Longitudinal Data Collection

CCTS Biostatistics Core

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For repeated data collection on the same instrument within the same record, REDCap has two approaches.

1. Longitudinal data collection
2. Repeating instruments

These approaches can also be combined.

Which Option Should I Choose?

You might use **longitudinal data collection** if:

- There is a pre-defined number of events with or without temporal order.
- The Scheduling module is needed.

You might use **repeating instruments** if:

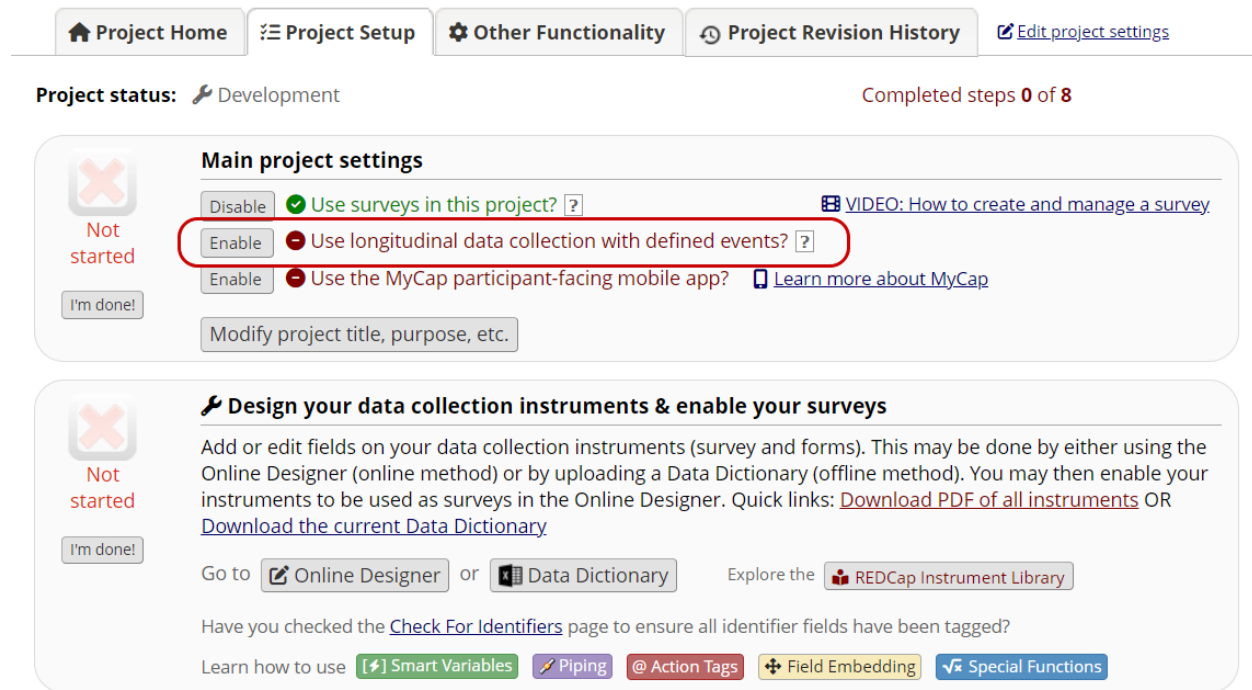- An unlimited or unknown number of repeated measures are expected.

You might use **longitudinal data collection + repeating instruments** if:

- There is a pre-defined number of events with or without temporal order.
- Within one or more defined events, data collection will be repeated an unlimited or unknown number of times.

Longitudinal Data Collection

Enable Longitudinal Data Collection in Main Project Settings

When your project is in development status, open the Project Setup page. Under Main Project settings, click `Enable` next to "Use longitudinal data collection with defined events." You can enable this option any time when in development status.

Figure 1: Enable Longitudinal Data Collection

Define Events

A longitudinal project lets you define "events" so that you can use a data collection instrument multiple times for a single record. We recommend you create all instruments in the Online Designer or via the Data Dictionary before you define events and designate instruments to them.

After you have created your instruments, click `Define My Events` on the Project Setup page.

Figure 2: Click Define My Events

Create each event by filling out each required field, described below.

Figure 3: Define My Events

Event #: An "event" may be a temporal event, such as baseline or follow-up data collection, or a task to be performed. Each event will be associated with one or more instruments, and each instrument can be associated with one or more events. Add as many events as you'll need for repeated measures in your

study. If different numbers of repetitions are planned for different instruments, create enough events for the maximum number of repeated measures.

Important: Don't make separate events for different data collection steps if there is no repeating data collection on a single instrument. For example, if you administer an intake form only once, at baseline, and an evaluation form only once, six months later, you should **not** create two separate events, even though data collection happens at different times.

Days Offset: This is an optional setting, available if you have enabled the Scheduling module. Use Days Offset when a fixed time interval between events will be applied to all subjects. If you don't need this option, just put the event's serial number (1, 2, 3...).

Unique Event Name (auto-generated): When you use piping, branching logic, or calculated fields, or otherwise refer to a variable by name in a longitudinal project, you must prepend the unique event name to access the correct version of the repeated field. For example, you might use `[baseline_arm_1][weight]` to refer to the weight measurement taken during the baseline event.

Arm: This is an option when there is more than one data collection structure of events and repeating instruments. For example, if you have two cohorts with different numbers of data collection events linked to different instruments, or different schedules of data collection, they may be assigned to separate arms.

Important: Don't make separate arms if you have multiple groups with the same number of events and linked instruments.

Designate Instruments for My Events

After you have defined your events, click `Designate Instruments for My Events`. Make sure each instrument is linked to at least one event. If an instrument isn't linked to any events, it will not show in the data entry form.

Figure 4: Designate Instuments for My Events

Scheduling and Calendar

Follow-up event dates are automatically generated based on the Days Offset entered on the "Define My Event" page, but they are modifiable within individual records.

Figure 5: Scheduling

Schedules appear on the Calendar with a link to the record's data entry forms.

Figure 6: Calendar

Preview Exported Data

Reports and data exports will include multiple rows for a single record ID, one for each event for which the record has data. The auto-generated column called `redcap_event_name` will indicate the event associated with each row. A row will only contain data for instruments completed as part of the associated event; fields

from non-repeating, non-associated, or incomplete instruments will appear blank.

Figure 7: Exported Data

Repeating Instruments

By enabling repeating instruments, you can collect data on a single instrument an unlimited number of times without defining the number or schedule ahead of time. You may use this if, for example, you want clinic patients to submit the same assessment weekly with no defined end date.

Enable Repeating Instruments

On the Project Setup page, click `Enable` next to "Repeating instruments and events" in the "Enable optional modules and customizations" section.
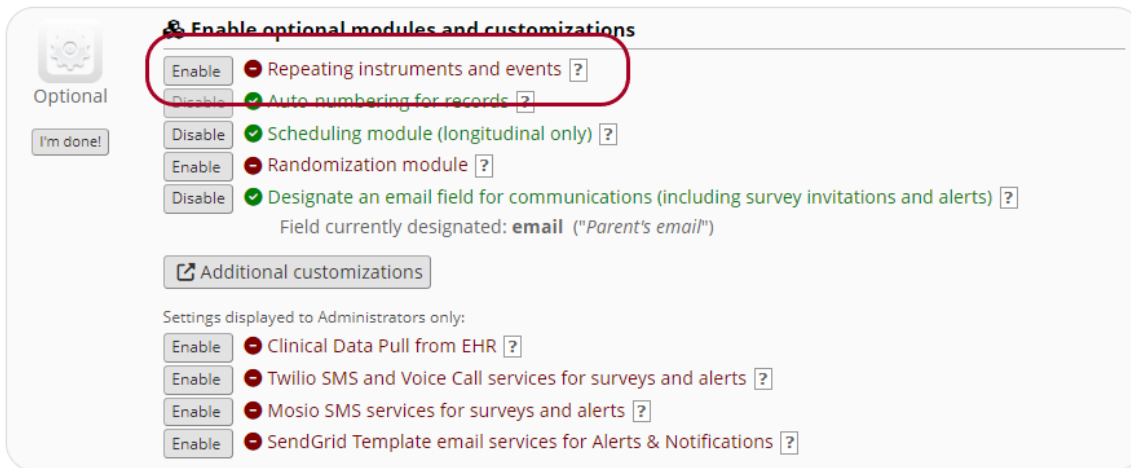

Figure 8: Enable Repeating Instruments and Events

Check the the box next to each instrument that should repeat indefinitely. Note that any selected instruments will repeat independently, potentially different numbers of times.

Figure 9: Select Repeating Instruments

When you use piping, branching logic, or calculated fields, or otherwise refer to a variable from a repeating instrument by name, you must append the instance number to access the correct version of the repeated field. For example, you might use `[weight][2]` to refer to the second weight measurement taken.

Preview Exported Data

Reports and data exports will include multiple rows for a single record ID, one for each instance of each repeating instrument. Exported data will include auto-generated columns for `redcap_repeat_instrument` and `redcap_repeat_instance`. Fields not associated with a row's instrument and instance will appear blank.

	A	B	C	D	E	F	G	T	U	
1	record_id	redcap_repeat_instrument	redcap_repeat _instance	firstname	lastname	email	screen_date	howoft_helpless	child_symptons___1	
2	1			John	Smith	test@test.com	7/25/2023			
3	1	pediatric_asthma_caregivers_qual	1					6	1	
4	1	pediatric_asthma_caregivers_qual	2					2	1	
5										

Figure 10: Exported Data

Longitudinal + Repeating Instruments

By using both longitudinal data collection and repeated instruments and events, you can repeat entire events or select instruments within each event. For example, you may wish to administer three different surveys at each weekly clinic visit. You might create a "Weekly Clinic Visit" event, designate the three survey instruments to that event, and repeat the entire event an open-ended number of times.

Enable Repeating Instruments or Events

Follow the instructions above to define your events and designate instruments. Click `Enable` next to "Repeating instruments and events" in the "Enable optional modules and customizations" section. Use the dropdown menus and checkboxes to select events or instruments for open-ended repetition.

Figure 11: Select Repeating Instruments and Events

Preview Exported Data

Reports and data exports will include multiple rows for a single record ID, one for each event and instance of repeating instruments. Exported data will include auto-generated columns for `redcap_event_name`, `redcap_repeat_instrument`, and `redcap_repeat_instance`. Fields will appear blank for non-repeating or irrelevant combinations of events and instrument instances.

	A	B	C	D	E	F	G	H	I	J	K	L
1	record_id	redcap_event_name	redcap_repeat_instrument	redcap_repeat_instance	depression	symptom_	symptom_	symptom_	symptom_	symptom_	symptom_	symptom_pe
2	1	3_month_followup_arm_1			3	1	1	1	1	0	0	0
3	1	baseline_arm_1	eligibility_questionnaire	1								
4	1	baseline_arm_1	pediatric_asthma_caregivers_quality_of_life	1	4	1	1	1	1	0	0	0
5	1	baseline_arm_1	pediatric_asthma_caregivers_quality_of_life	2	7	1	0	0	0	0	0	0
6	1	baseline_arm_1	testing_fields_by_request	1								
7	2	baseline_arm_1	eligibility_questionnaire	1								
8	3	3_month_followup_arm_1			6	0	1	0	0	0	0	0

Figure 12: Exported Data