the responsibility of the RT to schedule the audit trail reviews.

19.3.4.3 Who is responsible for these reviews, and are they qualified to interpret logs?

REDCap maintains the audit log in an accessible and downloadable format.

The RT is responsible for assigning the reviewer and determining their qualification to interpret the logs.

19.3.4.4 Do you conduct forensic reviews if suspicious activity is detected?

The RT is responsible for conducting forensic reviews if suspicious activity is detected.

19.3.5 Data Entry and Validation Checks (Subsec C4)

19.3.5.1 Do you conduct forensic reviews if suspicious activity is detected?

Yes, REDCap allows data fields to be configured with multiple data validation rules. These rules include format checks, ranges for dates and numeric entries, required fields, and designating that a field is an identifier. REDCap also utilizes functionality called "Action Tags" to further ensure that data are collected in an accurate, efficient manner. The RA team can train the RT on all of these features, but it is the responsibility of the RT to implement the features into their projects.

19.3.5.2 How do you handle data corrections or errors (formal data query, edit check process)?

REDCap allows for users with appropriate permissions to correct data or errors within a project. Any changes to the data are recorded in the REDCap audit log. Additionally, REDCap has a field comment log for each field. The field comment log allows users to record the reason they are making a modification to the data for each field that needs to be corrected.

It is the responsibility of the RT to make data corrections or address errors.

19.3.5.3 When data collection instruments are updated, is the previous version retained to show how data were collected at any point in time?

Yes, REDCap, when in production mode, creates a snapshot of all data collection instruments whenever a change is requested.

It is the responsibility of the RT to ensure that REDCap is in production mode prior to collecting research data.

19.3.5.4 Does the system lock old forms when a new version is released, preventing retrospective changes?

Yes, when a new version of a form is released, the old form is retired from data entry.

19.3.5.5 How do you inform users about updated forms (e.g., release notes, training)?

When a REDCap project is in production and updates are requested, the individual on the RT requesting the changes will receive an email notification from the system when the changes have been approved.

It is the responsibility of the change requestor to inform the remainder of the RT of any changes that have been made.

19.3.5.6 Do you use encryption of secure FTP for high-risk data transfers?

REDCap stores data in secure VMs (virtual machines) on the OU campus. It is the responsibility of the RT to ensure the security of that data when it has been extracted from REDCap.

19.3.5.7 How do you ensure integrity if data are exported for analysis outside of REDCap?

It is the responsibility of the RT to ensure the security of data if it has been exported outside of REDCap for analysis.

19.4 Electronic Signatures (Sec E)

19.4.1 Long-Term Accessibility (Subsec E2)

19.4.1.1 Does the signature record include the printed name of the signer, date/time of signing, and the meaning of the signature (e.g., review, approval)?

Yes, REDCap has the capability of collecting all of these various signature components. These components must be incorporated into the design of the REDCap survey.

It is the responsibility of the RT to ensure that all required signature components are included in their REDCap survey.

19.4.1.2 Is the date/time automatically captured by the system (vs. user-entered)?

Yes, REDCap automatically captures the survey completion date/time. REDCap also has the capability of capturing the date in a separate field, which can be either manually entered or automatically captured.

It is the responsibility of the RT to design and implement the appropriate date/time capture as is appropriate for their study.

19.4.1.3 Can different signature "meanings" be captured (reviewed, approved, verified)?

Yes, REDCap can have multiple signature field meanings. Each signature meaning can have a custom definition based on the specific needs of the study.

It is the responsibility of the RT to design and define any and all signature fields for their study.

19.5 Organizational Policies and SOPs (Sec F)

19.5.1 User Training (Subsec F2)

19.5.1.1 Are all users (administrators and end-users) trained on system use, Part 11 awareness, and data integrity principles?

Yes, the REDCap admin team offers training on system use and data integrity principles. It is the responsibility of the RT to schedule training for their staff.

19.5.1.2 Is there role-specific training (admin vs. standard user vs. data manager)?

It is the responsibility of the RT to determine the role-based needs for their staff and implement training.

19.5.1.3 Are competency tests used to confirm user understanding of Part 11 principles?

It is the responsibility of the RT to confirm user understanding of Part 11 principles. The RT may develop a competency test for their team, if desired.

19.6 Record Retention (Sec G)

19.6.1 Long-Term Accessibility (Subsec G2)

19.6.1.1 Are file formats chosen to ensure long-term readability (e.g., PDF, CSV)?

REDCap provides the export formats shown in Figure 19.1, ranging from the highly-portable (*e.g.*, .csv: comma separate value) to the specialized and proprietary (*e.g.*, .sas7bdat: SAS files).

To promote portability and long-term usefulness, we recommend exporting data as a csv. Even if you want something specialized in the short-term (*e.g.*, an SPSS file), we recommend exporting and storing second copy (as a csv) to improve the options available to others in the future.

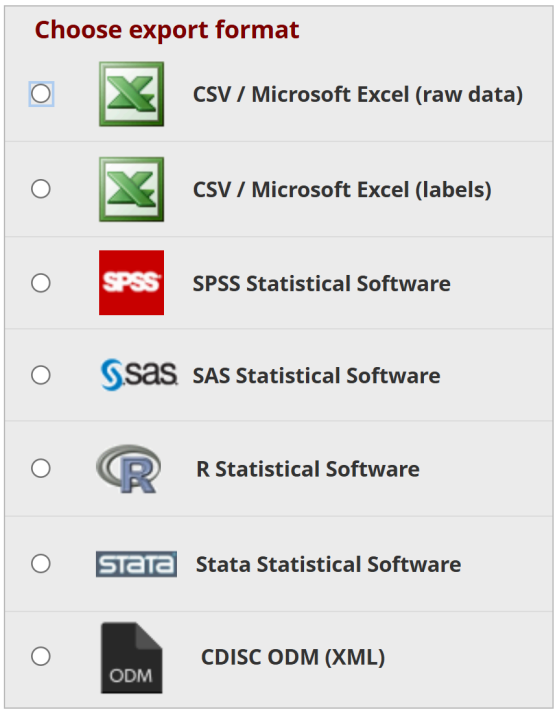


Figure 19.1: Data Export Formats.

> **i** Additional Chapter Details
>
> This chapter was started in March 2025. If you have suggested modifications or additions, please see How to Contribute on the book's welcome page.

IX Troubleshooting

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20. Trouble Logging into a REDCap Server

Help logging to a REDCap Server

Chapter Leads: Thomas Wilson

20.1 `ERR_TOO_MANY_REDIRECTS` Error

> **i** Problem Description
>
> This problem appears differently, depending on your browser. But all of the browsers ultimately display `ERR_TOO_MANY_REDIRECTS`.

Suggested Explanation and Solution:

Sometimes the authentication mechanism gets confused if you've logged into different OU or OU Health accounts. Fortunately there is an easy way to reset the credentials cached in your computer.

- First, visit https://outlook.office.com and complete login. Use your conventional OU credentials.
- Second, visit https://bbmc.ouhsc.edu/. Use your conventional OU credentials again.

21. Proposed Changes to a Project in Production

Help avoiding problems to production data

Chapter Leads: Will Beasley

21.1 Introduction

When a REDCap project is in production, the software provides several features to protect a project admin from accidentally corrupting or destroying valuable data that might be impossible to recollect. If you are unfamiliar with the process of moving a project to production, please first read Section 18.4.

When changes are desired to a production project:

1. a project admin initially places the project design in *Draft Mode*. Next,
2. the project is altered (eg, adding a new variable, rewording a multiple-choice option). Then,
3. the proposed changes from the *project admin* are submitted to the *server admin*. And finally,
4. the server admin reviews the proposals before deciding to accept or reject all the changes at once. There is not a mechanism that allows acceptance of some changes but rejects others.

If the modification raises no concerns of the server admin, then it's accepted without further correspondence. However, for a modification that raises concerns, the server admin will contact the project admin to verify the ramifications are understood.

In this role, the server admin relies on their (typically year of) research experience, as well as familiarity with REDCap mechanisms to avoid problems that are difficult to undo. Most of the concerns involve unintentional destruction or corruption of data.

21.2 Large number of records to be deleted before moving to production

Background

When a project is moved to production, the software will ask the project admin if the existing records should be deleted. In fact deletion is the default selection, because it's assumed that the project was thoroughly tested during development with fake records, and now is transitioning to real records.

When reviewing the proposal, the software informs the server admin how many records will be deleted, assuming the project admin selected "Delete All Records". If the server admin sees that 10-20 records will be deleted, they'll believe this is a reasonable volume of test records and accept the deletion as the project moves to production.

However, a larger volume like 50+ records might raise concerns that real data might have been entered, and now would be lost accidentally. The server admin will likely email the requester, in order to confirm all the records should be wiped. Notice it's not desirable to delete these test records once the project is in production, because the records will be included in the logs, and could confuse someone later auditing the project.

Tips to avoid additional correspondence

By all means, please create and employ a large volume of records to test. If you have created a lot of test records and don't want to risk a delay, you can mass delete them before requesting the move to production. In the "Other Functionality" tab, click "Erase all data".

To confirm your intent

If the server admin asks you about this issue... : In your response email, be clear that the large volume of records are in fact test records that should be discarded.

21.3 Deleting a variable

Background

You've deleted a variable that contains data.

In the review screen, the server admin will see a warning like:

Fields to be DELETED:

- `zip_code` "Zip Code of Residence" (106 records affected)
- `county` "County of Residence" (98 records affected)

This can raise concerns that the project admin meant to delete a different variable, or is unaware of the benefits of the `@HIDDEN` action tag.

Best Practices

Instead of deleting the variable, consider using the `@HIDDEN` action tag. Read about its uses in Section 9.2.5.

To confirm your intent

If the server admin asks you about this issue... : In your response email, be clear that you really want the variable's data erased forever. And explain why it's not adequate merely to conceal the variable from the user.

21.4 Deleting a multiple choice option

Background

You've deleted an option (within a multiple choice variable) that contains data. This scenario is a close relative of Section 21.3.

This can raise concerns that the project admin meant to delete a different option, or is unaware of the benefits of the `@HIDECHOICE` action tag.

Best Practices

Instead of deleting the response option, consider using the `@HIDECHOICE` action tag. Read about its uses in Section 9.2.6.

To confirm your intent

If the server admin asks you about this issue... : In your response email, be clear that you really want the variable options's data erased forever. And explain why it's not adequate to merely conceal the choice from the user.

21.5 Rewording a multiple choice option

Background

Sometimes multiple choice options need to be reworded during production, either because additional respondents have found ambiguities undiscovered during the pilot, or because the real world has changed.

A server admin will quickly approve a change like this, because it's clear the old wording and new wording are reflecting the same concept. In other words, it's safe to combine all the old 1s (ie, "mail") with the new 1s (ie, "male") in the same eventual bucket.

Old Code	Old Label	New Code	New Label
1	mail	1	male
2	female	2	female

However, this modification will corrupt the variable;s data. In other words, it's *unsafe* to combine the old 1s (ie, "male") with the new 1s (ie, "female"). During the analysis, all the respondents answering 1 will be combined, and the before/male values will be indistinguishable from the after/female values.

Old Code	Old Label	New Code	New Label
1	male	1	female
2	female	2	male

Best Practices

If you simply want to reorder the options presented to the user, then do it. Just make sure to keep the code-label pair consistent, like this revision does. The codes do not need to be sorted in numeric order. (In fact, the codes don't even need to be numeric.)

Old Code	Old Label	New Code	New Label
1	male	2	female
2	female	1	male

If the necessary changes are more complex, and involve rewording, reordering, creating, and/or deleting choices, then employ a combination of this section and Section 21.4.

Bibliography