AUTOMATION WITH REDCap

USING REDCAP TO AUTOMATE RESEARCH TASKS
LEARNING OBJECTIVES:

- Automated Survey Invitations (ASI)
- Triggers to kickoff ASI or Alert
- Alerts & Notifications
- Repeatable Survey Invitations
- Q & A
AUTOMATED SURVEY INVITATIONS (ASI)

Survey invitations that are automatically scheduled for immediate or future sending when certain conditions are true.
USE ASI’s to AUTOMATICALLY…

- Send email to participant after they complete a survey
- Send invitations when pre-defined logic becomes true
- Send survey invitation to participant N days after enrollment or discharge date from the hospital
- Send invitations to a sub-group of participants based on characteristics like age, or gender, or diagnosis, etc
## Enabling Surveys for REDCap Project

### Main project settings

**Enable** ✔️ *Use surveys in this project?*

<table>
<thead>
<tr>
<th>Instrument name</th>
<th>Fields</th>
<th>View PDF</th>
<th>Enabled as survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>3</td>
<td></td>
<td>Enable</td>
</tr>
<tr>
<td>Kickoff</td>
<td>1</td>
<td></td>
<td>Enable</td>
</tr>
<tr>
<td>Initial Survey</td>
<td>3</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>Survey 1 Month</td>
<td>3</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>Survey 3 Month</td>
<td>3</td>
<td></td>
<td>✔️</td>
</tr>
</tbody>
</table>
TRIGGERS

- When a record is saved
- If conditional logic is true when a record is saved
- When conditional logic is true during a data import, data entry, or as the result of time-based logic using the datediff() function
**datediff()**

Calculate the difference between two dates or times

- `datediff([date1], [date2], “units”, returnSignedValue = false) >= 7`

<table>
<thead>
<tr>
<th>units</th>
<th>description</th>
<th>calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;y&quot;</td>
<td>years</td>
<td>1 year = 365.2425 days</td>
</tr>
<tr>
<td>&quot;M&quot;</td>
<td>months</td>
<td>1 month = 30.44 days</td>
</tr>
<tr>
<td>&quot;d&quot;</td>
<td>days</td>
<td></td>
</tr>
<tr>
<td>&quot;h&quot;</td>
<td>hours</td>
<td></td>
</tr>
<tr>
<td>&quot;m&quot;</td>
<td>minutes</td>
<td></td>
</tr>
<tr>
<td>&quot;s&quot;</td>
<td>seconds</td>
<td></td>
</tr>
</tbody>
</table>

**DATEDIFF = [date2] minus [date1]**

Datediff returns the absolute value of the difference in dates by default. The result is always non-negative.
returnSignedValue

datediff([date_v1], [date_v2], "d", TRUE)

MUST BE LOWERCASE!

Uppercase ‘TRUE’ throws an error. returnSignedValue must be written in lowercase
ASI STEP 1: COMPOSE MESSAGE

**STEP 1: Compose message**

From: [Display name (optional)]
redcapsupport@lifespan.org

To: [All participants who meet the conditions defined]

Subject: Initial Survey

Send test email

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.
ASI STEP 2: CONDITIONS

- When the following survey is completed
- And/Or when the following logic becomes true
This is an optional setting. When enabled, REDCap will re-evaluate the logic against the record’s data values whenever the record values are changed AFTER the invitation has been scheduled but BEFORE it has been sent to the respondent. And if the logic is no longer true (i.e., if the data values have changed during the time after the survey invitation was scheduled), it will not send the invitation to the respondent but will instead delete it (as if it had never been scheduled). Additionally, if the invitations get deleted due to this setting, then the invitations *may* get scheduled again later if data values are changed such that the logic evaluates as true again. Enabling this setting provides you with greater control over when and how invitations get sent when using conditional logic for Automated Survey Invitations.

In general, it is advisable not to check the 'Ensure logic is still true' box if the Step 3 delay is short (e.g. less than a day). In other cases, you WANT to re-check.
• An 'opt-out' field to cancel future surveys
• Useful if participants drop out, die, or otherwise aren't interested in your emails.
• Requires ‘Ensure Logic is Still True’ to be enabled
ASI STEP 3: WHEN TO SEND

**STEP 3: When to send invitations AFTER conditions are met**

- Send immediately
- Send on next -- select day -- at time
- Send the invitation -- select days, hours, minutes
  - after the automated survey invitation has been triggered
- Send at exact date/time: 
  
**OPTIONAL:**

- Re-send invitation at specified time
- Send it based on when:
  - the automated survey invitation has been triggered
  - Or based on the time value of a field from “Kickoff” [date, begin]
WHAT IF THEY DON’T RESPOND?

- Enable Reminders
- Automatically re-send survey invitation if no response after N hours/days
- Select how often to re-send
ASI STEP 4: ACTIVATE

- Must be set to active for ASI to be sent
- When ‘Active’, your settings will be initiated immediately and REDCap will be actively 'listening' in order to send/schedule invitations for your surveys based upon the conditions you’ve defined.
**Automatically Send Surveys at Fixed Time Intervals**

<table>
<thead>
<tr>
<th>Instrument name</th>
<th>Fields</th>
<th>View PDF</th>
<th>Enabled as survey</th>
<th>Instrument actions</th>
<th>Survey-related options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>3</td>
<td></td>
<td>Enable</td>
<td>Choose action</td>
<td></td>
</tr>
<tr>
<td>Kickoff</td>
<td>1</td>
<td></td>
<td>Enable</td>
<td>Choose action</td>
<td></td>
</tr>
<tr>
<td>Initial Survey</td>
<td>3</td>
<td></td>
<td>Choose action</td>
<td>Survey settings</td>
<td>Automated Invitations</td>
</tr>
<tr>
<td>Survey 1 Month</td>
<td>3</td>
<td></td>
<td>Choose action</td>
<td>Survey settings</td>
<td>Automated Invitations</td>
</tr>
<tr>
<td>Survey 3 Month</td>
<td>3</td>
<td></td>
<td>Choose action</td>
<td>Survey settings</td>
<td>Automated Invitations</td>
</tr>
</tbody>
</table>

Here’s an example project that collects some demographic info and has surveys to be administered initially, and at 1 & 3 months afterwards. There’s an instrument called Kickoff which contains one date field called `date_begin`. This date variable is used to trigger the ASIs to be sent. ASI are setup to immediately send the initial survey, and then the other surveys 1 and 3 months later.
ASI Example 2

ASI with Defined Events for Longitudinal Project

Data Collection Instrument

<table>
<thead>
<tr>
<th>Data Collection Instrument</th>
<th>Screening (1)</th>
<th>Initial (2)</th>
<th>Month1 (3)</th>
<th>Month3 (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kickoff</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey (survey)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Info

Survey title: Study Survey
Event: Initial

When the following logic becomes true:

datediff([date_begin], "today", "d", true) >= 0

Survey title: Study Survey
Event: Month1

When the following logic becomes true:

datediff([date_begin], "today", "d", true) >= 30

Survey title: Study Survey
Event: Month3

When the following logic becomes true:

datediff([date_begin], "today", "d", true) >= 90
Construct alerts and send customized notifications

Allows for greater complexity and has more capabilities than ASI’s

- Alerts apply to both surveys AND data entry forms
- Allows for more options regarding who can be recipient (survey participant, other project users, etc)
- Allows you to include attachments, including those uploaded into REDCap ‘File Upload’ field types
Alerts & Notifications

1. Trigger Alert
   - When a record is saved
   - And/or If conditional logic is true
   - Time-based logic

2. Set Alert Schedule
   - When to send?
   - How often to send?
   - Recurring or just once?

3. Message Settings
   - Which email address to send to/from
   - Include links to surveys, attachments
Example

Smoking Cessation Demo Project

- Has Eligibility Criteria
- Has a question where action may be required if a participant responds in a certain way
Use Case 1

- Email PI when a participant is eligible for your study

**STEP 1: Triggering the Alert**

A) How will this alert be triggered?
- When a record is saved on a specific form/survey
- If conditional logic is TRUE when a record is saved on a specific form/survey
- When conditional logic is TRUE during a data import, data entry, or as the result of time-based logic

B) Trigger the alert...

when "Screening" is saved with any form status (excludes data imports)

while the following logic is true:

(age) >= 18 and [cigs_yn] = '1' and [quit_yn] = '1' and [study_yn] = '1'
Use Case 2

Participant responds in a way that requires follow-up...

- Option A: Setup Alert to notify staff that a participant needs outreach
- Option B: Setup Alert that emails participant directly
Participant responds in a way that requires follow-up...

Use Case 2

Title of this alert: Notify Staff: Action Required

STEP 1: Triggering the Alert

A) How will this alert be triggered?
   - When a record is saved on a specific form/survey
   - If conditional logic is TRUE when a record is saved on a specific form/survey
   - When conditional logic is TRUE during a data import, data entry, or as the result of time-based logic

B) Trigger the alert...

when "Screening" is saved with any form status

while the following logic is true:
   [want_help] = "1"

STEP 2: Set the Alert Schedule

When to send the alert? Send immediately

STEP 3: Message Settings

Subject: Prevent piping of data for identifier fields

Message:

Reach out to participant

Hi Staff Name,

Record ID [record-name] would like to be contacted by a staff member. Please reach out to this participant. Thanks!

redcapsupport@lifespan.org

To: Richardson, Jeffrey

Wed 6/1/2022 10:00 AM

Hi Staff Name,

Record ID 8, would like to be contacted by a staff member. Please reach out to this participant. Thanks!
Use Case 2

Participant responds in a way that requires follow-up...

Option B: Direct Outreach

**STEP 1: Triggering the Alert**

A) How will this alert be triggered?
- When a record is saved on a specific form/survey
- If conditional logic is TRUE when a record is saved on a specific form/survey
- When conditional logic is TRUE during a data import, data entry, or as the result of time-based logic

B) Trigger the alert...

when "Screening" is saved with any form status (excludes data imports)

while the following logic is true:

\[ \text{[want_help] = '1'} \]

(e.g., [age] > 30 and [sex] = "F")

**STEP 2: Set the Alert Schedule**

When to send the alert?
- Send immediately
- Send on next Day at time: 07:30 AM
- Send the alert days hours minutes after the alert has been triggered
- Send at exact date/time: MM/DD/YYYY HH:MM
Participant responds in a way that requires follow-up…

Use Case 2

Email To:
* must provide value
+ Show more options

Subject:
* must provide value

Message:
* must provide value

Prevent piping of data for identifier fields

Sample of message participant will receive:

- **Option B: Direct Outreach**

From: redcapsupport@lifespan.org
To: jrichardson@lifespan.org
Subject: How can I help?
Message: Hi,

My name is Jeff, I’m a Research Assistant for the project. When you completed our survey yesterday, you indicated that you’d like to be contacted by a staff member. How can I help answer your questions?
AUTOMATICALLY SEND REPEATING SURVEYS

- Can’t we just use ASI’s to send repeatable surveys? ...No!
- Cannot use ASI’s to remind participants to repeat a survey
- The ASI will only fire once conditions are met for the first instance, and reminders will only be sent for that instance
- Repeat instance invitations must be sent manually or instruct participant to click the “repeat” button

Answer: Send w/ Alerts & Notifications
• Setup Alerts & Notifications to email repeatable survey to participant on recurring basis
• When using the longitudinal module in a project, one downside is that you must specify all the events ahead of time, making sure to build out the maximum number of events that one might need, even though all of them likely won't be used by all records. However, with the repeating instruments functionality, one does not need to specify how many repetitions will needed ahead of time; one can simply repeat an instrument an unlimited amount of times.

• Sometimes called, “One to Many Data Collection” – For every 1 participant, there may be many…
  • Medications
  • Family Members
  • Adverse Events
  • Multiple Visits

• Each repeating element is connected to the overall record but can repeat independently of the other instruments. Each record in the project can have a different number of repeated instances of any given instrument or event. One record may have five medications, but another may have two or none, for example. Such flexibility makes this feature very powerful
Enabling Surveys for Repeating Instruments

Setting up repeating instruments and/or repeating events in a project is very quick and easy. From the Project Setup page, in addition to enabling surveys, you must Enable the use of repeatable instruments and specify which data collection instruments are going to be repeating.

Once an instrument is set to repeat, you will see options on the Record Home Page to add another instance of the instrument for the currently selected record. All instances of a repeating instrument will then be displayed as a table near the bottom of the Record Home Page, thus allowing viewing of the instances and easy navigation within them.
After enabling the instrument itself as both a survey, and a repeating instrument, you must take an additional step in order to allow survey respondents to enter their responses in a repeating fashion. In the survey settings, near the bottom of the page, is the “(Optional) Allow Respondents to repeat the survey” setting.

When the repeat survey setting is enabled, it will display a button at the end of the survey so that the respondent can choose to enter another response for the survey, thus essentially allowing them to take the survey multiple times in a row. In this way, they will be able to enter as many responses for that same survey as they need.
Hypothetical Weight Loss Study

Demographics Instrument

- Name & Email Address
- Starting Weight
- Kickoff Date [date_begin]

Daily Food Journal - Repeatable

- Sent out at 7pm each evening to track the participant’s daily food intake & calories

Weekly Weigh-Ins - Repeatable

- Sent every 7 days after [date_begin] to track the participant’s weight over time
Repeatable Survey: Daily Food Tracker

Title of this alert: Daily Food Tracking

**STEP 1: Triggering the Alert**

A) How will this alert be triggered?
- When a record is saved on a specific form/survey *required*
- If conditional logic is TRUE when a record is saved on a specific form/survey

B) Trigger the alert when the following logic becomes true:

\[
\text{datediff}(\text{date_begin}, \text{today}, \text{d}, \text{true}) \geq 0
\]

**STEP 2: Set the Alert Schedule**

- Send immediately
- Send on next day at time: **19:00**
- Send the alert: days, hours, minutes after the alert has been triggered
- Send at exact date/time: **MM/DD/YYYY HH:MM**

Send it how many times?
- Just once
- Multiple times on a recurring basis:
  - Send every: **days:** **1**, after initially being sent
  - Send up to: **times total** (including the first time sent)

**STEP 3: Message Settings**

- **Alert Type:** Email
- **Email From:** redcap.support@lifespan.org
- **Email To:** [email]"Email Address"
- **Subject:** Daily Food Journal

Please enter the food you ate today at the link below.

[survey/link/food_tracker]
Repeatable Survey: Daily Food Tracker

Message participant will receive:

From: redcapsupport@lifespan.org
To: jrichardson7@lifespan.org
Subject: Daily Food Journal
Message: Please enter the food you ate today at the link below.
Food Tracker

Food Tracker
Please complete the survey below.
Thank you.

- Date: 2022-03-01
- Did you eat breakfast? Yes
- What did you eat for breakfast? pancakes, syrup, fruit, coffee
- How many total calories? 600
- Did you eat lunch? No
- Did you eat dinner? Yes
- What did you eat for dinner? Lasagna, buttered roll, broccoli, glass of wine
- How many total calories? 1100

Submit and
- New Food Journal Entry
- Submit
Repeatable Survey: Weight Tracker

Conditional time-based logic to trigger alert:

<table>
<thead>
<tr>
<th>Trigger the alert...</th>
</tr>
</thead>
<tbody>
<tr>
<td>when the following logic becomes true:</td>
</tr>
<tr>
<td><code>datediff(date_begin, &quot;today&quot;, &quot;d&quot;, true) &gt;= 0</code></td>
</tr>
</tbody>
</table>

Send every 7 days after triggered:

- [ ] Send the alert 7 days 0 hours 0 minutes after the alert has been triggered

& every 7 days thereafter:

- [ ] Send every 7 days after initially being sent

Sent to field we've setup and validated as email:

<table>
<thead>
<tr>
<th>Email To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[email] &quot;Email Address&quot;</td>
</tr>
</tbody>
</table>

Includes link to repeatable survey

Please weigh-in for this week at the link below...

[survey-link:weight_tracker]
THANK YOU!!!

Lifespan Biostatistics, Epidemiology, & Research Design (BERD) Core

Contact REDCapSupport@Lifespan.org for REDCap Questions