# Using REDCap for Clinical Data Management



School of Social and Community Medicine

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# **Purpose**

Through this hands on session, delegates will learn how to:

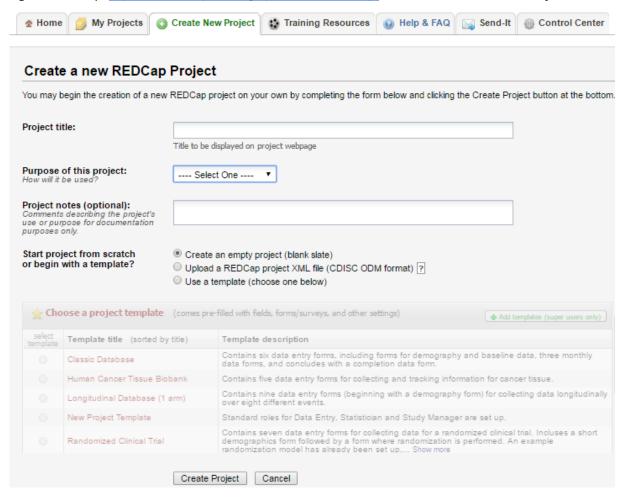
- create a project
- add fields
- add branching logic
- validate fields
- enter/export data
- create reports

# **Pre-requisites**

Delegates have been given access to the REDCap training server

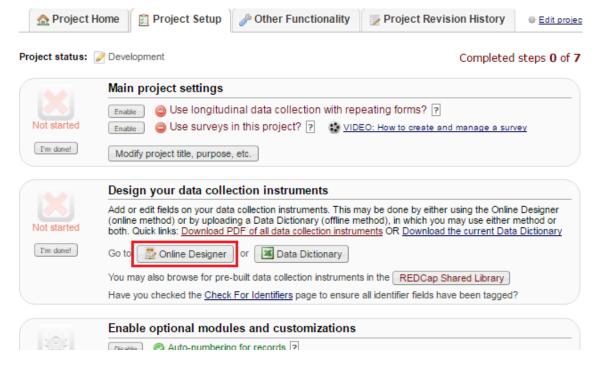
## Create a new project

1. Log into REDCap http://sscmredcap-training.epi.bris.ac.uk/redcap/ and select 'Create New Project' tab



For the project title, enter **Practice Project** - **[your name]**, under **Purpose**, select **Just for Fun** and under **Start project from scratch**, select **Create an empty project**.

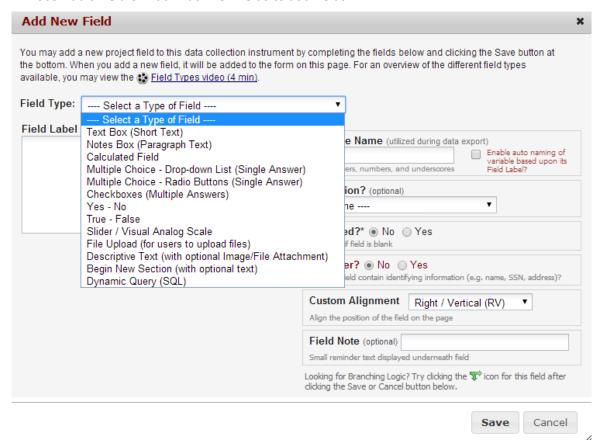
The **Project Setup** page will be displayed. Click on **Online designer**.



- 2. In the **Online Designer**, a new instrument called **My First Instrument** has been automatically created for you. Rename this to **Forma Fitness Sport Club Registration** by using the **Rename** option in the **Choose action** button.
- 3. Click on the instrument name to start editing. The questionnaire has one field, **Record Id**.

## **Adding fields**

1. Use Add a field or Add Matrix of Fields to add fields



#### **Notes on field types**

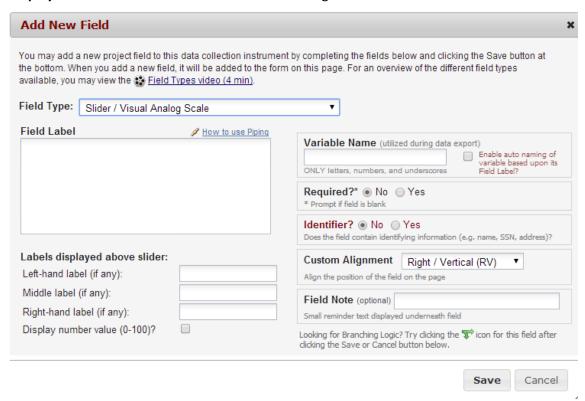
**Section Header** - Use the **Begin New Section** field type. A quirky REDCap behaviour: **you need to create at least one field for the section before you create a Section Header.** 

For short **text**, **dates** and **numbers** – Use the **Text Box** field type. Add field **Validation** for dates and numbers. Use the **Notes Box** field type for recording paragraphs.

Yes - No, True - False - these fields will provide two radio button options.

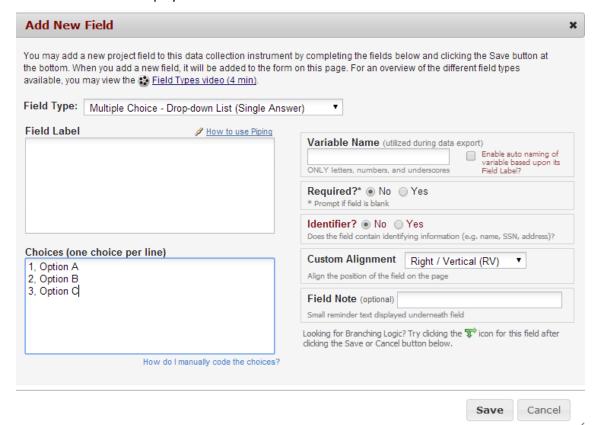
Use the **Slider** field for a visual analogue scale.

Use Labels displayed above slider to add information and a range to a Slider field.



Use the Multiple choice or Checkboxes field types to choose Single/Multiple choice.

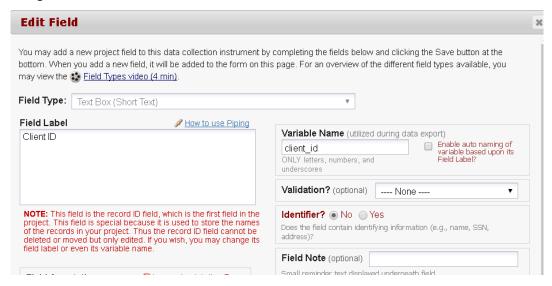
Add options in the **Choices** box. First add the code number to be used in the statistical analysis, followed by a comma and the text to be displayed for the user.



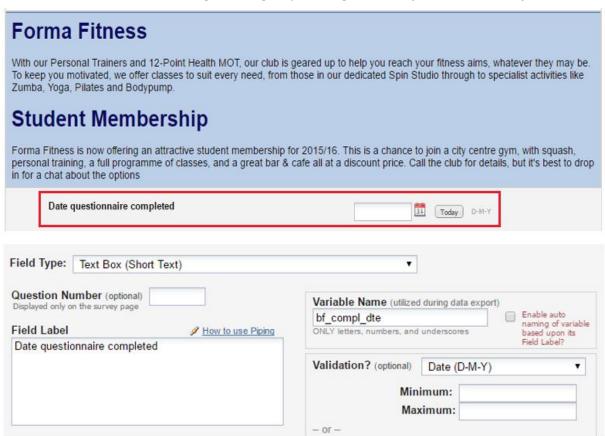
## **Exercise 1**

Create the Forma Fitness Sport Club Registration form.

Using the edit button , rename Record ID as Client Id then Save.



Use the **Add Field** button to set up each field. Note that a **Section Header** cannot be created until there is at least one variable field following it, so begin by creating the **Date questionnaire completed** field.

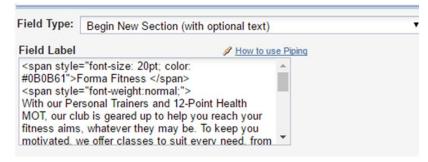


Prefix variable names with **bf**\_ (booking form) followed by the question description (*e.g.* bf\_compl\_dte, bf\_gender, *etc*. Note that **variable names cannot contain spaces or uppercase characters**.

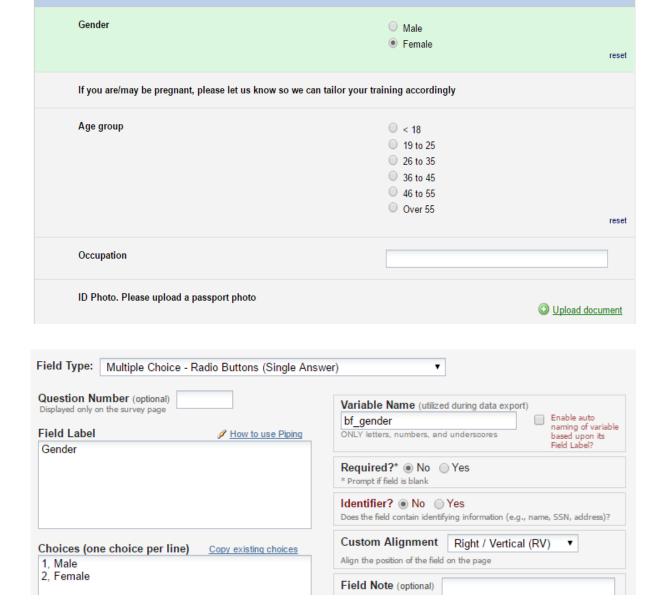
REDCap supports the use of HTML tags such as **<span style> <i> <b>** to format text in a field label. Several styles are used in this course booklet and you can request a more comprehensive document at the end of the course.

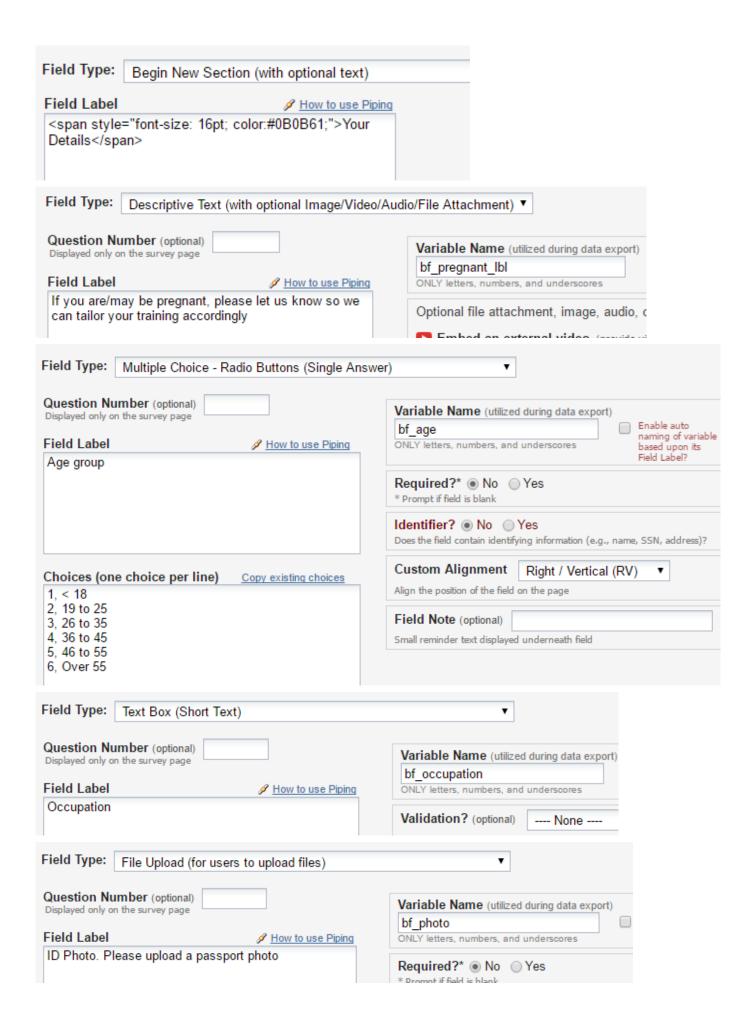
For the **Forma Fitness** title use tags to change the formatting of the text.

**Your Details** 

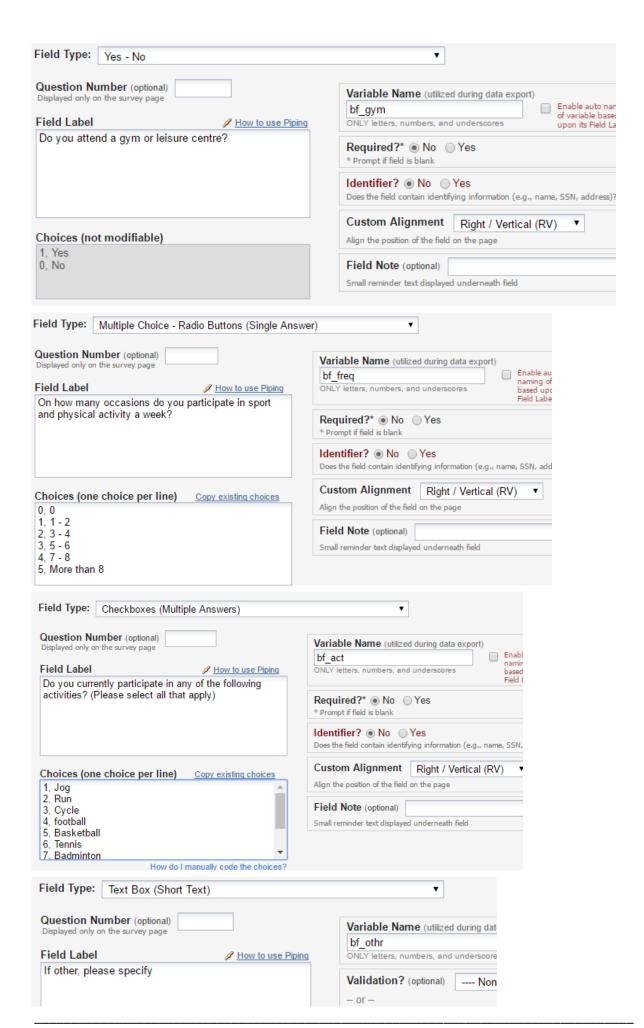


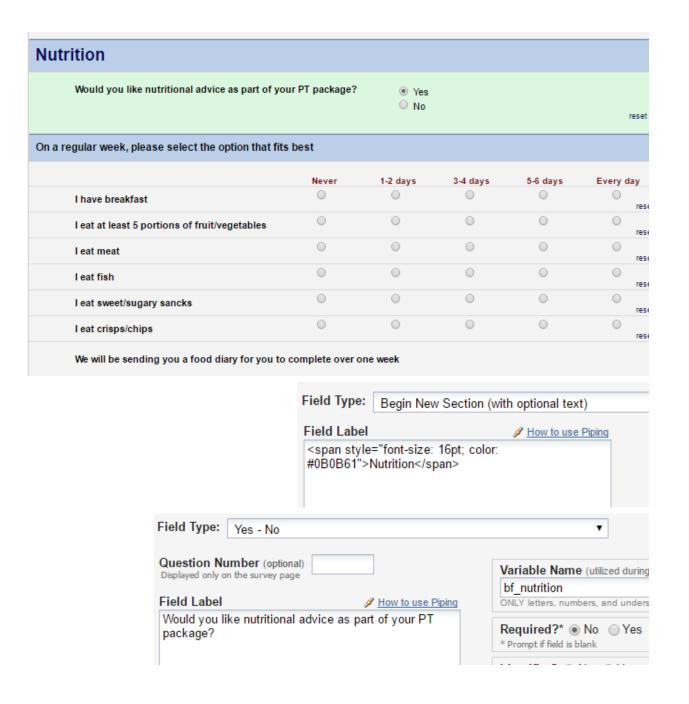
As before, the Section Header cannot be created until there is a variable field following it so create the **Gender** field before the section header **Your Details**.

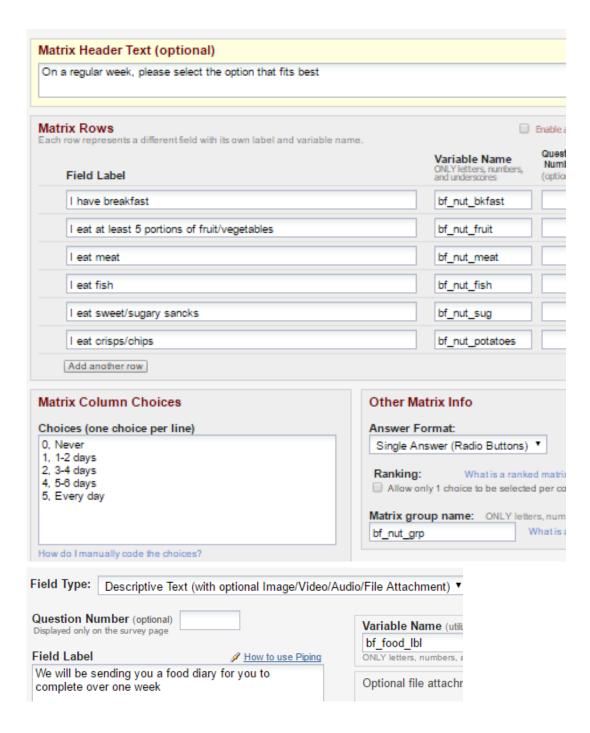




In order to provide you with the best option, we are interested in your current	t level of activity.
Do you take part on regular sports or physical activity (at least once a week)?	Yes No reset
Do you attend a gym or leisure centre?	○ Yes ○ No reset
On how many occasions do you participate in sport and physical activity a week?	0
Do you currently participate in any of the following activities? (Please select all that apply)	Use Jog Run Cycle football Basketball Tennis Badminton Weights Yoga  ✓ Other
If other, please specify	
Field Label <span font-w<="" style="font-siz and Physical Activity &lt;span style = " th=""><td>New Section (with optional text)  ### How to use Piping  Ze: 16pt; color: #0B0B61"&gt;Sports  / Participation</td></span> veight: normal;">In order to best option, we are interested in activity.	New Section (with optional text)  ### How to use Piping  Ze: 16pt; color: #0B0B61">Sports  / Participation
Etald Towns Law as	
Field Type: Yes - No  Question Number (optional) Displayed only on the survey page  Field Label  Do you take part on regular sports or physical act (at least once a week)?	
Choices (not modifiable)  1, Yes 0, No	Align the position of the field on the page  Field Note (optional)  Small reminder text displayed underneath field

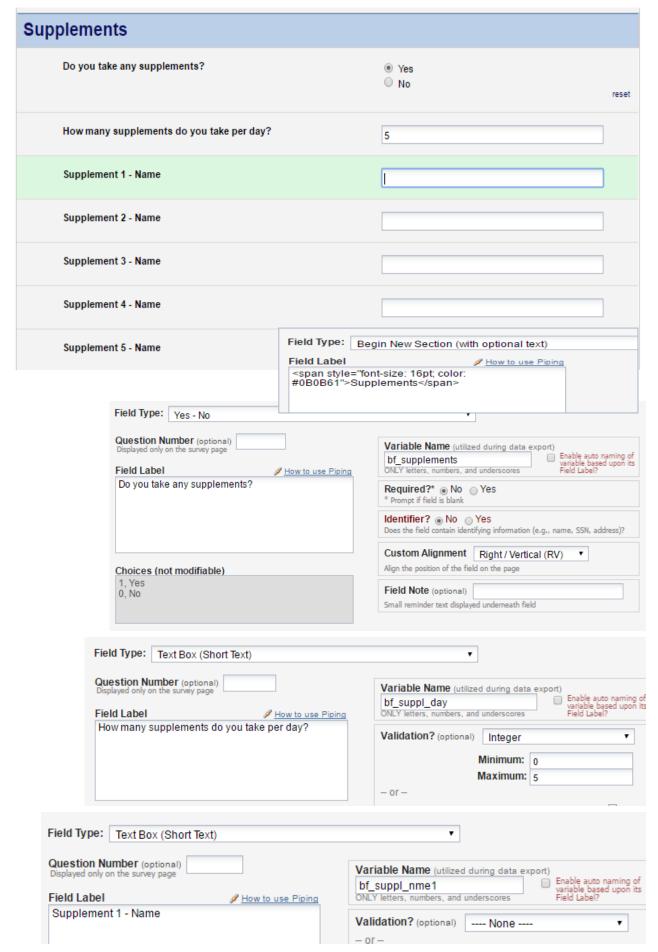




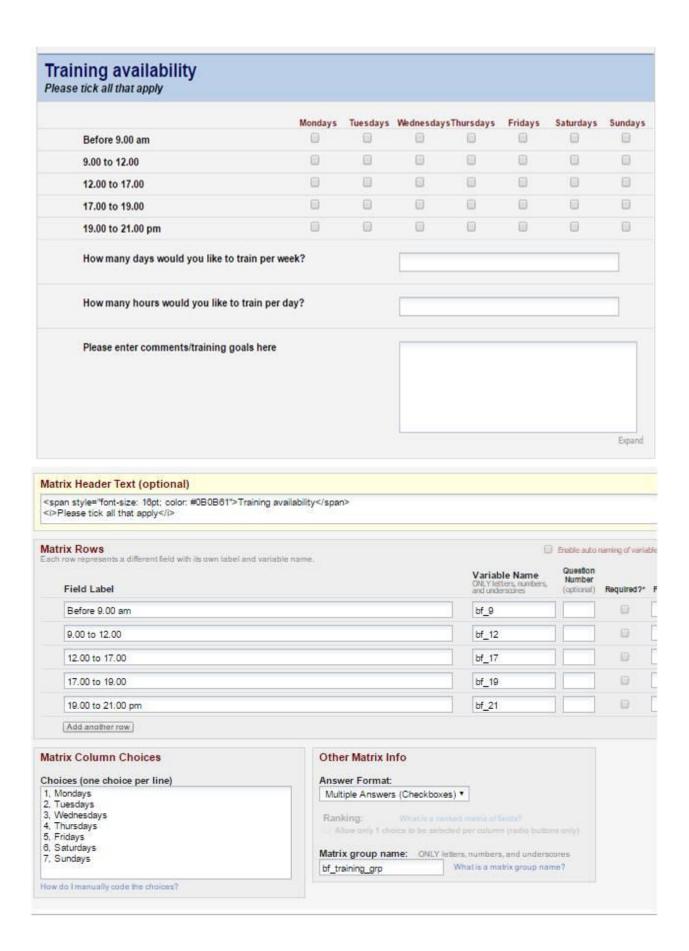


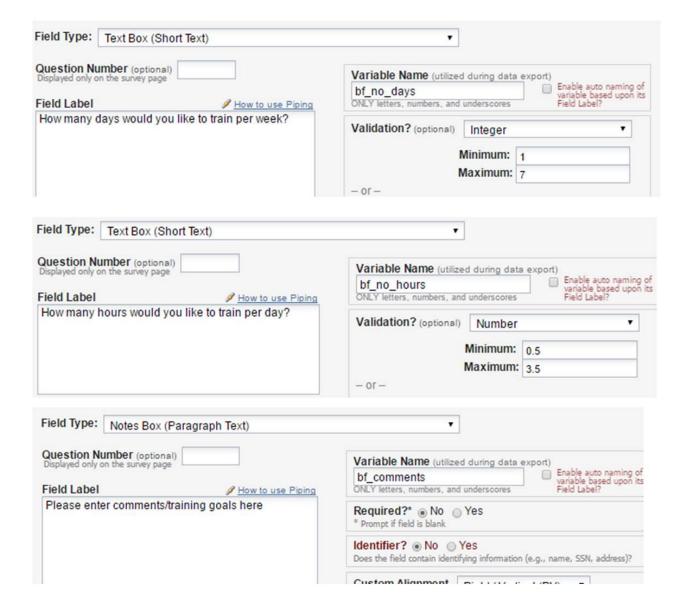
If required, enter validation for text fields, for example allowing only numbers or dates to be accepted. Minimum and maximum values can be set so that in a question such as **How many days would you like to train per week?** validation could be fixed to allow only integers between 1 and 7.





Repeat for Supplements 2 to 5.





### Adding instruments

Once you have completed the Forma Fitness Sport Club Registration section, use

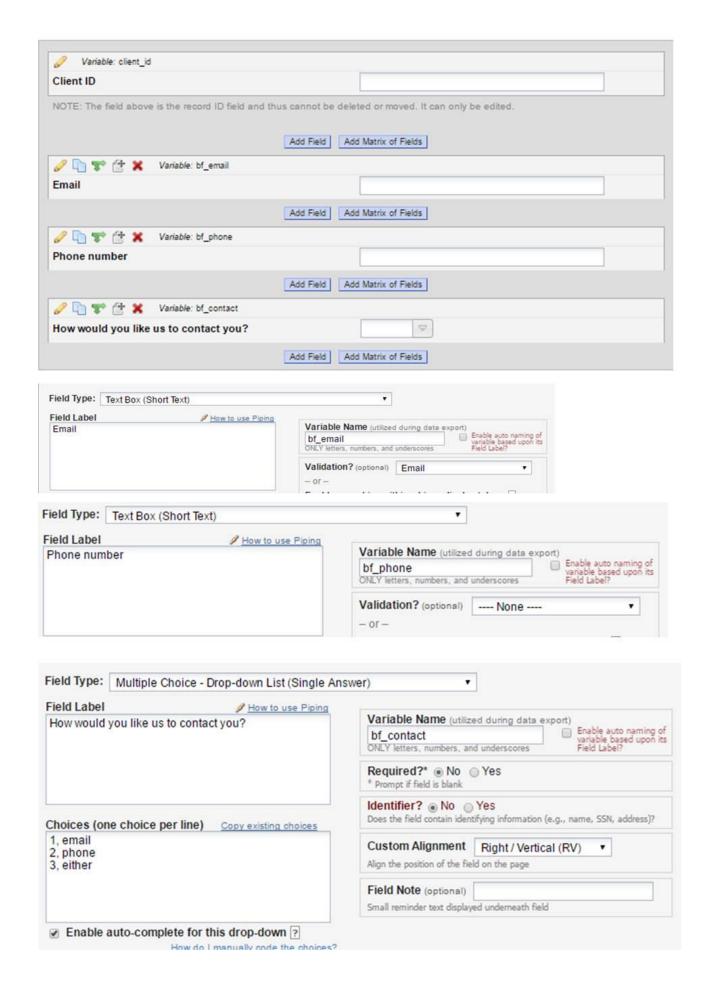


A list of all existing instruments will be displayed. Select Create a new instrument from scratch.



#### **Exercise 2**

- 1. Create a new instrument called Office Use Only
- 2. Replicate the **Office Use Only** form adding appropriate validation.



## Adding branching logic

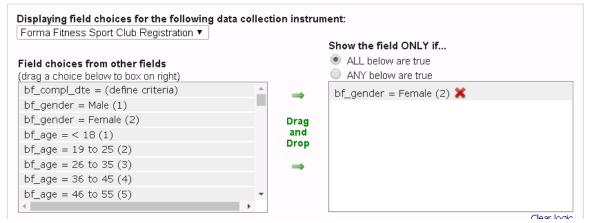
Branching Logic may be employed when fields/questions need to be hidden under certain conditions. If branching logic is defined, the field will only be visible if the conditions provided are true (*i.e.* show the field only if...).

Use the **Branching Logic** button to add logic to a field.

You may specify the conditions in the Advanced Branching Logic Syntax text box or by choosing the Drag-N-Drop Logic Builder method which allows you to build your logic in a user friendly fashion by simply dragging over the options you want.

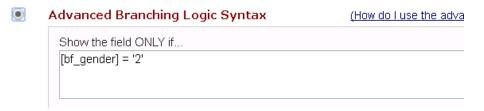
#### **Exercise 3**

- 1. Select the Forma Fitness Sport Club Registration form
- 2. The label 'If you are/may be pregnant, please let us know so we can tailor your training accordingly.' only needs to be displayed if the answer to the question 'Gender' is 'Female'.
- 3. Use the **Branching logic button** for this label and use the **Drag-N-Drop** facility to select the logic. E.g. [bf\_gender] = 'Female'
- Drag-N-Drop Logic Builder



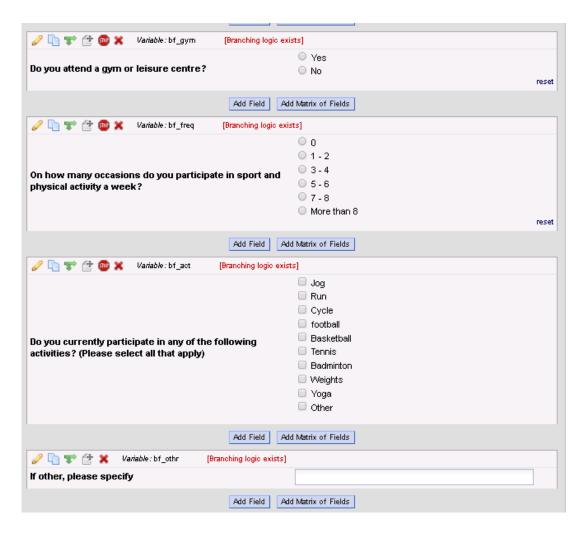
4. Select Save

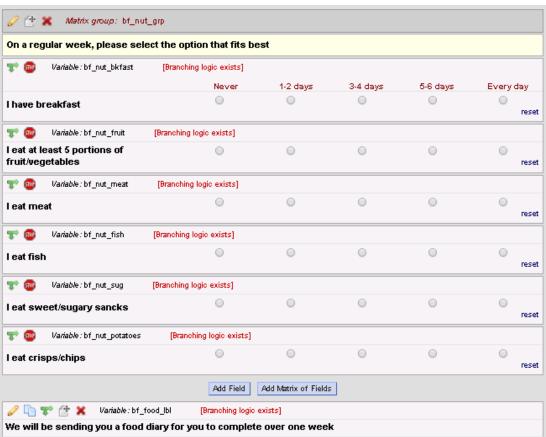
Click on the Branching logic button again to view how REDCap has stored your choice



REDCap enters the variable name in [] and your selection in the **Advance Branching Logic** box. Once you are familiar with this, you can type the logic directly in this box.

5. Repeat the process for the following questions requiring branching logic in the **Forma Fitness Sport Club Registration** example.





# Advanced branching logic

#### Repeating questions a set number of times

Use the 'Forma Fitness Sport Club Registration' form. In this form, we find questions that are repeated a number of times. The number of times these questions are needed is dependent on the answer to a previous question: e.g. How many supplements do you take per day? If the answer is '0', no related questions should be displayed, if the answer is '1', just one related question should be displayed, if '2', two questions and so on.

#### **Exercise 4**

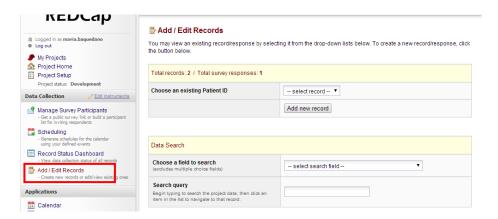
Select the **Forma Fitness Sport Club Registration** form and add logic to display only the required number of repeating questions



**Meeting several conditions** - Branching logic can also be used to display questions/labels depending on the answer to multiple questions.

## **Data Entry**

To add/edit records, select the Add/Edit Records menu under the Data Collection group.



To add a record, if Enable 'auto-number' has been selected in the project setup, select Add new record button; if 'Enable auto-number' has not been selected, enter ID in the box and press enter.

To edit an existing record, use the dropdown under Choose and Existing Client ID.

If a project has a large number of records, you can use the **Data Search** facility. You can select a field to search by and start typing in the **Search Query** box. Records that match the criteria will be displayed.

For **non-longitudinal** projects, when choosing **Add/Edit records**, the first instrument will be displayed ready for input or editing. For **longitudinal** projects, the **Event Grid** will be displayed so that user can select instrument and event to complete.



The grid below displays the form-by-form progress of data entered into the project for one particular Participant ID for all defined events. You may click on the colored buttons to access that form for that event. If you wish, you may modify the events below by navigating to the <a href="Define My Events">Define My Events</a> page.



#### Participant ID 1

Data Collection Instrument	01 - Baseline	02 - Visit 2 (2)	03 - Visit 3 (3)
Baseline	•		
Treatment	•		

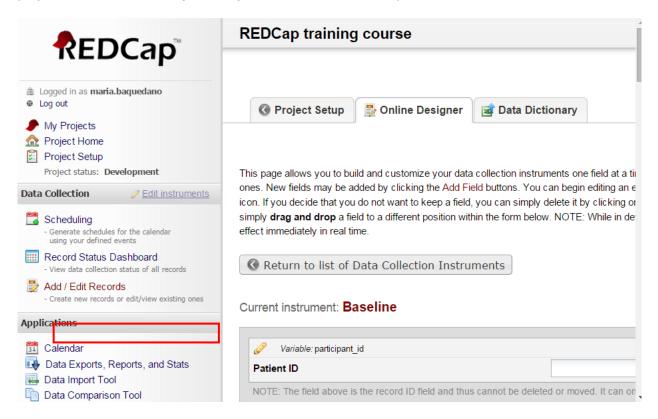
#### **Exercise 5**

- Select Add/Edit Record and Add new record. The Office Use Only form will be displayed. Enter information for this form and then click Save and go to Next Form and complete the Forma Fitness Sport Club Registration form.
- 2. Add a few participants. We will use this data to test the Data Export.

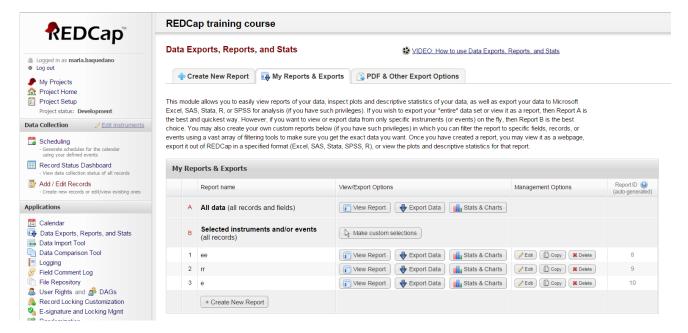
**Notice:** Only test data should be added whilst the project is in development status. Once the project instruments have been finalised, the project should be moved to production in preparation for real patient data to be entered. When promoting a project to production, all previously entered data is deleted. See the **Promote a project to production** section, for steps to follow prior to going live.

## **Data Export**

REDCap allows you to easily export your project data to Microsoft Excel, SAS, Stata, R, or SPSS for analysis. Exporting your data out of REDCap is simple. To get a quick data dump of all records for your project, choose the **Data Exports, Reports and Stats** one-click option.

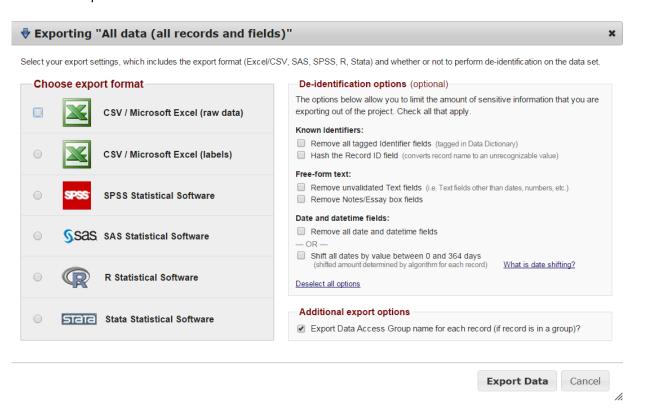


In the resulting screen, either select the **Export Data** button for a quick download of all current data or select the **Make custom selections** to specify the form(s) for which data is to be downloaded.



Use Reports to download only specific fields across the dataset

Once you have made your selections, click **Export Data**. The **Exporting Data** dialog will be displayed. Select the required format and follow the on-screen instructions.

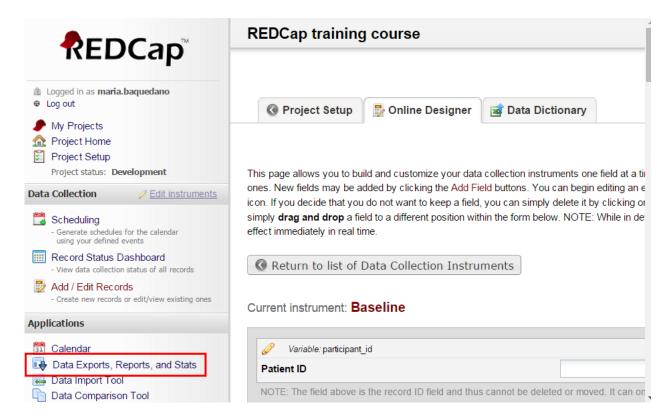


When downloading data to SPSS/STATA, make sure the 'Export survey identifier field and survey timestamps field(s)' is NOT selected. This only applies to projects where surveys have been enabled.

## **Report Builder**

You may use this page to build and save custom reports, which will query the project in real time and display the resulting data in a table format. Once created, you may view your reports at any time as well as modify or delete them. Your saved reports will be displayed on the left-hand menu as links, which can be clicked to display the report.

1. Select Data Exports, Reports and Stats on the left hand side menus

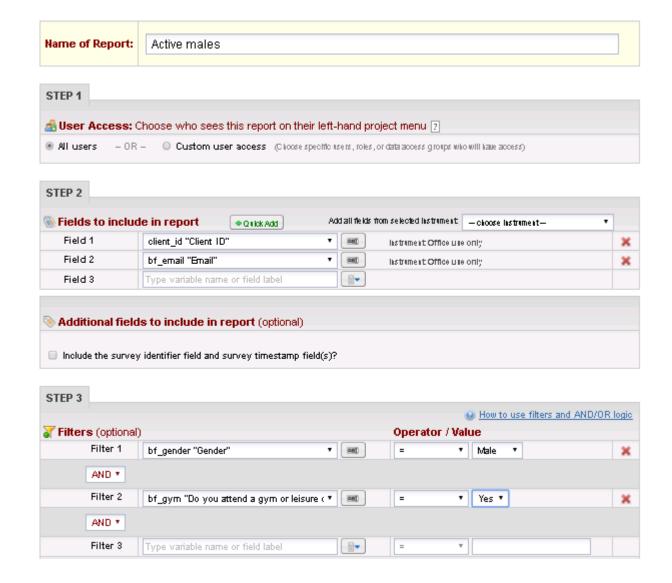


2. Click the **Create New** Report button. In the resulting screen, add the report name and select all required fields and filters. Save the report

The report will be listed under **Reports.** Click on the link to **View** the report

## **Exercise 6**

Create a new report to extract the participant IDs and email addresses for all male active clients (currently attending a gym or leisure centre).



Reports can be **ordered** by selected fields (up to 3 fields).

For complex projects switch to **Use Advanced logic.** 

## APPENDIX I – Advanced REDCap features

## **Setting a Project as Longitudinal**

- 1. Select the **Project Setup** tab and click on **Enable 'Use longitudinal data collection with repeating forms'** under **Main project settings**
- 2. Select Define my events under Define your events and designate instruments for them

The Define My Events tab is displayed



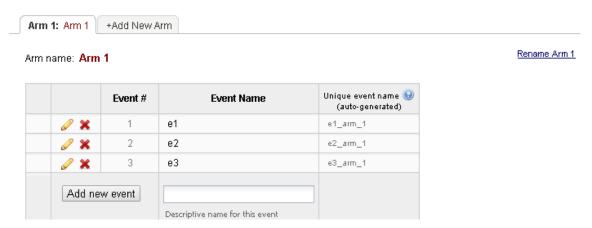
This application allows you to define 'events' for your project that allow for the **utilization of data collection forms multiple times for any given project record** (often used when collecting longitudinal data). An 'event' may be a temporal event in the course of your project, such as a participant visit or a task to be performed. After events have been defined, you will need to designate the data collection instruments that you wish to utilize for any or all events, thus allowing you to use a form for multiple events for the same project record. You may **group your events into 'arms'**, in which you may have one or more arms/groups for your project. Each arm can have as many events as you wish. You may use the table below to create new events and/or arms, or modify existing ones. (One arm and one event will be initially defined as the default for all projects.)

#### STEP #1:

To add new events below, provide an **Event Name** for that event, and then click the *Add new event*. Once events have been added, you can easily change their order by dragging and dropping the event using the up-down arrow icon on the far left for a given row in the table.

#### STEP #2:

Once you have defined your events on this page, you may navigate to the <u>Designate Instruments for My Events</u> page, where you may select which data collection instruments that you wish to utilize for each event you defined.



- 3. To add an event, enter data under Event Name and press Enter
- 4. Select the Designate Instruments for My Event tab and choose Begin Editing
  - e.g. Select the events for each of your instruments as per image below and click Save

Since you have defined multiple events on the <u>Define My Events</u> page, you may now select which data collection instruments that you wish to utilize for each event by using the table below. This allows you to enter data on any data collection form multiple times for any given project record. Any and all data collection instruments can thus be used for any event defined.

Click the Begin Editing button to change the relationships below by designating which forms you wish to utilize for which events. When you are finished making changes, click the Save button to finalize your changes.



When adding participant's information, REDCap will allow multiple completion of questionnaires assigned to more than one event.

#### III Event Grid

The grid below displays the form-by-form progress of data entered into the project for one particular Client ID for all defined events. You may click on the colored buttons to access that form for that event. If you wish, you may modify the events below by navigating to the <a href="Define My Events">Define My Events</a> page.



#### Client ID mai 1





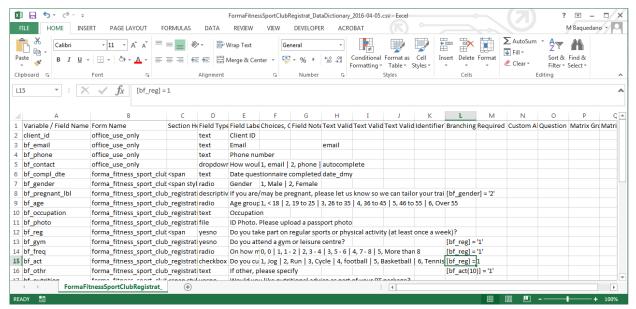
## **Data dictionary**

Project fields can be created or amended using either the **Online Designer** or the **Data Dictionary.** 

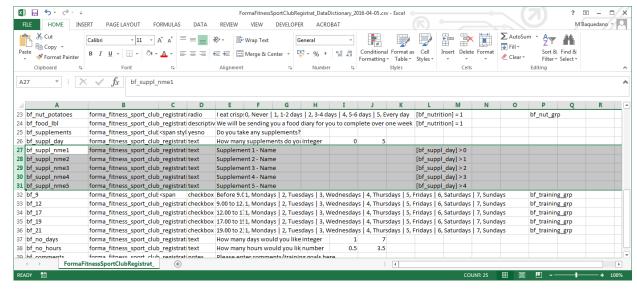
The Data Dictionary is a specifically formatted CSV (comma delimited) file within which you may construct your project fields and afterward upload the file to REDCap to commit the changes to your project.

To view the data dictionary, select 'Edit Instruments' and choose the 'Data Dictionary' tab. In the resulting screen click the <u>Download the current Data Dictionary</u>

An Excel compatible file will be downloaded. Open it to view formatting

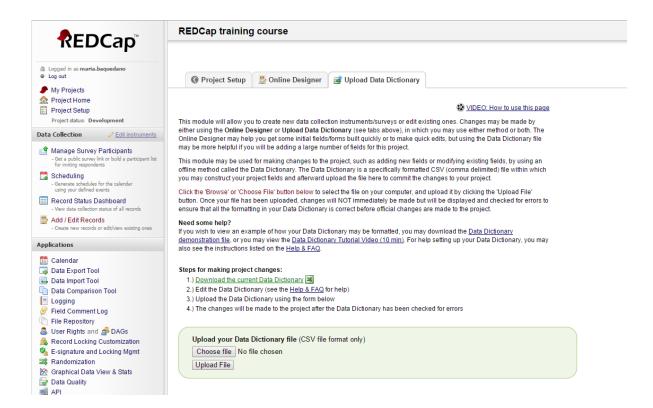


The Data Dictionary is the preferred method for adding repetitive questions or changing branching logic (e.g. Supplement Name).



The first question could be set up in the Online designer. Then, download the data dictionary, insert as many rows as required, copy the question and paste as many times as required. You will need to amend variable names, labels and logic.

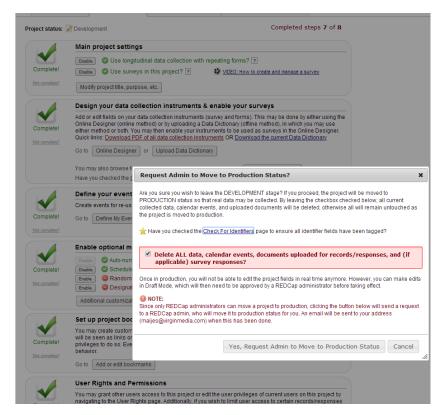
Save the file and upload to REDCap by clicking the 'Choose file' button



## Promote project to production

Once the instruments have been finalised and tested, the project is ready to move to Production status.

- 1. Access the Project Setup tab and set status to I'm done! under all sections in the Project Setup.
- 2. Select Move the Project to Production



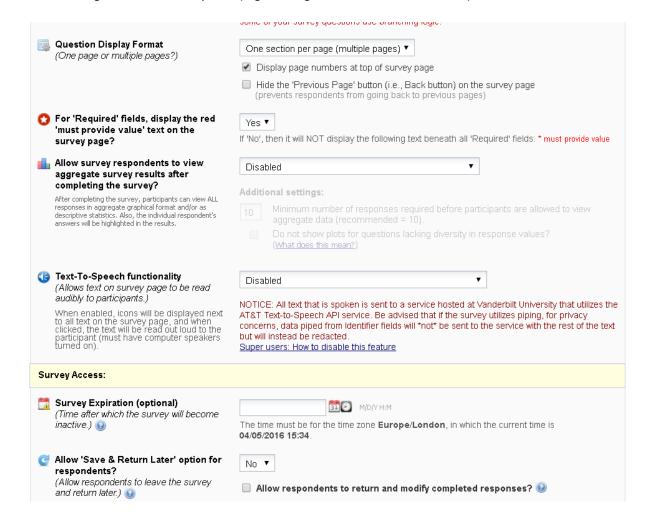
The **Request Admin to Move to Production Status** dialog box will be displayed. Follow the instructions to **check for Identifiers** and select **Yes, Request Admin to move to production status.** An email will be sent to the REDCap team so they can approve the project and promote it to production.

# **Using Surveys**

Using surveys is a simple and fast way to collect responses from participants. You can enable one or multiple instruments within your projects as surveys. You can then send survey links via email to your participants.

- 1. Select the Project Setup menu and click Enable the Use surveys in this project.
- 2. Under 'Enable optional modules..' select Designate an email field to use....' And select the email field in the Office use only form.
- 3. Access the **Online designer** and enable all required instruments as survey. For our example, enable the Forma Fitness Sport Club Registration as survey.

The Survey settings page will be displayed. Amend the Survey Instructions and Survey Acknowledgement text as required (e.g. add signature and contact details).

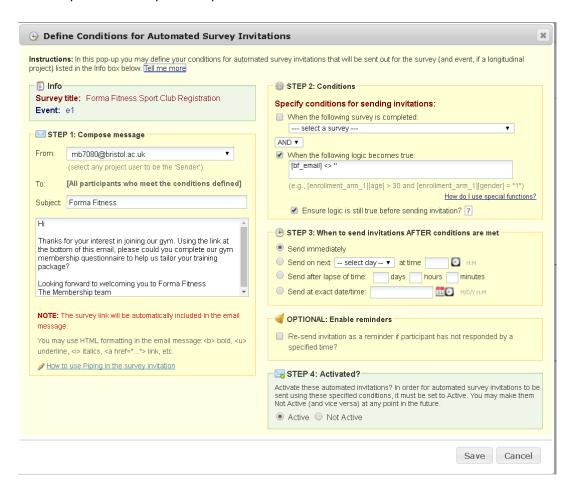


Save the changes.

4. In the Online Designer, select Automated Invitations and choose Modify invitation for event 1



5. Complete fields as per example below and select Save



Emails can be sent Immediately or as per predefined schedule. A log of sent invitations can be reviewed using the Survey Invitation Log tab.

6. To see this functionality in action, choose Add/Edit Records. Create a new record and add your email address under **Email** in the **Office Use Only** form.

When you save this form, an email will be sent to you with the link to complete the **Forma Fitness Sport Club Registration** form.

The Survey functionality can also be used to send a public/generic URL if anonymous responses are required.