A Platform For Planning and Managing Data For Clinical and Translational Research

Stephany N. Duda, PhD
Research Director, Vanderbilt Data Coordinating Core
Assistant Professor of Biomedical Informatics, Vanderbilt University
Agenda

• A Brief History of REDCap
• REDCap Walkthrough
• Diversity: Supporting the Research Enterprise
• Measures of Impact
• What’s New and What’s Next?
• Questions & Discussion

35 min.
Agenda

• A Brief History of REDCap
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• Diversity: Supporting the Research Enterprise
• Measures of Impact
• What’s New and What’s Next?
• Questions & Discussion
2004 Needs Assessment
Researchers needed help managing data for small/medium-sized, non-trial research projects (pilot, R01, PPG)

Hypothesis
Researchers will do the right thing (secure, audit trails, etc) if provided an easy way to get needed tools

Problem
Many projects, few resources
Researchers will collect data more safely and effectively IF better tools are easy to use.
Solution
Metadata-driven application
(no per-project programming)

2004 – Launch
Development led by Paul Harris, PhD
REDCap: Research Electronic Data Capture
First REDCap project operational at Vanderbilt

2006 - REDCap Consortium
Launched REDCap Consortium to share with other universities and foster collaboration for future development
Agenda

• A Brief History of REDCap
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• Diversity: Supporting the Research Enterprise
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• Questions & Discussion
The REDCap Consortium is composed of 1,036 active institutional partners from CTSA, GCRC, RCMI and other institutions in 80 countries. The consortium supports a secure web application (REDCap) designed exclusively to support data capture for research studies.

The REDCap application allows users to securely submit data, and is currently in production use by over 145,000 users spanning numerous institutions. If your institution is already running REDCap, you may use this application.

Learn more about REDCap by watching a video guide.

Recent publications using REDCap:


View all 959 articles
Log In

Please log in with your user name and password. If you are having trouble logging in, please contact REDCap Administrator.

Username:  
Password:  
Log In  Forget your password?

For more information about the global REDCap software consortium, please visit projectredcap.org.

Welcome to REDCap!

REDCap is a secure, web-based application for building and managing online surveys and databases. Using REDCap's streamlined process for rapidly developing projects, you may create and design projects using 1) the online method from your web browser using the Online Designer and/or 2) the offline method by constructing a 'data dictionary' template file in Microsoft Excel, which can be later uploaded into REDCap. Both surveys and databases (or a mixture of the two) can be built using these methods.

REDCap provides automated export procedures for seamless data downloads to Excel and common statistical packages (SPSS, SAS, Stata, R), as well as a built-in project calendar, a scheduling module, ad hoc reporting tools, and advanced features, such as branching logic, file uploading, and calculated fields.

Learn more about REDCap by watching a brief summary video (4 min). If you would like to view other quick video tutorials of REDCap in action and an overview of its features, please see the Training Resources page.

Please note that any publication that results from a project utilizing REDCap should cite grant support (UL1 TR000445 from NCATS/NIH).

NOTICE: If you are collecting data for the purposes of human subjects research, review and approval by an institutional review board is required. Use REDCap for research purposes only.
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Want to learn more about REDCap?
The REDCap Overview video is a detailed demonstration of the basic features and functionality.

REDCap Fundamentals sessions are available at least once a month. These introductory sessions provide a basic guide to project creation and development. Please login to RATE to see the next available date and to register.
Listed below are the REDCap projects to which you currently have access. Click the project title to open the project. Newly created projects begin in Development status as you begin to build and design them. When you are ready to begin entering real data in the project, you may move it to Production status to designate the project as officially collecting data. When you are finished collecting data or if you wish to stop collection, the project may be set to Inactive status, although it may be brought back to Production status at any time when you are ready to begin collecting data again. Also listed is the project type, which designates if the project is in classic or longitudinal data collection format.

You last accessed the User Access Dashboard earlier today. It is recommended that you access the User Access Dashboard at least once a month to review which users still have access to your projects.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Records</th>
<th>Fields</th>
<th>Instruments</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCASAnet Cancer Case Abstract Form (Argentina)</td>
<td>142</td>
<td>131</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet Cancer Case Abstract Form (Brazil)</td>
<td>40</td>
<td>131</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet Cancer Case Abstract Form (Chile)</td>
<td>122</td>
<td>131</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet Cancer Case Abstract Form (Haiti)</td>
<td>81</td>
<td>131</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet Cancer Case Abstract Form (Honduras)</td>
<td>49</td>
<td>131</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet Cancer Case Abstract Form (Mexico City)</td>
<td>62</td>
<td>131</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet Cancer Case Abstract Form (Peru)</td>
<td>68</td>
<td>131</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet TB (Argentina)</td>
<td>28</td>
<td>160</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet TB (Brazil)</td>
<td>58</td>
<td>160</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet TB (Chile)</td>
<td>73</td>
<td>160</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet TB (Haiti)</td>
<td>0</td>
<td>160</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCASAnet TB (Honduras)</td>
<td>59</td>
<td>160</td>
<td>3 forms</td>
<td></td>
<td></td>
</tr>
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<td></td>
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REDCap Features

- Build online surveys and databases quickly and securely - Create and design your project rapidly using secure web authentication from your browser. No extra software is required.
- Fast and flexible - Conception to production-level survey/database in less than one day.
- Export data to common data analysis packages - Export your data to Microsoft Excel, PDF, SAS, Stata, R, or SPSS for analysis.
- Ad Hoc Reporting - Create custom queries for generating reports to view or download.
- Scheduling - Utilize a built-in project calendar and scheduling module for organizing your events and appointments.
- Easily manage a contact list of survey respondents or create a simple survey link - Build a list of email contacts, create custom email invitations, and track who responds, or you may also create a single survey link to email out or post on a website.
- Send files to others securely - Using ‘Send-It’, upload and send files to multiple recipients, including existing project documents, that are too large for email attachments or that contain sensitive data.
- Save your data collection instruments as a PDF to print - Generate a PDF version of your forms and surveys for printing to collect data offline.
- Advanced features - Auto-validation, calculated fields, file uploading, branching/skip logic, and survey stop actions.
- REDCap API - Have external applications connect to REDCap remotely in a programmatic or automated fashion.
- Data Queries - Document the process of resolving data issues using the Data Resolution Workflow module.
Create a new REDCap Project

You may begin the creation of a new REDCap project on your own by completing the form below and clicking the Create Project button at the bottom.

Project title: Double Data Entry Example
Title to be displayed on project webpage

Purpose of this project: Research
(How will it be used?)

Name of P.I. (if applicable):
First name
MI
Last name

Email of P.I. (if applicable):

Name of P.I. as cited in publications (if applicable):
(e.g. Harris PA)

VUnetID of P.I. (if applicable):

IRB number (if applicable):

Grant number (if applicable):

Please specify:
- Basic or bench research
- Clinical research study or trial
- Translational research 1 (applying discoveries to the development of trials and studies in humans)
- Translational research 2 (enhancing adoption of research findings and best practices into the community)
- Behavioral or psychosocial research study
- Epidemiology
- Repository (developing a data or specimen repository for future use by investigators)
- Other

Start project from scratch or begin with a template?
- Create an empty project (blank slate)
- Use a template (choose one below)

Choose a project template (comes pre-filled with fields, forms/surveys, and other settings)

<table>
<thead>
<tr>
<th>select template</th>
<th>Template title (sorted by title)</th>
<th>Template description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Demography</td>
<td>Contains a single data collection instrument to capture basic demographic information.</td>
<td></td>
</tr>
<tr>
<td>Classic Database</td>
<td>Contains six data entry forms, including forms for demographics and baseline data, three monthly data forms, and concludes with a completion data form.</td>
<td></td>
</tr>
<tr>
<td>Human Cancer Tissue Biobank</td>
<td>Contains five data entry forms for collecting and tracking information for cancer tissue.</td>
<td></td>
</tr>
<tr>
<td>Longitudinal Database (1 arm)</td>
<td>Contains nine data entry forms (beginning with a demographics form) for collecting data longitudinally over eight different events.</td>
<td></td>
</tr>
<tr>
<td>Longitudinal Database (2 arms)</td>
<td>Contains nine data entry forms (beginning with a demographics form) for collecting data on two different arms (Drug A and Drug B) with each arm containing eight different events.</td>
<td></td>
</tr>
</tbody>
</table>

Instanitate a project in ~ 30 seconds
Create everything ...
Or begin from a template ...
### Create a new REDCap Project

You may begin the creation of a new REDCap project on your own by completing the form below and clicking the Create Project button at the bottom.

**Project title:**

Double Data Entry Example

Title to be displayed on project webpage

**Purpose of this project:**

Research

**Name of P.I. (if applicable):**

First name | M | Last name

**Email of P.I. (if applicable):**

**Name of P.I. as cited in publications (if applicable):**

(e.g. Harris PA)

**VUNetID of P.I. (if applicable):**

**IRB number (if applicable):**

**Grant number (if applicable):**

Please specify:

- Basic or bench research

### Choose a project template

<table>
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</tr>
</tbody>
</table>
**Test Project**

Record Status Dashboard
- View data collection status of all records

Add / Edit Records
- Create new records or edit existing ones

Data Collection Instruments:
Basic Demography Form

### Applications

- Calendar
- Data Export Tool
- Data Import Tool
- Data Comparison Tool
- Logging
- Field Comment Log
- File Repository
- User Rights and DAGs
- Graphical Data View & Stats
- Data Quality
- Report Builder

### Help & Information

- Help & FAQ
- Video Tutorials
- Suggest a New Feature

If you are experiencing problems, please contact your REDCap administrator

---

**Data Collection**

- Project Home
- Project Setup
- Other Functionality
- Project Revision History

---

Your new REDCap project has been created and is ready to be accessed. You may now begin exploring your project and the many features available to you. Below are some instructions to help you get started.

### Project status: Development

**Completed steps 0 of 7**

#### Main project settings

- Not started
  - Enable Use longitudinal data collection with repeating forms?
  - Enable Use surveys in this project?
  - Modify project title, purpose, etc.

#### Design your data collection instruments

- Not started
  - Go to Online Designer or Data Dictionary

You may also browse for pre-built data collection instruments in the REDCap Shared Library.

Have you checked the Check For Identifiers page to ensure all identifier fields have been tagged?

#### Enable optional modules and customizations

**Optional**

- Enable Auto-numbering for records
- Enable Dynamic Data Pull (DDP) from StarPanel
- Enable Scheduling module (longitudinal only)
- Enable Randomization module
- Designate an email field to use for invitations to survey participants

---

**VIDEO: How to create and manage a survey**

**Download PDF of all data collection instruments OR Download the current Data Dictionary**

**REDCap Shared Library**
Your new REDCap project has been created and is ready to be accessed.
You may now begin exploring your project and the many features available to you. Below are some instructions to help you get started.

Project status: Development

Main project settings
- Not started
- Enable Use longitudinal data collection with repeating forms?
- Enable Use surveys in this project?

VIDEO: How to create and manage a survey

Modify project title, purpose, etc.

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Enable optional modules and customizations
- Optional
- Enable Auto-numbering for records
- Enable Dynamic Data Pull (DDP) from StarPanel
- Enable Scheduling module (longitudinal only)
- Enable Randomization module
- Enable Designate an email field to use for invitations to survey participants

Additional customizations
**Project status:** Development

### Main project settings

- **Not started**
  - Use longitudinal data collection with repeating forms?
    - Enable
  - Use surveys in this project?
    - Enable
  - **I'm done!**
  - Modify project title, purpose, etc.

### Design your data collection instruments

- **Not started**
  - Add or edit fields on your data collection instruments. This may be done by either using the Online Designer (online method) or by uploading a Data Dictionary (offline method), in which you may use either method or both.
  - Quick links: Download PDF of all data collection instruments OR Download the current Data Dictionary
  - **Go to Online Designer** or **Upload Data Dictionary**
  - Have you checked the Check For Identifiers page to ensure all identifier fields have been tagged?

### Enable optional modules and customizations

- **Optional**
  - Auto-numbering for records
    - Enable
  - Scheduling module (longitudinal only)
    - Enable
  - Randomization module
    - Enable
  - Designate an email field to use for invitations to survey participants
    - Enable
  - **I'm done!**

**Set up project bookmarks (optional)**
**Main project settings**

- Use longitudinal data collection with repeating forms?
  - Enable

- Use surveys in this project?
  - Enable

**Design your data collection instruments**

Add or edit fields on your data collection instruments. This may be done by either using the Online Designer (online method) or by uploading a Data Dictionary (offline method), in which you may use either method or both.

Quick links: [Download PDF of all data collection instruments](#) OR [Download the current Data Dictionary](#)

- Go to Online Designer
- Upload Data Dictionary

Have you checked the [Check For Identifiers](#) page to ensure all identifier fields have been tagged?

**Enable optional modules and customizations**

- Auto-numbering for records
- Scheduling module (longitudinal only)
- Randomization module
- Designate an email field to use for invitations to survey participants

**Set up project bookmarks (optional)**
# Online Designer

Current instrument: **Basic Demography Form**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>record_id</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** The field above is the record ID field and thus cannot be deleted or moved. It can only be edited.

### Contact Information

- **Variable:** first_name
- **Variable:** last_name

[Add Field] [Add Matrix of Fields]
Adding Form Fields

You may add a new project field to this data collection instrument by completing the fields below and clicking the Save button at the bottom. When you add a new field, it will be added to the form on this page. For an overview of the different field types available, you may view the Field Types video (4 min).

Field Type: ---- Select a Type of Field ----

- Text Box (Short Text)
- Notes Box (Paragraph Text)
- Calculated Field
- Multiple Choice - Drop-down List (Single Answer)
- Multiple Choice - Radio Buttons (Single Answer)
- Checkboxes (Multiple Answers)
- Yes - No
- True - False
- Slider / Visual Analog Scale
- File Upload (for users to upload files)
- Descriptive Text (with optional Image/File Attachment)
- Dynamic Query (SQL)
REDCap Forms Interface

- PDF Downloads
- File Uploads
- Many Variable Types
- Human Readable Labels
- Data Validation/Format Checks

Form Status Colors

- Log in as dudasm | Log out
- My Projects
- Project Home
- Project Setup
- Project status: Development

Data Collection
- Edit instruments
- Record Status Dashboard
- Add/Edit Records

Applications
- Calendar
- Data Export Tool
- Data Import Tool
- Data Comparison Tool
- Logging
- Field Comment Log
- File Repository
- User Rights and FAQs
- Graphical Data View & Stats
- Data Quality
- Report Builder

Help & Information
- Help & FAQ
- Video Tutorials
More Forms Features

Equations

Automatic Variable Coding

Branching Logic

Matrix Questions

Sliders

Date of birth: 1924-05-15
Age (years): 90

Ethnicity:
- Hispanic or Latino
- NOT Hispanic or Latino
- Unknown / Not Reported

Race:
- Unknown / Not Reported

Gender:
- Female
- Male

Has the patient given birth before?
- Yes
- No

How many times has the patient given birth?
8

Please provide the patient's weekly schedule for the activities below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gym (Weight Training)</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Aerobics</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Eat Out (Dinner/Lunch)</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Drink (Alcoholic Beverages)</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Other information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specify the patient's mood

- Very sad
- Indifferent
- Very happy

Click bar above and then drag to set response

reset
<table>
<thead>
<tr>
<th>Study ID</th>
<th>12TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consent Information</td>
<td></td>
</tr>
<tr>
<td>Date subject signed consent</td>
<td>2014-05-16</td>
</tr>
<tr>
<td>Upload the patient’s consent form</td>
<td></td>
</tr>
<tr>
<td>Contact Information</td>
<td></td>
</tr>
<tr>
<td>First Name</td>
<td>Stephany</td>
</tr>
<tr>
<td>Last Name</td>
<td>Duda</td>
</tr>
<tr>
<td>Street, City, State, ZIP</td>
<td>2525 West End Ave. Nashville, TN 37203</td>
</tr>
<tr>
<td>Phone number</td>
<td>(615) 555-1234</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:stephany.duda@vanderbilt.edu">stephany.duda@vanderbilt.edu</a></td>
</tr>
<tr>
<td>Date of birth</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
</tbody>
</table>
Record Status Dashboard

The Dashboard shows the **form status** of every record, across each data collection instrument.

Legend for status icons:
- Red: Incomplete
- Green: Complete
- Yellow: Unverified
- Checkmark: Partial Survey Response

### Classic

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>Pre-Screening Survey</th>
<th>Participant Info Survey</th>
<th>Participant Morale Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

### Longitudinal

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>Pre-Screening Survey Initial Data</th>
<th>Participant Info Survey Initial Data</th>
<th>Participant Morale Questionnaire Week 1</th>
<th>Participant Morale Questionnaire Week 2</th>
<th>Participant Morale Questionnaire Week 3</th>
<th>Participant Morale Questionnaire Week 4</th>
<th>Completion Data (to be entered by study personnel only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>•</td>
<td>•</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>
Data Summaries

REDCap Consortium Partners

Graphical Data View & Descriptive Stats

This module can display all project data in aggregate graphical format and as descriptive statistics, and it is designed to assist in data cleaning and evaluation.

Institution's longitude: [Refresh Plot]

<table>
<thead>
<tr>
<th>Total (N)</th>
<th>Missing</th>
<th>Unique</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>StDev</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>523</td>
<td>15 (2.8%)</td>
<td>479</td>
<td>-155.08</td>
<td>153.05</td>
<td>-49.88</td>
<td>68.77</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-122.24</td>
<td>-114.14</td>
<td>-89.41</td>
</tr>
</tbody>
</table>

Lowest values: -155.08 0236, -147.8269656, -123.246732, -123.246732, -123.127823
Highest values: 150.928938, 151.182315, 151.182562, 153.022134, 153.0530248
Basic Features

“Nobody knows *your* research as well as *you* do.”

REDCap is designed for and controlled by the researcher.

---

**Projected Schedule for "5442"**

The projected schedule below was automatically generated for Study ID "5442" based on your pre-defined Events for Arm 1. You may change the value of any dates generated below simply by clicking inside the date box and selecting a new date. Any dates generated below that fall on weekends will be listed in red. Click the Create Schedule button to finalize this schedule, which will then be added to the Calendar.

<table>
<thead>
<tr>
<th>Time</th>
<th>Date / Day of Week</th>
<th>Event Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/14/2011</td>
<td>Monday</td>
<td>Enrollment</td>
</tr>
<tr>
<td>02/15/2011</td>
<td>Tuesday</td>
<td>Baseline Visit</td>
</tr>
<tr>
<td>02/21/2011</td>
<td>Monday</td>
<td>Week 1 Visit</td>
</tr>
<tr>
<td>02/28/2011</td>
<td>Monday</td>
<td>Week 2 Visit</td>
</tr>
<tr>
<td>03/04/2011</td>
<td>Friday</td>
<td>Patient Interview</td>
</tr>
<tr>
<td>03/11/2011</td>
<td>Friday</td>
<td>Week 3 Visit</td>
</tr>
<tr>
<td>03/19/2011</td>
<td>Saturday</td>
<td>Study Close</td>
</tr>
</tbody>
</table>

---

**External Connections**

**Longitudinal Events**

**Data De-identification**

**Participant Scheduling**

---

**REDCap API Help Page**

This page may be used for obtaining information for constructing or modifying REDCap API requests. Click any of the categories in the list below to expand its section.

- **What is an API?**
  - The acronym API stands for *Application Programming Interface*. An API is just a defined way for a program to accomplish a task, usually retrieving or modifying data. In REDCap's case, we provide an API method for both exporting and importing data in and out of REDCap (these functionalities will come in the future). Once we expand the REDCap API, we will add it to a more comprehensive feature set.

---

**Basic Features**

REDCap is designed for and controlled by the researcher.
Data Validation and Quality Tools

“Garbage in, garbage out.”

Validation and data cleaning tools improve data quality at the front end.

Double-Data Entry

Data Quality Tool

Validation

Data Quality Rules

<table>
<thead>
<tr>
<th>Rule #</th>
<th>Rule Name</th>
<th>Rule Logic (Show discrepancy only if...)</th>
<th>Total Discrepancies</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Missing values*</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>b</td>
<td>Missing values* (required fields only)</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>c</td>
<td>Field validation errors (incorrect data type)</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>d</td>
<td>Field validation errors (out of range)</td>
<td>-</td>
<td>22</td>
</tr>
<tr>
<td>e</td>
<td>Outliers for numerical fields (numbers, integers, sliders, calc fields)</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
## Data Export to Statistical Packages

### Simple Data Export (one-click)
To perform a quick data dump of your entire data set, simply download the file provided.

### Advanced Data Export
This option provides a variety of choices for customizing what fields one at a time.

<table>
<thead>
<tr>
<th>Software</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microsoft Excel</strong></td>
<td>You may download the survey results in CSV (comma-separated) format, which can be opened in Excel. You have the choice of downloading the data either with the full headers and answer labels or just with the answer codes (i.e. raw data). &lt;br&gt;&lt;br&gt;<em>NOTE: If you are using a version of Microsoft Excel prior to Excel 2007, due to limitations the data will only be read to 255 columns when opened.</em></td>
</tr>
<tr>
<td><strong>SPSS Statistical Analysis Software</strong></td>
<td>Instructions: Download and save all 3 files on the right to a common location. First, double-click on the Pathway Mapper (.bat) file, which will run quickly and invisibly. (If you are not using a Windows operating system, such as Mac or Linux, please see the Additional Instructions.) Now double-click on the *.sps file, which will open SPSS. When the file is loaded and displayed, choose Run-&gt;All from the top menu options. This action will launch the script that will automatically read in all data and manipulate data fields with labels, option values, etc. &lt;br&gt;&lt;br&gt;<a href="#">Additional instructions</a></td>
</tr>
<tr>
<td><strong>SAS Statistical Software</strong></td>
<td>Instructions: Download and save all 3 files on the right to a common location. First, double-click on the Pathway Mapper (.bat) file, which will run quickly and invisibly. (If you are not using a Windows operating system, such as Mac or Linux, please see the Additional Instructions.) Now double-click on the *.sas file, which will open SAS. When the file is loaded and displayed, choose Run (or Run-&gt;Submit) from the top menu options. This action will launch the script that will automatically read in all data and manipulate data fields with labels, option values, etc. &lt;br&gt;&lt;br&gt;<a href="#">Additional instructions</a></td>
</tr>
<tr>
<td><strong>R Statistical Software</strong></td>
<td>Instructions: Use command <code>read.csv('filename')</code> to read in data file.</td>
</tr>
<tr>
<td><strong>STATA Analysis and Statistical Software</strong></td>
<td>Instructions: Download both files to common location and double-click on *.do file. This action will launch the script that will automatically read in all data and manipulate data fields with labels, option values, etc.</td>
</tr>
</tbody>
</table>
Security and Audit

“REDCap is an easy way to do the right thing.”

- REDCap can be installed in HIPAA, Part-11, and FISMA compliant environments.
- Individual projects have built-in security and audit tools.

---

**Comprehensive User Rights View**

<table>
<thead>
<tr>
<th>Username</th>
<th>Expiration</th>
<th>Manage Survey Participants</th>
<th>Calendar</th>
<th>Data Export Tool</th>
<th>Data Import Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>elliotvj</td>
<td>never</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>red_0004</td>
<td>03/26/2013</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>red_0006</td>
<td>never</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data Access Groups**

<table>
<thead>
<tr>
<th>Data Access Groups</th>
<th>Users in group</th>
<th>Number of records in group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard University</td>
<td>red_0004</td>
<td>6</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>red_0005</td>
<td>8</td>
</tr>
<tr>
<td>[Not assigned to a group]</td>
<td>elliotvj</td>
<td>2</td>
</tr>
</tbody>
</table>

**Authentication and user access controls**

**Audit trails and logging**

<table>
<thead>
<tr>
<th>Time</th>
<th>Username</th>
<th>Role</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:58am 12/19/2012</td>
<td>red_0004</td>
<td>Manage/Design</td>
<td>Move project to production status</td>
</tr>
<tr>
<td>10:57am 12/19/2012</td>
<td>red_0004</td>
<td>Manage/Design</td>
<td>Create report</td>
</tr>
<tr>
<td>10:55am 12/19/2012</td>
<td>red_0004</td>
<td>Manage/Design</td>
<td>Download exported data file (CSV raw)</td>
</tr>
<tr>
<td>10:53am 12/19/2012</td>
<td>red_0004</td>
<td>Created User doej</td>
<td>user = 'doej'</td>
</tr>
<tr>
<td>2:30pm 12/18/2012</td>
<td>elliotvj</td>
<td>Manage/Design</td>
<td>Download data dictionary</td>
</tr>
<tr>
<td>2:30pm 12/18/2012</td>
<td>elliotvj</td>
<td>Manage/Design</td>
<td>Delete report</td>
</tr>
<tr>
<td>2:29pm 12/18/2012</td>
<td>elliotvj</td>
<td>Manage/Design</td>
<td>Unchecked item in project checklist</td>
</tr>
</tbody>
</table>
Community-curated library, approved instruments only
Please complete the survey below.

Thank you!

1) Have you ever eaten nachos?
   * must provide value
   - Yes
   - No

2) I use nachos to treat a medical condition (other than hunger).
   - True
   - False

3) What is the primary problem that nachos are treating?
   - Asthma
   - Cancer
   - Other

4) When did you last eat nachos?
   - I am currently eating nachos.

5) Have you traveled somewhere specifically to get nachos?
   - Yes
   - No

6) What is the farthest distance (in miles) you have traveled to get nachos?
   - 500
   - Distance in miles

   A calculator to convert kilometers to miles is here.

7) Are you currently craving nachos?
   - Yes
   - No

What do you think about these nacho features?

11) The cheesy goodness
    - 1 Don't like
    - 2
    - 3 Neutral
    - 4
    - 5 Love it

12) The crunchy goodness
    - 1 Don't like
    - 2
    - 3 Neutral
    - 4
    - 5 Love it

reset
Agenda

• A Brief History of REDCap
• REDCap Walkthrough
• Diversity: Supporting the Research Enterprise
• Measures of Impact
• What’s New and What’s Next?
• Questions & Discussion
Many Types of Projects

Proven track record supporting diverse studies.

- Clinical Research
- Basic Research
- Global Health
- Operational Support
- Community Research
Great for Multi-Site Studies

Centralized:

– Many sites access a single REDCap installation

– Use REDCap’s “Data Access Groups” feature to sequester sites, so each site only sees its own data

De-Centralized:

– Each site uses its own REDCap installation with the same set of data collection instruments

– Can share forms templates/data dictionaries/metadata easily via email (ad hoc standards)

(light technology stack + lots of adopting sites ... great collaborations happen)
Diversity – Supporting the Enterprise

Junior Faculty / Trainees - Great for teaching research data management

Important Concept

Data planning is a wise investment for your research study ...

Good Practice

- Code categorical variables during data collection. It helps in later analysis.
- Use software that checks data type and ranges when accepting data from end-user.
- Keep audit trails of all data changes.
- Paper and computer logs of who added or changed data.
- Some rules for electronic records ...

Good Practice

- Be exact and discrete when defining variables.
- Be consistent! Similar questions should use similar codes.
- Keep a current copy of your codebook for use during statistical analyses.

Important Concept

Always, clearly define all data you will collect before seeing the first research subject.

It’s an ethics thing!

Actionable Best Practices - Empower Researchers
Goals Accomplished

“Solid tools + smart people = amazing things.”

• The workflow for building projects includes ALL research team members and helps solidify the data management plan before enrolling the first patient.

• The user interface helps researchers identify downstream issues.

• Multi-site studies benefit from REDCap’s

• REDCap doesn’t make it impossible to develop a bad study design… but it does make it harder.
Agenda

• A Brief History of REDCap
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• **Measures of Impact**
• What’s New and What’s Next?
• Questions & Discussion
Measuring Impact

Vanderbilt System Statistics

One Week

Overall

<table>
<thead>
<tr>
<th>Total projects (excludes 'practice' projects)</th>
<th>20,990</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Project status</td>
<td></td>
</tr>
<tr>
<td>- Production</td>
<td>view types</td>
</tr>
<tr>
<td>- Development</td>
<td>view types</td>
</tr>
<tr>
<td>- Inactive</td>
<td>view types</td>
</tr>
<tr>
<td>- Archived</td>
<td>view types</td>
</tr>
<tr>
<td>• Project types</td>
<td></td>
</tr>
<tr>
<td>- Projects not containing surveys</td>
<td>6,086</td>
</tr>
<tr>
<td>- Projects containing surveys</td>
<td>14,904</td>
</tr>
<tr>
<td>• Project purpose</td>
<td></td>
</tr>
<tr>
<td>- Research</td>
<td>view subcategories</td>
</tr>
<tr>
<td>- Operational Support</td>
<td>4,795</td>
</tr>
<tr>
<td>- Quality Improvement</td>
<td>6,036</td>
</tr>
<tr>
<td>- Other</td>
<td>2,564</td>
</tr>
</tbody>
</table>

>15,000 Users
The REDCap Consortium is composed of 1,036 active institutional partners from CTSA, GCRC, RCMI and other institutions in 80 countries. The consortium supports a secure web application (REDCap) designed exclusively to support data capture for research studies.

The REDCap application allows users to build and manage online surveys and databases quickly and securely, and is currently in production use or development build-status for more than 112,000 projects with over 145,000 users spanning numerous research focus areas across the consortium. To find out if your institution is already running REDCap, you will find contact information on the Consortium Partners page. Learn more about REDCap by watching a brief summary video (4 min).

Map of REDCap Consortium Partners
REDCap Consortium

2014: 1,030+ consortium partner sites across 80 countries

Partners create enormous potential for collaboration!
Measuring Impact

Recent publications using REDCap:


Data Validation and Other Strategies for Data Entry. West J Nurs Res. 2014 Apr 29. [Epub ahead of print].


View all 959 articles
Agenda

• A Brief History of REDCap
• REDCap Walkthrough
• Diversity: Supporting the Research Enterprise
• Measures of Impact
• What’s New and What’s Next?
• Questions & Discussion
What’s New? Data Resolution Workflow

- Complex Data Rules
- Formal Data Query Workflow
- Enhanced User Management
What’s Next? Data Exchange

The Dynamic Data Pull (DDP) is a special feature that imports StarPanel clinical data into REDCap through the Research Derivative (RD). The RD is a fully identified repository of clinical data drawn from StarPanel, the Enterprise Data Warehouse, HEO, and other sources.

Your project and users must meet certain requirements before DDP is requested.

1. The DDP must only be used for RESEARCH PURPOSES. Quality improvement studies and other non-research projects are not eligible to use DDP at this time.
2. Your project must have an ACTIVE IRB PROTOCOL.
3. DDP users must be Key Study Personnel (KSP), specifically named on the IRB protocol.
4. DDP users must already have access to StarPanel.

When you are ready to request DDP in this project, follow these two steps.

1. Submit this IRB amendment and wait for IRB approval. (Please use DISCOVR-E to submit the amendment.)
2. After you have received your new IRB approval letter, please complete this DDP request survey.

Your request will be processed within one week. You will be contacted via email with next steps.

What is the DDP?
The Dynamic Data Pull (DDP) is a special feature for importing data into REDCap from an external source system. It provides an adjudication process whereby REDCap users can approve all incoming data from the source system before it is officially saved in their REDCap project. The DDP can only be enabled by a REDCap administrator (super user), so you should contact them if you wish to utilize the DDP for this project.

How the DDP works
The DDP has the ability to fetch data from the external source system both manually in real time and automatically at a regular interval. The DDP can only import external data for records that already exist in the REDCap project, in which it assumes that a record identifier (e.g. medical record number) is stored within each REDCap record so that the DDP can connect the REDCap record to a record from the source system. Once REDCap has a record identifier value for a given record, it will then go and immediately retrieve the data from the source system in real time, and later it will also check the source system at regular intervals for any additional data.
What’s Next? Data Exchange

Clinical Enterprise
- labs
- admission/discharge/transfer
- demographics
- registries
- clinic notes
- billing codes
- outpatient

Research Enterprise
- meds

Dimension 1
Informatics Methods Development
Examples:
- Natural Language Processing
- Pattern Recognition
- Automated Phenotyping
- Automated Study Recruitment Eligibility
- End User Research Integration Methods
- Anonymization and Reidentifiability

De-identified
BioVU
Identified

Research Data Warehouse Framework
PCORI-Related Exploration

1. Dynamic Data Pull from the EMR (previous slide)

2. REDCap inside the EMR and Patient Portal

Data Collection Forms

Surveys for Patient-reported Outcomes
3. PROMIS Computer Adaptive Tests (CATs)
Various PROMIS CATs
4. Gift Card Distribution

Patient Surveys

Building Local Using REDCap Plug-ins (will evaluate for Consortium)

Automated Gift Card Distribution Upon Completion

Next Challenge: e-Consent Model
Want to learn more?

http://projectredcap.org

Video Resources

Below are some informational videos about REDCap and the consortium that can help you get started and gain a better understanding of the REDCap application and its functionality. We are currently working on adding more videos to the collection.

1) Introductory Overviews
   - General Introductory Webinar (130 min) - February 2010
   - Brief Overview of REDCap (4 min)
   - Detailed Overview of REDCap (78 min)

2) Basic Features & Functionality
   - The Online Designer and Data Dictionary Upload (4 min)
     - The Online Designer (5 min)
     - The Data Dictionary (10 min)
   - Overview of Basic Data Entry (18 min)
   - Applications (5 min)

3) Project Types
   - Overview of Project Types (3 min)
   - Traditional Project (3 min)
   - Single Survey Project (5 min)
   - Longitudinal Project (3 min)
   - Longitudinal + Scheduling Project (3 min)
   - Operations Project (2 min)

4) Special Topics
   - Project Field Types (4 min)
• 5-week free course
• General topics in clinical research data management + REDCap
• Access to a REDCap installation during the course period (for educational use only.)
Thank you to Paul Harris, Veida Elliot, Rob Taylor, and Brenda Minor on the REDCap team for content and images.

Image: “thank you note for every language”, woodleywonderworks, Flickr (CC). 2013-05-13