

# Preventing REDCap Survey Fraud

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# Strategies for Dealing with Bad Actors

- Public facing surveys must deal with **bad actors trying to get rewards** from being in your study.
- We recommend three interrelated types of **strategies**:
  1. Survey Design
  2. Consent & Measures
  3. REDCap Monitoring

# Strategies Overview

## 1. Survey Design

- reCAPTCHA and nedCAPTCHA setup
- Instruments: validation, action tags, inverse/open eligibility questions

## 2. Consent & Measures

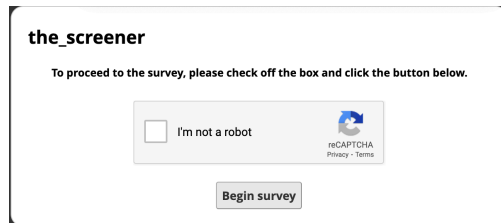
- Consent language
- Conscientious Responder Scale (attention checks)

## 3. REDCap Monitoring

- Trap fields (contradiction and hidden fields)
- QA forms
- Survey completion times & data quality rules
- Response limits

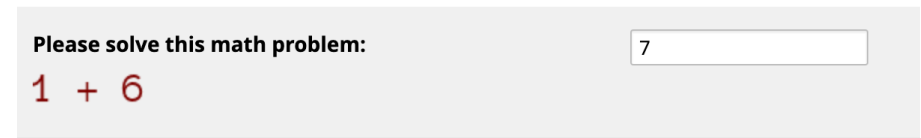
# Survey Design

- Use Google's magic **reCAPTCHA** feature
  - **Survey Distribution Tools** > "Protect the public survey using the Google reCAPTCHA feature"
- Use plug-in modules like **nedCAPTCHA**



The screenshot shows a web form titled "the\_screener". Below the title, it says "To proceed to the survey, please check off the box and click the button below." There is a checkbox labeled "I'm not a robot" next to a reCAPTCHA logo. Below the checkbox is a "Begin survey" button.

reCAPTCHA



The screenshot shows a grey rectangular box. At the top, it says "Please solve this math problem:" followed by a text input field containing the number "7". Below this, the math problem "1 + 6" is displayed in red text.

nedCAPTCHA

# Survey Design

- Format your project fields to make it easy to **spot duplicates**:
  - Use **email validation**
  - Use **phone number validation**
  - Ask for first and last name in **separate** fields
- Use the @RANDOMORDER action tag
  - Scrambles answer choices to deal with people/bots who always choose the **same response to every question**.

6) Choose the number "four".

1

3

5

4

2

# Survey Design

- Invert eligibility fields
  - Example Criteria:
    1. Need foreign-born individuals: Were you born in the US? Yes/No
    2. Need PLWHIV: Are you currently NOT living with HIV? Yes/No
- Open-ended questions
  - Example Criteria:
    1. Need Miami-based people: What county do you live in?
    2. Specific age requirements: How old are you (in years)?

# Consent & Measures

## Consent Language:

- Include **warning text**:
  - *Data will be screened for multiple submissions and if any are found, ALL entries will be removed.*
  - *All information must be honest, correct, and accurate to be eligible for compensation.*

# Consent & Measures

Use the [Conscientious Responder Scale](#) - Examples:

1. Choose the first option—”strongly disagree”—in answering this question
2. Please answer this question by choosing option number two, “disagree”

State that some questions are for fraud detection



# REDCap Monitoring

## Create fields to catch contradictions

- Ideal for multi-step surveys (Prescreen -> Full Screen)
- Requires 2 questions with similar theme or confirmation
  - City and ZIP code
  - Age (self-report) DOB
  - County and city
  - Ask questions twice on separate instruments

# REDCap Monitoring

## Use hidden fields & REDCap reports:

- Add a *hidden email-validated field* named something like "dmy\_email" with a label like "Email" and/or a *hidden email-validated field* named something like "dmy\_email2" with a label like "Additional Information".
  - Use the @HIDDEN-SURVEY action tag to create the field(s).
  - Often bots will see "email" in the field name and insert email values.
  - The goal is to create *secret prompts* that will trick a bot into entering a *red flag*.
- Create a REDCap *alert* that notifies staff when a *hidden field is filled*.


# REDCap Monitoring


- Have a designated staff member do **scheduled reviews** of the database with a **checklist**:
  - Complete QA form for random sampling of records (record-level supervision)
  - Monitor survey completion time (project-level supervision)
  - Increase response limits

# REDCap Monitoring

## QA Form

- Use piping, Action Tags, and Smart Variables to facilitate completion
- Good for record-level monitoring
- Can be random-sampled out of X records at each sitting
- Track who did what with @CALCTEXT( [user-fullname] )

 Editing existing Record ID 8.

Record ID	8
QA date	<input type="text" value="02-02-2024"/>  Today M-D-Y
List all key/outcome variables here.	
Viral load: ____	
Staff completing QA	<input type="text" value="Daniel Hernandez Altamirano"/> <a href="#">View equation</a>
Form Status	
Complete?	<input type="text" value="Incomplete"/> ▾

# REDCap Monitoring

## Monitor survey completion times

- Create a variable named something like `completion_sec` which can **measure how much time** a respondent takes on the questionnaire.
  - The Action Tags needed (the example instrument/survey is `the_screener`):

`@CALCTEXT([survey-duration-completed:the_screener:s]) @HIDDEN-SURVEY`



The screenshot shows the 'Edit Field' interface in REDCap. The 'Field Type' is set to 'Text Box (Short Text, Number, Date/Time, ...)'. The 'Field Label' is 'completion time in seconds'. The 'Variable Name' is 'completion\_sec'. The 'Action Tags / Field Annotation' section contains the code: `@CALCTEXT([survey-duration-completed:the_screener:s]) @HIDDEN-SURVEY`. A purple dashed arrow points from this code to the 'Field Label' text. The 'Required?' and 'Identifier?' options are both set to 'No'. The 'Validation?' dropdown is set to 'None'. The 'Custom Alignment' is set to 'Right / Vertical (RV)'. The 'Field Note' is empty.

# REDCap Monitoring

- Use `completion_sec` to find suspiciously quick submissions.
- Bots not carefully built would usually finish a long survey in seconds.
- If you are not seeing the completion time calculated, use **Data Quality Rule H**.

**Data Quality**

This module will allow you to execute data quality rules upon your project data to check for discrepancies in your data. Listed below are some pre-defined data rules that you may utilize and run. You may also create your own rules or edit, delete, or reorder the rules you have already created. To find discrepancies for a given rule, simply click the Execute button next to it, or click the Execute All Rules button to fire all the rules at once. It will provide you with a total number of discrepancies found for each rule and will allow you to view the details of those discrepancies by clicking the View link next to each. [Read more detailed instructions.](#)

Upload or download Data Quality Rules

Execute rules: All All except A&B Clear

Apply to: All Records

Rule #	Rule Name	Rule Logic (Show discrepancy only if...)	Real-time execution ?	Total Discrepancies	Delete rule?
A	Blank values*	-		Execute	
B	Blank values* (required fields only)	-		Execute	
C	Field validation errors (incorrect data type)	-		Execute	
D	Field validation errors (out of range)	-		Execute	
E	Outliers for numerical fields (numbers, integers, sliders, calc fields)**	-		Execute	
F	Hidden fields that contain values***	-		Execute	
G	Multiple choice fields with invalid values	-		Execute	
H	Incorrect values for calculated fields	-		Execute	
I	Fields containing "missing data codes"	-		Execute	

Add

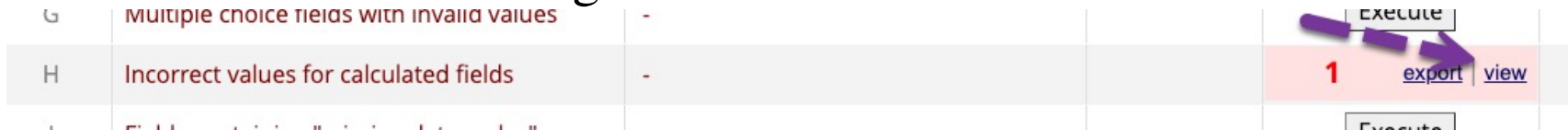
Enter descriptive name for new rule (e.g., Participants below age 18)

Enter logic for new rule (e.g., [age] < 18)  
[How do I use special functions?](#)

Execute in real time on data entry forms ?

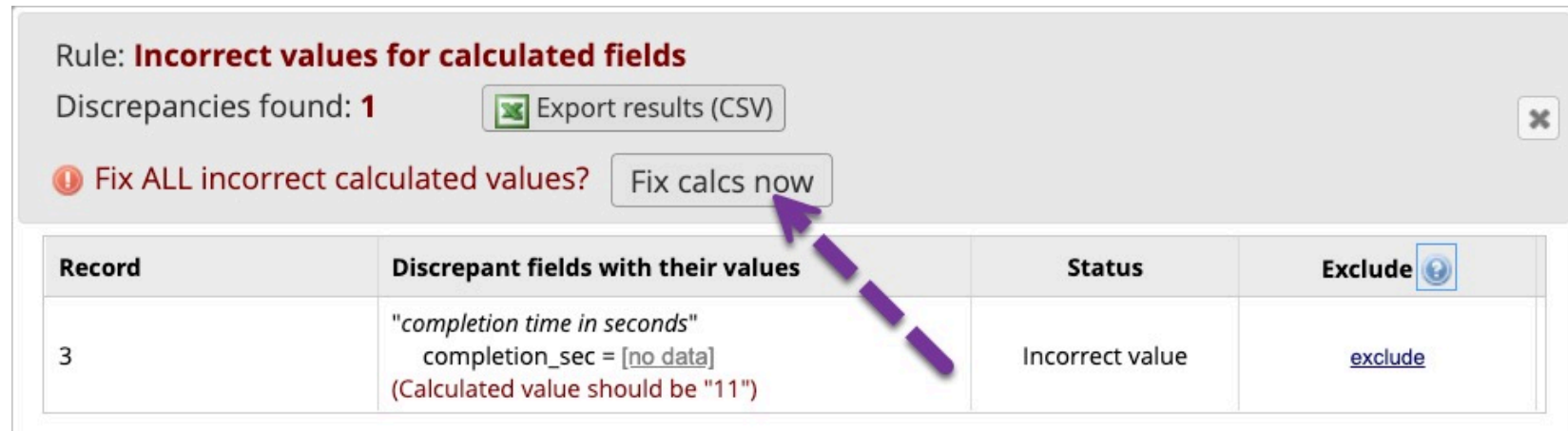
# REDCap Monitoring

- Tell it you want to view the missing values:



G	Multiple choice fields with invalid values	-		execute
H	Incorrect values for calculated fields	-	1	export view

- Then tell it to fix the calculated fields:



Rule: **Incorrect values for calculated fields**  
Discrepancies found: **1**

**Fix ALL incorrect calculated values?**

Record	Discrepant fields with their values	Status	Exclude <input type="button" value="⊕"/>
3	"completion_time_in_seconds" completion_sec = [no data] (Calculated value should be "11")	Incorrect value	<a href="#">exclude</a>

- Create a report that lists 'completion\_sec' for all records
  - Look for extremely quick responses in the variable.

# REDCap Monitoring

## Data Quality Rules

- Creates custom rules for project-level monitoring
  - Follows logic-building rules in REDCap

	1	No missing viral loads	[viral_load] = "	<input type="checkbox"/>	Execute	✖
	<input type="button" value="Add"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>		
		<b>Enter descriptive name for new rule</b> (e.g., Participants below age 18)	<b>Enter logic for new rule</b> (e.g., [age] < 18) <a href="#">How do I use special functions?</a>	Execute in real time on data entry forms <input type="checkbox"/>		



# REDCap Monitoring

## Response Limits

- The control is found in the survey settings of instruments
- Automatically **freezes the survey** after X responses to **prevent floods**
- Designated staff could complete database review then **increase the limit**
- Limit message is custom - can **set pace** and when to check back

**Survey Access:**

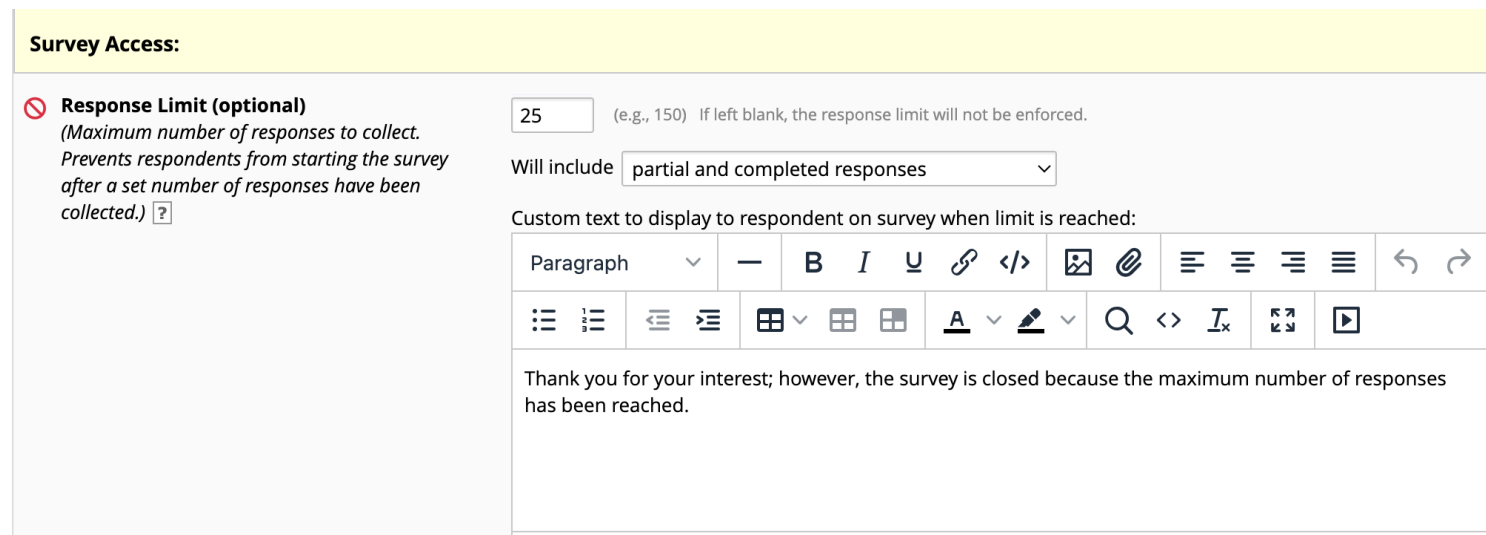
**Response Limit (optional)**  
*(Maximum number of responses to collect. Prevents respondents from starting the survey after a set number of responses have been collected.) ?*

(e.g., 150) If left blank, the response limit will not be enforced.

Will include

Custom text to display to respondent on survey when limit is reached:

Paragraph



# Access Research Support

- Talk with your REDCap Administrator
- If you are working on HIV related project contact us (<https://charm.miami.edu/>)
  - Check with your institution's research offices for resources

# Thank you to:

- Chris Battiston (Women's College Hospital - Toronto)
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- Scott Carey (Johns Hopkins University)
- Viktoriya Babicheva (Boston College - Connell School of Nursing)

# Questions?



<https://charm.miami.edu/>

Request help with the research navigation portal:

