

INTRODUCTION TO REDCAP

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**Advance
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BROWNHealth
UNIVERSITY

OUTLINE

- **What is REDCap?**
- **Why use REDCap?**
- **Getting Started**
- **Advanced Features**
- **Q & A**

WHAT IS REDCAP?

REDCap was created in 2004 at Vanderbilt University. It originally supported a small group of clinical researchers who needed a secure data collection tool that met HIPAA compliance standards. REDCap quickly became their go-to method for supporting both single and multi-site research studies

REDCap is a secure web application for building and managing online surveys and databases. While REDCap can be used to collect virtually any type of data in any environment (including compliance with 21 CFR Part 11, FISMA, HIPAA, and GDPR), it is specifically geared to support online and offline data capture for research studies and operations.

The REDCap Consortium, a vast support network of collaborators (of which lifespan is one), is composed of thousands of active institutional partners in over one hundred countries who utilize and support their own individual REDCap systems.

Note: Cannot be used for commercial purposes



WHAT IS REDCAP?

Institutions	Countries	Projects	Users	Articles
5624	144	1.4M	2M	17.1k

Map of REDCap Consortium Partners



Services and Features

- Surveys
- Multi-site studies
- Secure data collection
- Scalable
- Proven reliable since 2004
- Online and offline
- Export to common statistics packages

We're probably all familiar with 'free range' data

- Inconsistent data formats
- unstandardized data entry over people and time (personal and historical touches to the data)

REDCap can help increase the quality of data entry

- Increase research productivity
- Promote future research
- And increase data security.

WHY REDCAP?

Visit Date	Lab Value	Result	Gender
Dec 2012	181	pos	m
6-Apr	missing	+	F
7/9/2001	unkown	na	female
Aug '94	87	neg	f
4/7/98	unknown	Positive	Male

WHY REDCAP?

- ONLINE OR OFFLINE PROJECT DESIGN
- AVAILABILITY
- SECURE AND WEB-BASED
- FAST AND FLEXIBLE
- MULTI-SITE ACCESS
- FULLY CUSTOMIZABLE
- AUDIT TRAILS
- A BUILT-IN PROJECT CALENDAR
- A SCHEDULING MODULE
- MANY ADVANCED FEATURES
- REGULATORY COMPLIANCE

WHY REDCAP?

- AVAILABLE IN MULTIPLE LANGUAGES
- E-CONSENT
- DIVERSE AND FLEXIBLE SURVEY DISTRIBUTION
- REDCAP MOBILE APP
- DATA QUALITY
- CUSTOM REPORTING
- EXPORT DATA TO ANALYSIS PACKAGES
- SECURE FILE STORAGE AND SHARING
- DATA-BASED TRIGGERS AND ALERTS
- CONNECT TO OTHER RESOURCES

GETTING STARTED

KEY TERMS

- Projects

Main project settings

- Use surveys in this project? [?](#)
- Use longitudinal data collection with defined events? [?](#)

⚙️ Enable optional modules and customizations

- Repeatable instruments [?](#)
- Auto-numbering for records [?](#)
- Scheduling module (longitudinal only) [?](#)
- Randomization module [?](#)
- Designate an email field for communications

Your REDCap project is a space to build and manage and store all things related to your research study (data, data collection tools, staff working on project, logging of any changes, etc)

Once new project is created, you're taken to the 'Project Setup' page

Note: Here is where you can choose to enable surveys, use longitudinal data with defined events, and enable things like repeatable instruments, use randomization for assigning participants into treatment vs control groups, scheduling, designating email field for communications, etc.

KEY TERMS

- Instruments
 - Surveys
 - Forms
- Your project will include data collection Instruments, which can be either surveys, or forms
- Surveys: Data is entered online and accessed through a link. Anyone with the link can complete a survey. No REDCap account is required
- For Forms...Must have a REDCap account to login to REDCap and access data entry forms. Data is entered from within REDCap by study personnel

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

Go to [Online Designer](#) or [Data Dictionary](#) Explore the [REDCap Instrument Library](#)

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

Learn how to use [Smart Variables](#) [Piping](#) [@ Action Tags](#) [Field Embedding](#) [Special Functions](#)

KEY TERMS

- Fields
 - Field Types
 - Field Labels
 - Variable Names

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

Text Box (Short Text, Number, Date/Time, ...)

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

Signature (draw signature with mouse or finger)

File Upload (for users to upload files)

Slider / Visual Analog Scale

Descriptive Text (with optional Image/Video/Audio/File Attachment)

Begin New Section (with optional text)

Dynamic Query (SQL)

Add New Field

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 instrument and you can view the [Field Types video \(4 min\)](#).

Field Type: Text Box (Short Text, Number, Date/Time, ...)

Field Label: First Name

Use the Rich Text Editor ?

Variable Name: fname
(utilized in logic, calcs, and exports)
ONLY letters, numbers, and underscores
 Enable auto naming of variable based upon its Field Label?

How to use: [Smart Variables](#) [Piping](#)

[Field Embedding](#)

Validation? (optional) ---- None ----

- or -

-- select ontology service --

Required?* No Yes
* Prompt if field is blank

Identifier? No Yes
Does the field contain identifying information (e.g., name, SSN, address)?

Custom Alignment: Right / Vertical (RV)
Align the position of the field on the page

Field Note (optional)
Small reminder text displayed underneath field

Action Tags / Field Annotation (optional)

Learn about [@ Action Tags](#) or [using Field Annotation](#)

Current instrument: **Demographics**

[Preview instrument](#)

[Add Field](#)

[Add Matrix of Fields](#)

[Import from Field Bank](#)

     Variable: fname

First Name

- Branching Logic
- Piping
- Field Embedding
- Field Matrix
- Data Quality
- Data Security
- Identifiers
- Exporting Data

ADVANCED FEATURES

BRANCHING LOGIC

Branching or skip logic determines whether to show/hide fields based on the value input of another field CLICK

In this ice create Questionnaire, The first q asks, 'Do you like ice cream?' The question that follows will be Based on the answer given...

If they answer yes, branching logic is set to ask 'What is your favorite flavor?' and if they answer no, 'Who hurt you?'

Current instrument: **Ice Cream Questionnaire**

The screenshot displays a questionnaire editor interface for an instrument titled "Ice Cream Questionnaire". It shows three questions in a vertical sequence, each with its own set of control buttons (Add Field, Add Matrix of Fields, Import from Field Bank) and a variable name.

- Question 1:** "Do you like ice cream?" with radio button options for "Yes" and "No". Variable: `icecream_yn`.
- Question 2:** "What is your favorite flavor?" with a text input field. Variable: `fav_flavor`. Branching logic: `[icecream_yn] = '1'`.
- Question 3:** "Who hurt you?" with a text input field. Variable: `who_hurt_you`. Branching logic: `[icecream_yn] = '0'`.

[PIPING]

Piping is a way, using square brackets, to essentially take a data value and display it somewhere else

Variable: first_name

Your first name
* must provide value

Add Field Add Matrix of Fields

Variable: last_name

Your last name
* must provide value

Add Field Add Matrix of Fields

Variable: date_today

[first_name], please enter today's date?

Add Field Add Matrix of Fields

Your first name
* must provide value

Jeff

Your last name
* must provide value

Richardson

Jeff, please enter today's date?

10-07-2021

{ FIELD EMBEDDING }

Field embedding is a feature which, using curly brackets, gives you greater control over the look & feel of your data collection instruments.

Unlike piping which deals with a data value, with field embedding, you're moving the entire field element itself, to somewhere else on the same page

FIELD EMBEDDING

Variable: fname_mom
Mother's First Name

Variable: lname_mom
Mother's Last Name

Variable: email_mom
Mother's Email

Variable: age_mom
Mother's Age

Variable: fname_dad
Father's First Name

Variable: lname_dad
Father's Last Name

Variable: email_dad
Father's Email

Variable: age_dad
Father's Age






Variable: fname_child
Child's First Name














Variable: lname_child
Child's Last Name

Field Type: Descriptive Text (with optional Image/Video/Audio/File Attachment) ▾

Question Number (optional)
Displayed only on the survey page

Field Label Use the Rich Text Editor ?

Paragraph ▾ — **B** *I* U     

	First	Last	Email Address	Age
Mother	{fname_mom}	{lname_mom}	{email_mom}	{age_mom}
Father	{fname_dad}	{lname_dad}	{email_dad}	{age_dad}
Child	{fname_child}	{lname_child}	{email_child}	{age_child}

	First	Last	Email Address	Age
Mother	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Father	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Child	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

MATRIX (GRID) OF FIELDS

Over the last 2 weeks, how often have you been bothered by the following problems?

1. Feeling nervous, anxious, or on edge	<input checked="" type="radio"/> Not at all <input type="radio"/> Several Days <input type="radio"/> Over half the days <input type="radio"/> Nearly every day
2. Not being able to stop or control worrying	<input type="radio"/> Not at all <input type="radio"/> Several Days <input type="radio"/> Over half the days <input type="radio"/> Nearly every day
3. Worrying too much about different things	<input type="radio"/> Not at all <input type="radio"/> Several Days <input type="radio"/> Over half the days <input type="radio"/> Nearly every day
4. Trouble relaxing	<input type="radio"/> Not at all <input type="radio"/> Several Days <input type="radio"/> Over half the days <input type="radio"/> Nearly every day
5. Being so restless that it's hard to sit still	<input type="radio"/> Not at all <input type="radio"/> Several Days <input type="radio"/> Over half the days <input type="radio"/> Nearly every day
6. Becoming easily annoyed or irritable	<input type="radio"/> Not at all <input type="radio"/> Several Days <input type="radio"/> Over half the days <input type="radio"/> Nearly every day
7. Feeling afraid as if something awful might happen	<input type="radio"/> Not at all <input type="radio"/> Several Days <input type="radio"/> Over half the days <input type="radio"/> Nearly every day

Over the last 2 weeks, how often have you been bothered by the following problems?

		Not at all sure	Several days	Over half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					reset
2. Not being able to stop or control worrying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					reset
3. Worrying too much about different things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					reset
4. Trouble relaxing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					reset
5. Being so restless that it's hard to sit still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					reset
6. Becoming easily annoyed or irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					reset
7. Feeling afraid as if something awful might happen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					reset

DATA QUALITY

- USING REDCAP
TO REDUCE
ERRORS IN
DATA ENTRY

Avoid un-necessary data
collection errors with field
validation

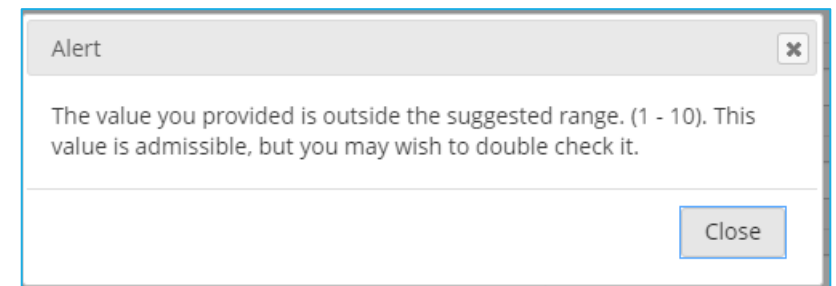
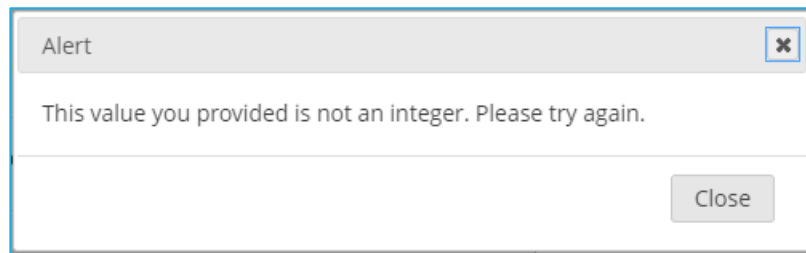
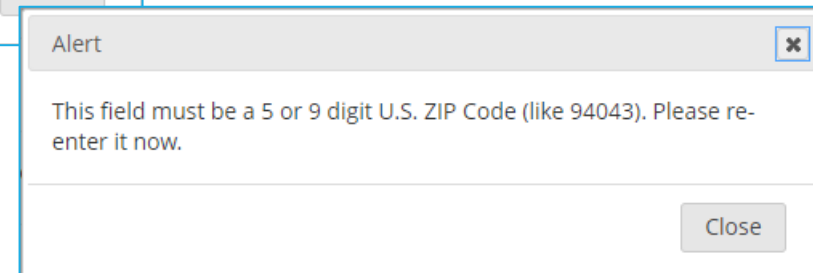
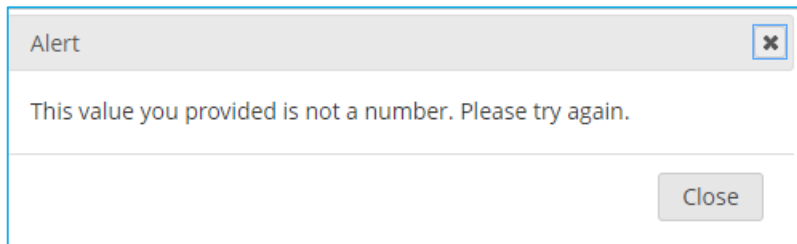
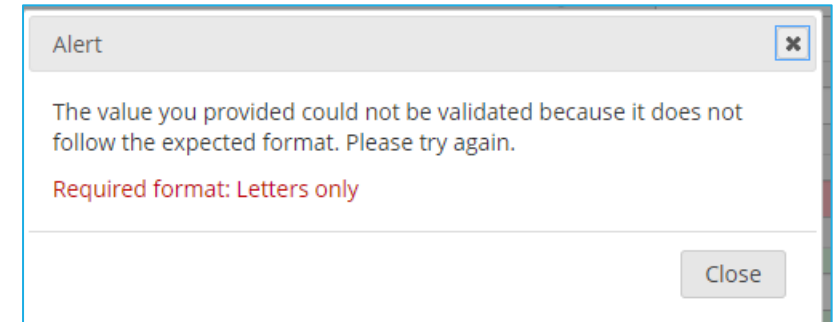
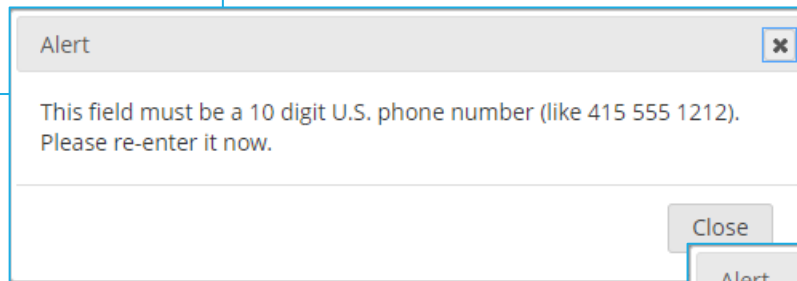
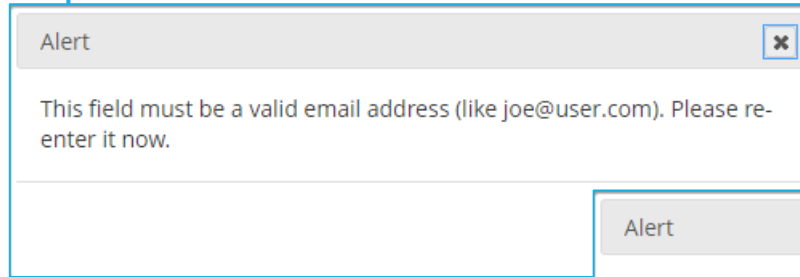
Field Validation

The image shows a screenshot of the REDCap field validation interface. A dropdown menu is open, displaying a list of validation options. The options include:

- None ----
- Date (D-M-Y)
- Date (M-D-Y)
- Date (Y-M-D)
- Datetime (M-D-Y H:M)
- Datetime (Y-M-D H:M)
- Datetime w/ seconds (M-D-Y H:M:S)
- Datetime w/ seconds (Y-M-D H:M:S)
- Email
- Integer
- Letters only
- MRN (10 digits)
- MRN (generic)
- Number
- Number (1 decimal place - comma as decimal)
- Number (1 decimal place)
- Number (2 decimal places - comma as decimal)
- Number (2 decimal places)
- Number (3 decimal places - comma as decimal)
- Number (3 decimal places)
- Number (4 decimal places - comma as decimal)
- Number (4 decimal places)
- Phone (North America)
- Time (HH:MM)
- Time (MM:SS)
- Zipcode (U.S.)

The background shows parts of the form configuration interface, including fields for "Validation? (optional)", "Required?* No", "Identifier? No", "Custom Alignment", and "Field Note (optional)".

Field validation ensures that for certain fields, a user doesn't enter incorrect data type. If they do, an error message will pop up and ask that the mistake is corrected.



WHEN TO VALIDATE?

- Dates & Times
- Email Address
- Numbers & Integers
- Letters Only
- MRN
- Phone Numbers
- Zip Codes

DATA QUALITY

- USING REDCAP TO REDUCE ERRORS IN DATA ENTRY

Double Data Entry

Double data entry is a feature that can be enabled. Two separate study staff can each enter participant information into REDCap. Data collected on a participant by each reviewer can subsequently be compared to identify discrepancies.

🚫 Data Comparison Tool

This page may be used for comparing two records currently in the project. Select a record from each of the lists below and hit the 'Compare' button. A comparison table will then be displayed showing the differences between the two records.

Study ID	
<input type="text" value="--- Choose a record ---"/>	<input type="text" value="--- Choose a record ---"/>
<input type="button" value="Compare"/>	

DATA SECURITY

Assign individual or group level rights to control who can modify, edit, export, or delete the data

Username or users assigned to a role (click username to edit or assign to role)

Expiration (click expiration to edit)

Project Design and Setup

User actions:

- Edit user privileges
- Assign to role

Expiration (click expiration to edit)	Project Design and Setup	User Rights	Data Access Groups	Data Export Tool	Reports & Report Builder	Graphical Data View & Stats	Calendar	Data Import Tool	Data Comparison Tool	Logging	File Repository	Record Locking Customization	Lock/Unlock Records	Data Quality (create/edit rules)	Data Quality (execute rules)	API	REDCap Mobile App	Create Records	Rename Records	Delete Records
never	✓	✓	✓	Full Data Set	✓	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✗	✓	✓	✗	✗

User Rights

- Control user access

Upload or Download Users

Add new users: Give them custom user rights or assign them to a role.

Add new user Add with custom rights

— OR —

Assign new user Assign to role

Create new roles: Add new user roles to which users may be assigned.

Enter new role name Create role

(e.g., Project Manager, Data Entry Person)

DATA SECURITY

Project logging, which creates an audit trail for your project, is another aspect of REDCap Security

Logging

- Project log lists all changes made to this project, including data exports, data changes, and the creation or deletion of users.

Logging Export (CSV): All logging All pages using current filters Current page

This module lists all changes made to this project, including data exports, data changes, and the creation or deletion of users.

Filter by event:
Filter by user name:
Filter by record:
Filter by time range from to Custom range Past Day Past Week Past Month Past Year No limit
Displaying events (by most recent):

Time / Date	Username	Action	List of Data Changes OR Fields Exported
12/06/2021 9:21am	jrichardson7	Manage/Design	Edit project field
12/06/2021 9:21am	jrichardson7	Manage/Design	Copy project field
12/06/2021 9:20am	jrichardson7	Updated Record (Auto calculation) 17	dt_calc = '9', n_correct = '0', score = '0'
12/06/2021 9:20am	jrichardson7	Created Record 17	dt = '2021-12-06', dt7 = '2021-12-13', dt7neg = '2021-11-29', calcdatetime_complete = '2', record_id = '17'
12/06/2021 2:29am	jrichardson7	Manage/Design	Download Users (CSV)
12/06/2021 1:41am	jrichardson7	Manage/Design	Edit project field
12/06/2021 1:39am	jrichardson7	Manage/Design	Edit project field
12/06/2021 1:38am	jrichardson7	Manage/Design	Edit project field
12/06/2021 1:35am	jrichardson7	Manage/Design	Copy project field
12/06/2021 12:30am	jrichardson7	Manage/Design	Reorder project fields

IDENTIFIERS

When creating a new field, REDCap allows you to easily tag such fields as identifiers for greater data security

By tagging identifiers, you can now easily export a de-identified dataset by clicking the 'Remove all tagged identifier fields' in the data export options

Identifier? No Yes
Does the field contain identifying information (e.g., name, SSN, address)?

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

Go to [Online Designer](#) or [Data Dictionary](#) Explore the [REDCap Instrument Library](#)

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

Learn how to use [Smart variables](#) [Piping](#) [Action tags](#) [Field embeddings](#) [Special functions](#)

Check For Identifiers

This module will help you assess whether or not some fields may be identifiers, and then allows you to easily tag such fields as identifiers for greater data security. While this same process can be accomplished in the Data Dictionary or Online Designer, this page provides a streamlined way of tagging fields as identifiers very quickly. Based off the variable name or field label, the fields listed below may possibly contain identifiers (e.g., name, phone number, address). Please review the entries and select all identifiers, where appropriate. Any fields already tagged as identifiers will already be checked below.

Demographics

Variable Name	Field Label	Identifier?
record_id	Record ID	<input type="checkbox"/>
fname	First Name	<input checked="" type="checkbox"/>
pt_gender	Patient Gender	<input checked="" type="checkbox"/>
date_today	Today's Date	<input type="checkbox"/>

De-identification options (optional)

The options below allow you to limit the amount of sensitive information that you are exporting out of the project. Check all that apply.

Known Identifiers:

- Remove all tagged Identifier fields (tagged in Data Dictionary)
- Hash the Record ID field (converts record name to an unrecognizable value)

Free-form text:

- Remove unvalidated Text fields (i.e. Text fields other than dates, numbers, etc.)
- Remove Notes/Essay box fields

Date and datetime fields:

- Remove all date and datetime fields

— OR —

- Shift all dates by value between 0 and 364 days (shifted amount determined by algorithm for each record) [What is date shifting?](#)








[Deselect all options](#)

OPTIONS FOR EXPORTING DATA

Exporting "All data (all records and fields)"

Select your export settings, which includes the export format (Excel/CSV, SAS, SPSS, R, Stata) and if you wish to perform de-identification on the data set.

Choose export format

-  CSV / Microsoft Excel (raw data)
-  CSV / Microsoft Excel (labels)
-  SPSS Statistical Software
-  SAS Statistical Software
-  R Statistical Software
-  Stata Statistical Software
-  CDISC ODM (XML)

De-identification options (optional)

The options below allow you to limit the amount of sensitive information that you are exporting out of the project. Check all that apply.

Known Identifiers:

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Date and datetime fields:

- Remove all date and datetime fields
- OR —
- Shift all dates by value between 0 and 364 days (shifted amount determined by algorithm for each record) [What is date shifting?](#)

[Deselect all options](#)

Advanced data formatting options

Set CSV delimiter character
Set the delimiter used to separate values in the CSV data file (only valid for CSV Raw Data and CSV Labels export formats):

Force all numbers into a specified decimal format?
You may choose to force all data values containing a decimal to have a specified decimal character (comma or period/full stop). This will be applied to all calculations and number-validated text values in the export file.

NOTE: Your data formatting selections above will be remembered in the future and will be pre-selected upon your next export.

TIP:

**AN HOUR OF DESIGN SAVES A
WEEK OF ANALYSIS**

THANK YOU!!!

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