

Introduction to REDCap

Part I: Overview of features

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Outline

- 1 Introduction
- 2 Data input:
Instruments and surveys
- 3 Getting data:
Data Exports, Reports, and Stats
- 4 Additional features
- 5 Conclusion

Introduction

What is REDCap

Description

REDCap

<https://project-redcap.org/>

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, is composed of thousands of active institutional partners in over one hundred countries who utilize and support their own individual REDCap systems.

- Developed at Vanderbilt University

[*J Biomed Inform.* 2009 Apr;42(2):377-81],

[*J Biomed Inform.* 2019 May 9; doi: 10.1016/j.jbi.2019.103208]

- Used by 8057 institutions in 164 countries [[redcap](https://project-redcap.org/)]

REDCap at ULiege

Key persons (so far)

- Local installation at Uliege: <https://redcap.uliege.be/>
- Administrator:
Yves Welsh (udimed@uliege.be, UDIMED, GIGA)
 - Server well-being
 - User creation
 - Interface language change
 - Some emergency interventions in the project
- General (unofficial) help for CRC:
Nikita Beliy (CRC, GIGA)
 - Project creation
 - Project consulting

Some definitions

Field A variable (unique) \approx column in excel table

Instrument A collection of fields presented as form
Main way to interact with project DB

Record An entry in project DB \approx line in excel table

Report A view on data in project DB
Main way to extract data from REDCap

User An experimenter, person having access to project DB

Participant A participant/subject in the study
Corresponds to one record in project DB

Data input: Instruments and surveys

Data input

- 1 Online input by users (experimenters)
instruments (fr: formulaires)
- 2 Online input by study participants
surveys (fr: enquêtes)
- 3 Offline input by users – REDCap mobile APP
- 4 Direct import from CSV table
- 5 Direct import using API

Instruments (users) and surveys (participants)

a.k.a formulaires and enquêtes

Any instrument (input by users) can be activated as survey (input by participants)

Instrument

For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you ...

- 5a) Cannot get to sleep within 30 minutes
- ☒ Not during the past month
☐ Less than once a week
☐ Once or twice a week
☐ Three or more times a week
- 5b) Wake up in the middle of the night or early morning
- ☐ Not during the past month
☒ Less than once a week
☐ Once or twice a week
☐ Three or more times a week
- 5c) Have to get up to use the bathroom
- ☐ Not during the past month
☐ Less than once a week
☒ Once or twice a week
☐ Three or more times a week
- 5d) Cannot breathe comfortably
- ☐ Not during the past month
☐ Less than once a week
☐ Once or twice a week
☒ Three or more times a week

Survey

For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you ...

- 5a) Cannot get to sleep within 30 minutes
- ☒ Not during the past month
☐ Less than once a week
☐ Once or twice a week
☐ Three or more times a week
- 5b) Wake up in the middle of the night or early morning
- ☐ Not during the past month
☒ Less than once a week
☐ Once or twice a week
☐ Three or more times a week
- 5c) Have to get up to use the bathroom
- ☐ Not during the past month
☐ Less than once a week
☒ Once or twice a week
☐ Three or more times a week

REDCap implementation of PSQI by REDLOC institution.
REDCap Shared Library.

Fields (questions) types

Classic question types are supported:

- Static text and section headers with inline videos and images
- Single line text/number/date/time and multi-line text
- Multiple choice selections and matrices
- PDF viewer, file uploads and signatures

Simple entries

1) Simple text

2) Simple time

3) Simple date D-M-Y

4) Slider Left Middle Right

[reset](#)

File visualisation/upload

8) File upload [Upload file](#)

9) Signature [Add signature](#)

Multiple choices

5) Drop-down

6) Single selection ☐ Selection 1
☒ Selection 2
☐ Selection 3 [reset](#)

7) Multiple selection ☐ Selection 1 ☒ Selection 2 ☒ Selection 3

Matrix (single and multiple choice)

	Choice 1	Choice 2	Choice 3	
10) First question	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
11) Second question	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
12) First question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13) Second question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Fields (questions) creation interface

Modifier le champ

Pour **Type of field** du champ à ce formulaire, remplissez les champs ci-dessous et cliquez sur le bouton "Enregistrer" en bas. Quand vous ajoutez un nouveau champ, il sera automatiquement ajouté au formulaire. Pour un aperçu des différents types de champ disponibles, consultez la [vidéo sur les types de champ \(4 min\)](#).

Type de champ : Champ texte (texte court, nombre, date/heure, ...)

Numéro de la question (optionnel)
Affiché uniquement sur la page d'enquête

Etiquette de champ
1. During the past month, what time have you usually gone to bed at night?

Utiliser l'éditeur de texte enrichi

Word-like and HTML source editors

Question, as shown in instrument/survey

Balises d'action / Annotation de champ (optionnel)

En savoir plus : Balises d'action ou Utiliser des annotations de champs

Magic box requiring 2nd level of Enlightenment

Variable name (unique)

Nom de variable (utilisé dans la logique, les calculs et les exportations)
psqi_1

Validation ? (optionnel) Time (HH:MM)

Minimum :
Maximum :

Validations and some field visual parameters
also use the word **today** or **now** (not wrapped in quotes) for date/time fields.

~ OU ~
-- sélectionner le service d'ontologie --

Obligatoire ☒ Non ☐ Oui
* Informer l'utilisateur si le champ est vide

Identifiant ? ☒ Non ☐ Oui
Le champ contient-il des données identifiantes (par ex. prénom, nom, adresse)?

Alignement personnalisé Droite / Vertical (RV)

Aligner la position du champ sur la page

Note de champ (optionnel) BED TIME
Petit rappel textuel affiché sous le champ

Enregistrer Annuler

Calculated fields

a.k.a Champ calculé

Calculates values based on other fields:

Automated diagnosis

Additional index



76

[View equation](#)

Diagnosis score



8

[View equation](#)

Diagnosis



EMCS

[View equation](#)

Mathematical operations:

Variable Name: *seconds_total_score*

Field Label: Additional index

Calculation: `sum([seconds_arousal], [seconds_vis_fixation], [seconds_vis_pursuit],
[seconds_movements], max([seconds_pain], [seconds_command]),
max([seconds_intentional], [seconds_functional]))`

Calculated fields

a.k.a Champ calculé

Calculates values based on other fields:

Automated diagnosis

Additional index



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[View equation](#)

Diagnosis score



8

[View equation](#)

Diagnosis



EMCS

[View equation](#)

Conditions:

Variable Name: *seconds_diagnosis_score*

Field Label: Diagnosis score

Calculation: `if([seconds_functional] > 0, 8, if([seconds_intentional] > 0, 7, if([seconds_command] > 0, 6, if([seconds_movements] > 0, 5, if([seconds_vis_pursuit] > 0, 4, if([seconds_vis_fixation] > 0, 3, if([seconds_pain] > 0, 2, if([seconds_arousal] > 0, 1, 0))))))))`

Calculated fields

a.k.a Champ calculé

Calculates values based on other fields:

Automated diagnosis

Additional index



76

[View equation](#)

Diagnosis score



8

[View equation](#)

Diagnosis



EMCS

[View equation](#)

Non numeric values:

Variable Name: *seconds_diagnosis*

Field Label: Diagnosis

Calculation: `@CALCTEXT(if([seconds_diagnosis_score] > 7, 'EMCS',
if([seconds_diagnosis_score] > 5, 'MCS+', if([seconds_diagnosis_score] > 1,
'MCS-', if([seconds_diagnosis_score] > 0, 'UWS', 'Coma')))))`













Inline fields

a.k.a. Embedding fields

Entry fields can be placed inside text and tables

112. Indiquez les **espaces présents et utilisés** quotidiennement dans le logement.

* Obligatoire

	Cet espace est-il présent dans le logement ? <i>(Indiquez OUI ou NON. Si OUI, indiquez le nombre)</i>	Cet espace est-il utilisé quotidiennement ? <i>(Indiquez OUI ou NON. Si OUI, indiquez le nombre)</i>	Est-ce qu'une personne en fauteuil roulant pourrait accéder à cet espace et l'utiliser ? <i>(Indiquez OUI ou NON. Si OUI, indiquez le nombre)</i>
Exemple: Chambre(s)	Oui, 3 ▼	Oui, 2 ▼	Oui, 1 ▼
Cuisine	▼  	▼  	▼  
Salle à manger	▼  	▼  	▼  

From ARC Habitage survey.

Getting data: Data Exports, Reports, and Stats

Getting data

- ① Direct value visualisation (Report)
- ② Display descriptive statistics
- ③ Export data as CSV file (+ script to use with R, SAS, SPSS...)
- ④ Direct export using API (CSV, XML)

Data visualisation

Reports and Stats

Report as seen in REDCap

Record ID recid_1d	1. During the past month, what time have you usually gone to bed at night? pwp_1	2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night? pwp_2	3. During the past month, what time have you usually gotten up in the morning? pwp_3	4. During the past month, how many hours of actual sleep did you get ... or of hours you spent in bed. pwp_4
1	13:35	15	13:35	15
2	15:23	18	15:23	8
3	13:35	19	13:35	24
4	13:43	20	13:43	8

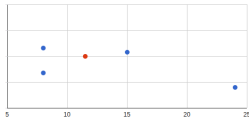
Descriptive statistics on each variable

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.) [pwp_4](#) [Refresh Plot](#)

Total Count (N)	Missing*	Unique	Min	Max	Mean	StDev	Sum	Percentile						
								0.05	0.10	0.25	0.50 Median	0.75	0.90	0.95
4	0 (0.0%)	3	8	24	13.75	7.59	55	8	8	8	11.50	17.25	21.30	22.65

Lowest values: 8, 8, 15, 24

Highest values: 8, 8, 15, 24



[Download image](#)

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Fields and participant selection

Fields selection

STEP 2

Fields to include in report [+ Quick Add](#) Add all fields from selected instrument: -- choose instrument --

Field 1	<input id""="" record="" type="text" value="record_id "/>		Instrument: Pittsburgh Sleep Quality Index...	×
Field 2	<input 1.="" during="" month,="" past="" the="" ti"="" type="text" value="psqi_1 " what=""/>		Instrument: Pittsburgh Sleep Quality Index...	×
Field 3	<input 2.="" during="" how="" lo"="" month,="" past="" the="" type="text" value="psqi_2 "/>		Instrument: Pittsburgh Sleep Quality Index...	×
Field 4	<input 3.="" during="" month,="" past="" the="" ti"="" type="text" value="psqi_3 " what=""/>		Instrument: Pittsburgh Sleep Quality Index...	×
Field 5	<input 4.="" during="" how="" m"="" month,="" past="" the="" type="text" value="psqi_4 "/>		Instrument: Pittsburgh Sleep Quality Index...	×
Field 6	<input type="text" value="Type variable name or field label"/>		Instrument:	

Recording selection

STEP 3

Filters (optional) [How to use filters and AND/OR logic](#)

Operator / Value

Filter 1	<input type="text" value="pittsburgh_sleep_quality_index_psqi_o"/>		<input type="text" value="="/>	<input type="text" value="Complete"/>	×
AND					
Filter 2	<input type="text" value="Type variable name or field label"/>		<input type="text" value="="/>	<input type="text" value=""/>	

Additional features

Longitudinal studies

Events and repeated instruments

Field A variable (unique)

Instrument A collection of fields

Event A collection of instruments

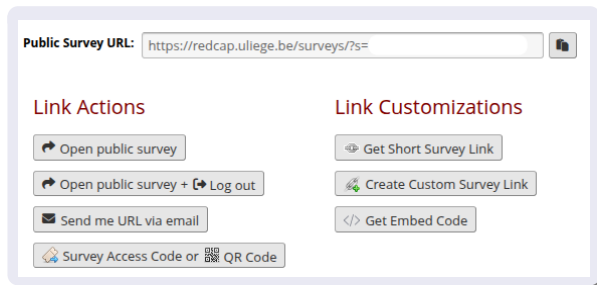
Same instrument may belong to **different** events

Record ID 1				Same event twice	
Data Collection Instrument	Event1	Event2	Event3	Repeated event (#1)	+ Add new (#2)
Pittsburgh Sleep Quality Index (PSQI) (survey)	✓			⊕	⊕
Test formular (survey)			●		
Delete all	Same instrument repeated 3 times			×	×

Public surveys

Survey Distribution Tools

If first instrument in project is a survey:



The screenshot shows a web interface for configuring a public survey. At the top, there is a label "Public Survey URL:" followed by a text input field containing the URL "https://redcap.uliege.be/surveys/?s=" and a small icon button to the right. Below this, the interface is divided into two columns. The left column is titled "Link Actions" in red text and contains four buttons: "Open public survey" (with a circular arrow icon), "Open public survey + Log out" (with a circular arrow and a person icon), "Send me URL via email" (with an envelope icon), and "Survey Access Code or QR Code" (with a key and QR code icon). The right column is titled "Link Customizations" in red text and contains three buttons: "Get Short Survey Link" (with a link icon), "Create Custom Survey Link" (with a gear and link icon), and "Get Embed Code" (with a code icon).

- Automatically add new record to project DB

For existing participants

Survey title: Test formular

Event: Event2

"Active" must be selected in order for automated survey invitations to be triggered and sent using the conditions specified in this popup. You may make it Not Active (and vice versa) at any point in the future. [?]

☐ Active
 ☐ Not Active

STEP 1: Compose message

From: (select any project user to be the 'Sender')

To:

Subject:

Send test email

Open Sans Paragraph 10pt B I U A S V

Please take this survey.

You may open the survey in your web browser by clicking the link below: [survey-link]

If the link above does not work, try copying the link below into your web browser: [survey-url]

This link is unique to you and should not be forwarded to others.

Specify conditions for sending invitations:

☐ When the following survey is completed:

-- select a survey --

AND

☐ When the following logic becomes true:

[?]

Condition for sending invitation

Test logic with a record: -- select a record --

☐ Ensure logic is still true before sending invitation? [?]

[How to use "store logic" to disable an automated invite](#)

STEP 3: When to send invitations AFTER conditions are met

☐ Send immediately

☐ Send on next -- select day -- at time : H:M

☐ Send the invitation days hours minutes

after -- select the exact time that the automated invitation was triggered --

☐ Send at exact date/time: Y M D H M

OPTIONAL: Enable When to send invitation

☐ Re-send invitation as a reminder if participant has not responded by a specified time?

- Must have participant's email in REDCap
- Can define conditions to trigger
- Can be programmed to be sent in future

Users rights

Privileges for Viewing and Exporting Data

Data Viewing Rights pertain to a user's ability to view or edit data on pages in the project (e.g., data entry forms, reports). Users with 'No Access' Data Viewing Rights for a given instrument will not be able to view that instrument for any record, nor will they be able to view fields from that instrument on a report. Data Export Rights pertain to a user's ability to export data from the project, whether through the Data Exports page, API, Mobile App, or in PDFs of instruments containing record data. Note: Data Viewing Rights and Data Export Rights are completely separate and do not impact one another.

	Data Viewing Rights				Data Export Rights			
	No Access (Hidden)	Read Only	View & Edit	Edit survey responses	No Access	De-Identified*	Remove All Identifier Fields	Full Data Set
Pittsburgh Sleep Quality Index (PSQI)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Test formular (survey)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

- Rules for each instrument
- Can be defined for groups or individual user

Bells and whistles

In no particular order

- Out-of-grid completion with REDCap app
Android and iPhone only
- Participant-facing app
- Internal calendar with reminders
- Alerts for users
- Quality control
- Centralized missing values tags
- Participants grouping with different set of events and instruments
- “Hiding” some participants from users (data access groups)

Strong sides

Implicitly compared to Surveys from FPLSE

- Flexible surveys/forms compositions
 - Conditional questions
 - Pre-calculated values, default and read-only fields
 - Highly customizable field appearances
 - Multi-language support
- Instruments fillable by participants and users
- Instruments can be completed offline (with app)
- Repeated forms for longitudinal studies
- Groups of participants with own list of instruments
- Convenient participants management system with automated invitations/alerts and reminders
- Extensive user management

Weak sides

Implicitly compared to Surveys from FPLSE

- No question order randomisation
- Multi-language support has blind spots
- User interface can be confusing
- A lot of features implemented by 80%:
 - Participant facing app can't be programmed for the time of the day
 - Can't enter the date of sent invitation into database
 - Can't change the size of fields
- Confusing terminology
 - User formular == "Instrument"
 - Database query == "Report"
- Difficult to find documentation and help

Where to get help

Lack of comprehensive documentation

- Official tutorial videos:
<https://projectredcap.org/resources/videos/>
- *Beginner's guide from University of Chicago*
- *Univ. of Wisconsin tutorials*
- Experimentation!
- Google/Youtube search:
REDCap how to + what you want to do

What's next?

Tutorial/practical session

26 Oct 2025

- Only in person at CRC (Big meeting room)
- Teams may be activated but only in passive mode
- Register here:
<https://indico.giga.uliege.be/event/593/>
- Registration deadline: 20 Oct 2026
- Don't forget PC (duh!)