

REDCap

Longitudinal Studies Class (201)

September 20, 2017



REDCap
Research Electronic Data Capture

ITHS

Institute of Translational Health Sciences
Accelerating Research. Improving Health.



Learning Objectives



Longitudinal features

- ▶ Setup
 - ▶ Logic
 - ▶ Data entry



Repeatable forms

- ▶ Setup
 - ▶ Data entry



Determining the best model for your project

- ▶ Data entry vs data analysis
 - ▶ Export consequences

ITHS' Focus

- Speeding science to clinical practice for the benefit of patients and communities.
- Promotes translation of scientific discovery by:
 - Fostering innovative research
 - Cultivating multi-disciplinary partnerships
 - Training the next generation of researchers
- More information: www.iths.org



General Workflow Models

Classical model

- *Longitudinal mode turned off*
 - *Each form can be filled out once per record*
 - *Simplest and easiest*
-

Longitudinal model (Single arm)

- *Longitudinal mode turned on*
 - *Single arm with a number of events defined*
 - *Instruments can be linked to multiple events*
-

Longitudinal model (Multiple arms)

- *Longitudinal mode turned on*
- *Multiple arms each with a number of events defined*
- *Instruments can be linked to multiple events in each arm*
- *The event setup can differ widely per arm*
- *Each record can only “live” in one arm at a time*

Longitudinal Setup

Enable Feature	Setup Arms	Setup Events	Link instruments	Check Dependents	Run Tests
					
<i>Enable longitudinal mode</i>	<i>Setup the desired number of arms</i>	<i>Setup the appropriate number of events per arm</i>	<i>Link up the proper instruments to each event in each arm</i>	<i>Setup features dependent on a correct longitudinal model</i>	<i>Test your model</i>

Each step requires the previous steps, so follow this order

Longitudinal Setup

Enable Longitudinal mode

Setup Arms

Setup Events

Link Instruments

Setup Dependent Features

Test Your Model



Enable Longitudinal Mode

- ▶ Hit the “Enable” button to turn on longitudinal mode
 - ▶ Found in the project setup page
 - ▶ Disable longitudinal mode hides features

Main project settings

Complete! Not complete

Use surveys in this project? [VIDEO: How to create and manage a survey](#)

Use longitudinal data collection with defined events? [VIDEO: How to create and manage a survey](#)

A screenshot of a software interface titled "Main project settings". It shows two checkboxes: "Use surveys in this project?" (checked) and "Use longitudinal data collection with defined events?" (unchecked). Below the checkboxes are two buttons: "Disable" and "Enable". A large green arrow points from the left towards the "Enable" button. The status bar at the bottom says "Complete!" with a checkmark icon.

Main project settings

Complete! Not complete

Use surveys in this project? [VIDEO: How to create and manage a survey](#)

Use longitudinal data collection with defined events? [VIDEO: How to create and manage a survey](#)

A second screenshot of the same software interface, showing the "Enable" checkbox now checked. A large green arrow points from the left towards the "Enable" button. The status bar at the bottom says "Complete!" with a checkmark icon.

Longitudinal Setup

Enable Longitudinal mode

Setup Arms

Setup Events

Link Instruments

Setup Dependent Features

Test Your Model



Setup Arms

- ▶ Location:
 - ▶ Navigate to the Project Setup page
 - ▶ Click on the “Define My Events” Button
- ▶ Basic setup:
 - ▶ Single arm is the default
 - ▶ To add additional arms use the “+Add New Arm” tab
- ▶ “Quick” setup:
 - ▶ Use the “Upload arms (CSV)” option
 - ▶ Download a template with the “Download arms (CSV)” option
- ▶ Rename your arm(s) as needed
- ▶ Order of arms is determined by number not name
- ▶ Do not change order if you have real data in the project

Longitudinal Setup

Enable Longitudinal mode

Setup Arms

Setup Events

Link Instruments

Setup Dependent Features

Test Your Model



Setup Events

- ▶ Also found in “Define My Events”
- ▶ Basic setup:
 - ▶ Each arm needs to have at least 1 event
 - ▶ To add extra events use the “Add new event” button after define the event name
- ▶ “Quick” setup:
 - ▶ Use the “Upload events (CSV)” option
 - ▶ Download a template with the “Download events (CSV)” option
 - ▶ Pro tip: only the event name and arm number are mandatory for the “Upload events (CSV)” option
- ▶ The event name and arm number automatically combine into the “unique event name”.
- ▶ Keep event names short

Longitudinal Setup

Enable Longitudinal mode

Setup Arms

Setup Events

Link Instruments

Setup Dependent Features

Test Your Model



Link Instruments

- ▶ Assign instruments to appropriate event(s)
- ▶ Needs to be done for each arm
- ▶ Always link the first instrument to the first event
 - ▶ Due to the record ID requirement
- ▶ Basic setup:
 - ▶ Click on "Begin editing"
 - ▶ Select the instruments you want to link
 - ▶ Click on the "Save" Button
- ▶ "Quick" setup:
 - ▶ Use "Upload instrument-events mappings (CSV)" option
 - ▶ Download a template with the "Upload instrument-events mappings (CSV)"

Longitudinal Setup

Enable Longitudinal mode

Setup Arms

Setup Events

Link Instruments

Setup Dependent Features

Test Your Model



Setup Dependent Features

- ▶ Surveys
 - ▶ Automatic survey invitations
 - ▶ Survey queue
 - ▶ Public survey link
- ▶ Repeatable forms
 - ▶ Repeatable instruments
 - ▶ Repeatable events
- ▶ Reports
- ▶ Branching logic
- ▶ Calculations

Longitudinal Setup

Enable Longitudinal mode

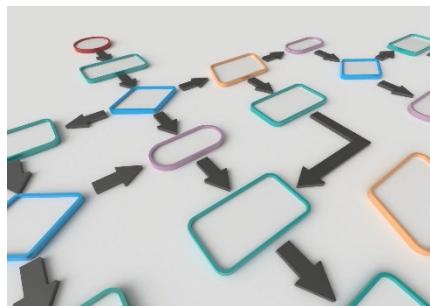
Setup Arms

Setup Events

Link Instruments

Setup Dependent Features

Test Your Model



Branching Logic

- ▶ Classic Branching logic
 - ▶ Define the **variable**
 - ▶ Put in an **operator**
 - ▶ Declare your **comparison value**

[age_of_child] >= '18'

- ▶ Longitudinal Branching Logic
 - ▶ Define the **event**
 - ▶ Define the **variable**
 - ▶ Put in an **operator**
 - ▶ Declare your **comparison value**

[baseline_arm_1][age_of_child] >= '18'

Longitudinal Setup

Enable Longitudinal mode

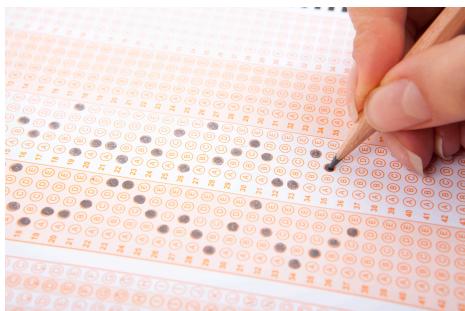
Setup Arms

Setup Events

Link Instruments

Setup Dependent Features

Test Your Model



Test Your Model

- ▶ Create a couple of test records
 - ▶ Use test data as close to real as possible
 - ▶ Simulate the workflow you intent to use
- ▶ Pay extra attention to the following features:
 - ▶ Survey mechanics
 - ▶ Branching logic
 - ▶ Calculations

Scheduling Module

Location

- *Enabled in the project setup page*
 - *Button in “Optional modules and customizations” section*
 - *Scheduling application found under “Data collection”*
 - *Calendar application found under “Applications”*
-

Setup

- *Enable “Scheduling module”*
 - *Navigate to the “Define My Events” page*
 - *Add “Days Offset” & “Offset Range”*
 - *“Days Offset” governs the order of events*
 - *“Offset Range” is used for schedule generation*
-

Use

- *Generate a schedule for each record in the “Scheduling” application*
 - *Adjust the schedule if necessary*
 - *View all scheduled records together in the “Calendar” application*
-

Longitudinal Data Entry

Adding new records

- *Navigate to the “Add / Edit Records” menu*
 - *Create a new record*
 - *In case of multiple arms, you’ll have to select the appropriate arm before creating a record*
-

Record home page

- *Page provides an overview for the data entry progress for a single record*
 - *Clicking on any dot will take you directly to that particular form in the corresponding event*
 - *General & event specific actions are located on this page*
-

Record Status Dashboard

- *Dashboard provides an overview for the data entry progress of all records*
- *Organised by event*
- *Use the “Create custom dashboard” option to craft your own custom overviews*

Infinitely Repeating Instruments or Events



Repeating Instruments

- ▶ Repeat any instrument as many times as needed
- ▶ Works in both classic and longitudinal mode
- ▶ Use for “fuzzy” data entry like “adverse events”

Repeating Events

- ▶ Only works for longitudinal mode
- ▶ Repeat any event as many times as needed
- ▶ Use for situations where the number of needed events differs per record. e.g. “Chemotherapy cycles”

Limitations

- ▶ Adding a repeating instrument to a repeating event is not allowed
- ▶ Use of repeating function will make analysis more challenging

Infinitely Repeating Setup

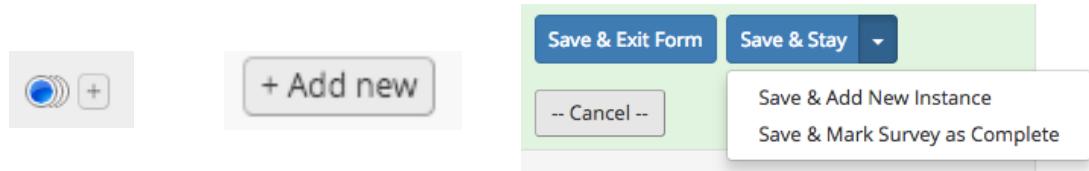


- ▶ Done after setup of:
 - ▶ Instruments
 - ▶ Longitudinal model
- ▶ Navigate to the “optional modules” section in the project setup page
 - ▶ Click on the “Modify” button next to the “Repeatable instruments and events” button
- ▶ In the resulting pop-up, select from the following for each event:
 - ▶ Not repeat anything
 - ▶ Repeat the entire event
 - ▶ Repeat instruments
 - ▶ Select the instruments to repeat
 - ▶ Use of a custom label is recommended
 - ▶ Use the variable name of a variable within the repeated instrument
 - ▶ Example labels:
 - ▶ Visit date: [visit_date]
 - ▶ Score: [score_total]

Using Repeating Instruments



- ▶ Instruments can be repeated by:
 - ▶ Users
 - ▶ Survey participants
- ▶ Users should look for:
 - ▶ The “plus” symbol in the record home page
 - ▶ The “Add New” button in the record homepage
 - ▶ The “Save & Add New Instance” option in the “Save & Stay” button on an instrument page



- ▶ Survey participants should look for a button at:
 - ▶ Next to the submit button
 - ▶ Below the survey completion text
- ▶ The text and location of the button can be configured in the survey settings of any repeating survey

Using Repeating Events



- ▶ Events can only be repeated by users
- ▶ User should look at the “+Add new” button in the record home page
- ▶ If you want to send out any survey in a repeated event, you’ll have to schedule that invitation manually. You can do that via:
 - ▶ The compose survey invitation in a form
 - ▶ The participant list
- ▶ Automated invitations are currently not available for repeated events



Export consequences

For longitudinal projects and repeatable instruments/events



- ▶ Classic projects
 - ▶ Single row of data per record
 - ▶ Smaller export files



- ▶ Longitudinal projects
 - ▶ 1 row per event, per record
 - ▶ Only if data is in the event
 - ▶ Sparse matrix
- ▶ Repeatable instruments/events
 - ▶ 1 row per repeat, per record
 - ▶ Bigger exports files
 - ▶ Unwieldly reports
 - ▶ Very sparse matrix

**Exports will have
1 row per record**

**Exports will have
Multiple rows per
record**

**Talk to your
analyst/statistician**



Ease of Data Entry VS Ease of Analysis

Design focused on

Easy Data Entry

- Tends to require more work to analyze
- Has greater flexibility for data entry

Design focused on

Easy Data Analysis

- Rigid data entry
- Better quality data

Solution?

- ▶ Talk to the parties involved
- ▶ Determine priorities for your study
- ▶ And if all else fails, → Compromise

Thank You

Questions?

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