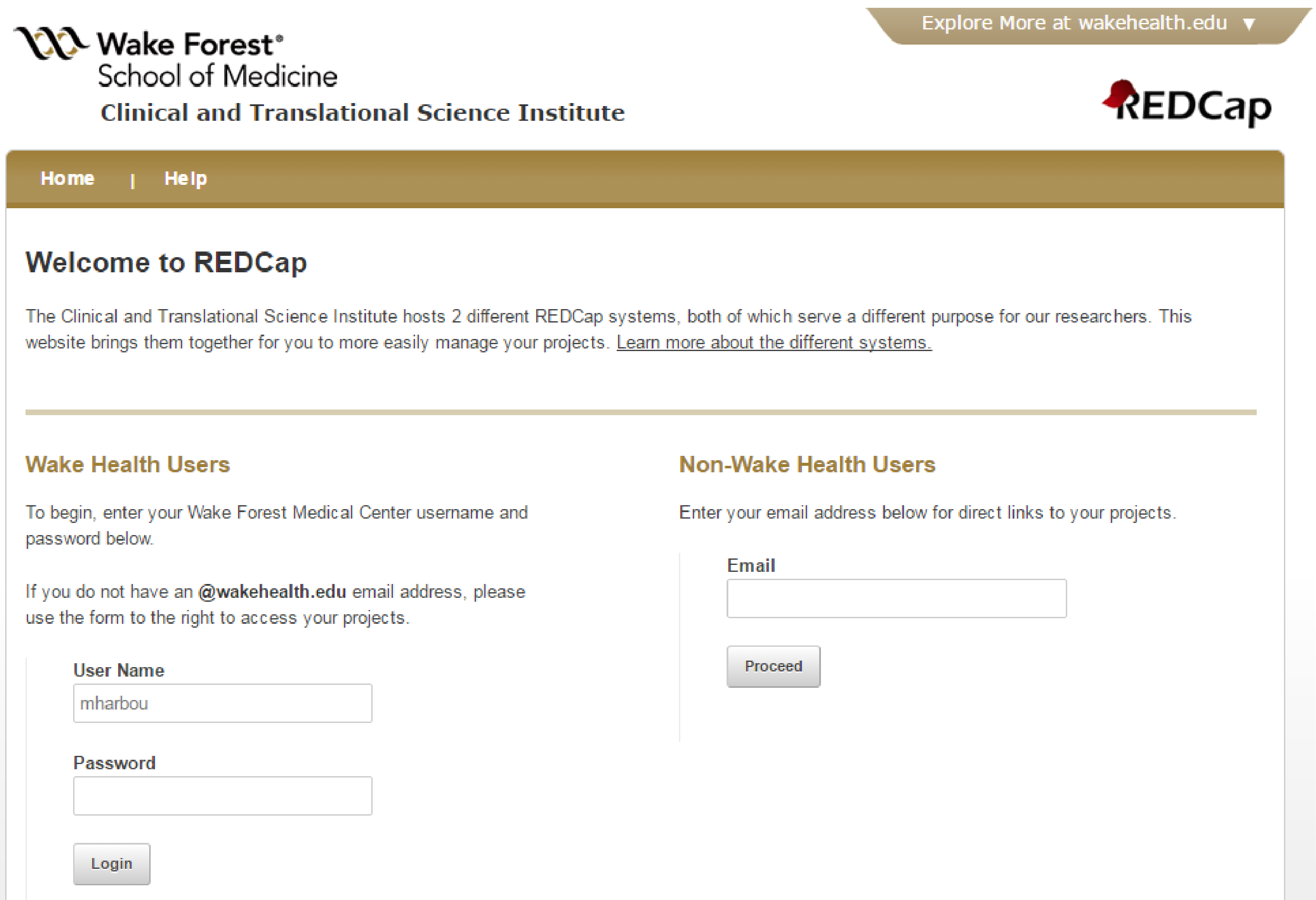
REDCap
Research Electronic Data Capture

The Basics

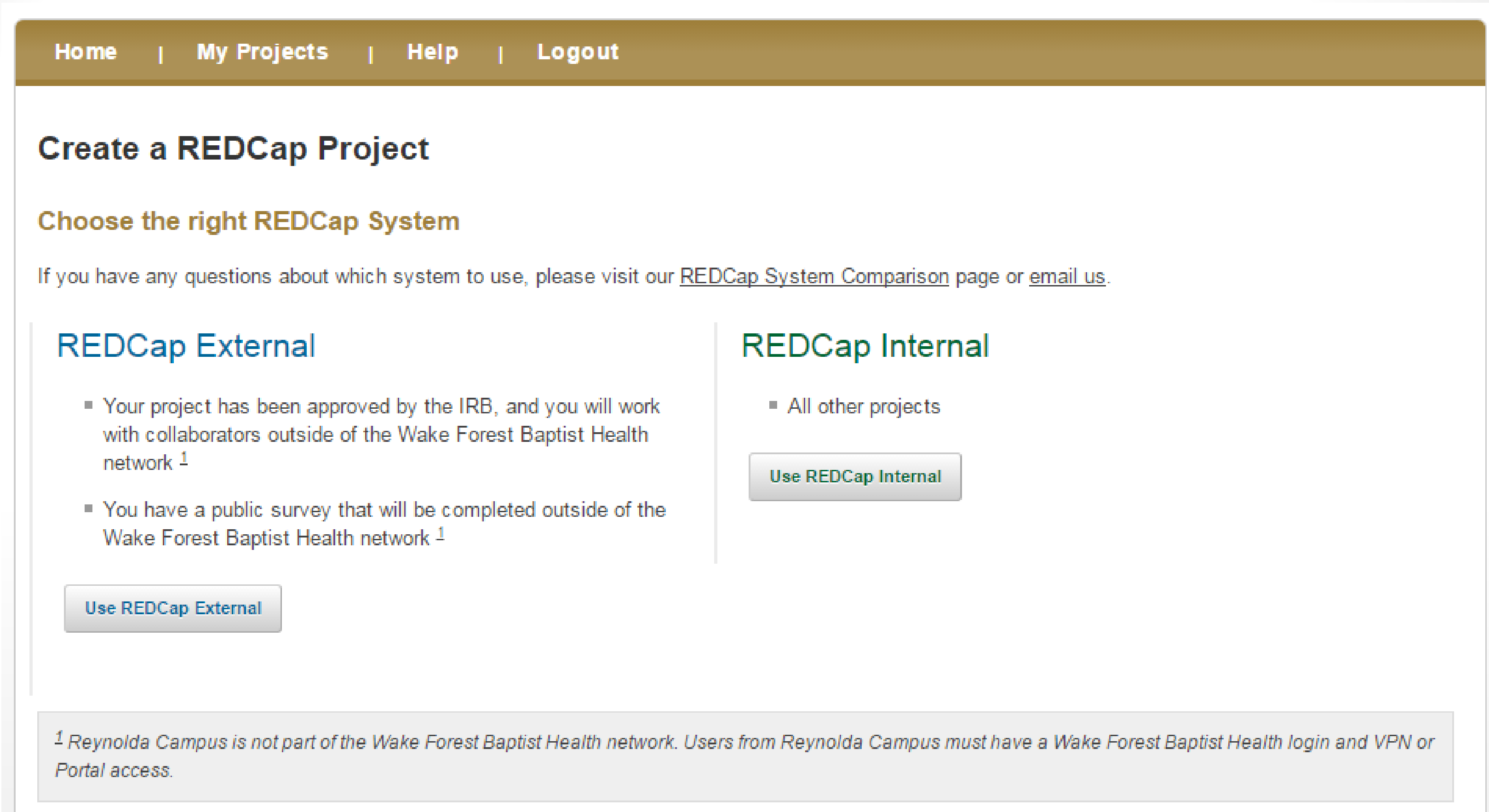
As of December 12, 2016

Accessing REDCap

1. To access REDCap, enter the URL into your internet browser: https://redcap.wakehealth.edu/
2. Login using your Medical Center ID and password
3. FAQ's and tutorial videos are available within the navigational bar by clicking on Help



Choosing the Correct System



- To create a new project, click on the *My Projects* tab then *New Project*. Navigate through the *REDCap Usage Agreement* to the System selection:

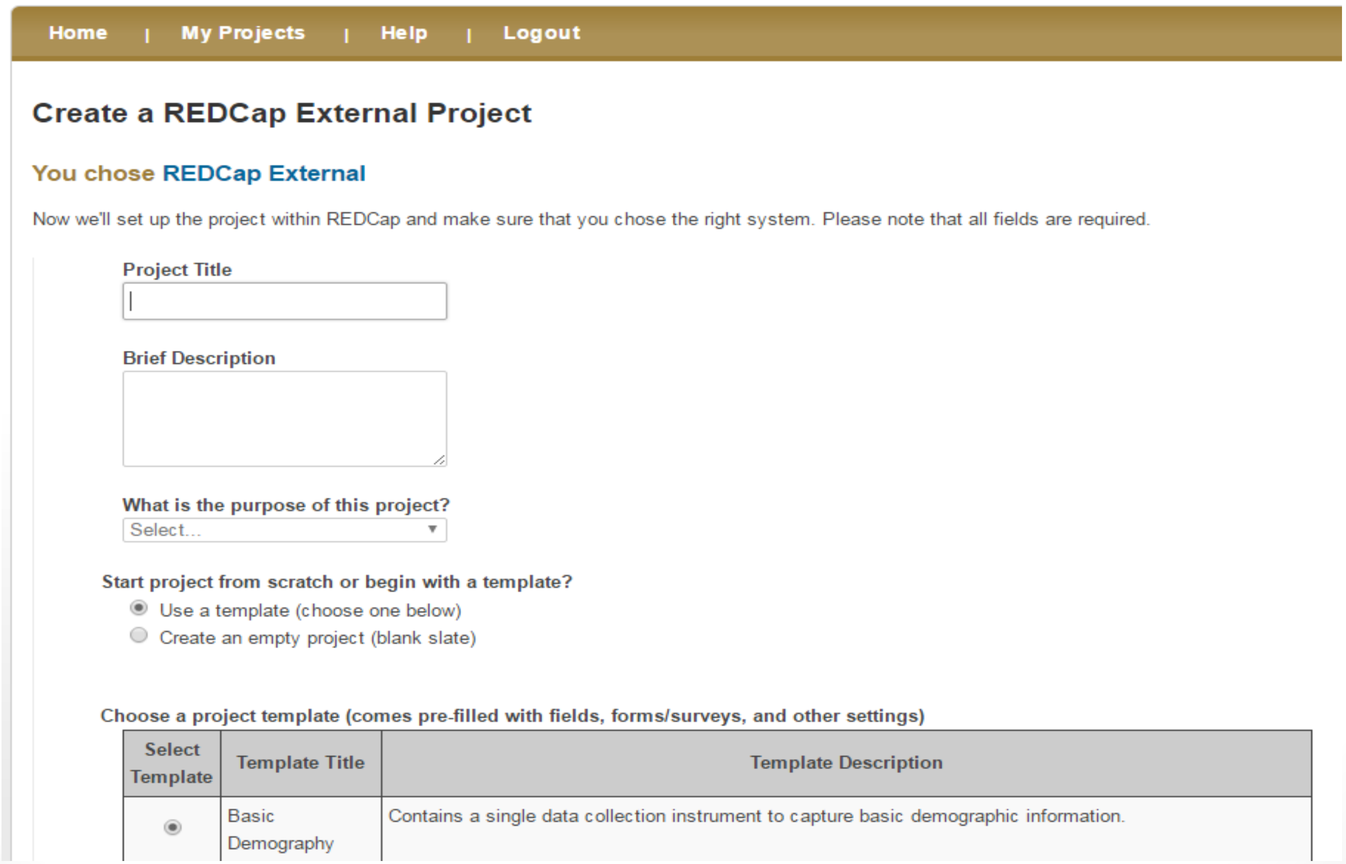
  Internal System - Internal projects that will be accessed only on the Wake Forest network.

  External System - Projects to be accessed outside of the Wake Forest network.

  (For example, surveys that will be emailed to participants.)
- The *REDCap System Comparison* hyperlink will provide additional detail on the available systems.

Create a New Project

1. Enter a Title and Brief Description of the Project
2. Select the appropriate purpose for the Project
    - *Practice / Just for Fun* allows a user to enter practice projects
    - *Research* is for projects that have or will be receiving IRB approval. Additional fields will display with regards to the Principal Investigator, IRB Number, and Research Type
    - *Operational Support*, *Quality Improvement*, and *Other* are additional choices for operational-type tracking
3. Select a template type or create an empty project
    - *Templates* allow the user to add or remove fields from instruments created by REDCap. *Templates* are available for surveys, data collection forms, and other settings. A template may be customized with specific fields for a project.
    - *Create an empty project* allows the user to build their own instruments/fields.



Navigation (Tool) Bar

Once the project has been created, the Navigation (Tool) Bar will appear on the left side of the page.

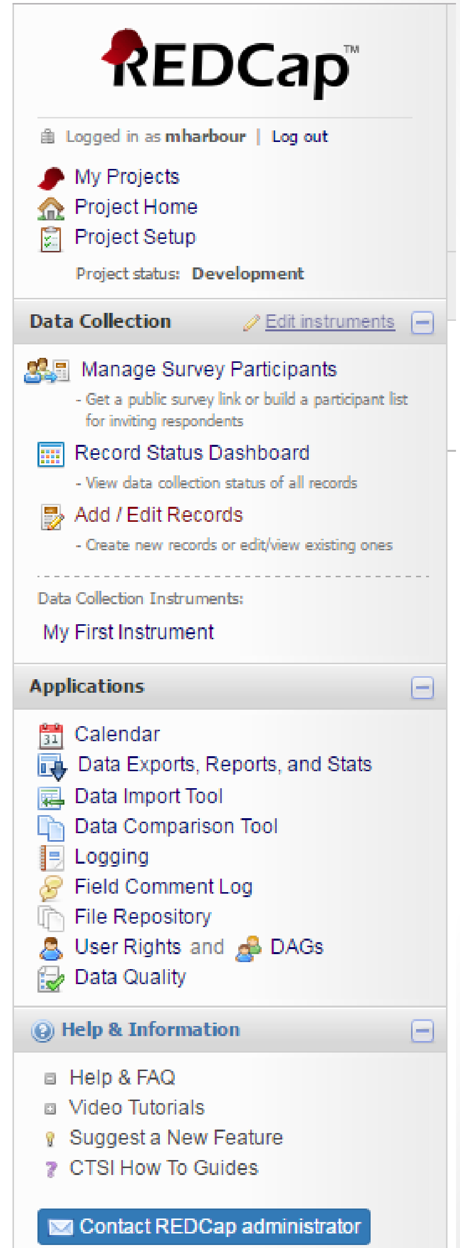
Section 1:
- My Projects, Project Home, and Project Setup allow the user to navigate quickly to the major functionality of the project.
- Notifies the user of the project status.

Section 2 (Data Collection):
- Allows the user to enter new records or navigate to the existing records.
- Allows the user to edit the instruments, if still in development mode.
- Data Collection Instruments will appear as they are created.
- If the survey functionality has been enabled, a Manage Survey Participants hyperlink will appear. This is the location of the general survey link.

Section 3 (Applications):
- Allows the user to navigate to the data export and reporting functionality as well as the User Rights section.

Section 4 (Reports)
- Custom reports created by a user (no reports in the screenshot to the right)

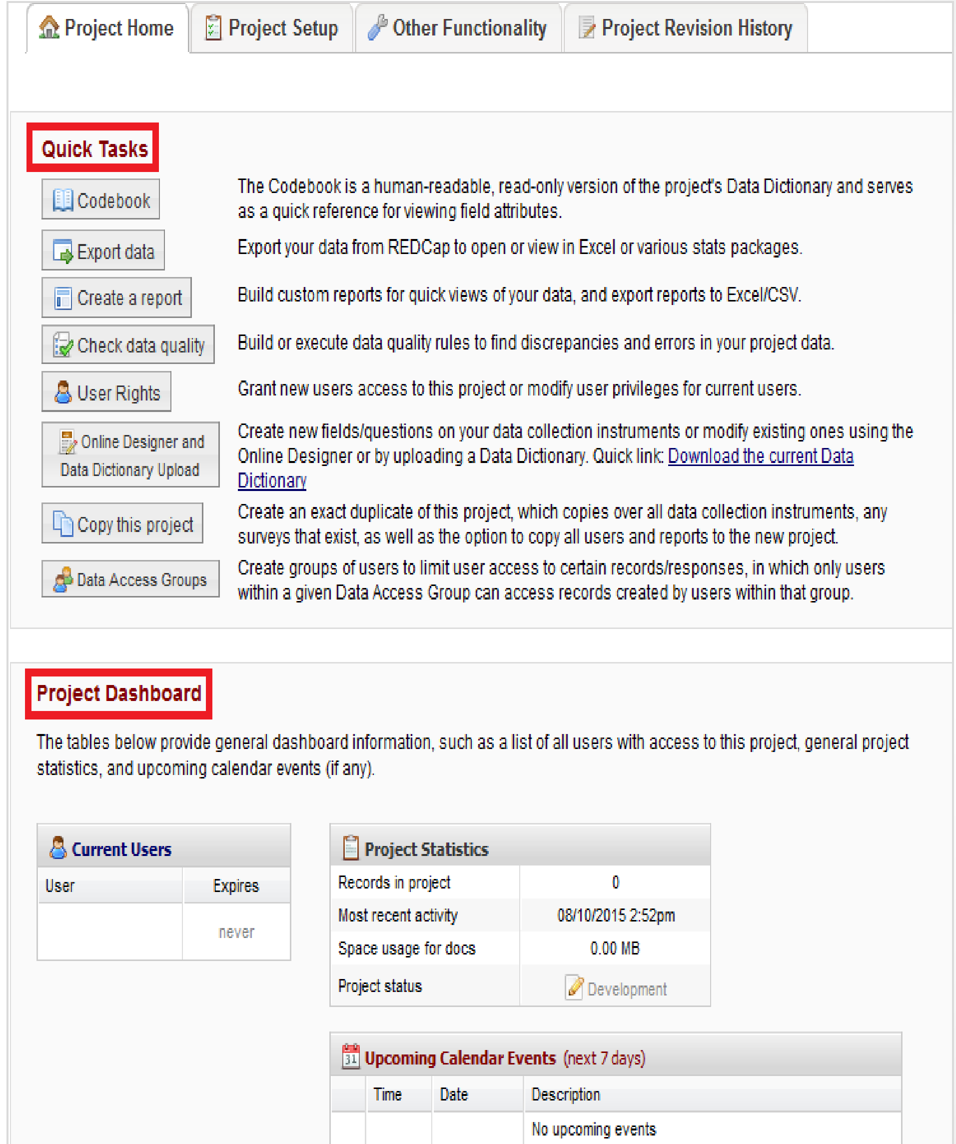
Section 5 (Help & Information)
- Tutorials and FAQs are available to users.



Project Home

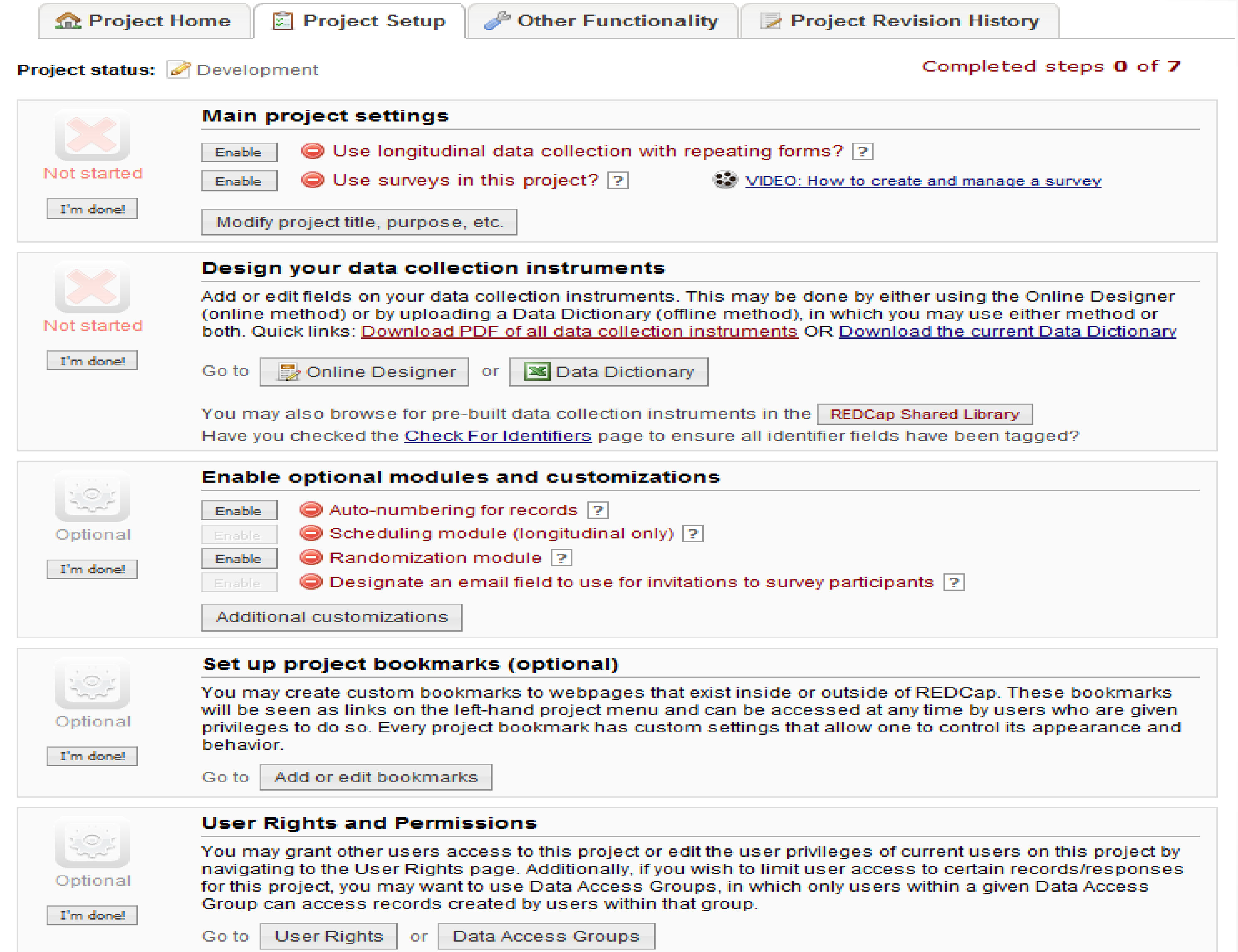
The *Project Home* tab includes a **Quick Tasks** section with short-cut icons for frequently used REDCap tools.

The **Project Dashboard** lists the current users associated with the project, any upcoming calendar events that have been added, and basic project statistics.



Project Setup

The *Project Setup* tab contains progress tools to assist in designing a project.



Project Setup - Main Project Settings

- Enabling **surveys** allows the user to send a form/questionnaire via email or post as a link. Additional information regarding surveys will follow later in the presentation.

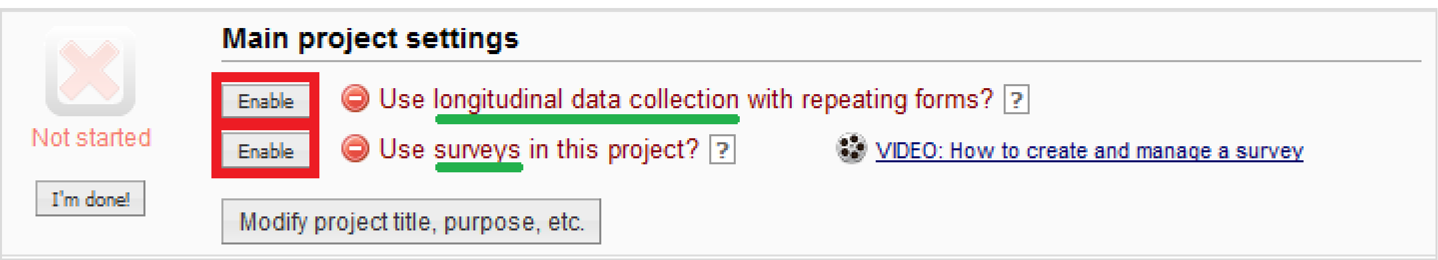
- Enabling **longitudinal data collection** will allow the user to utilize the same form(s) at multiple events (time points).

    - For example, a user may create a demographics form which would be used at Baseline. The project may also include questionnaires that would be used at Events 1, 2, and 3. If a form will be used multiple times for a participant, enabling longitudinal data collection is beneficial.

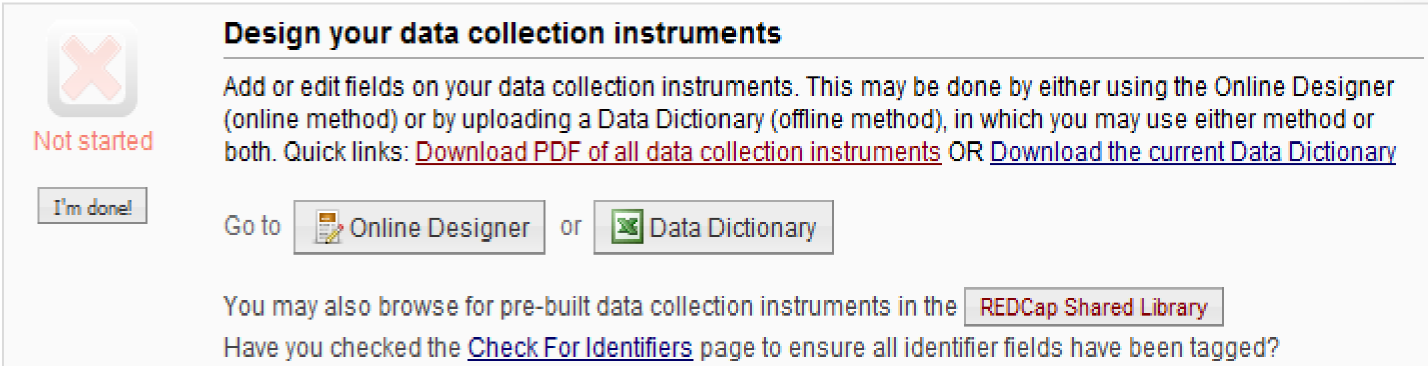
    - When the longitudinal data collection is enabled, the user will have a step on their project setup screen that will allow the user to define their events and subsequently designate the forms to be used at each event.

        - When defining events, the user will be able to add event names.

        - Once the user has defined the events, they must then designate instruments for the events. This process includes checking the boxes for the forms to be included within an event. If a box is not checked for a form, then the form will not appear when entering data. Each form must be attached to at least one event.



Project Setup - Designing the Data Collection Instruments



Three sources for creating the Data Collection Instruments:

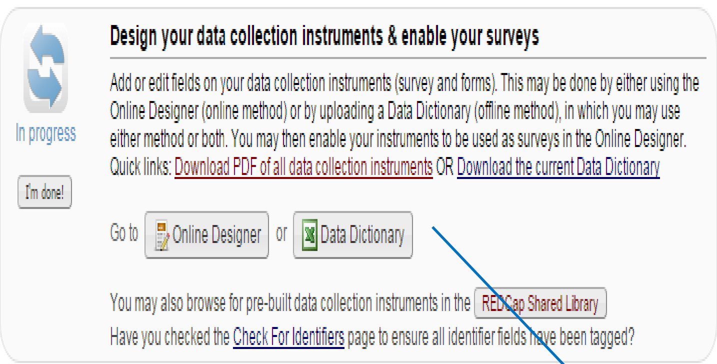
- The Online Designer is a simple way to develop project questions from scratch. The user can select how the questions are formatted, etc. Creating the questions using the Online Designer is covered in the subsequent slides.

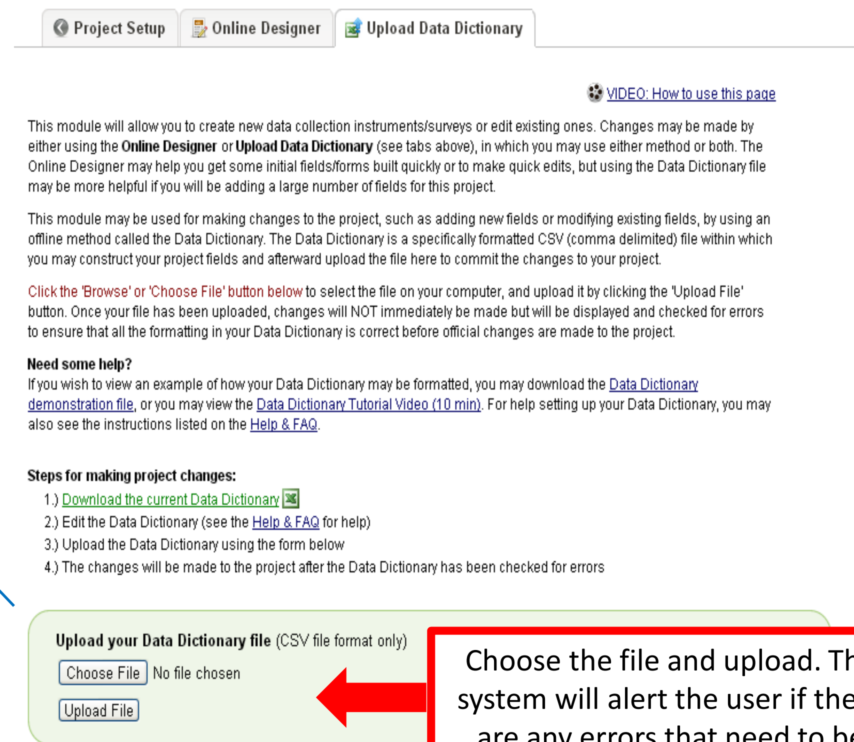
- A Data Dictionary is an Excel version of the forms. This option is most effective when the user has already created forms within REDCap that will be used for multiple projects. The Data Dictionary can be downloaded from one project and then uploaded into another project. REDCap will use the data dictionary to create the forms and questions within the project.

- The REDCap Shared Library contains pre-designed forms that a user can download into their project. The REDCap Consortium adds to and updates the Shared Library.

Creating/Editing Data Collection with the Data Dictionary Upload

- The Data Dictionary allows a user to upload previously created forms into other REDCap projects.
- The Data Dictionary files must be saved in the CSV format.
- If it is a new project and you have not created any fields, then the Data Dictionary upload will create the fields.
- If the project has existing forms, this will replace anything you may have previously created within the project.
- To add a form to what is already existing within REDCap, first download the data dictionary of the current project. Second, merge the excel files to include what is already in your project and the new forms you want to add. Third, upload the newly created file. Note the message that is prompted after the new file has been uploaded. The message will alert the user of how many fields are being added.

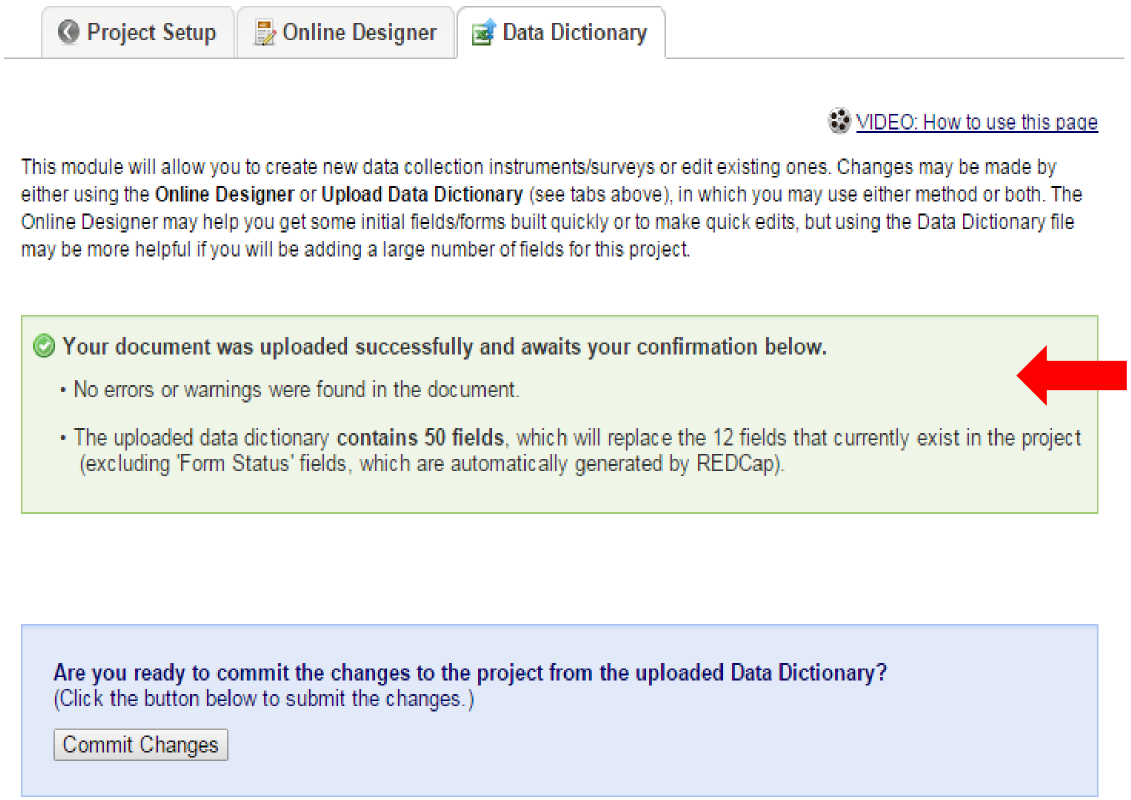




Choose the file and upload. The system will alert the user if there are any errors that need to be fixed and how many fields will be replaced, if any.

Data Dictionary Upload

- The message below will display once the user has uploaded a csv file containing a data dictionary.
- In this example, the data dictionary upload contained two new forms with 50 fields. The project already contained two forms with 12 fields. The notice below indicates the two forms with 12 fields will be replaced by the two new forms and 50 fields. If the results are accurate, then select the button to commit the changes.



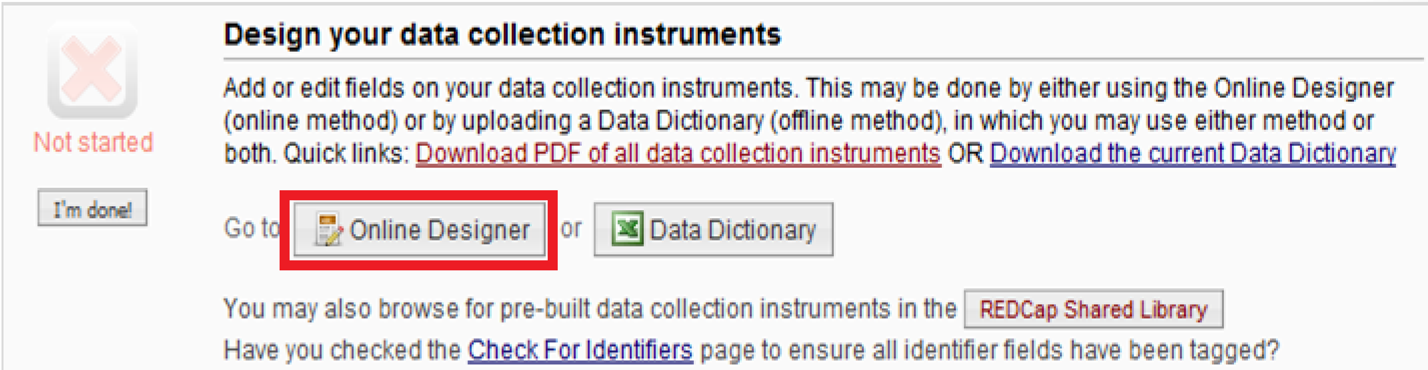
This box will alert the user to what is being replaced. If this is a new project without pre-existing forms, then the value will be 0 fields. If the user is adding or amending the project, ensure the values are correct (as in the example presented).

(If you are only adding additional forms, make sure the data dictionary contains more fields than the current project.)

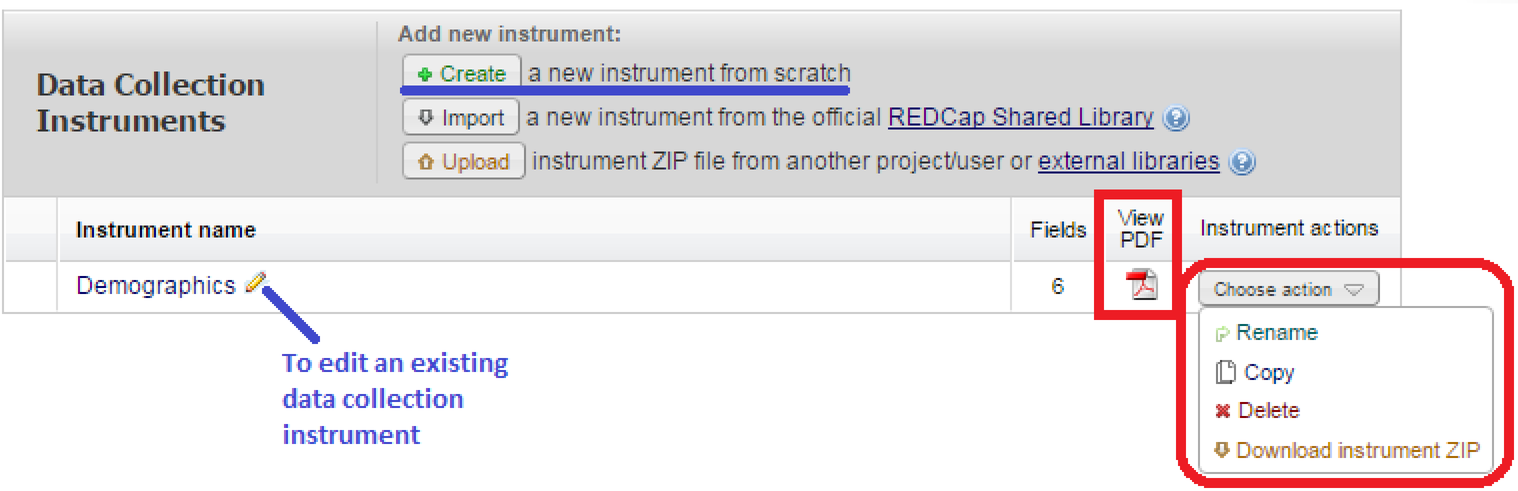
* It is very important to always include what is currently in your project along with additions and corrections you have made in the data dictionary when uploading.

Creating/Editing Data Collection Instruments with the Online Designer

Online Designer



Create, Edit, and Print Data Collection Instruments/Forms



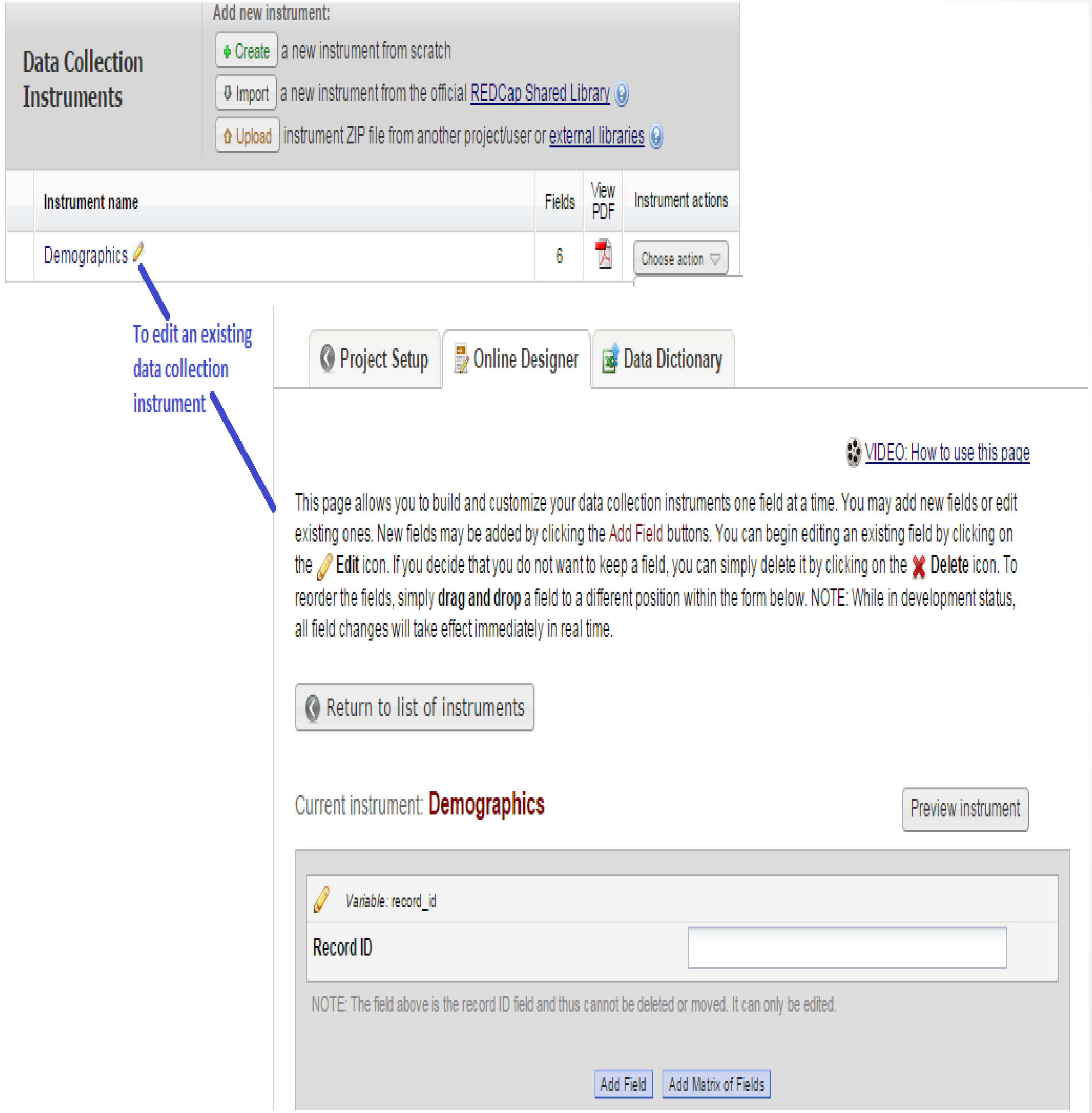
To edit an existing data collection instrument

Modify Data Collection Instruments

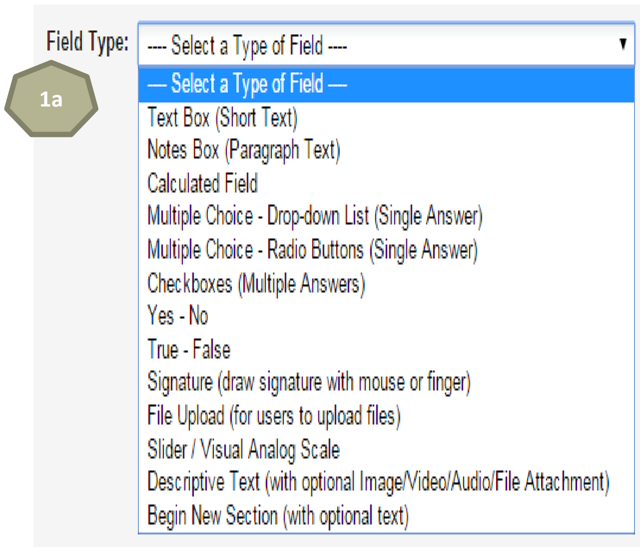
From the Online Designer tab, the user will click on the pencil icon to edit the Instruments.

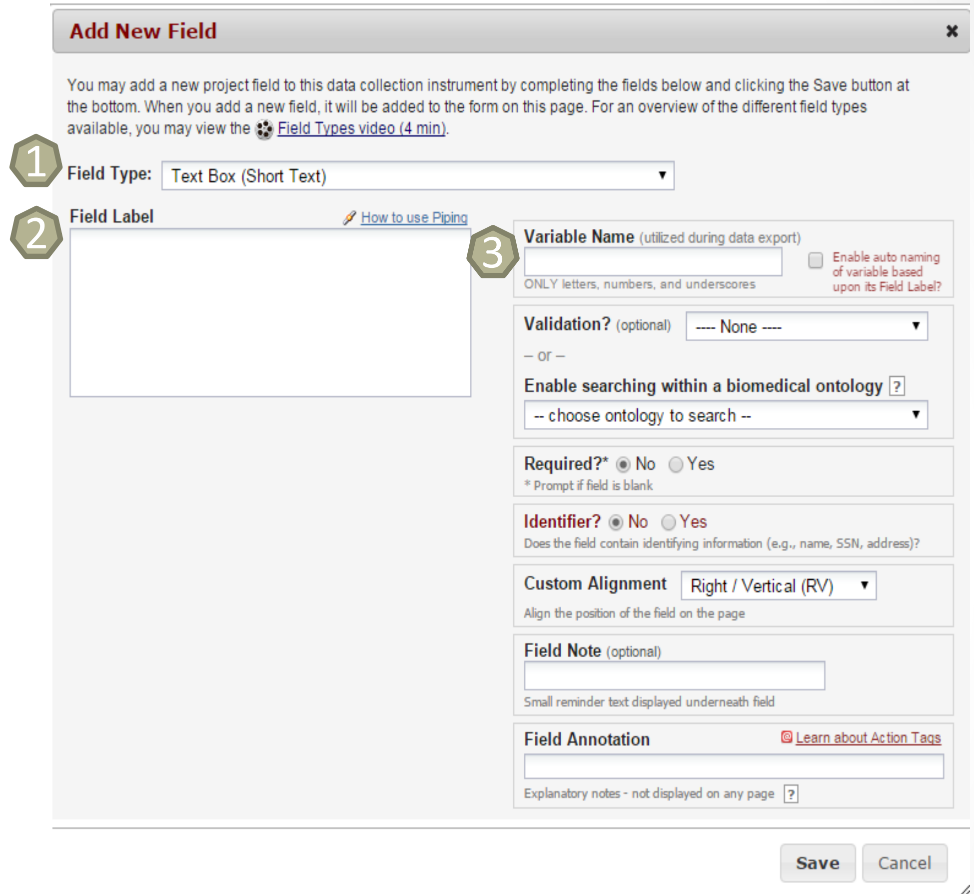
Note: The first field on the first form will be the Record ID. This field is an identifier that will connect all the instruments to a single participant/record. You cannot delete this field or move it to another location within the instrument.

The user may add questions to the form by choosing Add Field.



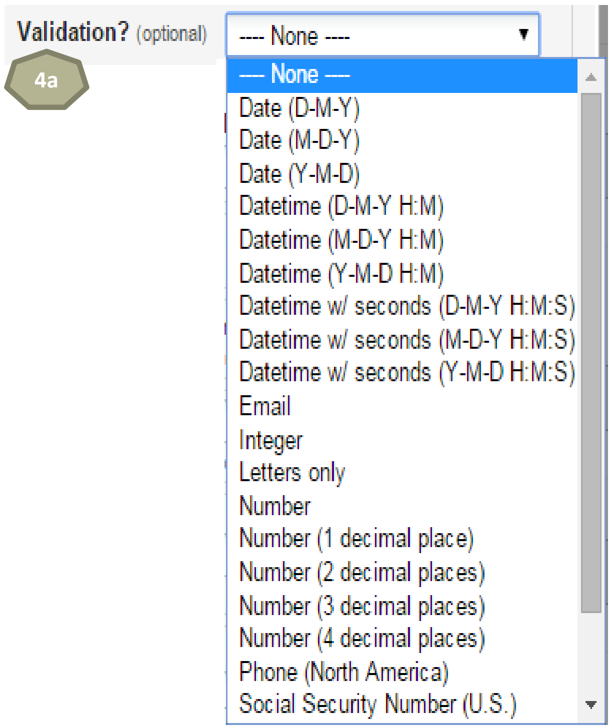
Essential Steps for Creating a new Field

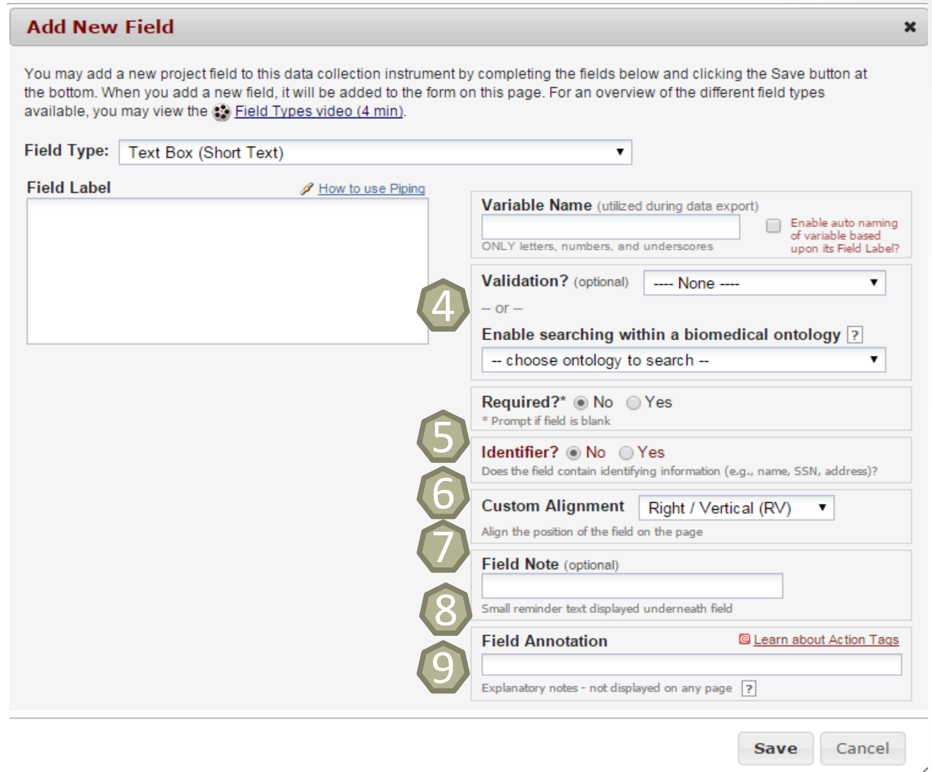




1. FIELD TYPE: The field type is the style of question to be asked. **1a** reflects the drop-down options.
2. FIELD LABEL: The question to be asked on the Instrument. For example, “What is your gender?”
3. VARIABLE NAME: This field is used for advanced functionality, data exports, and reporting.
   Variable names cannot be duplicated or begin with a number. The variable name is limited to 26 characters.
   An example variable name would be ‘gender’.

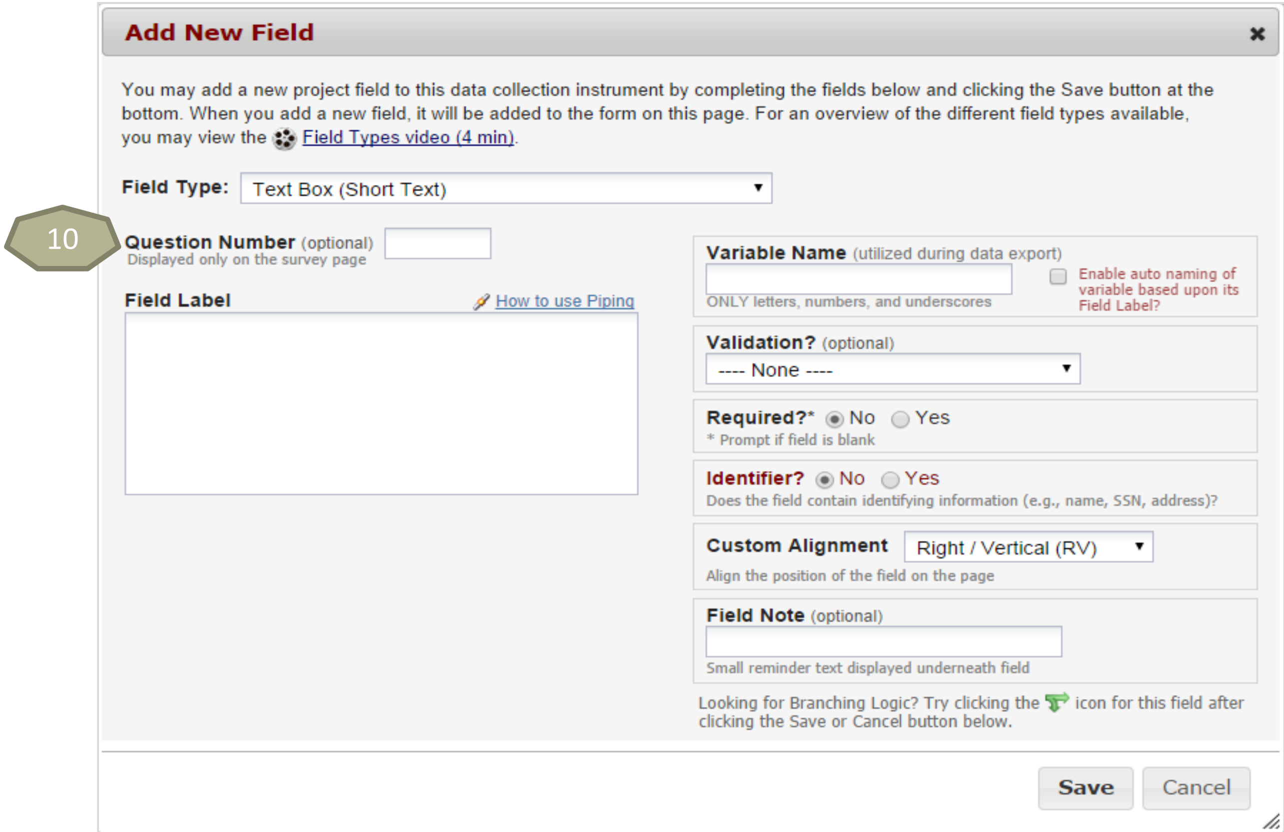
Customizing Steps for Creating a New Field





4. VALIDATION: The validation option is only available for Text Box field types. This allows you to validate the response for a date, time, number, integer, email, phone number, or zip code (options listed in 4a). Minimums and maximums are also an available feature within validation. This ensures accurate responses and is highly recommended if it is applicable to your question.
5. REQUIRED: If a field is designated as “Required?”, REDCap will prompt a notification if the question is not answered. Survey respondents will NOT be able to submit their survey without answering required fields, although the data they entered will be saved.
6. IDENTIFIER: If the question is one of the 18 HIPAA identifiers, the user must select “yes” that it is an identifier. This also allows for exporting of de-identified information.
7. CUSTOM ALIGNMENT: Allows the user to choose how the question is positioned within the Instrument.
8. FIELD NOTE: A small reminder that will display underneath the answer options.
9. FIELD ANNOTATION: Can be used to add explanatory notes or commentary about a given filed. Can also use action tags.
This field is not displayed on a page, it is merely for reference.

Customizing Steps for Creating a New Field

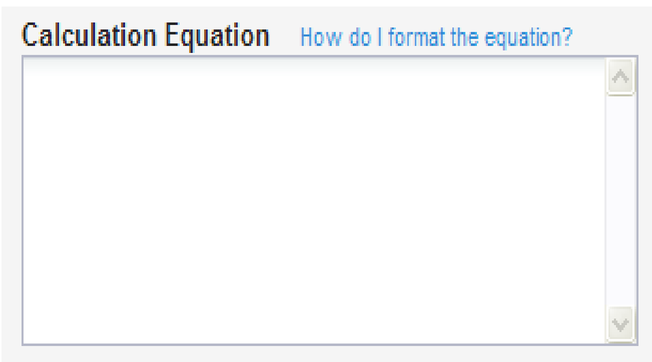


10. QUESTION NUMBER: If the Instrument is a survey and the user has selected custom question numbering within survey settings, then the user also has the option to assign a number to the field. The assigned number will only display on public surveys. **The numbers do not adjust for branching logic.**

Additional Steps for Calculated Field

In addition to the fields that were discussed on the *Essential Steps and Customizing Steps for Creating a New Field* slides, the following field information is required for a Calculated Field:

Calculated Field:



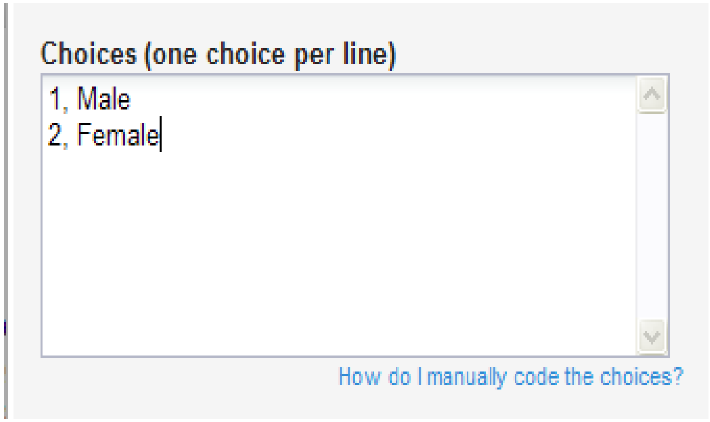
- The user will be required to enter a calculation using variable names in the correct order of operations.
- To get started with formatting the equation, select the link 'How do I format the equation?'
- This field can be used for basic calculations (ex: calculating a person's BMI), but can also be used to determine a score based on respondents' answers.
- Calculated fields will also do rounding, date differencing, and conditional logic.
- Ex: calculating BMI →

  [weight]*10000/([height]*[height])

Additional Steps for Multiple Choice and Checkboxes

In addition to the fields that were discussed on the *Essential Steps and Customizing Steps for Creating a New Field* slides, the following field information is required for a Multiple Choice or Checkbox Field:

Multiple Choice and Checkboxes:

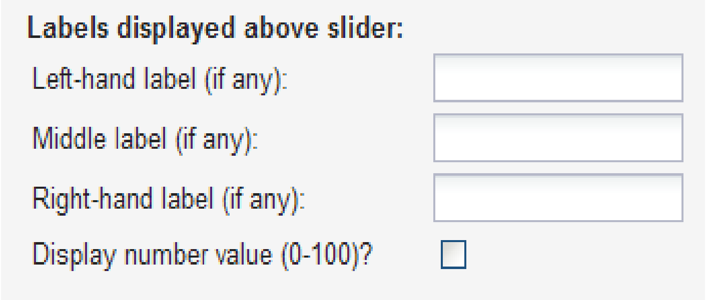


- List each answer option on a separate line.
- REDCap will automatically assign a coded value to the answer options.
- If the user has specific values they would like assigned to an answer, the user may manually enter them. An explanation of how to manually code is available in the *'How do I manually code the choices?'* link.
- While the two multiple choice options (radio button and drop-down list) only allow for one response, the checkbox option allows the respondent to select multiple answers.

Additional Steps for Slider / Visual Analog Scale

In addition to the fields that were discussed on the *Essential Steps and Customizing Steps for Creating a New Field* slides, the following field information is required for a Slider /Visual Analog Scale Field:

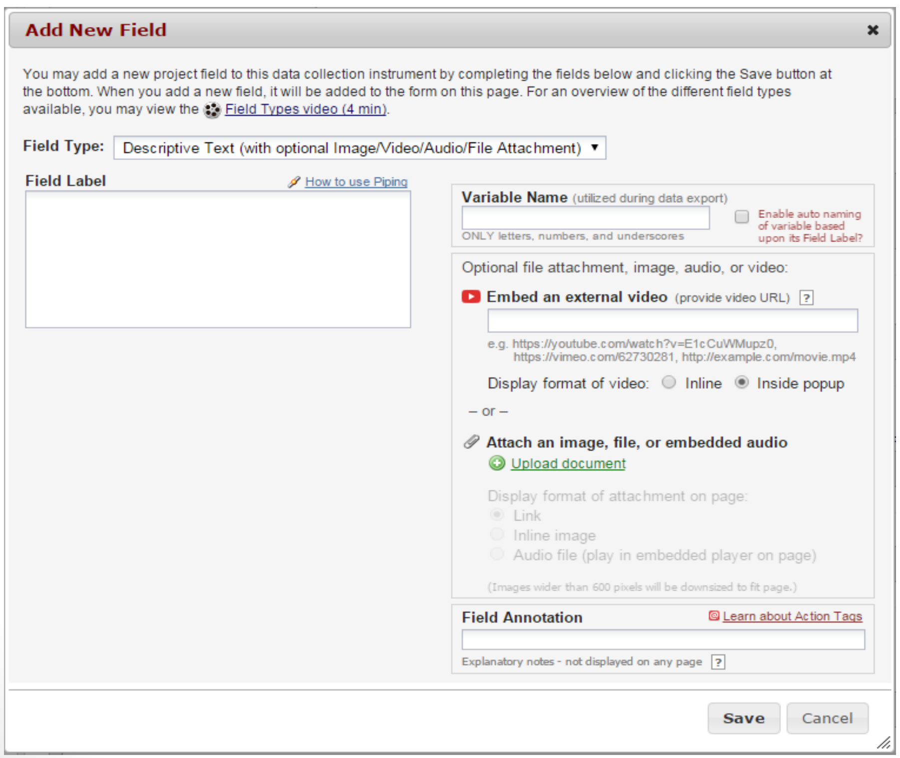
Slider / Visual Analog Scale:



- Produces a slider mechanism that is similar to an “Agree or Disagree” style question. Respondents can slide the bar to the appropriate location to answer the question.
- REDCap will assign this a value from 0 to 100 in the system background; however, if the user would like for this value to be displayed, then select the option to ‘Display number value (0-100)?’
- Labels can be added to appear above the slider mechanism. Labels aid the respondent in knowing how their response is defined.

Additional Features – Descriptive Text Field

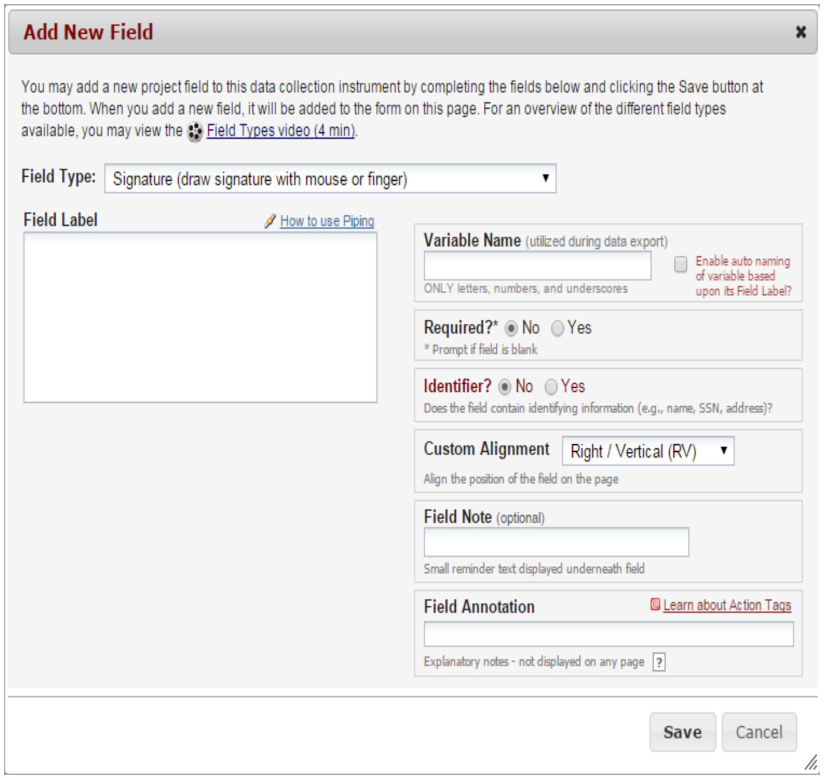
- The Descriptive Text Field Type allows the user to insert extra instructions within their form. This also allows the user to attach an image, file, or embedded audio or video.
- If a file is attached, REDCap will include a link for the respondent to open and view the file.
- If an image is attached, REDCap gives the user the option to include a link, but it also gives them the option to display it as an inline image. If the user selects the inline image option, the image will appear within REDCap (the respondent will not need to open an attachment).



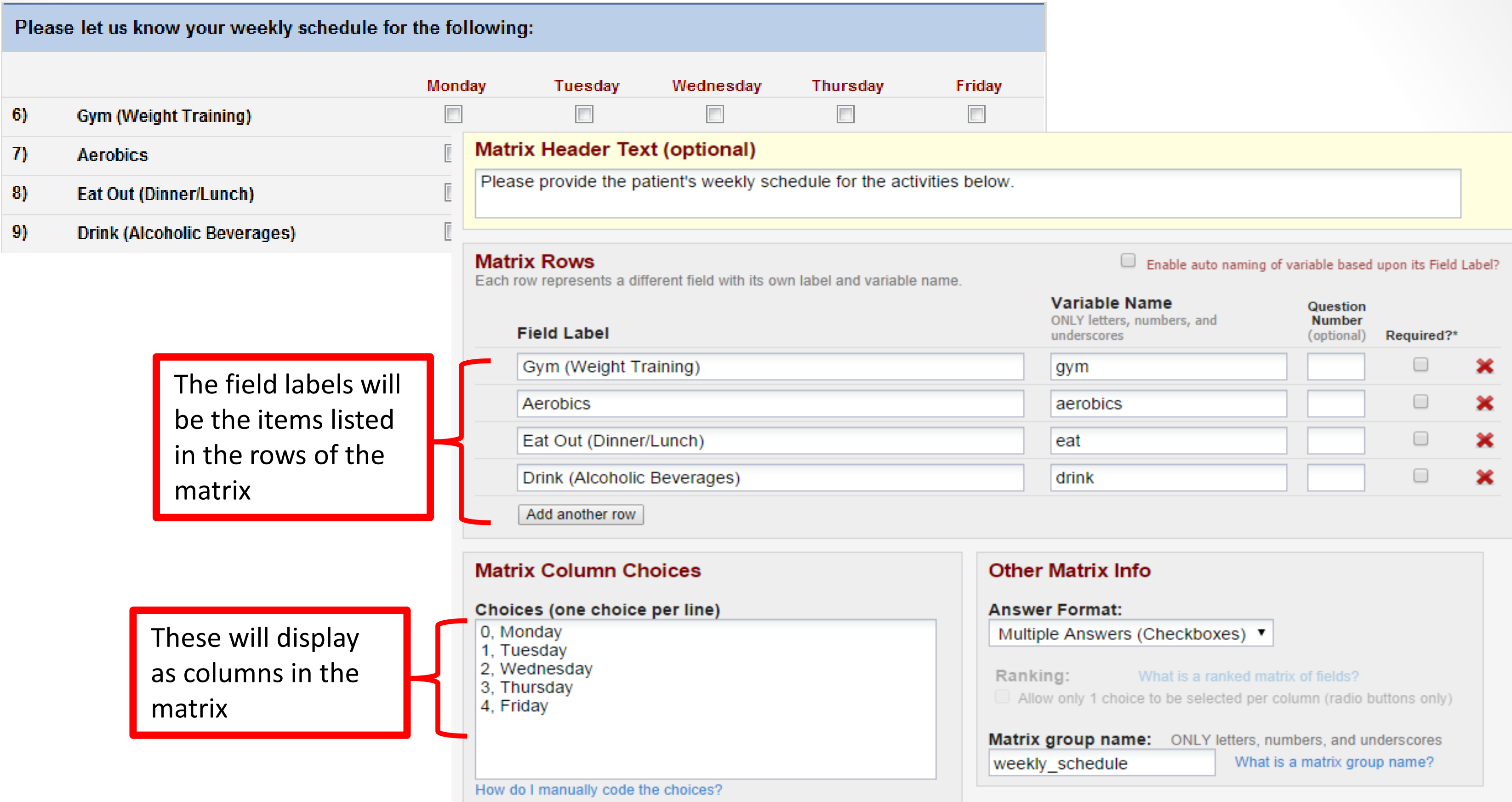
VIDEOs: The user will enter the video's URL (web address) in the "Embed an external video' text box. The video can be set to full-screen mode. The video is not hosted by REDCap, but will be hosted on another server elsewhere on the web and streamed to the user's web browser. YouTube and Vimeo videos are the most compatible video streaming services.

Additional Features – Signature Field

The Signature Field allows a participant to sign with a mouse, stylus, or finger (depending on the type of computer). The signature is saved and will print on the completed form.



Matrix of Fields

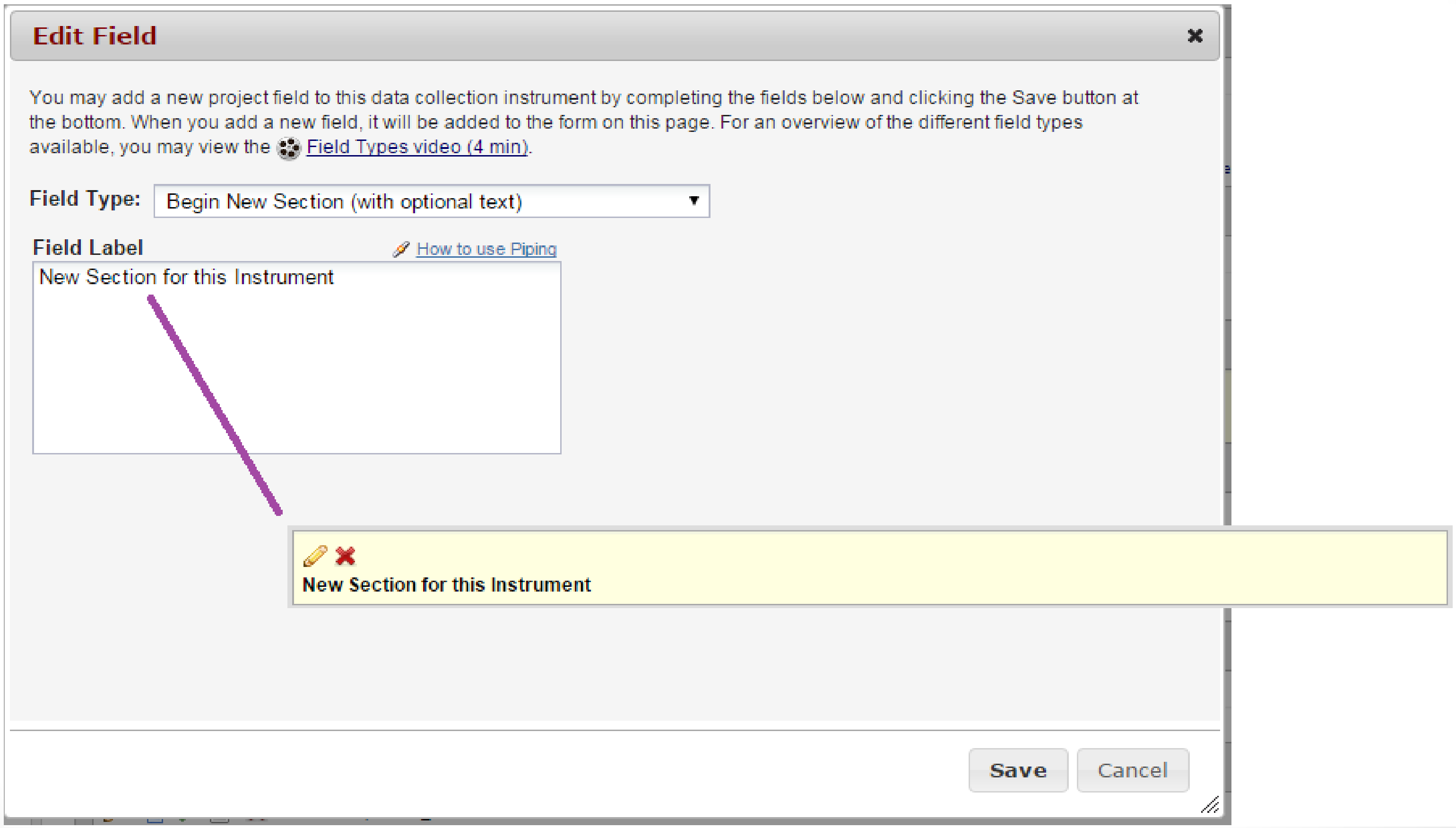


REDCap can display a matrix group of fields as either Single Answer (Radio Buttons) or Multiple Answers (Checkboxes).

1. To start click the "Add Matrix of Fields" button that will appear either above or below each field.
2. If desired, provide a text in the “Matrix Header Text (optional)” box to display a section header above the matrix.
3. Provide the field label and variable name for each field in the matrix. Assign a question number and designate a question as a required field, if needed.
4. Designate the matrix choice columns in the “Matrix Column Choices” box. Then set the answer format for the matrix, either Single Answer (Radio Buttons) or Multiple Answers (Checkboxes).
5. Provide a matrix group name for your matrix of fields. The matrix group name is a tag that is used to group all the fields together in a single matrix group.

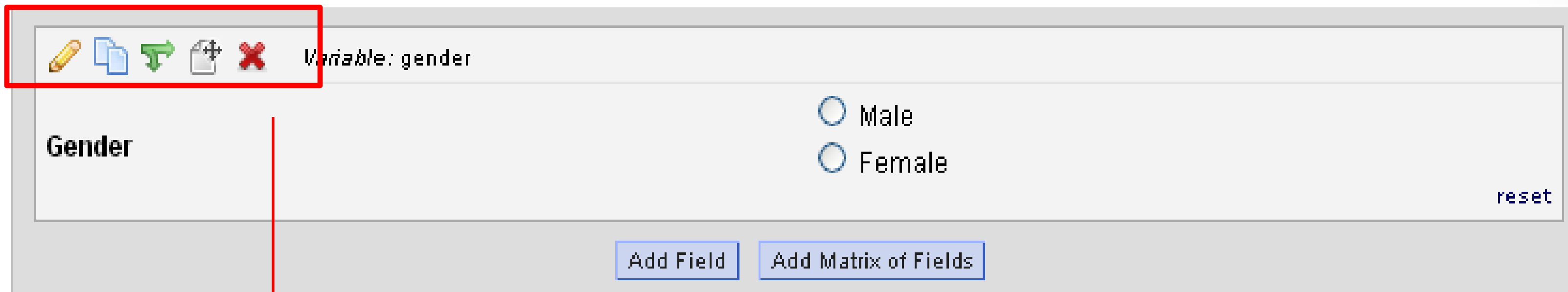
Begin New Section

- The Begin New Section Field Type allows the user to create headers within the Instrument. The headers will appear in a different color.
- An option exists for the survey functionality, which allows the Begin New Section field type to indicate a new page of questions.
- To add a section header, the user must first create their next field. Once that field is created, return to the place where the header is to be located and then add the new field.



Tool Options after a Question is Created

- Once a question is created, the question box contains Question Tools. As seen in the image below, a user can edit the question once it has been created.



Question Tools:

- Edit the question
- Copy the question
- Add Branching Logic to the question (demonstrated on next slide)
- Move the question to a new form or different place on the same form
- Delete the question

Practice

creating a project and adding fields to an instrument

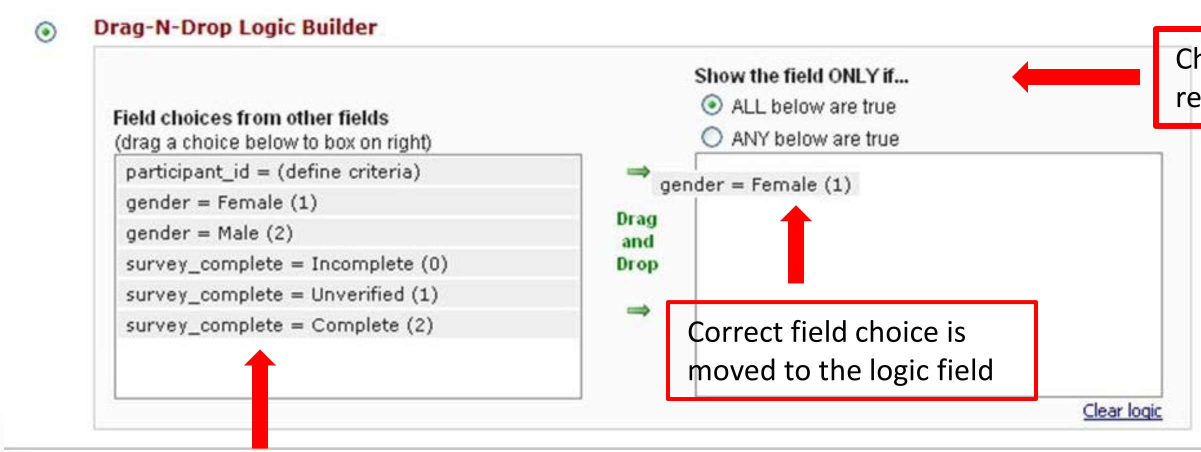
Branching Logic

With branching logic, the creator can choose between two different methods:

- The Drag-N-Drop Logic Builder is automatically selected. This method makes it very simple to apply branching logic to the form, although only less complex branching logic is available this way.
- With the Advanced Branching Logic Syntax, the creator will have to enter a specific formula for branching logic. Complex branching logic can be developed utilizing this tool. Notice the How do I use the advanced Syntax? tutorial hyperlink.

If advanced branching is not required, it is recommended to utilize the Drag-N-Drop Logic Builder to reduce error when adding branching logic.

- Basic format for Logic Syntax: [variable name] = “coded value”
- The above example shows [gender]=“1” which means “Are you pregnant?” will only be displayed if the response to “What is your gender?” is ‘1, Female’



Choose between ALL or ANY responses dragged below are true

Correct field choice is moved to the logic field

Includes all possible answer choices

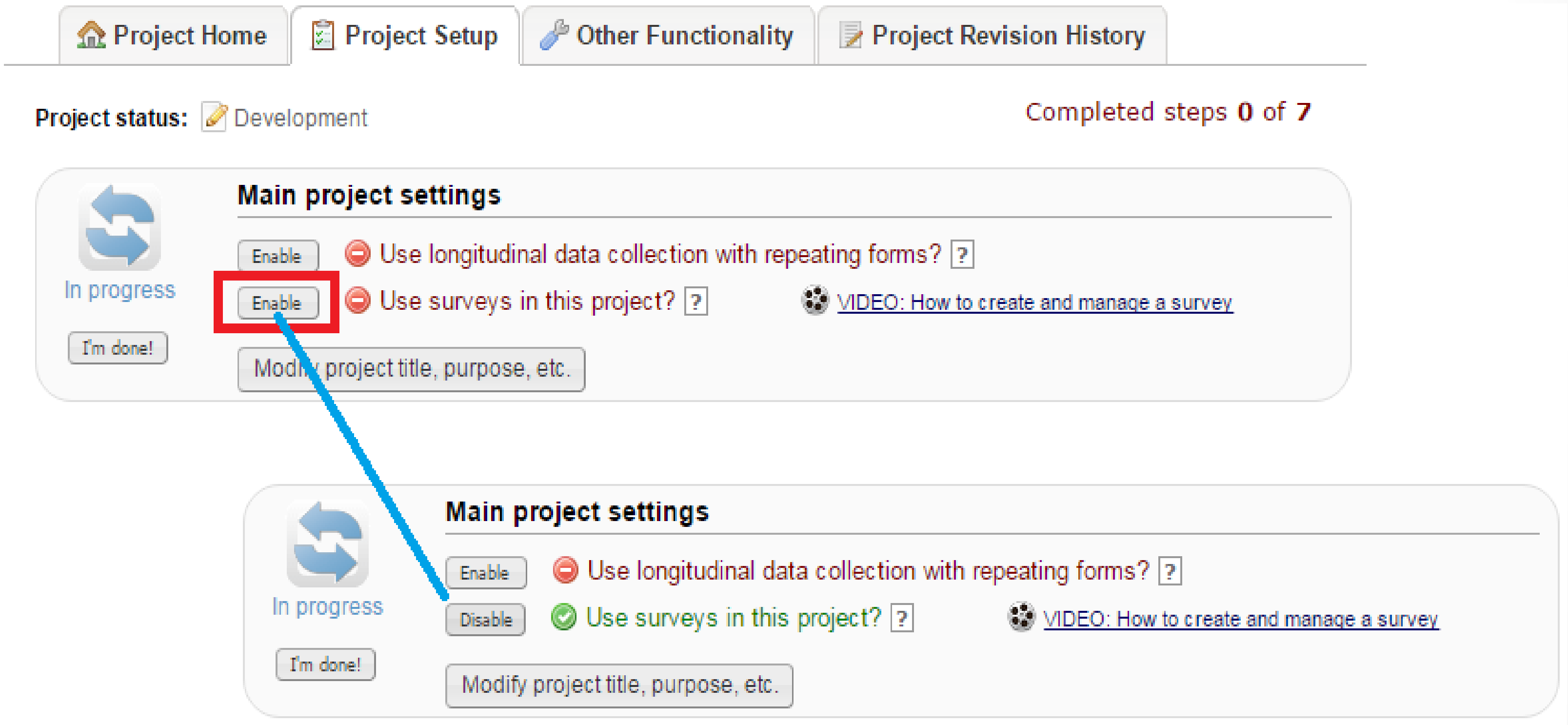
This example shows that the question “Are you pregnant?” will only be asked if someone answers “Female” to the question “What is your gender?”

Practice

branching logic

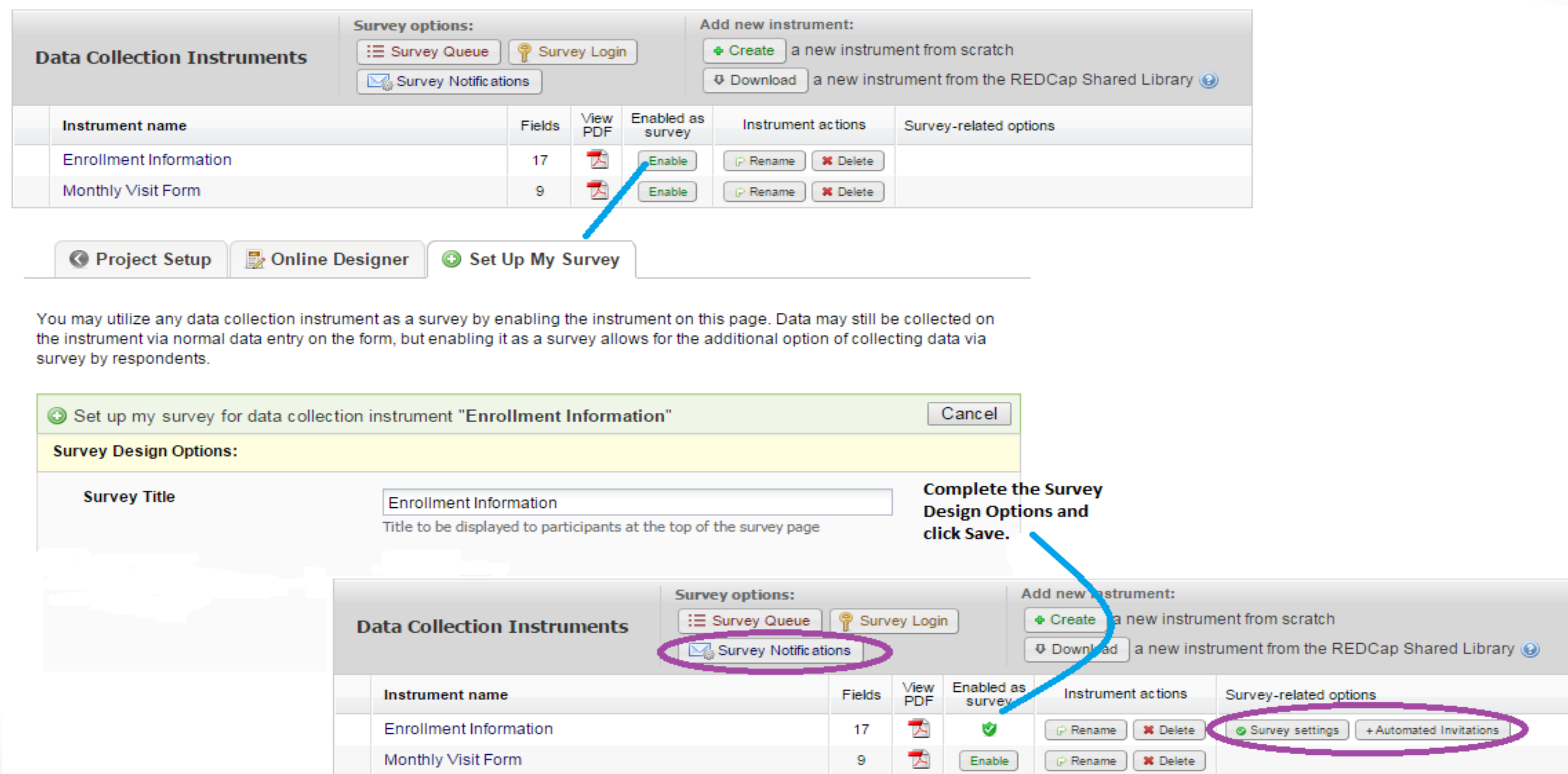
Project Setup - Enable the Survey Functionality

- If the instruments/forms need to become surveys, the user will need to enable the use of surveys in the project. Clicking enable surveys will allow you to then designate which forms will be used as surveys.

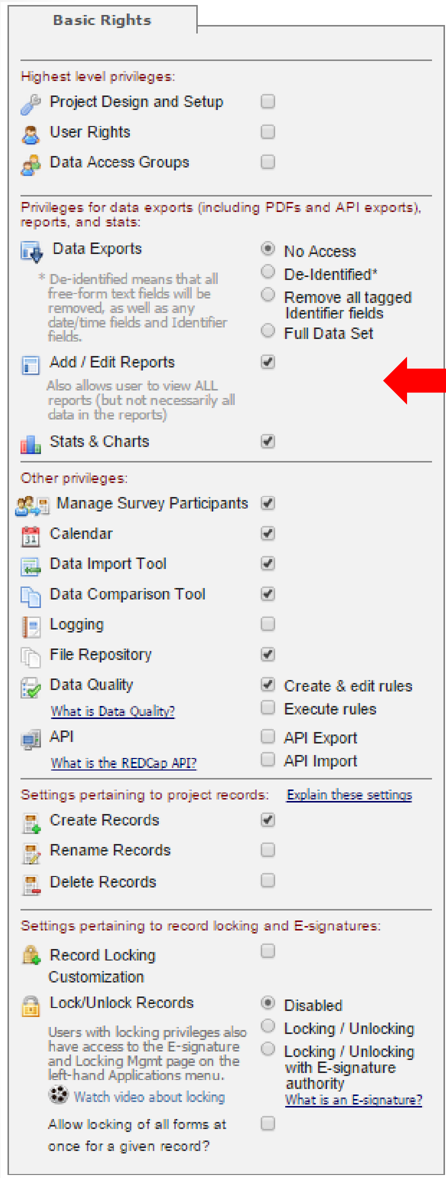


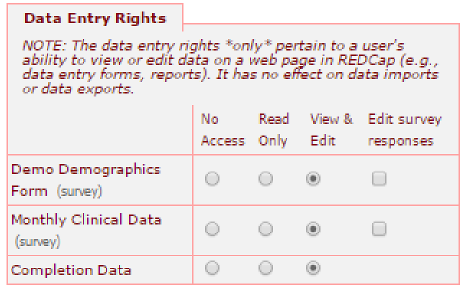
Online Designer – Survey Functionality

- Once the survey functionality has been enabled on the Project Setup tab, navigate to the Online Designer tab to enable the survey functionality on a particular instrument.
- Survey Options:
  - ❖ Survey Settings – allows the user to customize the survey including title, directions, automatically numbering.
  - ❖ Automated Invitations – allows the user to set up survey invitations and have them sent automatically depending on specified conditions.
  - ❖ Survey Notifications – allows the user to select a user of the project to be notified via email every time a survey is completed. Multiple people may be selected.



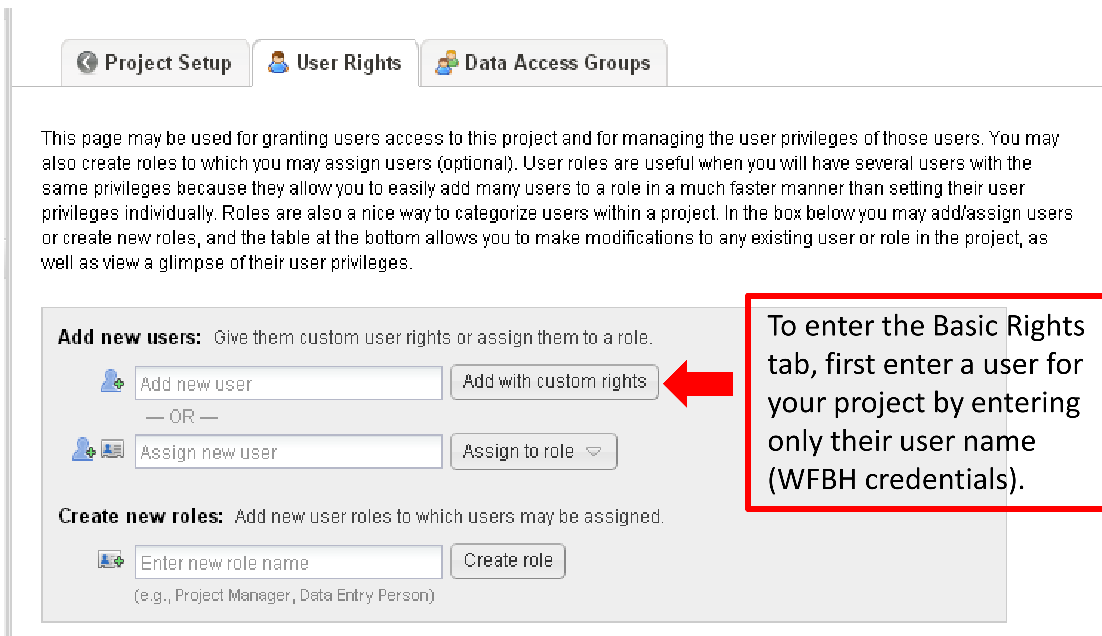
User Rights and Permissions





The Basic Rights tab allows the user to customize rights for each user in the project.

- User Rights is an application on the left side toolbar and also a step in the Project Setup screen that allows a user to add additional users to the project.
- Only users with a MEDCTR ID can be added to your project. If you need to add an outside user you must request that they get a username from the CTSI REDCap Team by using the "External User Request Form" located on the first page after logging into REDCap.
- You can add them with specific rights such as just data entering, or just exporting data or give them a role within the project that allows them to have certain rights.



To enter the Basic Rights tab, first enter a user for your project by entering only their user name (WFBH credentials).

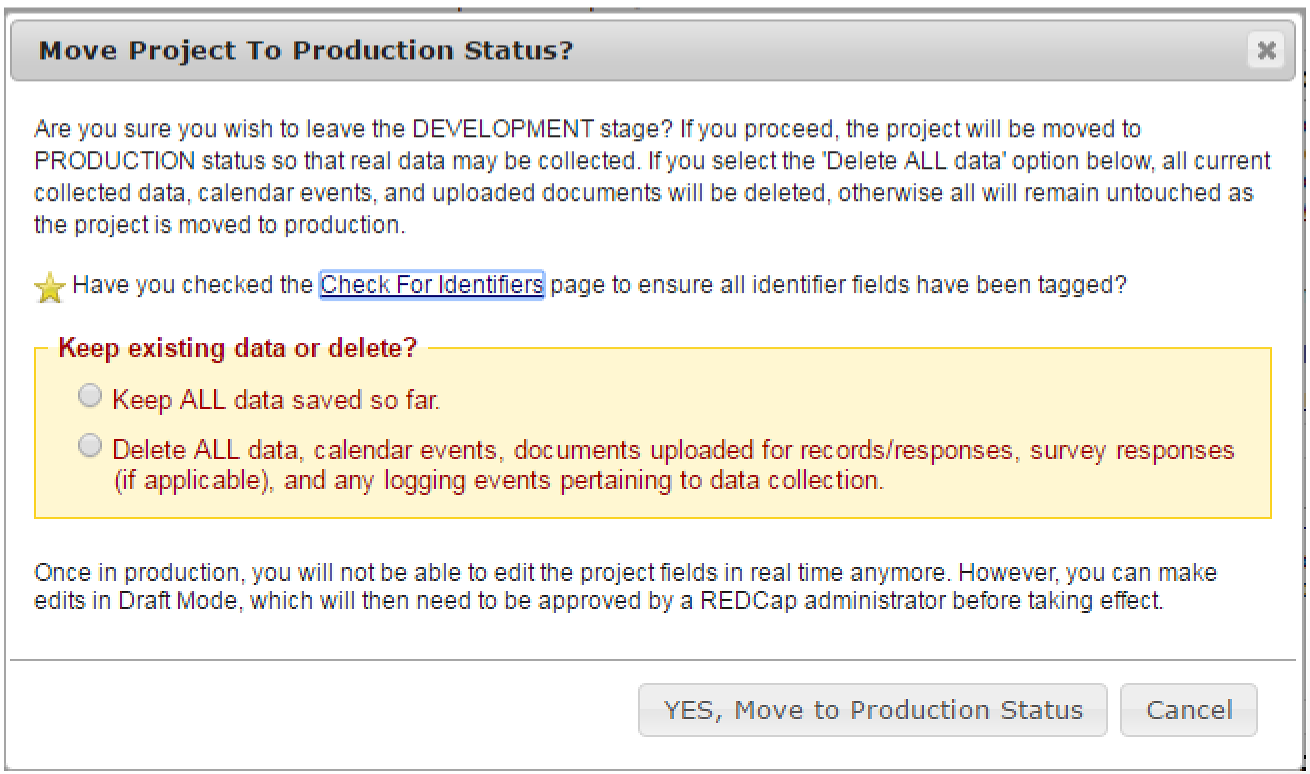
Development to Production

<u>Development</u>

- All project set-up changes happen immediately
- The user can enter “test data” to test all the functionality of the project (flow of questions, branching logic, calculated fields, etc.)

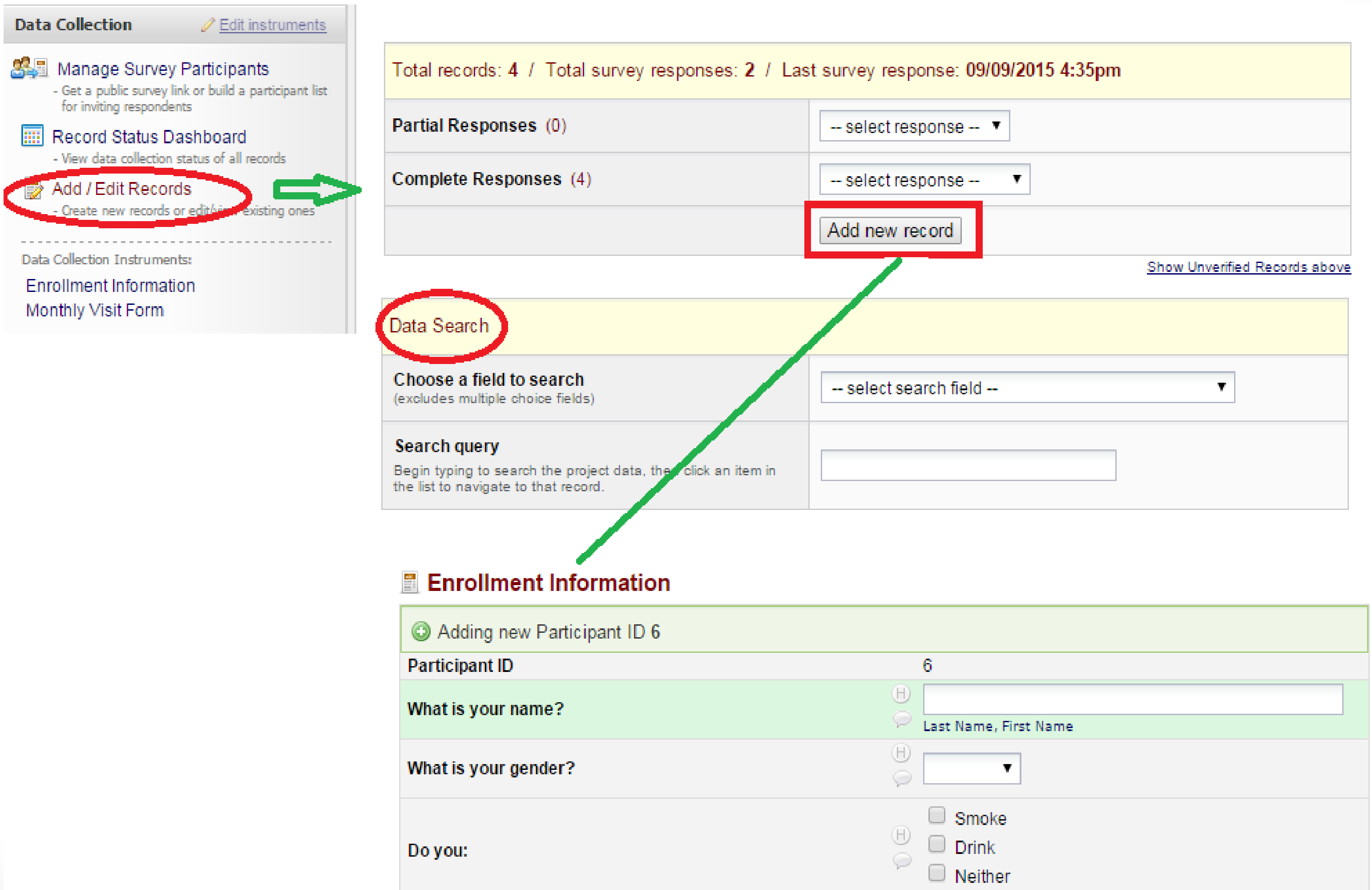
<u>Production</u>

- Any test data that was entered during the Development stage will be deleted prior to entering the production mode.
- Project design changes can still be made; however, the changes do not happen immediately. The project is placed into a ‘Draft Mode,’ changes are made and then are submitted to the CTSI REDCap Team for review. This is to ensure that any design changes do not delete/change any real data.

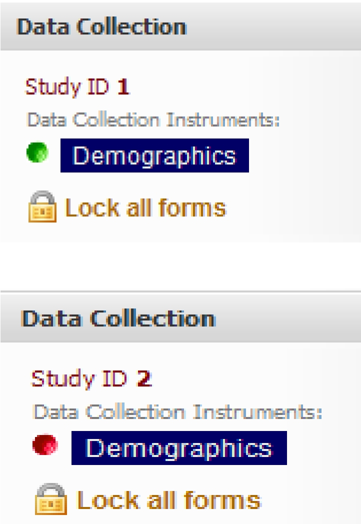


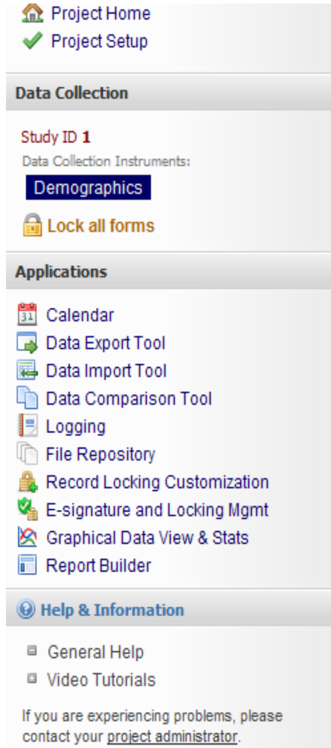
To Begin the Data Collection Process

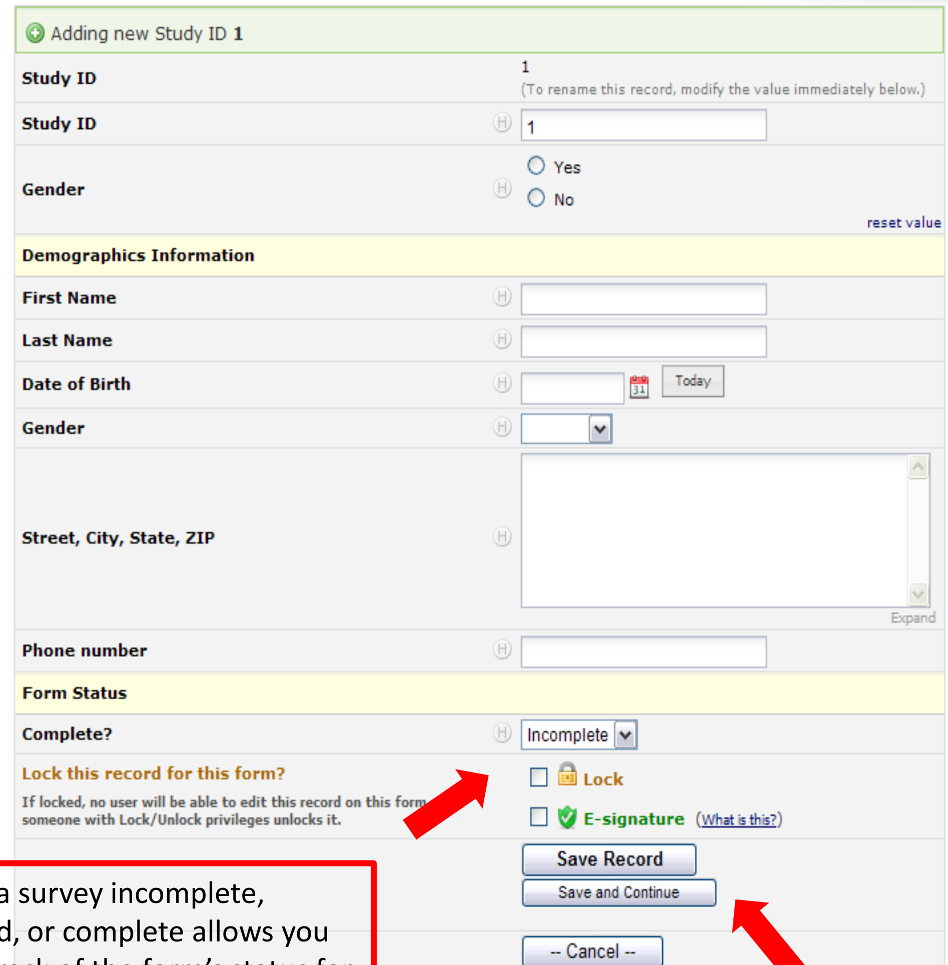
- To enter data, click the Add/Edit Records button on the left side of the screen. The project type (basic, survey, or longitudinal) will dictate a slight change in the appearance of the data entry screen.
  - ❖ The beginning of the data entry screen also has a data search feature that allows the user to search records based on the fields added to the project.
- Click on ‘Add New Record’ to begin entering data.



Data Collection Entries





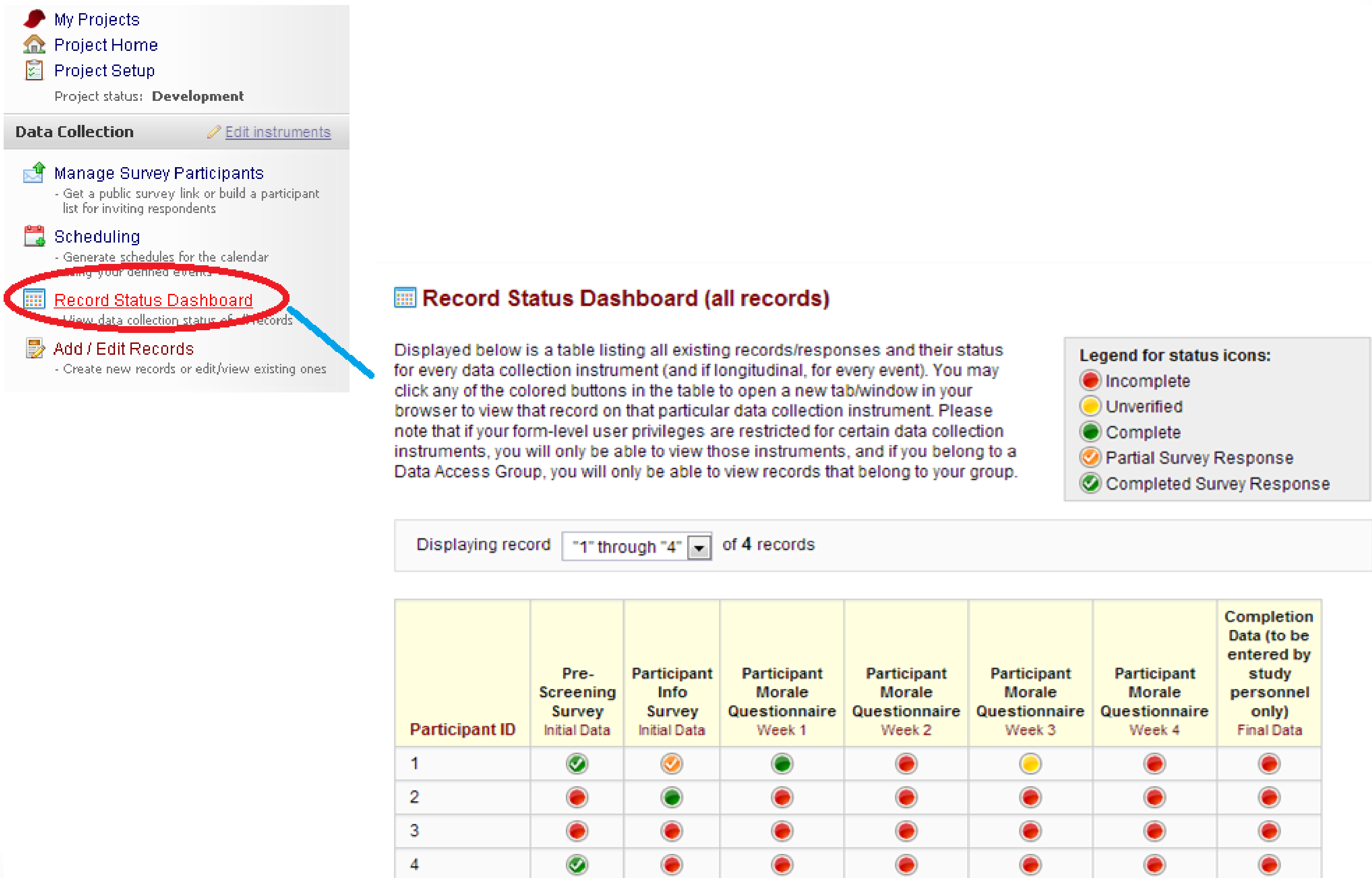


Marking a survey incomplete, unverified, or complete allows you to keep track of the form's status for each record.

The Save or Save and Continue buttons allow you to save the data you have entered and give you options on where to go next.

Record Status Dashboard

- The Record Status Dashboard is located on the left side of the screen, above the Add/Edit Records button. This feature provides the user an overview of the records and the status of the forms or surveys.

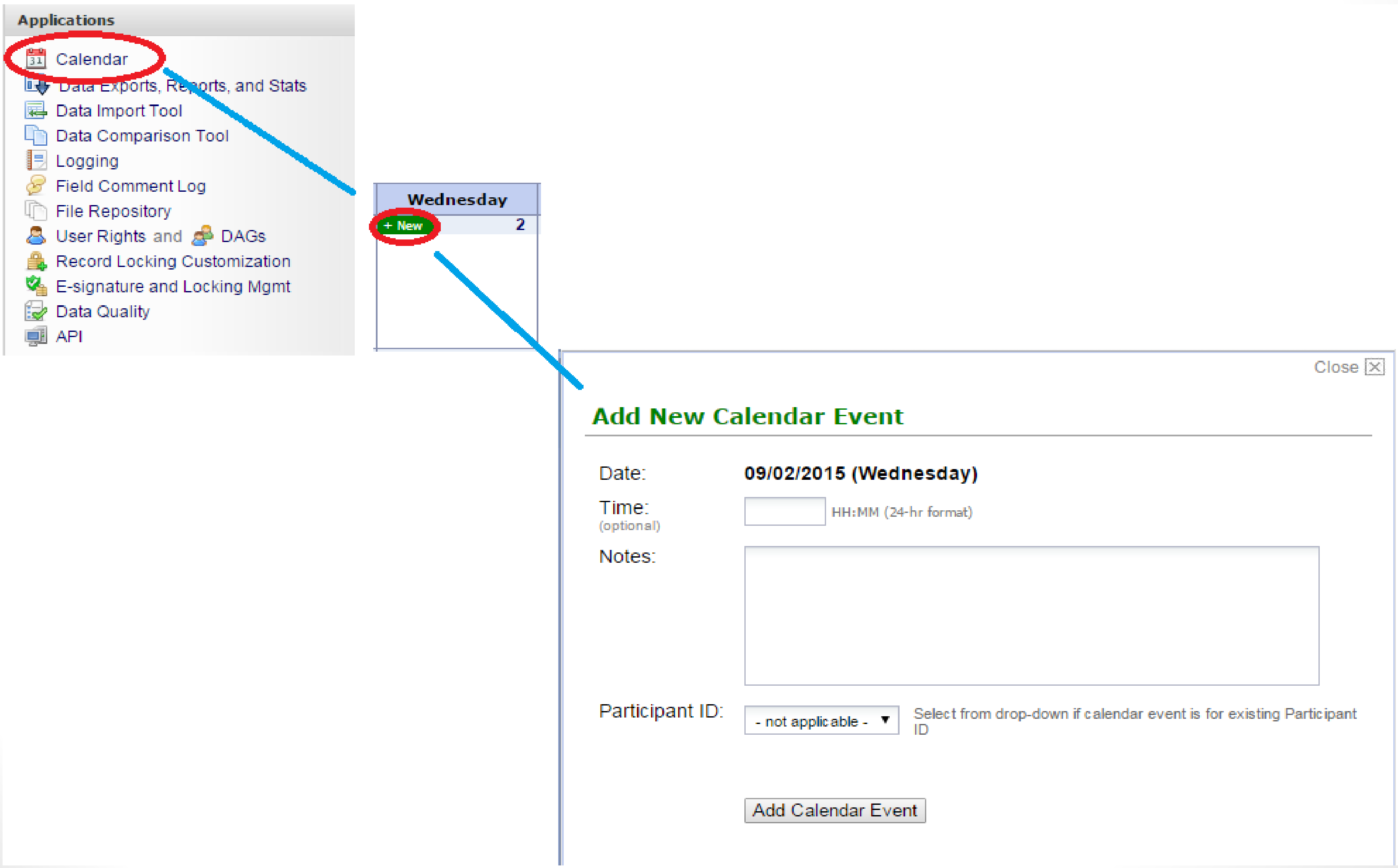


Practice

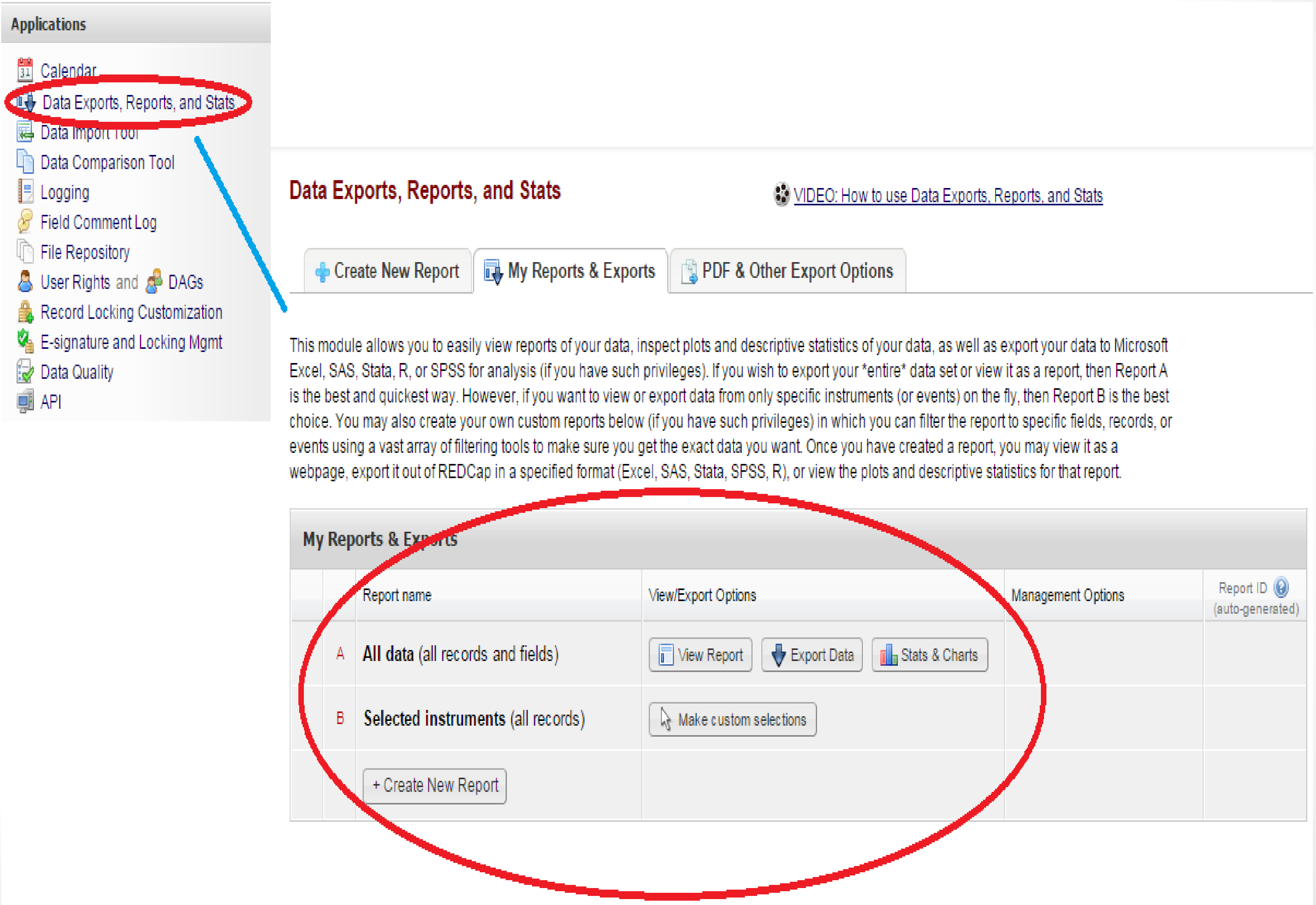
entering test data

Applications – Calendar

- An additional application associated with a Project is the Calendar.
- A user can add calendar events that are associated with their Project.
- The user can add general calendar events, but can also connect a specific calendar event with a Study ID.

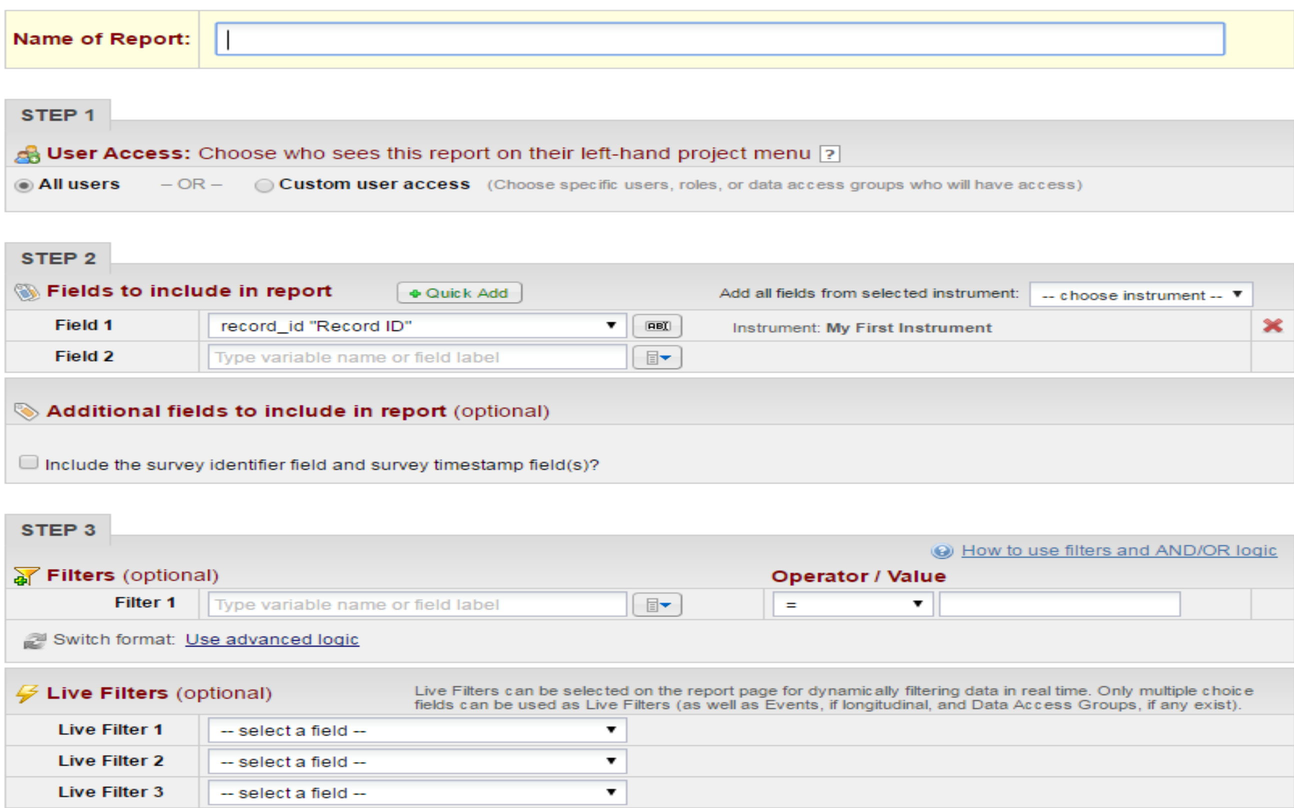


Applications - Data Export Tool



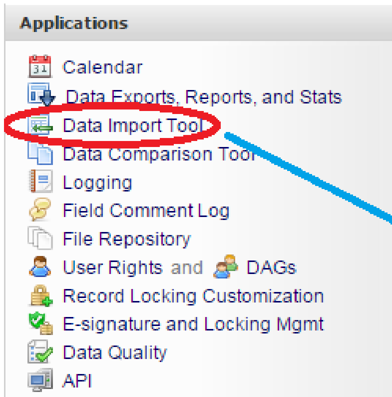
Applications – Create New Report (within Data Export Tools)

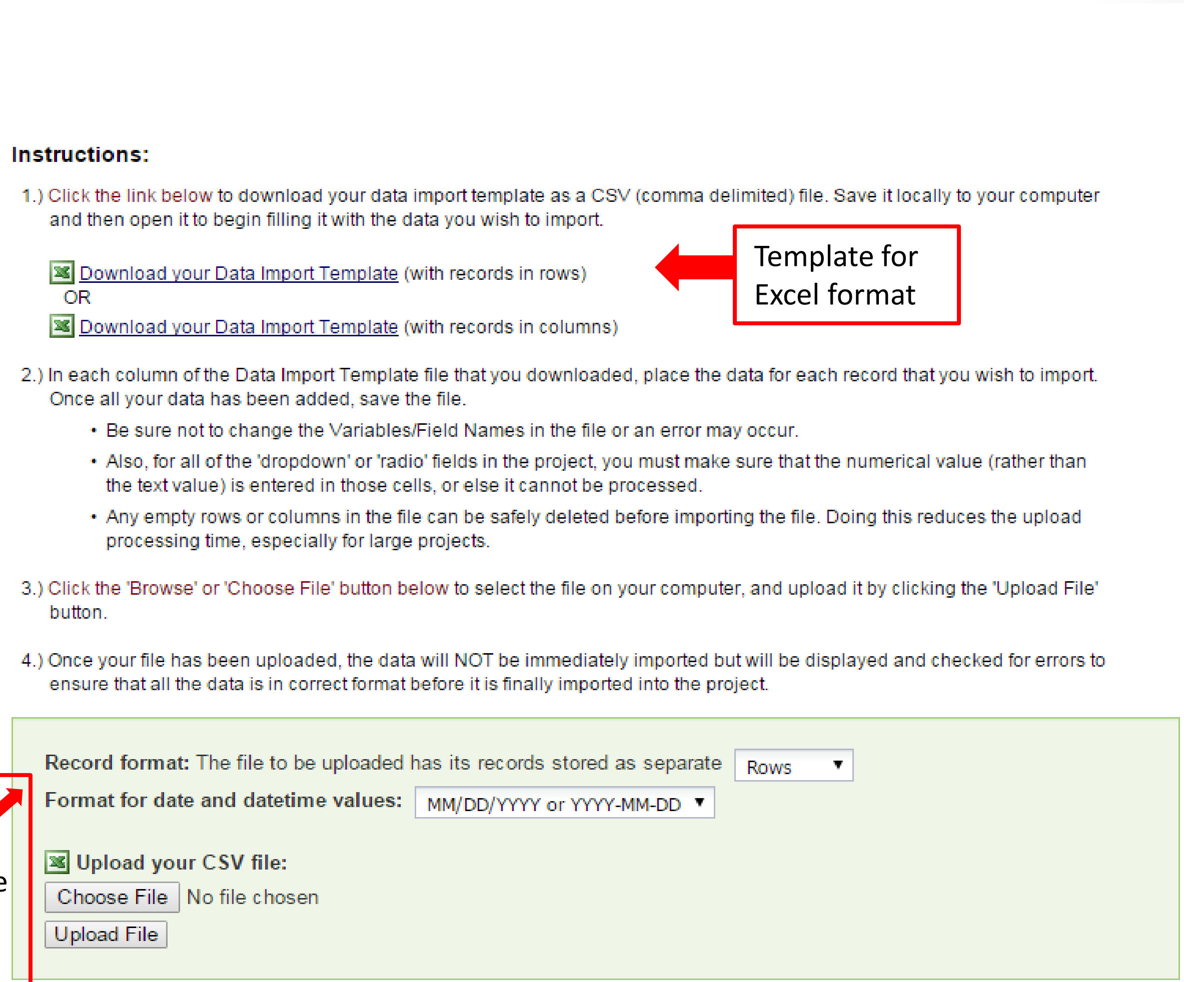
- The Report Builder allows the user to run real-time queries of all data within the project.
- Begin by naming the report and selecting which fields to be queried. All fields within the project can be included in the report. Depending on the specific Field Type, operators and values can also be added.
- Example: You only want to view the female responses.
  - Select the field to be “What is your gender?” and change the operator to “=“ and the value to “female.”
  - This will only pull responses where someone selected that they were female.
- All reports will be quickly accessible on the left-hand toolbar.
- All reports can be edited, copied, and deleted at any time. Changes will not effect any data you have collected.
- When viewing a report, it will appear in a chart format with rows and columns. All reports can be exported to Excel.



Applications – Data Import

- The Data Import Tool (located under Applications) allows the user to import data from an excel file.
- The user can locate the format and import data by downloading the data import template, adding in the data to the template, and then uploading into the project.





Template for Excel format

Upload a file with data:
- Must be CSV file
- Column headers must match variable names in project
- Only can use coded values for multiple choice questions

More Information about REDCap

For general REDCap information, visit the CTSI Website:

ctsi.wakehealth.edu/redcap

For specific questions, contact a REDCap Administrator:

ctsiredcap@wakehealth.edu