Using REDCap Mobile: Practical Suggestions for Remote Data Collection

CAPS Method Core
Lila Sheira, MPH
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Aims for the session:

• Understand REDCap interface
• Getting your project onto a tablet
• Navigating the tablet
• Sending data
• Editing your project
• Error messages
• Technology recommendations
• Additional features (time permitting)
  • Making mobile friendly instruments
  • Repeating instruments and longitudinal studies

Adolescent Shamba Maisha Team happy after learning REDCap Mobile
Getting started on the interface

- Takes you to the main page
- Most used parts of interface
- Review of data already collected; manually enter data
- Scheduling, data downloads, data quality checks and other data tools, and most importantly, all of the Mobile App features
Getting started on the interface

- Add team members and manage their access levels
- Optional customizations, such as randomization or longitudinal “add-ons”
- Where you’ll spend a lot of time...setting up the instrument!
- Some quick minor settings that you may select such as repeating instruments or a longitudinal customization (will discuss later)

Add team members and manage their access levels

Optional customizations, such as randomization or longitudinal “add-ons”

Where you’ll spend a lot of time...setting up the instrument!
Making your instruments mobile friendly

In online data collections / surveys, you can put everything in one instrument with page breaks to split up long sections of questions for the participant.

For the mobile app, there are no page break functionalities on the tablet/remote device. This means where you might want a true “break,” you should use separate forms.
Making your questions mobile friendly pt 1

Choosing your variable type

I make a notes box for every instrument for the data collectors to communicate with me.

Calculated fields are useful for saving time on variable creation in analysis phase (ex: making BMI) and for data checks (i.e. anthropometry)

Radio > Drop down for app users

Doesn’t work with the mobile app
Making your questions mobile friendly pt 2

Number instruments with no skip patterns to help find missing data!

Mark all as required. REDCap Mobile will alert the data collector to a missing question.

You can allow people to have de-identified databases, so you must mark the identifiers for REDCap to exclude.

I use this as a clarifier or reminder for the data collectors. For example, enter the date in XX format; enter 99 if missing, etc.

You can use HTML code to color code the responses by language:

0, No<font color="green">/Oyoo</font><font color="blue">/La</font>
1, Yes<font color="green">/Ee</font><font color="blue">/Ndiyo</font>
Getting REDCap Mobile set up on your device pt 1

**Two steps online:**

1. Go to user rights and for the appropriate users, select edit rights. Make sure the “Allows user to collect data offline” is selected.

Select user rights

Make sure “allows user to collect data offline” selected

Decide if user should have access to ALL data
Getting REDCap Mobile set up on your device pt 2

Two steps online:
2. Go to REDCap Mobile App and then make sure you have requested an API token.

Getting the token is not immediate and can take a few hours if you are working in a far away time zone—go on and do it in the early stages of setting up your project.
Getting REDCap Mobile set up on your device pt 3

**Three steps on your tablet:**
1. Download REDCap from the googleplay or App store (free)
2. Create an admin (only you)

This is the only interface on the admin log-in

Image borrowed from Vanderbilt University’s “Using REDCAP Mobile App” guide, 2016
Getting REDCap Mobile set up on your device pt 4

Three steps on your tablet:
1. Download REDCap from the googleplay or App store (free)
2. Create an admin (only you)
3. Create data collectors, i.e., app users IF they are not on the REDCap online system on each device.
   - In my experience, we have had one device per data collector, so set up one log-in per tablet

Piece of advice:
Document all the usernames and pins in one document for the study coordinators.
People will forget their log ins at first!

Image borrowed from Vanderbilt University’s “Using REDCAP Mobile App” guide, 2016
To add a new project: (should only happen once per project)

You *must* be connected to a semi-decent internet connection to download data for a new project.

Two ways to get a new project:
1. Scan the code
2. Enter a long code (so try #1 first)

*Both options are time sensitive*
On the REDCap online platform

After you have had someone scan, you have the opportunity to label the device.

This can be helpful for tracking refreshing, data syncs, cutting a tablet off from sending data, etc among app users.
Logging in to the mobile app

Looks the same if WiFi or not

Wifi connection

No WiFi connection
Inside your device—My Projects

My Projects

Adolescent Shamba Maisha--Lab form
Last Download: 2018-11-15 09:35 PM
0 Records (0 new; 0 modified)

Adolescent SM Sexual Behavior-Swahili
Last Download: 2018-11-17 12:54 AM
0 Records (0 new; 0 modified)

Adolescent SM Sexual Behavior-Dholuo
Last Download: 2018-11-17 12:54 AM
0 Records (0 new; 0 modified)

Adolescent SM Sexual Behavior-English
Last Download: 2018-11-17 12:55 AM
1 Records (1 new; 0 modified)

Adolescent Shamba Maisha--adolescent survey
Last Download: 2018-11-18 04:59 PM
1 Records (1 new; 0 modified)

Adolescent Shamba Maisha--Caregiver Survey
Last Download: 2018-11-27 08:50 AM
0 Records (0 new; 0 modified)

Always looks the same

Exit Interview - Control Participants
Last Download: 2019-01-10 03:58 PM
2 Records (Some new; 0 modified)

- Collect Data
- Send Data to Server
- Rename Records
- Sync Archive
- Refresh Setup & Data
- Project Admin
- Visit REDCap Website
- Send Emergency Data Dump
- Send Project Logs

Wifi connection

Exit Interview - Control Participants
Last Download: 2019-01-10 03:58 PM
2 Records (Some new; 0 modified)

- Collect Data
- No Connection to Send Data
- Rename Records
- Sync Archive
- Refresh Setup & Data
- Project Admin
- No Data to Dump
- No Logs to Send
- Manage Logs

No WiFi
Project settings on the tablet

Depending on your project type, select the correct sync method. Only repeating forms and longitudinal studies should use sync 3.0.

Use the old render form as recommended as the new one is still in development.
Collecting data for a project: 3 simple steps

1: Select “Collect data”

2: Select instrument

3: Select “Create New Record”

To make sure they must start at the “top”, under project setup, select “enable as a survey” and under options, select “(Optional) Auto-continue to next survey”

Once here, select create new record and you are ready to collecting data!
Screen Controls

- You will only likely need to adjust the font.
- Secure the instrument means you have to enter a password to navigate within the app.
- To exit this, tap “Hide instrument controls”
Securing the instrument(s)

A unique feature that allows you to essentially lock the screen on the instrument. When might you want to use this feature?

This is the alert that will come up. **Secure this instrument** means they can only stay on that page. **Secure ALL Instruments** means they can move around in a project.

This is what the screen looks like for Secure this instrument. Notice you cannot move forward. You must enter your pin to “release” the instrument.
Inside the instrument....

When changing a response after you have already selected one, try to remember to use the reset button.

This is *most* important for skip patterns and text response questions, so best to get into the habit for all question types.
Branching (skip patterns)

• Let’s say you have the following series of questions:
  • Have you ever been tested for HIV?
    • If YES: When was the last time you had an HIV test?
      • What was the result of this most recent HIV test?
    • IF NO: [auto-branching to the next section]

And then the participant changes their response....

You must first reset the answer. You will then get this error message not just once, but for every question linked...it can be annoying!!
Note any issues here, such as participant being distracted, falling asleep, or if there were inconsistent answers. Or any REDCap issues. Note anything that may help explain irregularities in the data.

Mark the form as complete once it is complete!!

Save the record! This is *VERY* important! It will also take you back to the main screen for the instrument.

This takes you to the next instrument in the order of your instruments.
Most common error message—DO NOT IGNORE!!

This means the data collector missed a field on the form. If you read the top part carefully it will tell you the first few letters of the question to help you identify.

Hit “cancel”, go find the missing field, correct it, and try again until you don’t see this error!

This nice feature reduces missing data *only* if you mark questions as required.
Projects with multiple instruments

Select save and go to next instrument.

This will take you to the next form in the instrument.

--Cancel--
Editing data on the tablet

Tap the red instrument bar to go back to the list of instruments. You just have to remember the record number (most recent on bottom).

Select the form you want to edit and select it. Then select the record number. Make sure to use “reset”

Save the record and tap the arrow at the top left.
Finishing data collection, part 1

Keep filling out the forms until you reach the final form....you’ll know you’ve reach it when it no longer says “Save and Go to Next Instrument”.

Then you can just select save record, which will take you back to the instruments portal for that record.
Finishing data collection, part 2

Notice the colors by the record numbers....red means not complete (i.e. skipped a required question) or it you didn’t select “Complete”.

This is instrument by instrument, not record by record.
Longitudinal Studies part 1

**Step 1:** Define your events (i.e. data collection time points) under **Project Setup ➔ Define your events and designate instruments for them ➔ Define my events**

**Step 2:** Make sure to designate individual instruments for your events under **Project Setup ➔ Define your events and designate instruments for them ➔ Designate Instruments**
Longitudinal studies, part 2

Selecting the record looks the same...

However once you select it, you see you have options to pick the different events. Once you select an event, you will only be able to collect data that you previously designated for that specific event.
For longitudinal and cross-sectional projects, REDCap offers a nice dashboard online where you can track completeness of instruments by record ID over events (for longitudinal projects).
Sending data—part 1

Connect to WiFi and tap “Send Data to Server”

2. This is the next screen. Tap “Begin Send of All Data”
Sending data—part 2

This is what it looks like if the sync was unsuccessful. If that happens, try again.

This is what it looks like if the sync was successful. Just select “Back to Project”
Refreshing the tablet

• REDCap officially recommends that data is refreshed after each sync.

• Lila officially recommends that you DON’T!
  • For remote data collection in areas with suboptimal internet, wait until you confirmed you have received the data to the server.

• When you refresh set up and data, it erases the data off the tablet. This is ok if all the data is on the server—but if not, you just lost the data!
Downloading data from the server to your device

**Cross-sectional studies**
- Do not download the data from the server
  - There is an option for this on user controls for people who you set up on the REDCap webpage

**Longitudinal studies**
- Trickier among multi-site locations
  - Downloading data from the server is useful for syncing correctly with the dashboard
    - **Must** have strong internet connection
  - May want to copy paste projects and collect by site if not too many sites
  - Otherwise may consider foregoing the dashboard feature

Setting Up Project
Healthy Mothers - Emily Tuthill
Set Up Complete
Do you want to download all 57 records from the project, or do you want to leave the project blank in the app?

- Download All 57 Records
- Download by Form Status
- Get a Partial Set of Data
- Do NOT Download Records
Editing your project after it has gone live: Try to avoid as much as possible!

<table>
<thead>
<tr>
<th>Online</th>
<th>Next steps...</th>
</tr>
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<tr>
<td>Result 1: All changes approved automatically</td>
<td></td>
</tr>
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<td>For example, changing wording or adding a category</td>
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<td><strong>Result 2:</strong> Changes need to be reviewed:</td>
<td></td>
</tr>
<tr>
<td>• Changing a variable substantially:</td>
<td></td>
</tr>
<tr>
<td>• Changing variable type</td>
<td></td>
</tr>
<tr>
<td>• Changing a skip pattern that affects already collected data,</td>
<td></td>
</tr>
<tr>
<td>• Changing numerical categories (1 to 0, for example)</td>
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Report from REDCap Administrator

Adolescent SM Sexual Behavior-Swahili

You’ll receive an email with a link that leads you to an overview like this.

Details regarding all changes made in Draft Mode:
- Records in project: 1
- Fields to be added: 0
- Fields to be modified: 18
- Total potentially critical issues: 6
  - Deleted fields that contain data: 0
  - Potentially critical issues in modified fields that contain data: 6
- Total field count BEFORE the changes below are committed: 150
- Total field count AFTER the changes below are committed: 150
- Mobile App: 2 users have initialized this project in the REDCap Mobile App. Please note that they *may* be affected by these changes and may not be able to successfully imported their data from the app afterward. You may want to have them first sync all their data back to the server before committing the changes displayed on this page.

Fields to be ADDED: none
Forms to be ADDED: none
Fields to be DELETED: none
Forms to be DELETED: none

KEY for Comparison Table below
- White cell = no change
- Yellow cell = field changed (Black text = new value, Gray text = current value)
- Green cell = new project field
It will detail changes variable by variable

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Section Header</th>
<th>Field Type</th>
<th>Field Label</th>
<th>Choices or Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>sexbvr_23_v2</td>
<td></td>
<td>radio</td>
<td>Je unaweza kukumbuka tarehe ambayo daktari alikuambia kuwa uko na &quot;genital herpes&quot;</td>
<td>1, Ndio 0, La 1, Ndio 2, La *Deleted options are okay since those options have no data.</td>
</tr>
<tr>
<td>sexbvr_26_v2</td>
<td></td>
<td>radio</td>
<td>Je, umewahi kuzungumza na mhudumu wa afya kuhusu kuzuia kupata mimba?</td>
<td>1, Ndio 0, La 77, Kataa 1, Ndio 2, La 77, Kataa *Data might be lost due to deleted choice(s)</td>
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<td><strong>Result 2:</strong> Changes need to be reviewed</td>
<td></td>
</tr>
<tr>
<td>Changing a variable substantially, like changing variable type</td>
<td>• <strong>Option 1:</strong> accept the changes and download the data pre-edits in its current form, save it, and edit it to match the new data format, and merge together later for analysis</td>
</tr>
<tr>
<td>Changing a skip pattern that affects already collected data, changing</td>
<td>• <strong>Option 2:</strong> Make a new variable moving forward, use skip patterns to skip the old variable, and combine the variables in the analysis form (depending on the issue/reason for change)</td>
</tr>
<tr>
<td>numerical categories (1 to 0, for ex)</td>
<td>• <strong>Option 3:</strong> If very few participants and variables, hard code those changes either online (edit form) or in your code (once you download the data)</td>
</tr>
</tbody>
</table>
Error Messages:

The most common message I have seen and received in late night whatsapp messages!
Meaning: internet not strong enough.
Solution: Keep trying to send; try new connection

Mystery error message that prevented data syncing for two weeks!

Solution:
After checking syncing, tablet updates, and other possible issues:
1. Enter data manually from tablets onto the server
2. Remove the project and reset it
3. Test sending data
Remote data management

• Record ID likely won’t match your study ID
  • You can also search records by variables you chose (your study ID, site, data collector, etc.)

• Set fields to link instruments to specific data collectors with more than one identifier for large teams
  • For example, interviewer initials, site ID, and participant initials

• Control what staff see by setting certain variables which may reveal arm as identifiers

• Run weekly reports and send to field coordinator to confirm enrollment / completion numbers

• Practice data collection on tablet as well as sending data many times before going live!
Technology recommendations

• Androids are cheaper...
  • But you need a gmail account
    • Solution: Make a study email account

• Make sure the device screen is large
  • This helps see skip patterns
  • More user friendly; happy staff=happy study

• Budget data for field staff to send data

• Set up tablets BEFORE you go to the field

• Try different WiFi connections if you are having trouble (4G, for example)

• Try to make sure tablets aren’t being used for personal use (wear and tear, loss, theft)
Extra slides—time permitting
Make instruments quickly pt 1

1) Check out the shared library for validated scales

Thousands of ready made scales...often with scoring!
2) Use excel to upload questions

All the options in the online format are now column headers

Easily edit questions or add questions

You can even edit branching, i.e. skip patterns
Repeating instruments

- When you want to ask someone a question multiple times at one time point
  - Medications and doses
- When you want to collect data not necessarily tied to a visit
  - Hospitalizations, or counts of some outcome

Repeating instruments and events

An excellent way to collect repeating data in REDCap is to use repeatable instruments and/or repeatable events. This is sometimes called one-to-many data collection. Some examples may include but are not limited to the following: data from multiple visits or observations, concomitant medications, adverse events, or repetitive surveys (daily, weekly, etc.).

Below you can specify a data collection instrument or a whole event of instruments to be infinitely repeatable, in which each repeating instrument or event can be repeated a different number of times for each record. You may set any event in the project to be repeatable "on" alternatively set selected instruments to be repeatable within an event. The 'Repeat Entire Event' option means that all the event's instruments will repeat together and stay connected, whereas the 'Repeat Instruments' option implies that the instruments will repeat separately and independently from each other on that event. Once an instrument or event is set to repeat, you will see options on the Record Home Page to add another instance of the instrument/event for the currently selected record.

<table>
<thead>
<tr>
<th>Event Name</th>
<th>Repeat entire event or selected instruments?</th>
<th>Instrument name (select instruments to repeat)</th>
<th>Custom label for repeating instruments (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event 1</td>
<td>Repeat Instruments (repeat)</td>
<td>My First Instrument Generalized Anxiety Disorder...</td>
<td>Example: [visit_date], [weight] kg</td>
</tr>
<tr>
<td>Visit 1</td>
<td>Repeat Entire Event (repeat all instruments together)</td>
<td>Exercise ...</td>
<td>Order ...</td>
</tr>
</tbody>
</table>
Finalizing your project online

• REDCap walks you through the seven steps you should take to make your project “live”
• Pro tip:
  • Take snapshots of your measures as you develop them
    • Online designer tab, only while in draft mode
  • Save a backup version of your study once finalized
    • Other functionality ➔ save copy
Action tags

Action tags are a powerful way to further refine and/or improve your instruments. Some of my favorites include:

- **@NOW**
  - For text box entry, enters current time and date

- **@TODAY**
  - For text box entry, enters current date

- **@NONEOFTHEABOVE**
  - For a select all question, also makes a non of the above which doesn’t allow it to be selected simultaneously with one of the options

- **@CHARLIMIT**
  - Limits text box to your chosen length

- **@HIDDEN – my favorite!**
  - Makes a question hidden

- **Can be used in conjunction with the @NOW to track survey times and to make sure it matches data collector entered @TODAY**

- **Can track average survey times**
Adding external collaborators to your project

1. Use this link: https://ucsf.service-now.com/ess/order_accounts.do
2. Select the REDCap Request option.
3. On the second page of the form enter the person’s name in the User 1 Name field. Select the appropriate person’s name from the drop-down menu.
4. If the collaborator is non-UCSF select the “Check this box” option and complete the First Name, Last Name and Email fields. Ignore the UCSF ID field.
Additional REDCap Features

• Scheduling feature
• Record ID is REDCap made. For longitudinal studies, you may want to make a document linking it with your unique id.
• Data reports—especially useful if you code scale scores
• Data reports-most useful on forms with no skip patterns
• Data comparison tool
Resources


• There are lots of youtube videos on Longitudinal modules and repeating measures which I highly recommend

• You can email me too: [Lila.Sheira@ucsf.edu](mailto:Lila.Sheira@ucsf.edu)