REDCap YES3 Exporter
External Module

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In today’s session, you will learn:

- What is the Yale Study Support Suite (YES3)
- What is the YES3 Exporter
  - What enhancements & features does it have
- How does the YES3 Exporter work
  - What export layouts are available
- How you can get the YES3 Exporter
What is YES3?

- The Yale Study Support Suite (YES3) are software tools released to the REDCap consortium for worldwide use.
- External Modules work within REDCap to expand its functionality.
- Based on systems designed, deployed, and perfected over several decades to support research operations.
- Available to you at no cost - developed through grant awards.

Peter Charpentier presents YES3 at the International REDCap Conference 2022.
What External Modules are part of the Suite?

- YES3 Exporter
- YES3 Dashboard
- YES3 Study Portal

Today’s training will focus on the YES3 Exporter.
How many of you have used the built-in data export feature in REDCap?

The standard export option in REDCap has many useful features (filters, de-identifying, exporting to statistical packages).
REDCap Export Limitation

- Longitudinal projects are exported as **one row per event** resulting in multiple rows per record.
  - Those new or inexperienced with statistical software find it difficult to analyze longitudinal data.
  - Those familiar with statistical software often subset longitudinal data by events and combine them to one row per subject.

*Is there a way to export the longitudinal data in a format that will make things easier?*
What are the enhancements in the YES3 Exporter?
YES3 Exporter Enhancements & Features

- Flexible output spreadsheet layouts (*horizontal, vertical, repeating form*)
  - Longitudinal: One row per record all events!
  - Simplifies analysis with statistical software

- Improved performance
  - Faster: can handle large exports

- Enhanced data dictionary
  - Export-specific data dictionary: simplifies data sharing
  - Metadata and distributions: quick reporting and validation

- Can export directly to a host file system

- Light and dark themes
YES3 Exporter Enhancements & Features

• Security and Compliance
  – Conforms to REDCap v12- form-specific access and export rights
  – Audit trails and tracking
    • Detailed export history log
    • Automated email summary of export activities (optional)

• Export templates and specifications
  – Templates can be saved and re-used
  – Specifications can be rolled back and restored
Enhanced Feature: Export-Specific Data Dictionary

- YES3 Data Dictionary is specific to the data in your export
  - Includes metadata and data distribution summaries
  - Summary data includes count, range, #nonblank, and either a frequency table or mean & variance, as appropriate to field type

For date/time field type, summaries of both date values and formatted values are included in the data dictionary
Enhanced Feature:
YES3 Exporter Log

- Audit trails – logs all data exports activity
- Detailed information using the inspect icon
Questions?

Next: How do I get it?
How do I install the YES3 Exporter so I can use it on my REDCap project?

Email your REDCap Administrator.

Send us an email at REDCap@yale.edu.
We will enable the module in your project.
There are resources to help you.
How does it work?
YES3 Exporter Components

- Manage Configurations
- YES3 Exporter Main
  - Set up data export configurations
- YES3 Exporter Event Prefixes
  - Modify auto-generated prefixes to distinguish different events
- YES3 Exporter Logs
  - Audit trail of each export that has been created and downloaded
- YES3 Exporter Documentation
YES3 Exporter Components
Manage: Configuration of Module

- **Set Up: Step #1**
  - Ask an Administrator to install the Exporter on your project

- **Set Up: Step #2**
  - Configure the Exporter
    - Must have project design and setup rights

![Configure YES3 Exporter Components](image-url)
YES3 Exporter Components
Manage: Export Configurations

- Manage configurations allows you to:
  - Enable daily email notifications
  - Permit exports to be saved to a host file system*
  - Set retention for backups

*Additional approvals required
YES3 Exporter Components
Event Prefixes

- **Set up:** Step #3,
  - If you are using a horizontal layout, review and edit the auto-generated prefixes

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**Exporter Event Prefixes**

Event prefixes
For horizontal export layouts the YES3 Exporter attaches event prefixes to column names. Keep the prefixes as short as you can manage.

Click [here](#) to restore your event prefixes to their default values.

<table>
<thead>
<tr>
<th>Event</th>
<th>Prefix</th>
</tr>
</thead>
<tbody>
<tr>
<td>baseline_arm_1</td>
<td>e1</td>
</tr>
<tr>
<td>fu_arm_1</td>
<td>e2</td>
</tr>
<tr>
<td>baseline_arm_2</td>
<td>e3</td>
</tr>
<tr>
<td>fu_arm_2</td>
<td>e4</td>
</tr>
</tbody>
</table>
YES3 Exporter Components
Main: Create Exports

1. Name your export and pick a layout format

New Export

Please provide a name and layout for the export to be added.
Note that while you can change the name later, you cannot change the layout once the export has been created.

Export NAME: new export
- Horizontal (longitudinal projects: one row per record)
- Vertical (one row per record+event)
- Repeating Form (one row per record+event+instance)

save  cancel
Export Layout #1 - Horizontal

- Longitudinal projects: one row per record

Example

Monthly follow up form for m1, m2 and m3 events:

<table>
<thead>
<tr>
<th>Instrument:</th>
<th>Monthly Follow Up Status (monthly_follow_up_status)</th>
</tr>
</thead>
<tbody>
<tr>
<td>176</td>
<td>[mthly_fu_date]</td>
</tr>
<tr>
<td></td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td>text (date_mdy), Required</td>
</tr>
<tr>
<td>177</td>
<td>[mthly_fu_complete]</td>
</tr>
<tr>
<td></td>
<td>Monthly Follow Up Completed</td>
</tr>
<tr>
<td></td>
<td>radio, Required</td>
</tr>
<tr>
<td></td>
<td>1 Yes</td>
</tr>
<tr>
<td></td>
<td>0 No</td>
</tr>
</tbody>
</table>

Event prefixes added to field names:

<table>
<thead>
<tr>
<th>study_id</th>
<th>m1_mthly_fu_date</th>
<th>m1_mthly_fu_complete</th>
<th>m2_mthly_fu_date</th>
<th>m2_mthly_fu_complete</th>
<th>m3_mthly_fu_date</th>
<th>m3_mthly_fu_complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>5/14/2021</td>
<td>1</td>
<td>6/9/2021</td>
<td>1</td>
<td>7/7/2021</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>3/30/2021</td>
<td>1</td>
<td>4/22/2021</td>
<td>1</td>
<td>5/20/2021</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>3/31/2021</td>
<td>1</td>
<td>4/28/2021</td>
<td>1</td>
<td>5/26/2021</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>4/16/2021</td>
<td>1</td>
<td>5/14/2021</td>
<td>1</td>
<td>6/9/2021</td>
<td>1</td>
</tr>
<tr>
<td>27</td>
<td>5/17/2021</td>
<td>1</td>
<td>5/14/2021</td>
<td>0</td>
<td>7/13/2021</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>4/29/2021</td>
<td>1</td>
<td>5/27/2021</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>6/15/2021</td>
<td>1</td>
<td>7/13/2021</td>
<td>1</td>
<td>8/10/2021</td>
<td>1</td>
</tr>
</tbody>
</table>
Export Layout #2 - Vertical

- One row per record + event
- The REDCap event id is included in the data export file

Example

<table>
<thead>
<tr>
<th></th>
<th>study_id</th>
<th>redcap_event_id</th>
<th>redcap_event_name</th>
<th>mthly_fu_date</th>
<th>mthly_fu_complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>17</td>
<td>9821</td>
<td>m1_arm_1</td>
<td>5/14/2021</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>9825</td>
<td>m2_arm_1</td>
<td>6/9/2021</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>9829</td>
<td>m3_arm_1</td>
<td>7/7/2021</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
<td>9833</td>
<td>m4_arm_1</td>
<td>8/4/2021</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>17</td>
<td>9837</td>
<td>m5_arm_1</td>
<td>9/1/2021</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>9841</td>
<td>m6_arm_1</td>
<td>9/29/2021</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>9821</td>
<td>m1_arm_1</td>
<td>3/30/2021</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>18</td>
<td>9825</td>
<td>m2_arm_1</td>
<td>4/22/2021</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>18</td>
<td>9829</td>
<td>m3_arm_1</td>
<td>5/20/2021</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>18</td>
<td>9833</td>
<td>m4_arm_1</td>
<td>6/17/2021</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>18</td>
<td>9837</td>
<td>m5_arm_1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>18</td>
<td>9841</td>
<td>m6_arm_1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>21</td>
<td>9821</td>
<td>m1_arm_1</td>
<td>3/31/2021</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>21</td>
<td>9825</td>
<td>m2_arm_1</td>
<td>4/28/2021</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>21</td>
<td>9829</td>
<td>m3_arm_1</td>
<td>5/26/2021</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>21</td>
<td>9833</td>
<td>m4_arm_1</td>
<td>6/23/2021</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>21</td>
<td>9837</td>
<td>m5_arm_1</td>
<td>7/21/2021</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>21</td>
<td>9841</td>
<td>m6_arm_1</td>
<td>10/1/2021</td>
<td>1</td>
</tr>
</tbody>
</table>
Export Layout #3 – Repeating Form

- One row per record + event + instance
- Only one repeating form can be defined in the export. You cannot export repeating events.
- Example

```
<table>
<thead>
<tr>
<th>study_id</th>
<th>redcap_event_id</th>
<th>redcap_event_name</th>
<th>redcap_repeat_instance</th>
<th>call_date</th>
<th>wks_frm_mat_start</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>28</td>
<td>9817</td>
<td>1</td>
<td>10/22/2021</td>
<td>31.6</td>
</tr>
<tr>
<td>3</td>
<td>35</td>
<td>9817</td>
<td>1</td>
<td>4/7/2021</td>
<td>3.3</td>
</tr>
<tr>
<td>4</td>
<td>35</td>
<td>9817</td>
<td>2</td>
<td>4/13/2021</td>
<td>4.1</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>9817</td>
<td>3</td>
<td>4/14/2021</td>
<td>4.3</td>
</tr>
<tr>
<td>6</td>
<td>35</td>
<td>9817</td>
<td>4</td>
<td>4/27/2021</td>
<td>6.1</td>
</tr>
<tr>
<td>7</td>
<td>35</td>
<td>9817</td>
<td>5</td>
<td>4/27/2021</td>
<td>6.1</td>
</tr>
<tr>
<td>8</td>
<td>35</td>
<td>9817</td>
<td>6</td>
<td>5/17/2021</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>36</td>
<td>9817</td>
<td>1</td>
<td>4/7/2021</td>
<td>1.1</td>
</tr>
<tr>
<td>10</td>
<td>36</td>
<td>9817</td>
<td>2</td>
<td>4/7/2021</td>
<td>1.1</td>
</tr>
<tr>
<td>11</td>
<td>36</td>
<td>9817</td>
<td>3</td>
<td>4/13/2021</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>36</td>
<td>9817</td>
<td>4</td>
<td>4/27/2021</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>36</td>
<td>9817</td>
<td>5</td>
<td>5/17/2021</td>
<td>6.9</td>
</tr>
<tr>
<td>14</td>
<td>36</td>
<td>9817</td>
<td>6</td>
<td>5/17/2021</td>
<td>6.9</td>
</tr>
<tr>
<td>15</td>
<td>36</td>
<td>9817</td>
<td>7</td>
<td>5/19/2021</td>
<td>7.1</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>9817</td>
<td>8</td>
<td>5/23/2021</td>
<td>7.7</td>
</tr>
</tbody>
</table>
```
Special Note - Checkbox Field Type

- Data from checkbox fields are exported with the checked-off options combined in a single column.
- This prevents innumerable columns in horizontal exports.

Example:

<table>
<thead>
<tr>
<th>study_id</th>
<th>base_date_lec</th>
<th>base_lec1</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>4/26/2021</td>
<td>2,3</td>
</tr>
<tr>
<td>46</td>
<td>4/30/2021</td>
<td>1,2,3</td>
</tr>
<tr>
<td>61</td>
<td>6/10/2021</td>
<td>1,2,3</td>
</tr>
<tr>
<td>70</td>
<td>6/22/2021</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>7/7/2021</td>
<td>1,2,3</td>
</tr>
<tr>
<td>88</td>
<td>10/5/2021</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>10/4/2021</td>
<td>1</td>
</tr>
<tr>
<td>96</td>
<td>7/12/2021</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>7/19/2021</td>
<td>1,3</td>
</tr>
<tr>
<td>109</td>
<td>7/30/2021</td>
<td>1,2,3</td>
</tr>
</tbody>
</table>
2. Set your export settings

- **Export name**: Monthly FollowUp Status
- **Export layout**: Horizontal
- **Options for selecting records to export**
  - Include: Selected records
  - Selection criterion: field: enroll
  - Selection criterion: event: baseline_arm_1
  - Selection criterion: value(s): 1
- **Options for data compliance (de-identified and coded datasets)**
  - Remove tagged identifiers
  - Remove date/time fields
  - Coded (shifted) dates
- **Options for conditioning exported values**
  - Sanitize exported text values by removing unprintable characters and HTML tags.
  - Maximum field label length: max #characters
  - Maximum text value length: max #characters
3. Select your export items
Instructions and Resources: Help Menu

- Click ? to bring up the Help Menu

**YES3 Exporter Main**

**EXPORT SETTINGS**

- Export name: monthly status horizontal
- Export layout: Horizontal

**Options for selecting records to export**

- Include: All records, Selected records
- Selection criterion: field enroll
- Selection criterion: event baseline_arm_1
- Selection criterion: value(s) 1

**Options for data compliance (de-identified and coded datasets)**

- Remove tagged identifiers
- Remove date/time fields
- Remove freetext fields
- Remove note/paragraph fields
- Coded (shifted) dates
- Coded (hashed) record id values

**Options for conditioning exported values**

- Sanitize exported text values by removing unprintable characters and HTML tags.
- Maximum field label length: max #characters
Instructions and Resources: Exporter User Guide

- **Purpose:** Step-by-step instructions
  - Includes a How-To Guide and Quick Start Tutorial
- **Audience:** People creating the exports

**YES3 Exporter User Guide**

*REDCap External Module*

*Version 1.00, July 2022*

**Introduction**

The YES3 Exporter external module compliments REDCap’s reports and data export tool by adding functionality to support data visualization, data sharing, and integration with statistical software and datamarts.

**Features**

- Flexible output spreadsheet layouts
  - Horizontal, vertical, and repeating form layouts
- Expediously handles large exports
  - Large volume exports have minimal impact on performance speed
  - In testing it took 186 seconds to export 3,272 rows and 3,079 columns to a 33MB export .csv file
- Enhanced data dictionary that includes metadata and data distributions
  - Each export is accompanied by a customized data dictionary to simplify data sharing
- Detailed audit for every export download
  - Includes the ability to email daily activity summaries automatically
- Incorporates form-specific user access and export rights
  - Compatible with REDCap v12 user-rigts and backward compatible with earlier permissions models
Instructions and Resources: Technical Guide

• Purpose: Explains how the data is processed
• Audience: People writing programs to process files (statisticians, data managers, programmers)

YES3 Exporter Technical Guide

YES3 Exporter version 1.0.0 June 2022

Intended Audience

This guide is intended for individuals who will be writing programs to process files generated by the YES3 Exporter. These include data managers and statistical programmers writing programs to import YES3 Exporter data into statistical systems such as SAS and R, as well as application developers seeking to integrate the YES3 Exporter into datamart generation and validation workflows.

The YES3 technical team

The following individuals participate in one aspect or another - usually multiple aspects - of YES3 software development.

Katy Araujo ninja, testing, documentation
Venugopal Bhatia application developer
Peter Charpentier lead EM developer
Kraig Eisenman IT system engineer
Brian Funaro lead IT system engineer
Mary Geda program manager, documentation lead
Kaitlin Maciejewski testing
Janet Miceli ninja, testing
Sui Tsang lead ninja, testing lead, documentation
Maxwell Wibert EM developer, REDCap@Yale portal website manager
The REDCap@Yale Team

Top Row
Denise Acampora
Katy Araujo
Peter Charpentier
Kraig Eisenman
Brian Funaro
Mary Geda

Bottom Row
Tyler Hamilton
Dana Limone
Janet Miceli
Jesse Reynolds
Sui Tsang
Maxwell Wibert

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