



University of Colorado **Anschutz Medical Campus**

REDCap: From Programming to Publication

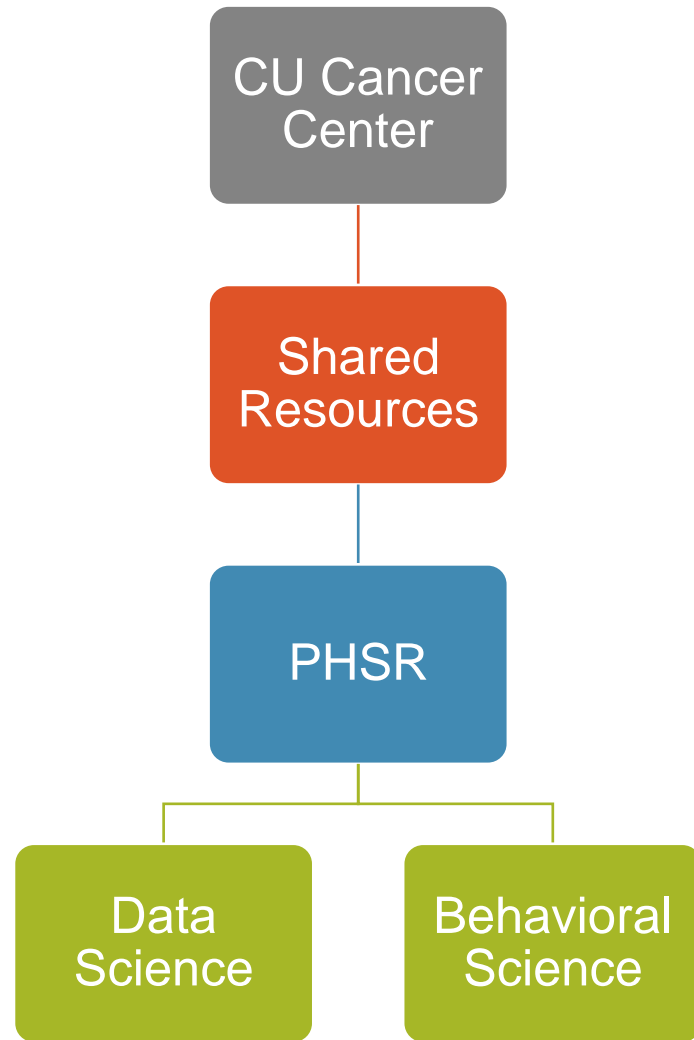
PHSR Behavioral Science Seminar
November 2024



Overview

- (Re)Introduction to PHSR
- REDCap Basics
- Example projects using REDCap
- Active REDCap Projects
- Questions

Population Health Shared Resource



Population Data Science Team:

Uses large population-based datasets to conduct cancer health services research and policy impact analyses.

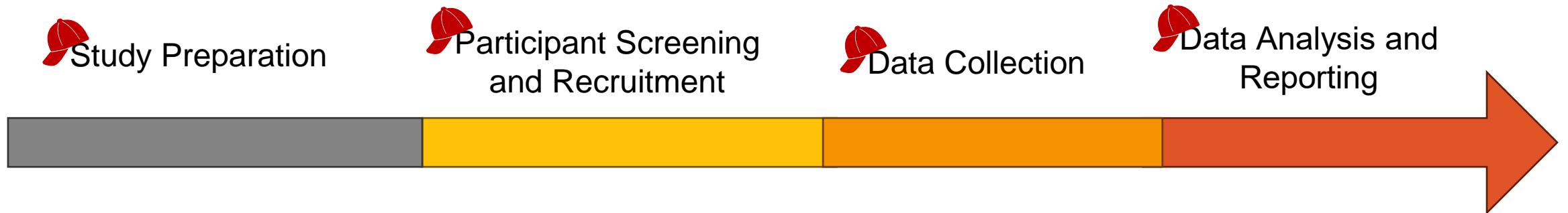
Behavioral Science Team:

Uses patient and community-focused methods to conduct research related to delivery of healthcare, behavioral interventions, and patient-reported outcomes.



- Developed by Vanderbilt University (📍📄) and grant-funded (citation required).
 - HIPAA-compliant
 - New features
- A tool for collecting, abstracting, and managing data.
 - Survey responses
 - EMR information
 - Participant tracking
 - Photo and audio data

Project Timeline



REDCap Basics



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REDCap Vocab

- Project
- Project Set-up

[Project Home](#) [Project Setup](#) [Other Functionality](#) [Project Revision History](#)

Project status: Development Completed steps **0** of **7**

Not started
[I'm done!](#)

Main project settings

[Disable](#) Use surveys in this project? [?](#) [VIDEO: How to create and manage a survey](#)

[Enable](#) Use longitudinal data collection with defined events? [?](#)

[Enable](#) Use the MyCap participant-facing mobile app? [Learn more about MyCap](#)

[Modify project title, purpose, etc.](#)

Optional
[I'm done!](#)

Enable optional modules and customizations

[Enable](#) Repeating instruments [?](#)

[Disable](#) Auto-numbering for records [?](#)

[Enable](#) Scheduling module (longitudinal only) [?](#)

[Enable](#) Randomization module [?](#)


[Enable](#) Designate an email field for communications (including survey invitations and alerts) [?](#)

[Enable](#) Twilio SMS and Voice Call services for surveys and alerts [?](#)

[Additional customizations](#)

Designer

	A	B	C	D	E	F	G	H	I	J
1	Variable / Field Name	Form Name	Section Header	Field Type	Field Label	Choices, Calculations	Field Note	Text Validation	Text Validation	Text Validation
2	record_id	demographics		text	Record ID					
3	consent	demographics		yesno	consent					
4	mrn	demographics		text	MRN					
5	email	demographics		text	Email			email		
6	date	demographics		text	Today's date			date_dmy		
7	gender	demographics		radio	Gender	Man, Man Woman, Woman Non-Binary,				
8	race	demographics		radio	Race	LA10608-0, American Indian or Alaska Native,				
9	source	demographics		dropdown	Source	1, Flyer 4, Social Media 2, Clinician 3,				
10	randomization	randomization		radio	Arm	1, Intervention (Arm 1) 0, Control (Arm 2)				
11	test	pre_survey		notes	Test					
12	log_date	daily_log		text	Today's date			date_mdy		
13	daily_log	daily_log		notes	Daily log					
14	uuid	daily_log		text	UUID					
15	startdate	daily_log		text	Start Date					
16	enddate	daily_log		text	End Date					
17	scheduledate	daily_log		text	Schedule Date					
18	status	daily_log		dropdown	Status	0, Deleted 1, Completed 2, Incomplete				
19	supplemental_data	daily_log		notes	Supplemental Data (JSON)					
20	serialized_results	daily_log		file	Serialized Result					
21	end_date	post_survey		notes	Date					
22	test_post	post_survey		radio	test post	1, a 2, b 3, c 4, d				
23										

	#	Variable / Field Name	Field Label <i>Field Note</i>	Field Attributes (Field Type, Validation, Choices, Calculations, etc.)										
Instrument: Demographics (demographics)  Enabled as survey														
	1	record_id	Record ID	text										
	2	consent	consent	yesno <table><tr><td>1</td><td>Yes</td></tr><tr><td>0</td><td>No</td></tr></table>	1	Yes	0	No						
1	Yes													
0	No													
	3	mrn	MRN	text										
	4	email	Email	text (email)										
	5	date	Today's date	text (date_dmy), Identifier										
	6	gender	Gender	radio <table><tr><td>Man</td><td>Man</td></tr><tr><td>Woman</td><td>Woman</td></tr><tr><td>Non-Binary</td><td>Non-Binary</td></tr><tr><td>Transgender</td><td>Transgender</td></tr><tr><td>1</td><td>None of these describe me. I would like to consider</td></tr></table>	Man	Man	Woman	Woman	Non-Binary	Non-Binary	Transgender	Transgender	1	None of these describe me. I would like to consider
Man	Man													
Woman	Woman													
Non-Binary	Non-Binary													
Transgender	Transgender													
1	None of these describe me. I would like to consider													

Field Programming

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 form on this page. For an overview of the different field types available, you may view the [Field Types video \(4 min\)](#).

Field Type: Checkboxes (Multiple Answers) ⌵

[Codebook](#)

Field Label ☐ Use the Rich Text Editor ?
Which of the following do you eat at Thanksgiving dinner? (please select all that apply)

Variable Name (utilized in logic, calcs, and exports)
dinner
ONLY letters, numbers, and underscores

How to use [Smart Variables](#) [Piping](#) [Field Embedding](#)

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

Choices (one choice per line) [Use the Choices Editor](#) [Copy existing choices](#)
1, Turkey
2, Stuffing/dressing
3, Cranberry Sauce (whole or jellied)
4, Mac and Cheese
5, Mashed Potatoes
6, Vegetable Casserole
7, Other (please specify) {dinner_o}

[How do I manually code the choices?](#)

Action Tags / Field Annotation (optional)

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

REDCap Vocab

- Events (longitudinal)
- Piping
- Logic
 - Branching
 - Smart Variable
 - Special Function

Data Collection Instrument	Consent (1)	Pre (2)	Post (3)
Consent (survey)	↓		
Demographics (survey)	✓		
Randomization	✓		
Pre Survey (survey)		✓	
Daily Log (survey)		✓	
Post Survey (survey)			✓

Current instrument: **Follow-Up Blood Disorder Characteristics**

[Preview instrument](#)

[Add Field](#) [Add Matrix of Fields](#) [Import from Field Bank](#)


Follow-up for [first-event-name][mrn] [first-event-name][consent_date]

[Add Field](#) [Add Matrix of Fields](#) [Import from Field Bank](#)

Advanced Branching Logic Syntax

How to use [Branching Logic](#) [Smart Variables](#) [Special Functions](#)

Show the field ONLY if...

[race(1)] = "0"

[Clear logic](#)

Test logic with a record: 1

Result: False (condition is not true)

Record Status Dashboard

Record ID	Consent			
	Consent	Sociodemographic Questionnaire	Randomization	Medical Chart Review
<u>1</u>				
<u>2</u>				
<u>3</u>				
<u>4</u>				
<u>5</u>				
<u>6</u>				

Randomization

Editing existing Record ID 4.

Event: Consent (Arm 1: Intervention)

Record ID 4

Arm

Already randomized
☒ Intervention (Arm 1)
☐ Control (Arm 2)

Form Status

Complete?

☒ Incomplete
☐ Unverified
☐ Complete

- Cancel -

Custom Record Dashboard

Dashboard displayed:

KH Follow-up

Modify

Create custom dashboard

Displaying record

Page 1 of 1: "19" through "257"

 of 8 records

250

 records per page

Custom Record Dashboard

You may create your own custom version of the Record Status Dashboard by setting up the configuration options below. Only users with Project Setup/Design privileges will be able to create custom dashboards. Once a custom dashboard has been created, it will be viewable to all users in the project.

Dashboard title:

KH Follow-up

Description / instructions:

(Optional) Displayed near top of page

Displays patients who have consented and the follow-up forms to be completed

Header orientation:

Horizontal (default)

Use 'Vertical' to transpose headers for a more compact display.

Group columns by instrument or event:

Event

Grouping by Event will display event name at top spanning over its instruments, whereas grouping by Instrument will do vice versa.

Select instruments/events:

(Optional) Include/exclude specific instruments (to display less columns)

[baseline_arm_1][patient_registration_form],[baseline_arm_1][bisonpi]

Filter logic:

(Optional) Filter the records displayed based on conditional logic

[first-event-name][consent] = '1' or [patient_registration_form_complete] = '1'
(e.g., [enrollment_arm_1][age] > 30 and [enrollment_arm_1][sex] = "1")

Filter by arm:

Display all arms

Display all arms in a tabbed display or display only a single arm

Sort by:

Sort the records by the value of a specific event's field in either ascending or descending order

Baseline (Arm 1: /

record_id "Record ID"

in

Ascending order

Save dashboard

Cancel

Delete dashboard

Example Projects



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Example Project #1

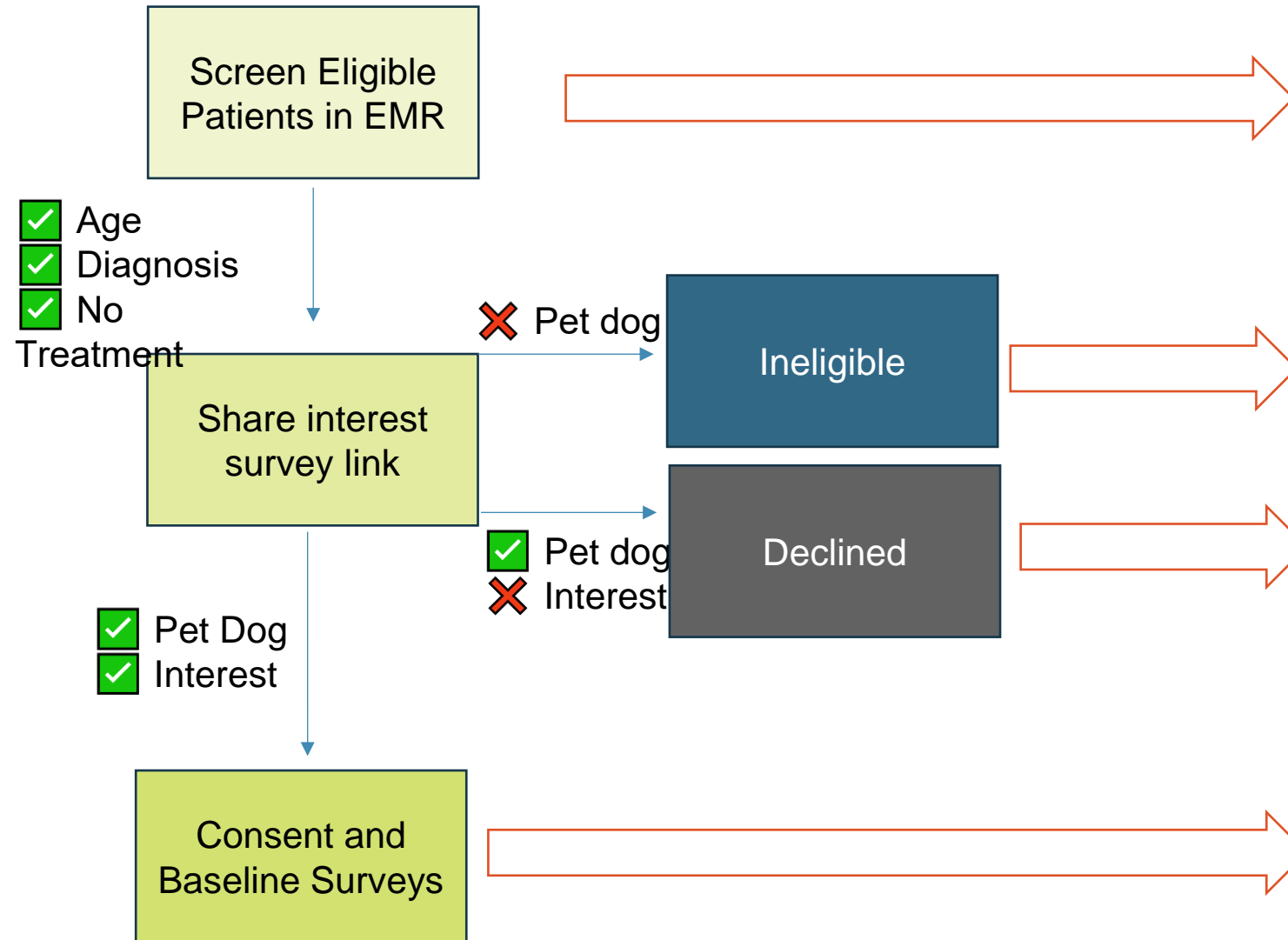
*Research Team wants to interview and collect data using the FACT instruments at **three time points** from **men over 65 with prostate cancer** who **opted not to pursue treatment at time of diagnosis** and **live with a pet**.*

How can REDCap help?

- Track progress and record data from EMR screening
- Collect longitudinal data for each participant linked to a single record ID
- Store interview audio files and transcripts



Accrual Flowchart



REDCap Benefits

Track characteristics of screened and consented patients

Screen and record characteristics not in EMR

Ask and record reasons for declining

Automatically share PDF copy of consent with participant

Reports

Data Exports, Reports, and Stats

 [VIDEO: How to use Data Exports, Reports, and Stats](#)

[+ Create New Report](#)

[My Reports & Exports](#)


[Other Export Options](#)



[Edit Existing Report: Reason for Not Consenting](#)

You may create a new report by selecting the fields/variables below that you want to include in the report. You may add as many fields to your report as you wish, and you can choose which users may view this report. You will also need to provide a name for your report, which will then be displayed on the project's left-hand menu for anyone to whom you have given access. You can filter the results returned in the report in a variety of ways, including using complex AND/OR logic. When you are finished, click the Save Report button at the bottom. The new report will then be added to your list of reports, after which you may immediately begin viewing them or exporting them.

Name of Report:	<input type="text"/>
Set as "public":	Enabling this feature below will auto-generate a public link for viewing the report without needing to log in to REDCap. <input type="checkbox"/> Report is publicly viewable by anyone with the public link
Description (optional): Displayed on page below report name	<div><div>Open Sans Paragraph 10pt B I U S A</div><div>≡ ≡ ≡ ≡ ≡ ≡ </> - 🔗 🖼️ 📎 📄 🔍 Ix ↶ ↷ <></div><div></div></div>

STEP 1

 **User Access:** Choose who can edit and view this report

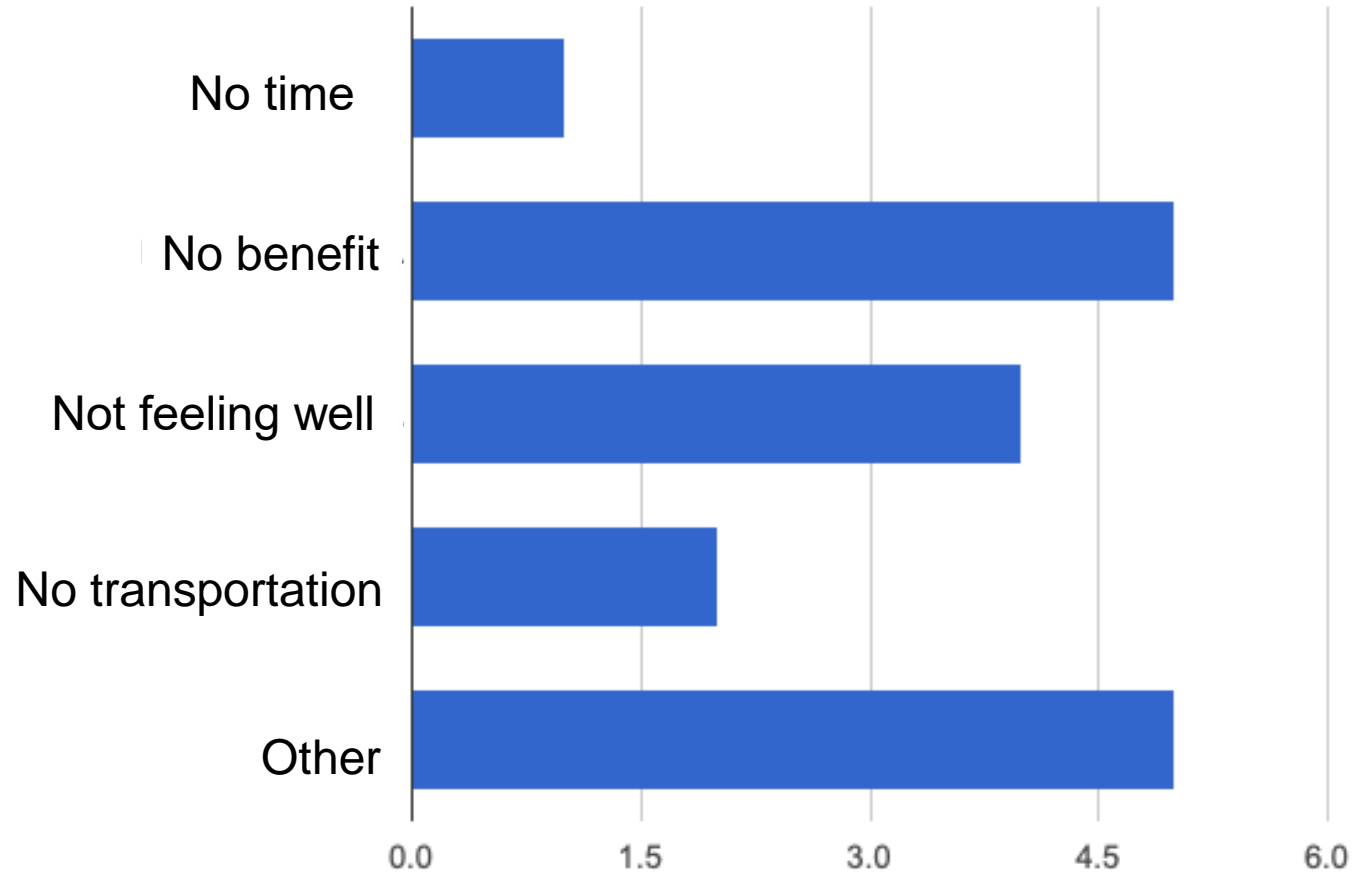
 **View Access:** Choose who sees this report on their left-hand project menu 

☒ **All users** - OR - ☐ **Custom user access** (Choose specific users, roles, or data access groups who will have access)

 **Edit Access:** Choose who can edit, copy, or delete this report (requires user to have 'Add/Edit/Organize Reports' privileges)

☒ **All users** - OR - ☐ **Custom user access** (Choose specific users, roles, or data access groups who will have access)

Reports



Example Project #2

*Research team is conducting a **large survey project** in which they intend to use **purposive sampling and community partnerships** in order to collect data regarding cancer risk factors and health behaviors*

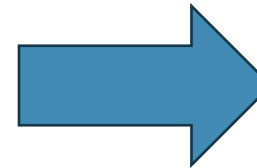
How can REDCap help?

- Sharable public link with passcode
- Dashboard to track real-time accrual by variables of interest

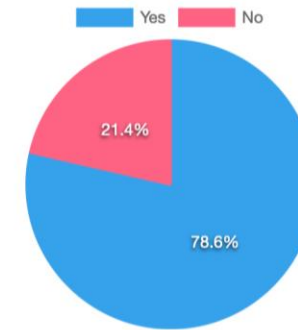


Project Dashboards

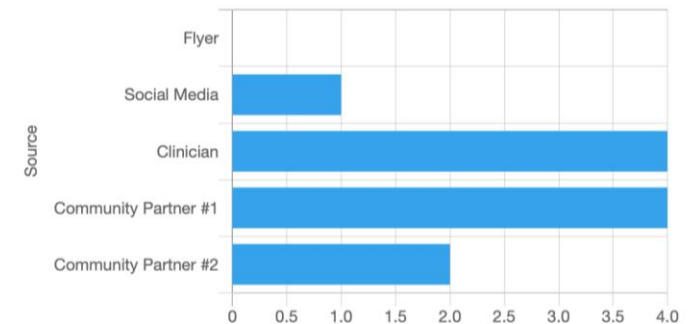
Dashboard title:	Consented Participants
User access:	Choose who sees this dashboard on their left-hand project menu (Note: Users with Setup/Design privileges can still access all dashboards via the Project Dashboards page.) <input checked="" type="radio"/> All users – OR – <input type="radio"/> Custom user access (Choose specific users, roles, or data access groups who will have access)
Set as "public":	Enabling this feature below will auto-generate a public link for viewing the dashboard without needing to log in to REDCap. <input checked="" type="checkbox"/> Dashboard is publicly viewable by anyone with the public link Public link: https://redcap.ucdenver.edu/surveys/?__dashboard=RYPX4JR... Create custom link
Dashboard content: Add any static or dynamic text to be displayed, including Smart Functions, Smart Tables, and Smart Charts. Dashboard help: Use the Wizard	<div>Open Sans Heading 2 24pt B I U S A</div> <div>Consented</div> <div>[pie-chart:consent:consent_arm_1]</div> <div>Consented by Source</div> <div>[bar-chart:source:consent_arm_1]</div> <div>Consented by Gender</div> <div>[bar-chart:gender:consent_arm_1]</div>



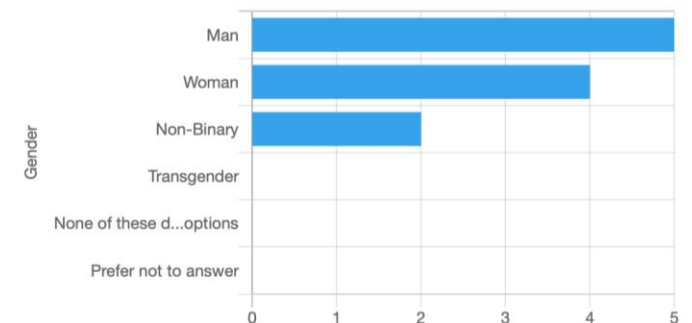
Consented



Consented by Source



Consented by Gender



Real Dashboard Programming

	Consented	Invited
Total	[aggregate-count:consent]	[aggregate-unique:participant_id:baseline_arm_1,baseline_screening_arm_2,week_prior_arm_2,baseline_arm_3]
Arm 1	[aggregate-count:consent:baseline_arm_1]	[aggregate-unique:participant_id:baseline_arm_1]
Arm 2	[aggregate-count:consent:baseline_screening_arm_2,week_prior_arm_2]	[aggregate-unique:participant_id:baseline_screening_arm_2,week_prior_arm_2]
Arm 3	[aggregate-count:consent:baseline_arm_3]	[aggregate-unique:participant_id:baseline_arm_3]

Example Project #3

Clinical research team wants to collect well-being data as part of a new exercise and counseling program for people at high-risk for cancer. A clinician on the team would like to be alerted if anyone scores low on the scales so that help can be provided.

How can REDCap help?

- Library of validated tools for measuring well-being, some are auto-scoring
- Participant list with contact preference and links that can also be shared in the EMR messaging system
- Automatic alerts if a participant meets certain criteria



Participant Lists

Participant List belonging to [Initial survey] "Consent Form" - Consent										
Displaying 1 - 18 of 18		Add participants		Compose Survey Invitations		Remove all participants		Export list		
Email	Phone	Record	Participant Identifier (optional) Disable	Invitation preference	Responded?	Invitation Scheduled?	Invitation Sent?	Link	Survey Access Code and QR Code	
1) kaithoov@gmail.com	770-238-7144					-		-	-	
2) kaithoov@gmail.com	770-238-7144					-		-	-	
3) kaithoov@gmail.com	770-238-7144					-				
4) kaithoov@gmail.com	770-238-7144					-				
1) kaitlyn.hoover@cuanschutz.edu						-		-	-	
2) kaitlyn.hoover@cuanschutz.edu						-		-	-	
3) kaitlyn.hoover@cuanschutz.edu	770-238-7144					-		-	-	

Alerts

Ed

You and an e

Title

A) H

B) T

C) T

* T

W

STEP 3: Message Settings

Alert Type:

☒ Email ☐ SMS Text Message ☐ Voice Call

Email From:

* must provide value

Display name (optional)

bisonprostudy@cuanschutz.edu

Email To:

* must provide value

+ Show more options

x bisonprostudy@cuanschutz.edu x kaitlyn.hoover@cuanschutz.edu

Or manually enter emails: jane@example.com; john@mysite.org

Subject

* must provide value

9-month follow-up

Message:

* must provide value

Open Sans Paragraph 10pt B I U S A

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☐ Prevent piping of data for Identifier fields ?

Hi!
It is time to complete the 9-month follow-up for [first-event-name][participant_id] in Arm 1.
BISON-PRO Study

In the subject or message, you may use [Piping](#) and [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:

Please complete your daily survey: [survey-link:daily_repeating_survey][new-instance]

Add attachments

Save Cancel

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ACTIVE PROJECTS



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Anschutz Medical Campus

BRIDGE Study

PIs: Dr. Randy Miles, MD and Dr. Jamie Studts, PhD

Surveys and interview with women who receive mammography and may be eligible for lung cancer screening, meaning they:

- Are between the ages of 50 and 80
- Have a 20 pack-year or more smoking history
- Currently smoke or have quit within the past 15 years

Have you considered lung cancer screening?

SHARE YOUR EXPERIENCE WITH US

We are conducting a study to learn more about mammography candidates who have a moderate to heavy smoking history to better understand their experiences and challenges with the cancer screening process.

From what we learn, we will develop a program to promote lung cancer screening.

IF YOU PARTICIPATE:

- You will complete a brief survey and 45-minute interview over Zoom with a study team member
- The interview can be done in the comfort of your own home. No in-person visit needed!
- Participants who complete the survey and interview will be compensated \$50!

COMIRB #24-1190
PI: Dr. Randy Miles



SCAN THIS QR CODE TO LEARN MORE!



Questions?
Call us at (XXX)XXX-XXXX
Or email us at ____@____.____

MyApps

MyApps

BRIDGE Study - CPC | REDCap

Interest Survey

REDCap

Logged in as hoovekai | Log out

My Projects

Contact REDCap administrator

Project Home and Design

Project Home

Project Setup

Designer

Dictionary

Codebook

Project status: Development

Data Collection

Survey Distribution Tools

Get a public survey link or build a participant list for inviting respondents

Record Status Dashboard

View data collection status of all records

Add / Edit Records

Create new records or edit/view existing ones

Show data collection instruments

Applications

Project Dashboards

Alerts & Notifications

Multi-Language Management

Calendar

Data Exports, Reports, and Stats

Data Import Tool

Data Comparison Tool

Logging and Email Logging

Field Comment Log

File Repository

User Rights and DAGs

Data Quality

REDCap Mobile App

REDCap Resources

External Modules

Manage View Logs

Help & Information

CCTSI

Colorado Clinical & Translational Sciences Institute

University of Colorado

Colorado Clinical & Translational Sciences Institute (CCTSI) with the Development and Informatics Service Center (DISC)

BRIDGE Study - CPC

PID 32436

Survey Distribution Tools

Public Survey Link

Participant List

Survey Invitation Log

Using a public survey link is the simplest and fastest way to collect responses for your survey. You may obtain the survey link below to email it to your participants. Responses will be collected anonymously (unless the survey contains questions asking for identifying data from the participant). **NOTE:** Since this method uses a single survey link for all participants, it allows for the possibility of participants taking the survey multiple times, which may be necessary in some cases.

To obtain the survey link, copy the URL below and paste it into the body of an email message in your own email client. Your email recipient(s) can then click the link to begin taking your survey.

Public Survey URL:

https://redcap.ucdenver.edu/surveys/?s=HAHNFNDNF3KH8FJA

☐ Protect the public survey using the Google reCAPTCHA feature ?

Link Actions

Open public survey

Open public survey + Log out

Send me URL via email


Survey Access Code or QR Code

Link Customizations

Get Short Survey Link

Create Custom Survey Link

Get Embed Code

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Anschutz Medical Campus

PHSR Behavioral Science

Allo-BMT Music Listening Study

PIs: Maria Olex, PsyD and Lauren Zimmaro, PhD

Inpatient transplant recipients complete pre- and post- battery of surveys as well as daily logs regarding music listening if intervention group

- COMIRB approved
- Participants are consented then randomized to control or intervention within REDCap
- Depending on group, REDCap sends daily links to participants to complete the daily log
- Upon completion of post surveys at discharge, daily log invitation automatically stops being sent

Alert #1

Edit

Options

Unique Alert ID: A-17561

SMS Text Message

Preview

Hi [first_name]! It is time to complete today's listening...

If the following logic is TRUE when the instrument "Hospital Anxiety and Depression Scale (HADS) (Baseline)" is saved and has a Complete status:
[consent_arm_1][randomization_complete] = '2' and [post_arm_1][hads_total...
Send immediately
Repeat every day – Send up to 28 times total (only once per record - i.e., never re-trigger)

Activity:

3 records had alerts scheduled (view list)

7 records were alerted (view list)

Last sent: 10/14/2024 2:35pm

Alert #2: Daily Log Email

Edit

Options

Unique Alert ID: A-18650

Email

Preview

From: joshua.pasek@cuanschutz.edu
To: [consent_arm_1][email_cm2]
Subject: Daily Music Listening Log
Hi [first_name]! It is time to complete today's listening...

If the following logic is TRUE when the instrument "Hospital Anxiety and Depression Scale (HADS) (Baseline)" is saved and has any form status:
[consent_arm_1][randomization_complete] = '2' and [post_arm_1][hads_total...
Send immediately
Repeat every day – Send up to 28 times total (only once per record - i.e., never re-trigger)

Activity:

7 records had alerts scheduled (view list)

3 records were alerted (view list)

Last sent: 11/05/2024 2:43pm

Example Record

Record Home Page

The grid below displays the form-by-form progress of data entered for the currently selected record. You may click on the colored status icons to access that form/event. If you wish, you may modify the events below by navigating to the [Define My Events](#) page.

[Choose action for record](#)

Legend for status icons:

Incomplete

Incomplete (no data saved) ?

Unverified

Partial Survey Response

Complete

Completed Survey Response

Many statuses (mixed)

Many statuses (all same)

Record ID 9 55555

Data Collection Instrument	Listening Log						
	Consent	Baseline	Post	(#1)	(#2)	(#3)	(#4)
Consent (survey)	<div></div>						
Sociodemographic Questionnaire (survey)	<div></div>						
Randomization	<div></div>						
Medical Chart Review	<div></div>						
Hospital Anxiety and Depression Scale (HADS) (survey)		<div></div>	<div></div>				
FACT-BMT (Version 4) - Scored (survey)		<div></div>	<div></div>				
Body Compassion Scale (survey)		<div></div>	<div></div>				
Brief MAIA-2 (survey)		<div></div>	<div></div>				
FFMQ-15: 15-item Five-Facet Mindfulness Questionnaire (survey)		<div></div>	<div></div>				
UCLA Loneliness Scale (survey)		<div></div>	<div></div>				
Self-Compassion Scale Short Form (SCS-SF) (survey)		<div></div>	<div></div>				
Daily Repeating Log (survey)				<div></div>	<div></div>	<div></div>	<div></div>

Conclusions

- Optimal use of REDCap is a collaborative effort that should be considered early in study planning.
- REDCap is always expanding its capabilities, so submit ideas for new features.
- REDCap not having a specific one-click feature does not mean it cannot do something at all. We can trick it!
- CU REDCap support is very responsive and knowledgeable!





University of Colorado **Anschutz Medical Campus**

Questions?

PHSR REDCap:
Kaitlyn.hoover@cuanschutz.edu

CU REDCap Support:
REDCap@ucdenver.edu