

# REDCAP

## Longitudinal Module (203)



# ITHS' Focus

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- Promotes translation of scientific discovery by:
  - ❑ Fostering innovative research
  - ❑ Cultivating multi-disciplinary partnerships
  - ❑ Training the next generation of researchers
- More information: [www.iths.org](http://www.iths.org)



Laboratory

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Institute of Translational Health Sciences  
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# Learning Objectives



## Longitudinal features

- Setup
- Changes to dependent features
- Data entry



## Repeatable forms and events

- Setup
- Data entry



## Determining the best model for your project

- Export consequences
- Data entry vs data analysis

# General Workflow Models

## Classic 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 Longitudinal



*Enable longitudinal mode*

## Setup Arms



*Setup the desired number of arms*

## Setup Events



*Setup the appropriate number of events per arm*

## Link instruments



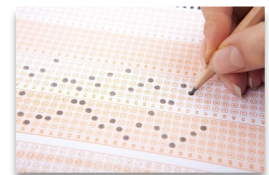
*Link up the proper instruments to each event in each arm*

## Check Dependents



*Setup features dependent on a correct longitudinal model*

## Run Tests



*Test your model*

**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? [?](#)

**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? [?](#)

# 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

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Setup Arms

---

Setup Events

---

Link Instruments

---

**Setup Dependent Features (1/2)**

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Test Your Model



## Set Up 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

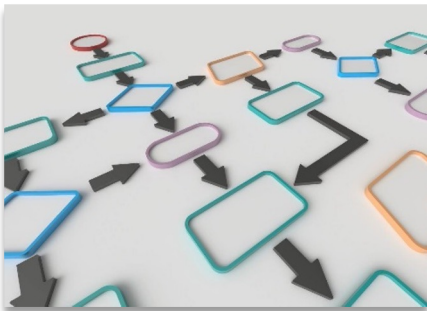
Setup Arms

Setup Events

Link Instruments

Setup Dependent Features (2/2)

Test Your Model



## Branching Logic Changes

- 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

---

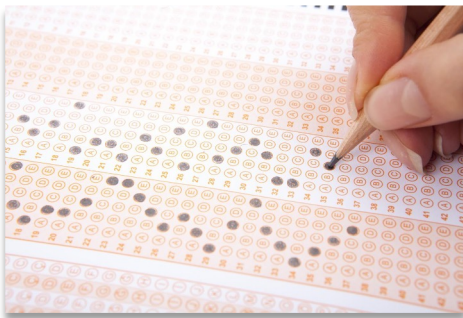
Link Instruments

---

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 intend to use
- Pay extra attention to the following features:
  - Survey mechanics
  - Branching logic
  - Calculations



Move to Production

# 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*
- *Organized by event*
- *Use the “Create custom dashboard” option to craft your own custom overviews*

# 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*





## Repeating Instruments & Events



# 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

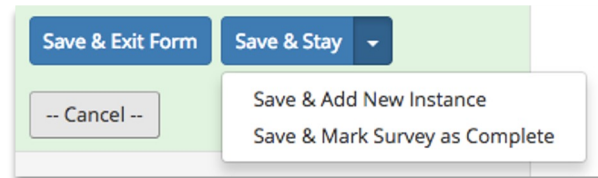
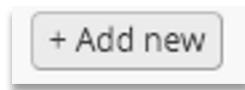
# Infinitely Repeating Setup



- 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 option
  - The participant list
- Automated invitations are currently not available for repeated events



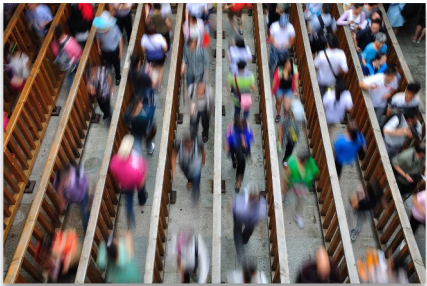
# Export consequences

## For longitudinal projects and repeatable instruments/events



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

**Exports will have  
1 row per record**



- Longitudinal projects
  - 1 row per event, per record
  - Only if data is in the event
  - Sparse matrix

**Exports will have  
Multiple rows per  
record**



- Repeatable instruments/events
  - 1 row per repeat, per record
  - Bigger exports files
  - Unwieldy reports
  - Very sparse matrix

**Talk to your  
analyst/statistician**

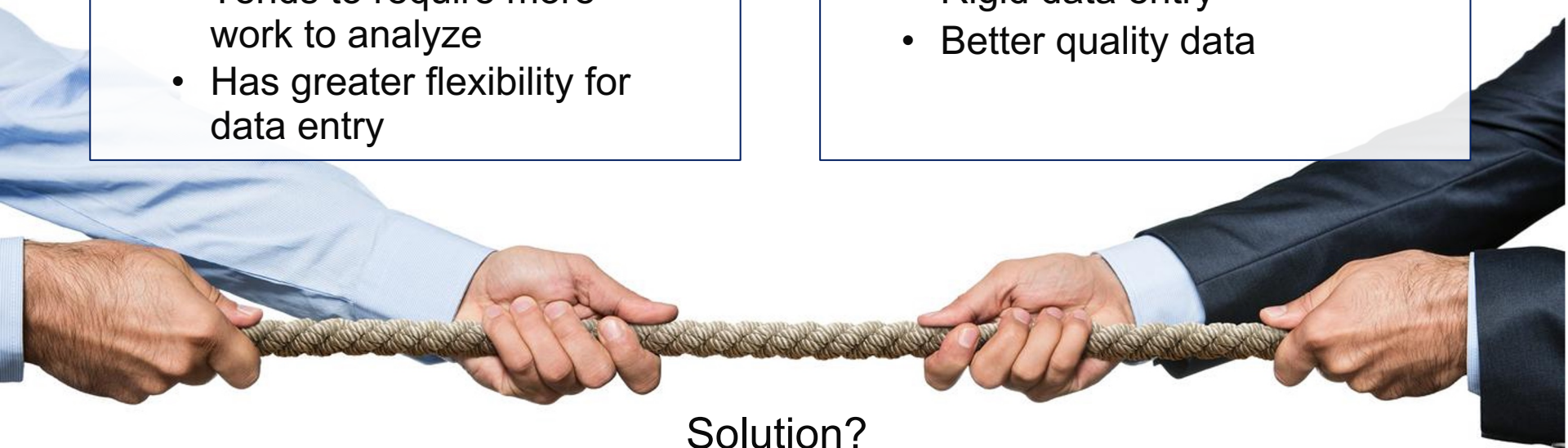
# Ease of Data Entry vs Ease of Analysis

## 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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*Members can connect with collaborators across the CTSA consortium.*