Repeating Data Collection in REDCap

The repeating instruments and events module is a REDCap feature useful for collecting data multiple times using the same instruments *without* set time points. There is also no limit to how many times a repeatable instrument or event is repeated for an individual record. This is useful for instances in which data will be collected using the same instrument multiple times, but the number of times will vary across participants. Repeatable instruments can be used in classic and longitudinal projects, while repeatable events are *only* for longitudinal projects.

Example Use Cases for Repeatable Instruments/Events

- Participants are asked to complete a form each time they are admitted to a facility, like a hospital;
- Forms for tracking samples;
- Contact logs, adverse event forms, or billing logs; or
- A parent is asked to complete a survey for each child they have.

How to Set Up Repeating Instruments and/or Events

1. On the "Project Setup" tab, select "Enable" next to "Repeatable instruments" in the "Enable optional modules and customizations" box.

	Enable	Repeatable instruments and events ?
1		
	Disable	Auto-numbering for records [?]
1	Enable	Scheduling module (longitudinal only) ?
	Enable	Randomization module ?
	Disable	Obsignate an email field for communications (including survey invitations and alerts) ?
		Field currently designated: email ("E-mail")

2. A pop up will appear with a list of your instruments. Select which instruments you would like to be repeatable.

	nstruments	
events. This is to the followin	sometimes called one-to-many data colle	to use repeatable instruments and/or repeatable ection. Some examples may include but are not limite ns, concomitant medications, adverse events, or
instrument ca enabling REDC Record Home	n be repeated over and over again (a diffe Cap's longitudinal module. Once an instru Page to add another instance of the instr	e infinitely repeatable, which means that an erent number of times for each record) even without ment is set to repeat, you will see options on the ument for the currently selected record. All instances ble near the bottom of the Record Home Page, thus
	ng of the instances and easy navigation w	/ithin them.
	ng of the instances and easy navigation w	ithin them. Custom label for repeating instruments (optional) Example: [visit_date], [weight] kg
allowing viewi		Custom label for repeating instruments (optional)
allowing viewi	Instrument name	Custom label for repeating instruments (optional) () Example: [visit_date], [weight] kg
allowing viewi	Instrument name Screening	Custom label for repeating instruments (optional) @ Example: [visit_date], [weight] kg [date_enrolled]
allowing viewi	Instrument name Screening Consent	Custom label for repeating instruments (optional) Example: [visit_date], [weight] kg [date_enrolled] [consent_yn]

- a. Custom label for repeating instruments Variables can be piped here to customize what appears next to each repeated instance on an individual's record dashboard.
- b. If you have the longitudinal module enabled, this pop up will be organized by event name and you can select whether to repeat instruments within the same event together or independently of one another.

calle	d one-to-many data c		seatable instruments and/or repeatable events. This is but are not limited to the following: data from multipli itive surveys (daily, weekly, etc.).	
nstr repe that that set t	ument or event can b eatable *or* alternativ all the event's instr the instruments wi	e repeated a different number of times rely set selected instruments to be repe ruments will repeat together and sta Il repeat separately and independen	ent of instruments to be infinitely repeatable, in which for each record. You may set any event in the project stable within an event. The 'Repeat Entire Event' op y connected, whereas the 'Repeat Instruments' op dy from each other on that event. Once an instrum dd another instance of the instrument/event for the c	to be tion means tion implies ent or event is
	Event Name	Repeat entire event or selected instruments?	Instrument name Custom label for repeating instruments (select instruments to repeat) Example: [visit_date], [w	
	Event 1	not repeating 🗸 🗸	Screening Consent Survey 1 - Baseline Survey 2 - Participant Follow Up Form 1 - Researcher Follow Up	
			Survey 2 - Participant Follow Up	
	Event 2	- not repeating 🗸	Form 1 - Researcher Follow Up	

How to Add a New Instance as a Form

- 1. While logged into REDCap, go to "Add/Edit Records" and select the record needed.
- 2. Click "+" or "+ Add New" on any repeating instrument or event to add a new instance. You can also add a new instance from within the instrument.
 - a. In the example below, the blue status circle next to the form means a mix of complete and incomplete instances.

	F	Record ID 11					
D	ata Colle	ection Instrument	Status				
Scree	ning (sur	vey)	۲				
Conse	ent (surve	Y)	0				
Surve	ey 1 - Bas	eline (survey)	۲				
Surve	ey 2 - Par	ticipant Follow Up	0_				
Form	1 - Rese	archer Follow Up	• +				
Other	r Info		0				
Repe	ating In	struments		Save & Exit Form	Save &		
				Cancel	Save & Stay		
Form Up (earcher Follow			Save & Go To Next Instance		
1	۲	06-03-2021		Delete data for THIS	Save & Go To Next Form		
2	•	07-23-2021			Save & Exit Record		
3	۲	08-12-2021		NOTE: To delete the entir			
		+ Add new		record action drop-down	Save & Go To Next Record		

How to Add a New Instance as a Survey

There are three different options for entering a new instance as a survey. Each option has its own pros and cons that should be weighed carefully based on your project needs. Additionally, the options listed are not mutually exclusive and can be used in combination together for multiple surveys within a project.

"Repeat the Survey" Button at the End of a Survey

When a survey is enabled as a repeating instrument, the survey option "Allow respondents to repeat the survey" appears under "Survey Termination Options" in "Survey Settings." Selecting this will create a customizable repeat button for participants. The repeating button can appear next to the submit button before the survey is repeated or after the survey is completed on the survey completion page. If enabled, a green repeat arrow appears next to the instrument on "Online Designer."

O (Optional) Auto-continue to next survey: Autor O OTHERWISE —	natically start	the next sur	vey instru	ument	after f	inishing	g this	surve	y ?					
Redirect to a URL (Redirect to a webpage when survey is completed) OR —	Provide a fuli URL, e.g. http://www.example.com/mypage.html, [survey-url:other_survey] / How to use Piping here													
Optional) Allow respondents to repeat the sur Set custom text for the button: Take this survey. Location of the button on survey: After survey is	again					mpleti	on, if i	they w	/ish. 🍯					
Survey Completion Text (Displayed after survey is completed as 'thank you'	Paragraph	~	в I	8	Ŧ	Ξ	4	=	\$	¢	К 7 К 3			
text or as acknowledgement text)	i≡ i≡	₫ 2	= ~		A	~ <u>*</u>	~	Q	$\langle \rangle$	<u></u> ×				
	1													
		e Pining ber												
	/ / How to us	se Piping her	<u>e</u>											
		<u>e Piping her</u> ubmit ar												
		ubmit ai	nd	gain	1									
	SI	ubmit ai	nd	gain										

Note: The "Repeat the Survey" button option is not available for repeating events with instruments that repeat together (i.e., not independently of one another).

Sending Automatic Survey Invitations (ASI) for Repeating Instruments

Automatic survey invitations, or ASIs, can be set up to send survey links for a repeating instrument at a recurring interval and can be used for repeating instruments and instruments on repeating events. This method will also work with Twilio SMS and Voice Calls.

How to Set Up an ASI for a Repeating Instrument

- 1. From the "Online Designer" page, select "Automated Invitations" next to the repeatable survey for which you would like to send invitations. A "Define Conditions for Automated Survey Invitations (ASI)" pop up will appear. Complete steps 1 through 3.
- 2. ASIs for repeatable surveys have an additional step compared to traditional ASIs. This is where you will set how many times and how often the survey invitation should be sent. Each invitation will be a new instance and all scheduled invitations are based on when the first invitation is sent.

Activ				Incite			-		~									T STEP 2: Conditions
								survey	£									
urvey																		Specify conditions for sending invitations:
	tive" must be selected in order for automated survey invitations to be triggered and sent using the conditions trified in this popup, You may make it Not Active (and vice versa) at any point in the future.														ions	When the following survey is completed: Demographics And Screening		
Activ																		AND V
-										_	_							When the following logic becomes true:
STEP	1: Cor	npos	e me	ssage														E mich are reasoning registrations and
rom:								nois.ed	u						~			
	(selec	t any p	roject	user t	o be th	he 'Se	nder')											(e.g., [age] > 30 and [sex] = "1")
ю:	[All p	artic	ipan	ts wh	o me	et th	e con	dition	s defi	ned]	t i							How do I use special functions?
ubject:	Repe	eating	ASI	Test														Test logic with a record select record
														s	end ter	st en	mail	Ensure logic is still true before sending invitation? Pow to use "stop logic" to disable an automated invit
Parag	raph		4	_	в		r u	5 6			E	Ξ	з	=	4		0	
					-				22			-	-	-				STEP 3: When to send invitations AFTER conditions are met
12	Ξ	4	1	Œ	- E	⊞		<u>A</u>	~ 4	2	- (Q	$\langle \rangle$	<u>T</u> *	**			 Send immediately
Please	take t	this s	urvey															O Send on next select day v at time I HM
You ma					vour	web	brows	ser by	lickin	g the	link	belo	w:					O Send the invitation days hours minutes
[survey					,					5								after v the exact time that the automated invitation was triggered v
If the li [survey		ove o	loes r	not wo	ork, tr	y cot	oying t	the link	below	w int	o you	ur w	eb bro	wser:				O Send at exact date/time:
This lin	nk is u	nique	to y	ou an	d sho	uld r	ot be	forwar	rded ti	o otł	iers.							C STEP 4: How many times to send it (repeating surveys only)
																		O Just once
																		Multiple times on a recurring basis:
																	-A	C Send every 5 days v after initially being sent.
NOTE:	You ma	ay mo nk] or	dify an (surve	remov	n the t	text y	ou wish	h in the	Compo	vill no	essag ot hav	e text	t box al	bove. Nake the	lake si surve	ure y	you include	Send up to 3 times total (including the first time sent).
/ How to	100000																	Leave blank to continue triggering and sending forever.
																		Learn about Data Collection Strategies for Repeating Surveys
																		OPTIONAL: Enable reminders
																		Re-send invitation as a reminder if participant has not responded by a specified time?

- a. Note: Scheduled ASIs for repeatable surveys can be cancelled via the "Survey Invitation Log." However, cancelling one invitation will delete all scheduled future invitations for that participant's survey.
- 3. Don't forget to set the ASI to "Active" and click "Save!"

Sending Alerts for Repeating Instruments

Alerts can also be used to email participants a link to create a new instance of the repeating survey. This is done using the "Smart Variables" [survey-link] or [survey-url] and [new-instance] in the alert message. Compared to ASIs, the alert module provides more flexibility in how the alert is triggered, scheduled, and where it is sent.

Below is an example of how [survey-link] or [survey-url] and [new-instance] can be used in an alert message. In this example, the following syntax is used to create the survey links to a new instance of the instrument named "Exercise Questionnaire":

[survey-link:exercise_questionnaire:Exercise Questionnaire][new-instance] and [survey-url:exercise_questionnaire][new-instance]

lert Type:	
Email From: * must provide value	Display name (optional) lore@illinois.edu
Email To: * must provide value	*[email] "What is your email address?"
+ Show more options	Or manually enter emails: Jane@example.com; john@mysite.org
Subject * must provide value	Repeating Instrument Alert
Message:	Paragraph ∨ − B I U & ⊠ ≣ ≣ ≣ ≣ ≦ ∽ ∂
* must provide value	
Prevent piping of data for Identifier fields ?	Please take this survey whenever you exercise: [survey-link:exercise_questionnaire:Exercise Questionnaire][new-instance]
	[survey-url:exercise_questionnaire][new-instance] Thank you,
	In the subject or message, you may use Pipping and [1] Smart Variables Example: Hi (first, name)! Please complete this survey: [survey-link:followup_survey]
	Learn about Data Collection Strategies for Repeating Surveys
	Example of a repeating survey using recurring alerts:

Importing Repeating Instances

When importing data into a repeating instance, it is important to notate the instance, instrument, and if applicable, event. See the <u>Importing Data to REDCap</u> document for more detailed information.

Exporting Repeating Instances

Data from repeating instruments and events will export in a long format. You may need to reformat your data after it is exported. In the example below, records 1 and 2 have data for the repeating instrument "Practice Form" which contains the question "Does the pet have a vet?" while record 3 does not.

Record ID record_ id	Repeat Instrument redcap_repeat_ instrument	Repeat Instance redcap_ repeat_ instance	Today's Date enroll_ date	Pet Name pet_id	Please select the option that best describes the origin of the pet's name: name_origin	Since taking the pet name survey, have you changed your pet's name? name_change	Does the pet have a vet? vet
1			06-23- 2021	Spot	Unknown/I did not name this pet (9)	No (0)	
1	Practice Form	1					Yes (1)
1	Practice Form	2					Yes (1)
2			06-23- 2021	Zuko	Fictional Character (1)	No (0)	
2	Practice Form	1					No (0)
2	Practice Form	2					No (0)
2	Practice Form	3					No (0)
2	Practice Form	4					Yes (1)
<u>3</u>			06-24- 2021	Scissors	Other (10)		

Using Fields from Repeating Instances in Piping and Logic

Piping and logic that reference fields in repeating instruments will always take data from the first instance of that instrument unless a "Smart Variable" is added *after* the variable name to specify which

repeating instance REDCap should refer to. Additionally, if you have the longitudinal module enabled and the field you are referring to is in a *different* event, you must include the unique event name (e.g., [event_1_arm_1]) *before* the repeating instance variable. You cannot refer to data from a specific instance number.

For example, the equation below uses smart variables to calculate a cumulative working time, [supp_total], from all previous instances by adding up [supp_time] in every instance. The smart variables [current-instance], [first-instance], and [previous-instance] indicate to REDCap which [supp_time] number to use in each part of the equation:

if([current-instance]=[first-instance], [supp_time][current-instance], sum([supp_total][previousinstance], [supp_time][current-instance]))

A list of smart variables that can be used with repeating instances and events can be viewed by clicking the green "Smart Variable" icon on the "Project Setup" page, "Online Designer" page when building an instrument, "Add or Edit Alert" pop up, and other areas of the REDCap interface.



Repeating Instances and the Survey Queue

Survey queues that contain repeating instruments work best when the "Repeat the Survey" button is enabled, the queue is *not hidden* for participants, and participants have access to their survey queue link.