Repeating Instruments and Events

REDCap has the ability to repeat a data collection instrument or an entire event of instruments an unlimited number of times without having to specify the amount needed. This is sometimes called one-to-many data collection, in which a project can have one or more repeating parts.

Link to Video Tutorial:
https://redcap.vanderbilt.edu/consortium/videoplayer.php?video=repeating_forms_events01.mp4&title=Designating%20Instruments%20for%20Events%20in%20Longitudinal%20Projects&referer=redcapstage.ctsi.ufl.edu

Concept

REDCap now has a feature to allow repeating instruments and events. This is very helpful if you have to collect multiple instances of the same data. This means that it is no longer necessary to create a specified number of instances of an instrument (or event) if you need to collect multiple instances. For example: if you are doing a study on a new experimental drug and need to track patient progress for 20 weeks, you might have an instrument that includes all the questions necessary for each week's visit. Now, instead of creating 20 instances of this "visit" instrument (say visit1, visit2, etc.), you can simply make the visit instrument a repeating instrument.

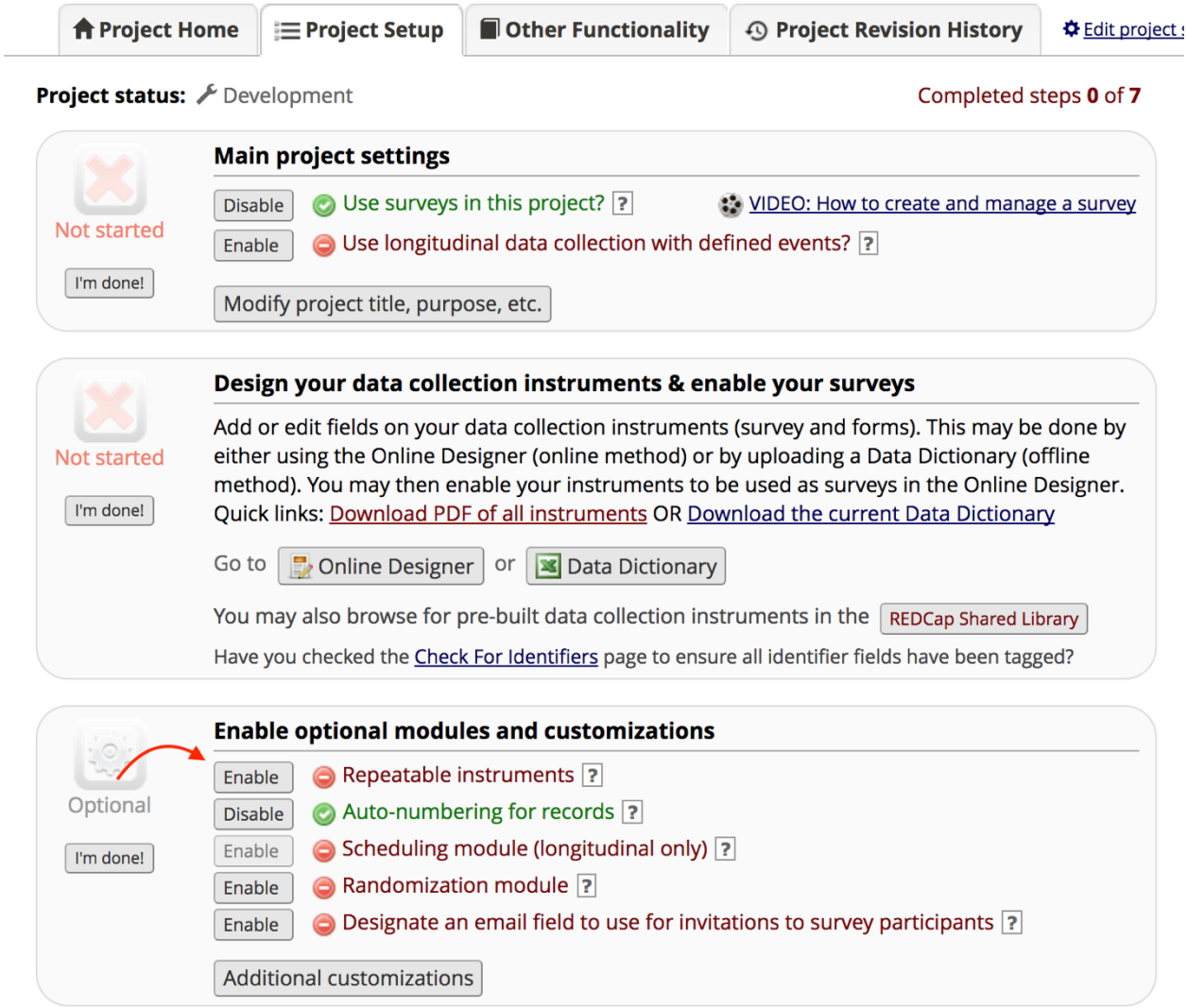
Another benefit is you are no longer limited by the planned number of repetitions. Continuing with the example above, say you had some patients that needed to be studied for an additional 12 weeks (32 weeks total). Instead of manually creating 12 more visit instruments, you can go to the previous visit instrument and select Save & Add New Instance. This way, you can easily add unplanned repetitions. You are no longer limited by your maximum number of instances.

Additionally, you can have a different number of instances of an instrument for different records. Using the above example, some patients may have data for 20 visits, and others may have data for 32 visits. You could even have some patients that missed a few visits, so they end up with 19, 18, or 30 visits. That is fine. Each record can have a unique number of repetitions.

Now let's take a look at the implementation of repeating instruments and events.

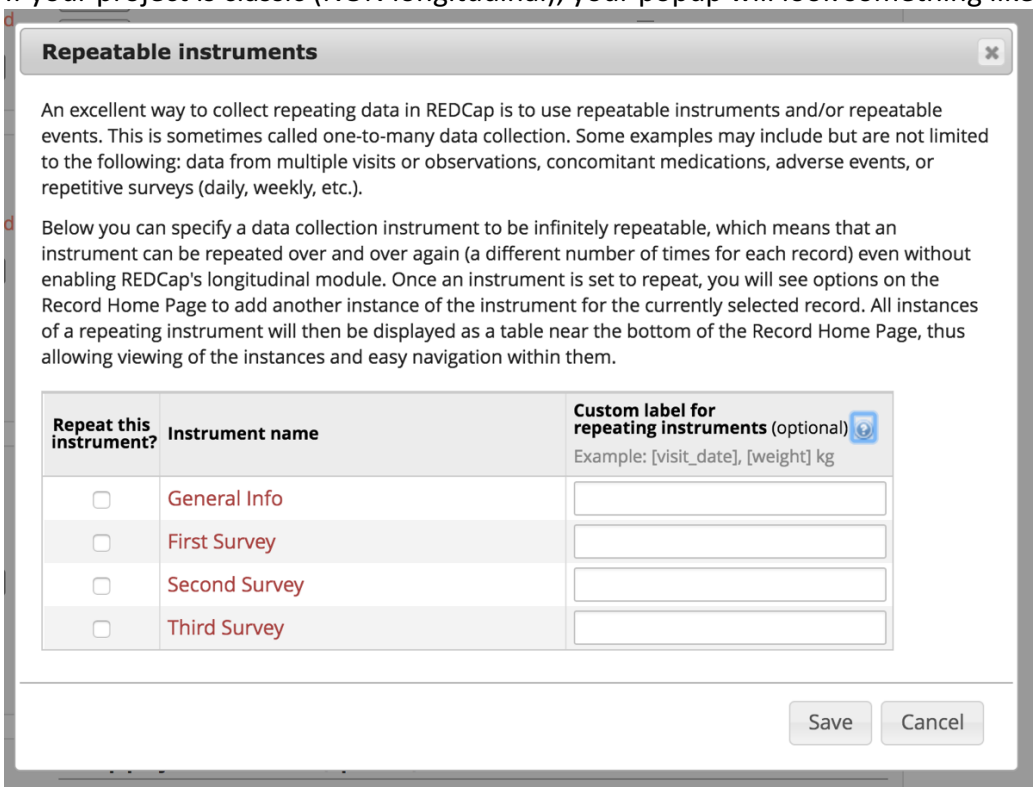
Preparing Repeating Instruments and Events

To use repeating instruments or events on your project, you must first enable it on the project setup page. It is the first option under the "Enable optional modules and customizations" section.

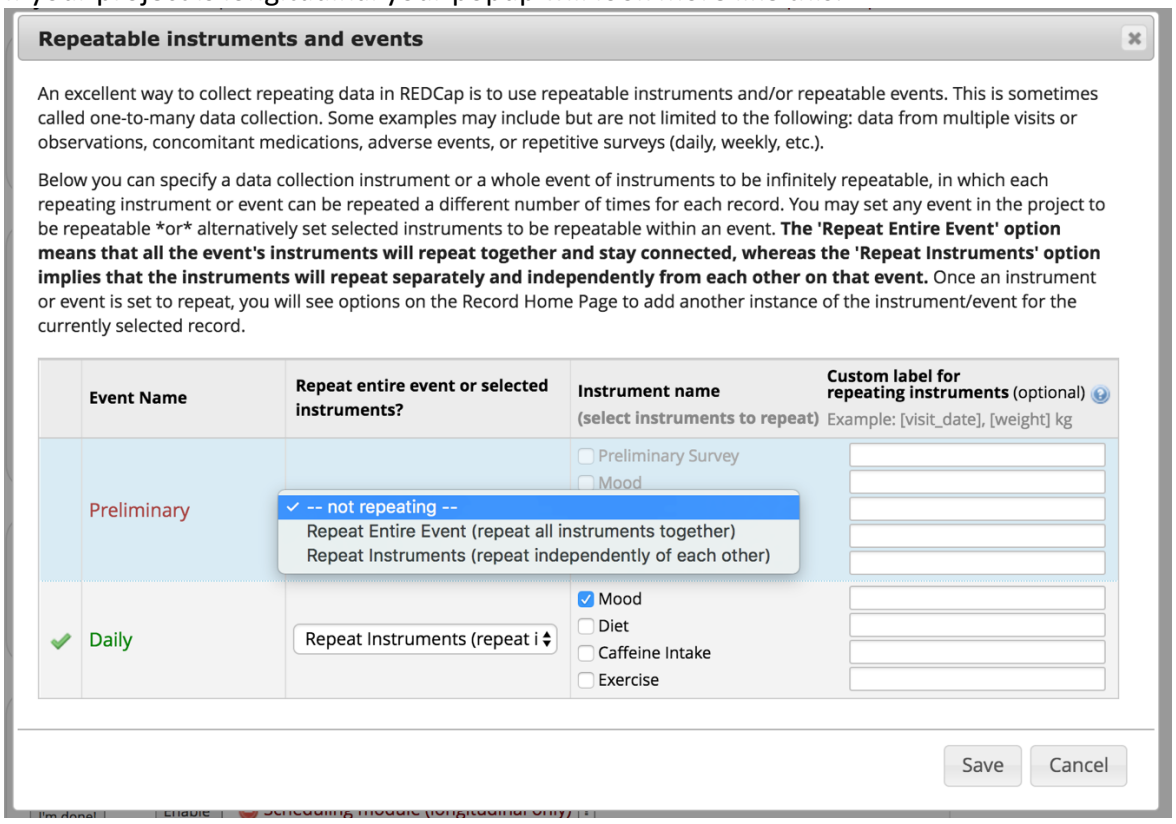


When you click enable, you will get a popup window asking which instruments (and events, if the project is longitudinal) should be made repeatable.

If your project is classic (NON longitudinal), your popup will look something like this:

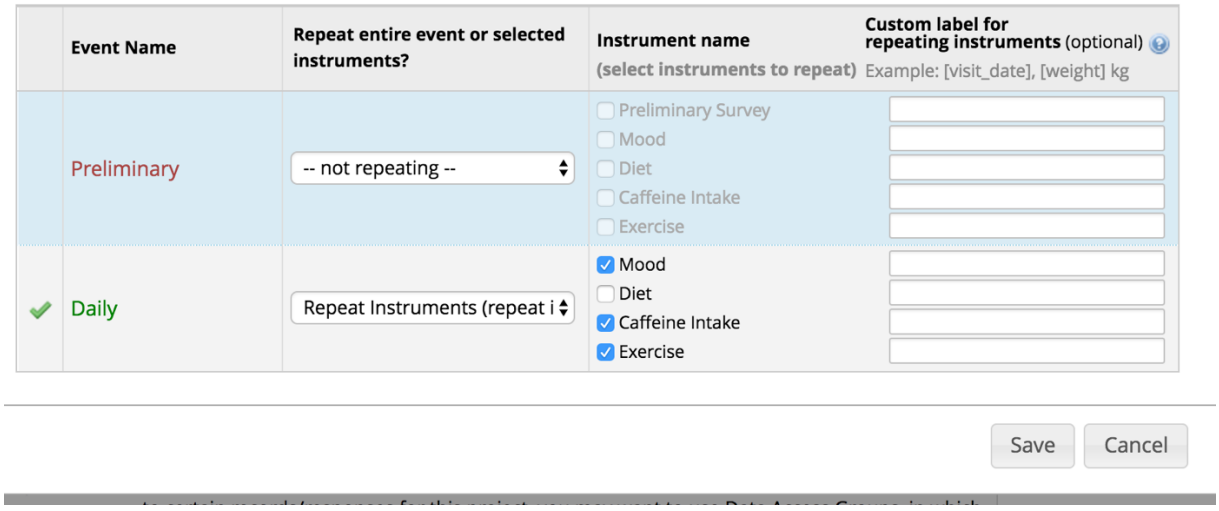


If your project is longitudinal your popup will look more like this:



For a classic (NON longitudinal) study:
If you have an instrument you would like to repeat, simply mark its checkbox in the “Repeat This Instrument?” column.

For a longitudinal study:
You will see each event listed along with its designated instruments. If you would like to repeat every instrument in the event, you can select “Repeat Entire Event (repeat all instruments together)” from the dropdown menu “Repeat entire event or selected instruments?”. Repeating an event would allow a participant to repeat all instruments in the event. However, the participant could not pick and choose what instruments should be repeated, it would instead repeat them all at once, as if they were a package. In case the participant needs to choose to repeat only specific instruments on an event, the event should not be marked for repeat, only the instruments that could be repeated. For example: in the screenshot above, the Daily event has instruments Mood, Diet, Caffeine Intake, and Exercise. Let’s say that the daily dietary info stays the same. In this case, you want the participants to be able to repeat the Mood, Caffeine Intake and Exercise instruments, but the Diet instrument should only be entered on the first Daily occurrence. To accomplish this, you select “Repeat Instruments (repeat independently of each other)” from the dropdown for the Daily event (in the “Repeat entire even or selected instruments?” column). Then, you check the Mood, Caffeine Intake, and Exercise instruments (under the “Instrument name” column). Now the participants can create new instances of the Mood, Caffeine Intake, and Exercise instruments as needed. Furthermore, the participants now have the flexibility to create a new instrument instance without creating a new instance of any other instrument. If the participant had done more exercising one day (say an extra bike ride), then they can add another Exercise instance without creating additional instances of the other instruments.

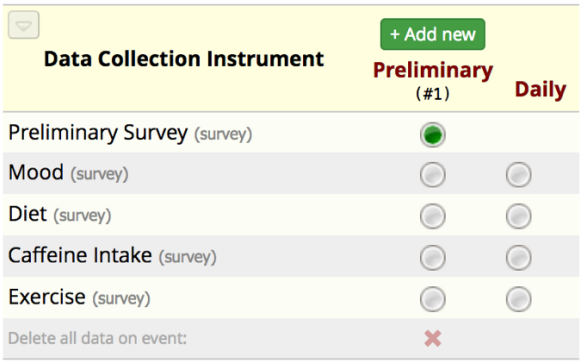


To recap, choose “Repeat Entire Event” if all instruments should be repeated together or choose “Repeat Instruments” if some instruments should have more instances than others.

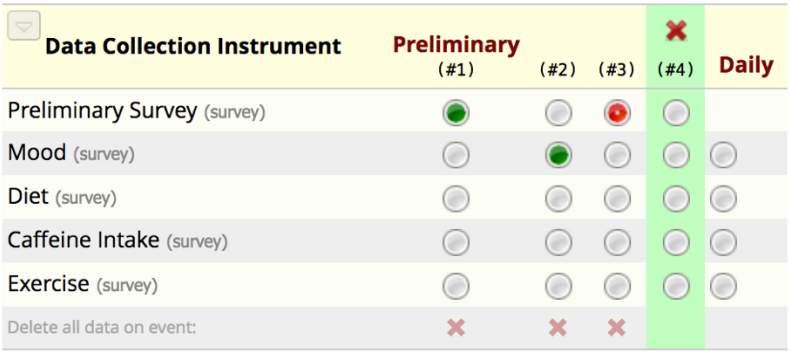
Creating and Editing Repeat Instances –

1) By Event

To record a new instance of an event, navigate to Add/Edit Records and select the appropriate record. From there, you can select "+Add new" for any event that is a repeating event.

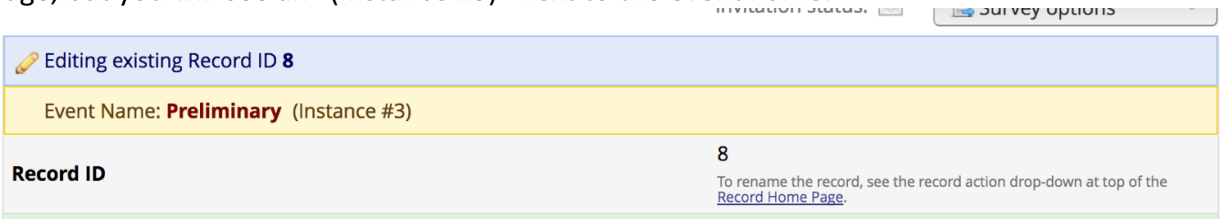


Notice, the event does not need to be completely filled out for you to add a new instance, but you cannot add a new instance if there is already an empty instance (no add new button on the 4th instance below).



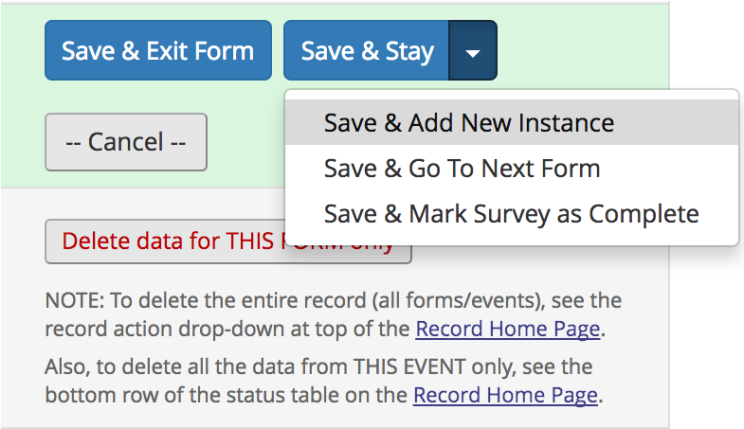
You can delete an instance by clicking the x at the bottom of the column (on the bottom row, "Delete all data on event").

You can alter each entry for a record just by clicking on the instrument and instance you want. For example: in the image above, you can complete the incomplete 3rd instance of the Preliminary Survey by clicking on the red bubble. This takes you to a standard record entry page, but you will see an "(Instance #3)" next to the event name.

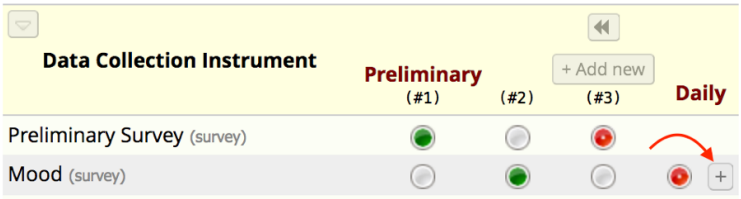


2) By Instrument

When editing a repeating instrument, you have an additional save option “Save & Add New Instance”.

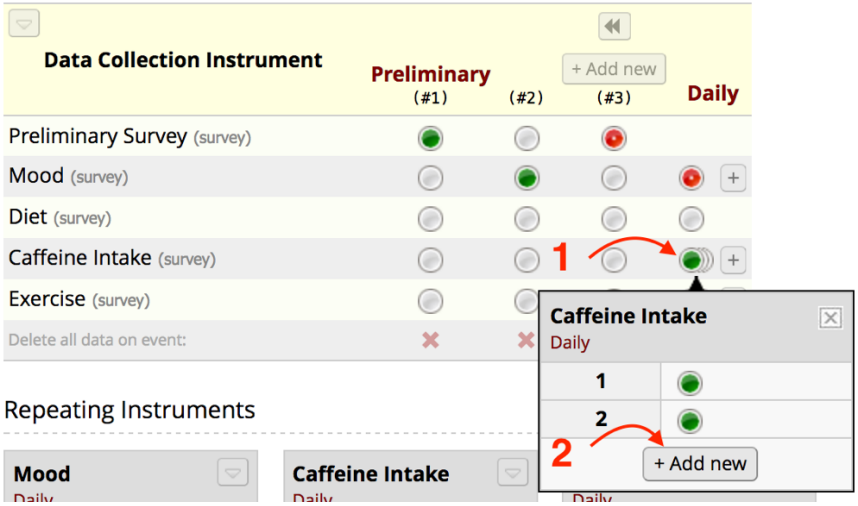


Or you can add a new instance to an instrument from the record home page as long as the instrument is not empty (has not had any data saved). Do this with the plus button on the side of the instrument.

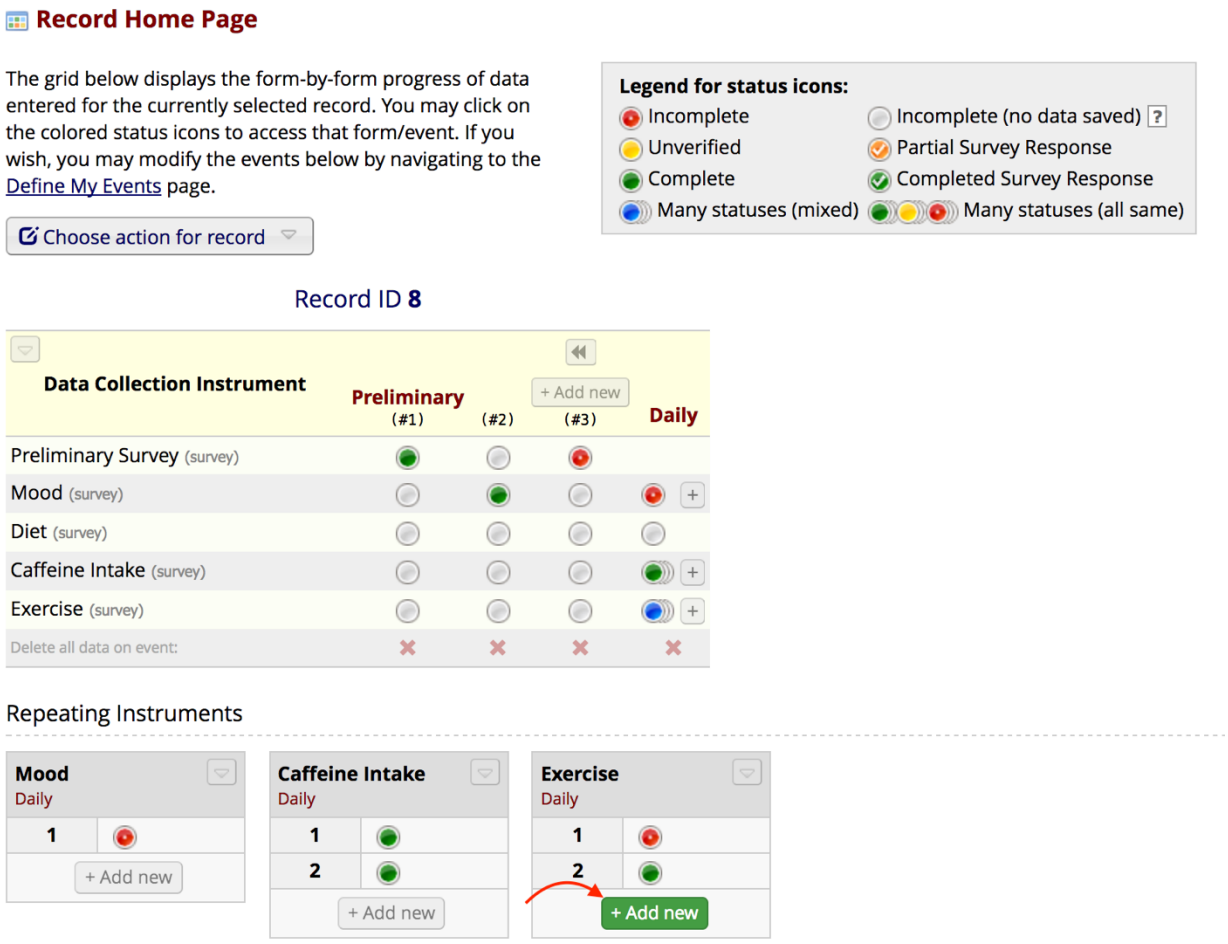


Or you can add an instance by

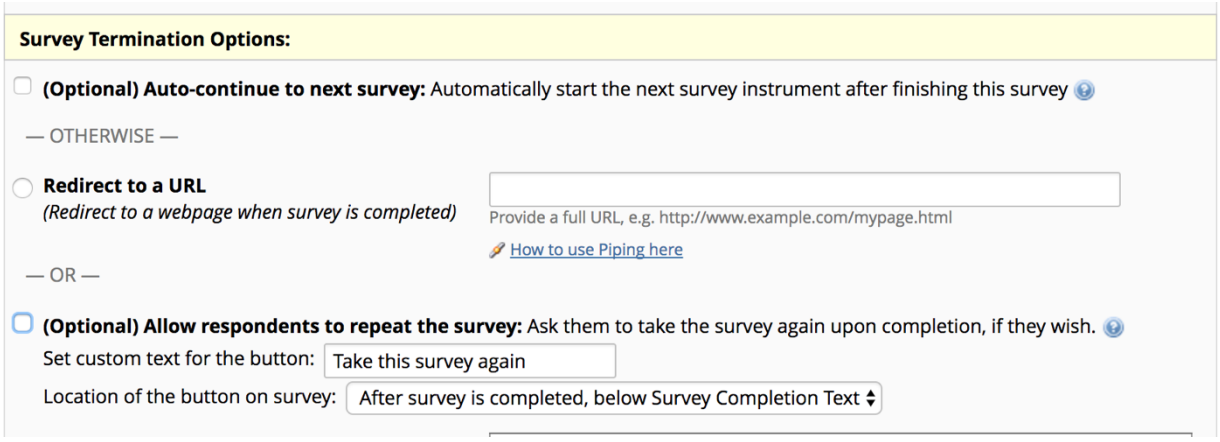
1) clicking a stack of multiple instances
2) and selecting the “+Add new” button at the bottom of the popup.



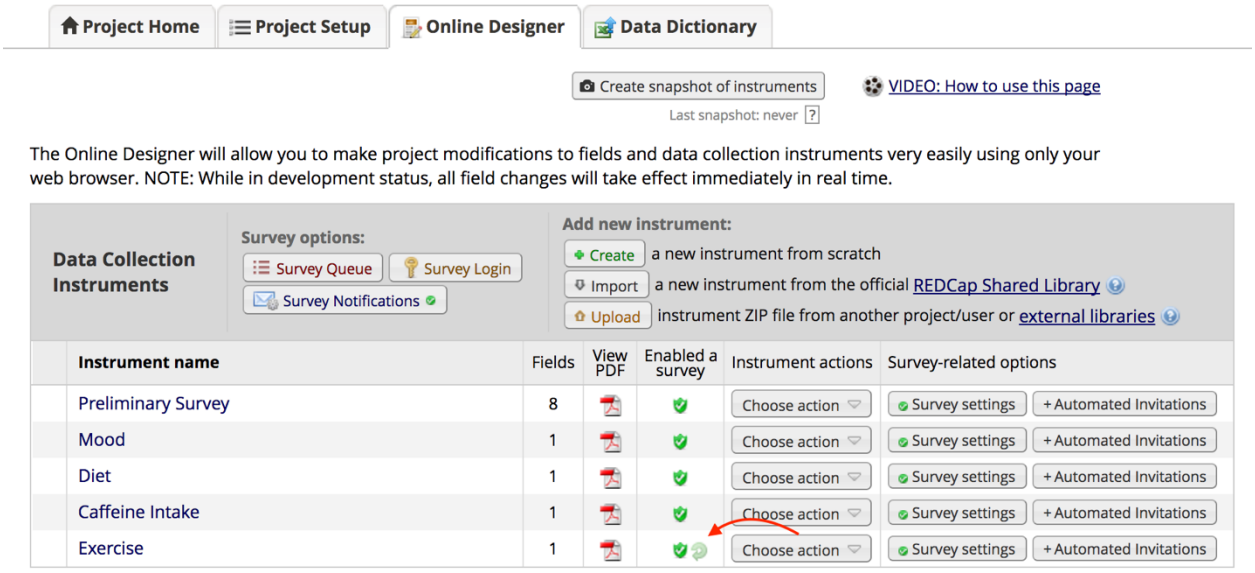
Once you create a few repeat instrument instances, you will see the entries below the primary record/instrument table. You can add a new instrument instance from these lists of repeating instruments too.



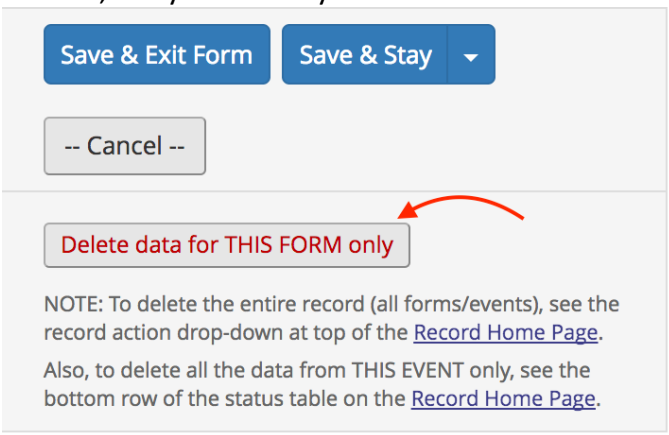
If you have surveys enabled, you can also allow participants to create new instances of an instrument in the Survey Settings.



Once you enable the "Allow respondents to repeat the survey" option, you will see a looping arrow icon next to the survey from the Online Designer page. Below, we have allowed respondents to repeat the survey on our repeating instrument, "Exercise". This is the only instrument we enable the option for, so it is the only one with a looping arrow icon.



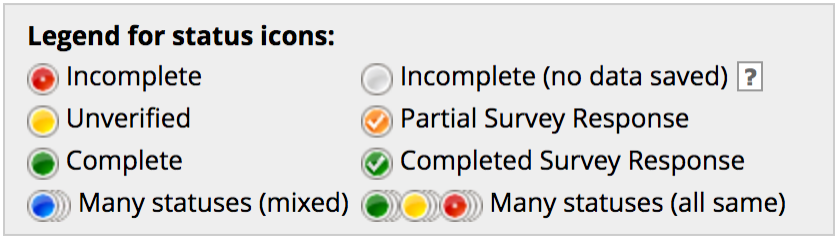
As in the repeating events section, you can delete entire events with the x at the bottom of the column, but you can only delete individual instances of instruments from their data entry page.



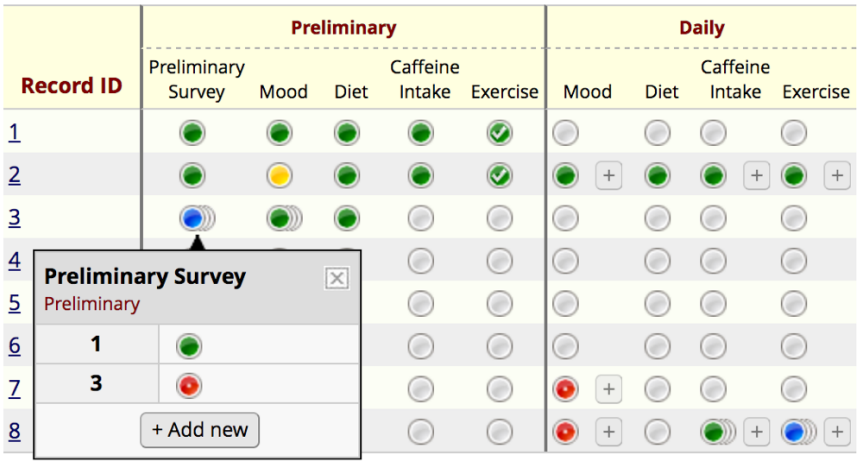
You can alter each entry for a record just by clicking on the instrument and instance you want. For example: in the image above, you can complete the incomplete 3rd instance of the Preliminary Survey by clicking on the red bubble. This takes you to a standard record entry page, but you will see an "(Instance #3)" next to the event name.

Viewing Repeating Instruments and Events

You can still navigate to Add / Edit Records to see the individual records (same view as the examples used in the Create and Edit Repeat Instruments section). However, there are a few new icons to indicate when multiple instances are created. If there are multiple instances for an instrument there are now overlapping bubbles. There is a legend on the top right of the Record Status Dashboard which explains the new status nicely.



Notice if you click on the overlapping bubbles, a popup will appear displaying all of the saved instances of the instrument as well as an "+Add new" button to create a new instance. In the example below, instances 1 and 3 had been filled in and saved for the "Preliminary Survey".



There are also a few differences between repeating events, and individual repeating instruments. In the image above, the Preliminary event was marked for repetition (Repeat Entire Event), while the Daily event has repeating instruments (Repeat Instruments). The Record Status Dashboard allows you to create new instances of individual instruments with the "+" button, but only if the instruments are both marked as individually repeating *and* they have one saved instance. You can see above that record 3 has no saved instances, so the option to add a new individual instance is not available.

Exporting and Importing Repeating Data and Project Data Dictionaries

You may want to export and import data from your project that has repeating events or instruments (or both). These options are largely unchanged, but there are a few caveats to be aware of.

For data exports, you must disable the “Export survey identifier and survey timestamp field(s)?” option (if your project includes surveys) if you plan to import your data later (you can manually make the changes, but this would be tedious and vulnerable to accidental changes). The survey identifier field keeps track of survey respondents, and the timestamp field tracks the time of submission. These two fields are not stored in the same location as your collected data (it is outside of the data dictionary structure). If you try to import a raw data csv or CDISC ODM (XML) that has survey identifier and survey timestamp fields, you will get an error since these fields are not within your data dictionary (and therefore cannot be imported). However, if you are not worried about importing your exported data (if it isn’t supposed to be a backup), the survey identifier and timestamp fields may be useful information to include.

If you want to use your project as a template, one option is to export (and later import) the data dictionary. However, similar to longitudinal capabilities, an imported data dictionary cannot enable repeating events and instruments. If you import a data dictionary form a project with repeating events or instruments, you will have to manually enable the “Repeating instruments” option on the Project Survey page. Another option for using a project with repeating instruments as a template is to copy the project. When you copy the project (from the project setup page) you have the option to include or exclude existing records, and your new copied version of the project will already have the Repeating Instruments option enabled.