AIM

ALLIANCE FOR INNOVATION
ON MATERNAL HEALTH

Guide to AIM-Developed REDCap® Projects

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Introduction

This guide is a companion to the AIM-developed Patient Safety Bundle REDCap® Projects[1] intended to facilitate collection of data for AIM patient safety bundle core measures. Each Project also provides a built-in report that prepares the data for upload to the AIM Data Center (ADC) with little to no additional formatting needed and in accordance with the specifications described in the **AIM Data Upload Guide**.

Per the **REDCap® website**:

"REDCap® is a secure web application for building and managing online surveys and databases. While REDCap can be used to collect virtually any type of data in any environment (including compliance with 21 CFR Part 11, FISMA, HIPAA, and GDPR), it is specifically geared to support online and offline data capture for research studies and operations."

AIM is not affiliated with **REDCap® (Research Electronic Data Capture)**. This guide and the accompanying AIM-developed REDCap® Projects do not imply endorsement. The AIM Data Team has noted that REDCap® is used by several state/jurisdiction teams to facilitate data collection for quality improvement activities and offers this guide and the Projects to improve standardization and reduce the burden of development and reporting to the ADC. ***The Projects may be useful to all AIM teams regardless of their choice of data collection system***. For example, the **question wording** necessary to produce measures aligned with the Core Data Collection plan of each patient safety bundle is contained within each Project.

Prior to use, this guide, the core data collection plan for the bundle you are implementing, and the Project(s) of interest should be reviewed by teams in detail and each Project should be configured and tested to ensure it meets the specific needs of the team. Security settings have not been pre-configured in AIM-developed REDCap® Projects. Each AIM team is responsible for configuring and testing the Project according to their security and quality improvement needs.

This guide assumes that users have an existing basic level of knowledge and skill along with access to a REDCap® server instance with appropriate licensing and user permissions. See **Appendix IV** for suggested training resources. This guide was initially developed using REDCap® version 13.2.2 and examples are based on the AIM Care of Pregnant and Postpartum People with Substance Use Disorder (CPPPSUD, now "SUD") patient safety bundle.

AIM REDCap® Projects are provided for download as single XML files (CDISC ODM format). Each XML file can be used to **create a clone of the AIM-developed Projects on your own REDCap® server** (it can be uploaded on the Create New Project page). Because it is in CDISC ODM format, it can also be used to import the project into another ODM-compatible system.

[1]The title case word "Project" is used in this document to refer to distinct REDCap® Projects developed to support AIM Patient Safety Bundles. Each Project is available as a file for import into REDCap®. You may think of a Project as a distinct data collection tool consisting of one or more forms/surveys.

Getting Started

Getting Started Key Steps

- Become familiar with the Core Data Collection Plan of the bundle you plan to implement.
- Assess each measure to determine the level at which it will be collected (see *Table 1* below). In general, if a measure is reported as a numerator and denominator, it is a patient-level measure.
- Determine your process and structure measure reporting frequency to the AIM Data Center (monthly or quarterly).
- Download the Project files from **the AIM website**. Project files can be imported into your own REDCap® server as described in the **next section**. Each zip file containing the Project files associated with a bundle also contains a ReadMe file (see below).

More than one type of AIM-developed REDCap® Project is usually needed to capture all core bundle measures. **Table 1a** describes the types of measures typically collected for AIM Patient Safety Bundles. Patient-level data that has already been aggregated may be collected using a facility-level Project. If you are familiar with entering data in the AIM Data Center, this is a similar approach. All patient-level Projects must be paired with facility-level Projects to collect all measures for a single bundle. A separate Project is available for measures that allow for sampling. Note that the file names are in a standard format across all bundles for easy reference. A table similar to Table 1a is available in the ReadMe file that comes with every package of AIM-developed Project files.

Table 1a

AIM REDCAP PROJECT TYPE	ASSOCIATED PROJECT FILE NAME	INTENDED PURPOSE
Facility	SUD_Mo_Facility_Complete.xml SUD_Qtr_Facility_Complete.xml SUD_Mo_Facility_Partial.xml SUD_Qtr_Facility_Partial.xml	Facility Projects assist users in capturing data that are NOT at the patient level. These measures often include assessment of provider education/training, policies, and resources. Project files that include *Partial* in the name omit measures that may be collected through patient and patient sample projects.
Patient	SUD_Mo_Patient.xml SUD_Qtr_Patient.xml	Patient Projects assist users in capturing data for typically smaller groups of patients with specific characteristics (e.g. patients with Perinatal Mental Health Conditions, Substance Use Disorder, Cardiac Conditions, Sepsis, etc.). The AIM Data Collection Plan does not usually allow sampling for these measures and all patients with certain characteristics of interest must be included. Some Optional measures fall into this category and are not available in AIM REDCap Projects at this time.
Patient Sample	SUD_Mo_Patient_Sample.xml SUD_Qtr_Patient_Sample.xml	Patient Sample Projects assist users in capturing data from a sample. These projects often require simple modification to deactivate (hide) fields if you do not sample every race/ethnicity category and payor category. See the **AIM Sampling Excel Workbook** for details on how to establish your categories.

A bundle-specific version of Table 1b (below) is also included in the ReadMe file for each bundle. This table can be useful when designing your data collection strategy.

Table 1b

FOLDER\FILENAME	VERSION	ABBREVIATED MEASURE ID (SEE SECOND TABLE BELOW)														
		ALL P1	P1	P2	P3	P4	P5	01	02	03	04	ALL S1	ALL S7	S1	S2	S3
Root																
ReadMe.docx	1.0															
AIM_REDCap_Project_User_Guide.pdf																
Facility																
SUD_Mo_Facility_Complete.xml	12/13/24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SUD_Qtr_Facility_Complete.xml	12/13/24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SUD_Mo_Facility_Partial.xml	12/13/24	✓	✓	✓								✓	✓	✓	✓	✓
SUD_Qtr_Facility_Partial.xml	12/13/24	✓	✓	✓								✓	✓	✓	✓	✓
Patient																
SUD_Mo_Patient.xml	12/13/24				✓	✓	✓	✓	✓	✓	✓					
SUD_Qtr_Patient.xml	12/13/24				✓	✓	✓	✓	✓	✓	✓					
SUD_Mo_Patient_Sample.xml	12/13/24			✓												
SUD_Qtr_Patient_Sample.xml	12/13/24			✓												

Key: Mo = Monthly reporting | Qtr = Quarterly reporting

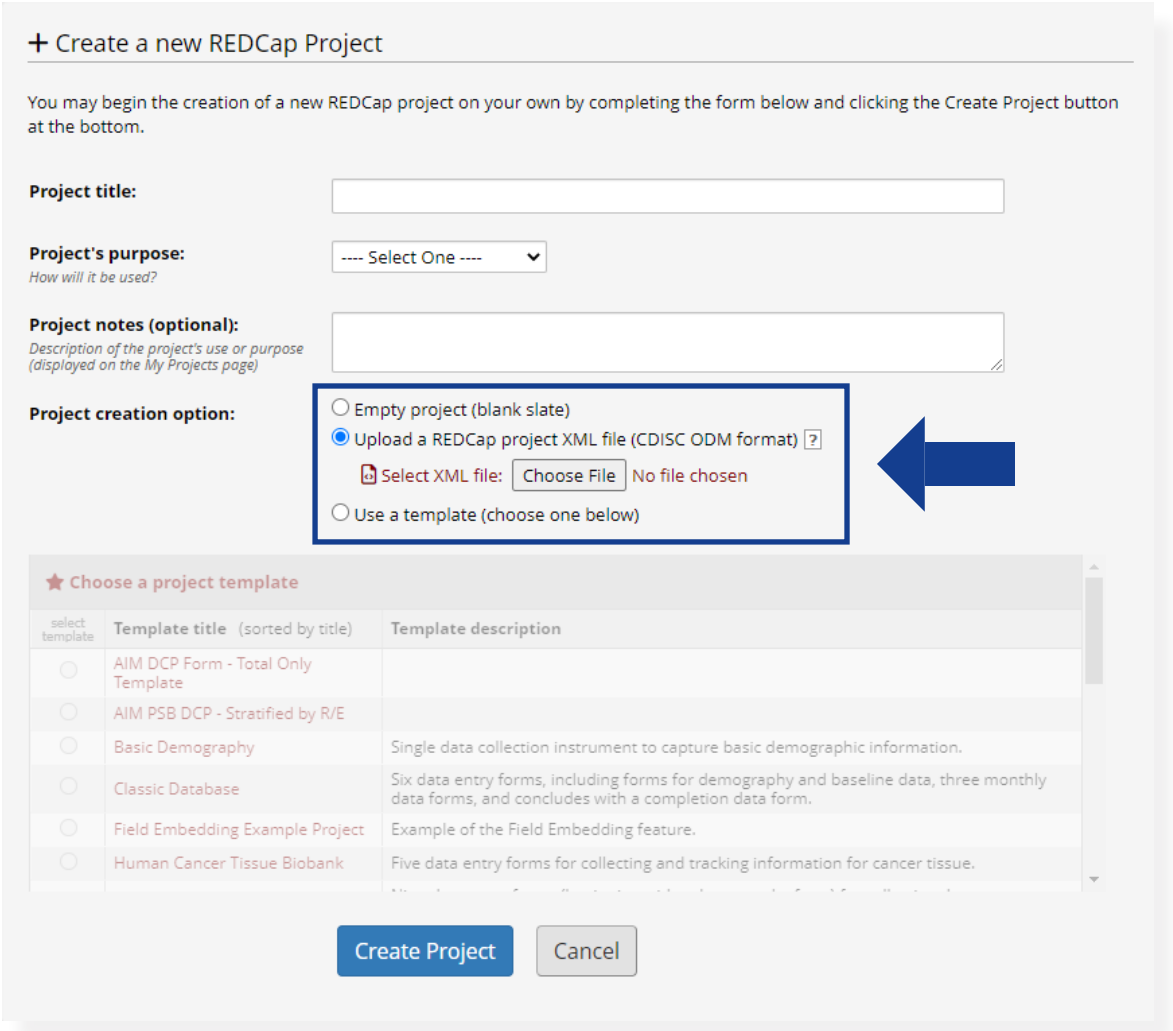
Notes:

1. State Surveillance Measures and Optional Measures are not included in AIM-developed REDCap Projects at this time.
2. Multi-bundle measures ("All") uploaded to the AIM Data Center will populate any active projects. In other words, if you have more than one bundle active, multi-bundle measures only need to be collected for one PSB. This is designed to reduce the data collection burden.

Importing a Project into your REDCap® Server

1. Request the Project(s) you need from **aimdatasupport@acog.org** or download it from the **AIM website**.
2. Log into your REDCap® server with an account level able to import new Projects.
3. Select Project as shown in Figure 1 below.
4. Choose to "Upload a REDCap® project XML file (CDISC ODM format)", as shown in Figure 1 below.
5. The newly created project can be found under "My Projects" after successful import.
6. Familiarize yourself with the project by entering false data ("Add/Edit Records" → "Add new record"). For now, one record is sufficient for testing purposes. Be sure to mark each instrument status as Complete at the end of entering the false data on each form. Use "Save and Go To Next Form" to progress until the final form ("Save and Exit Form").

Figure 1: Importing a Project, New Project Interface



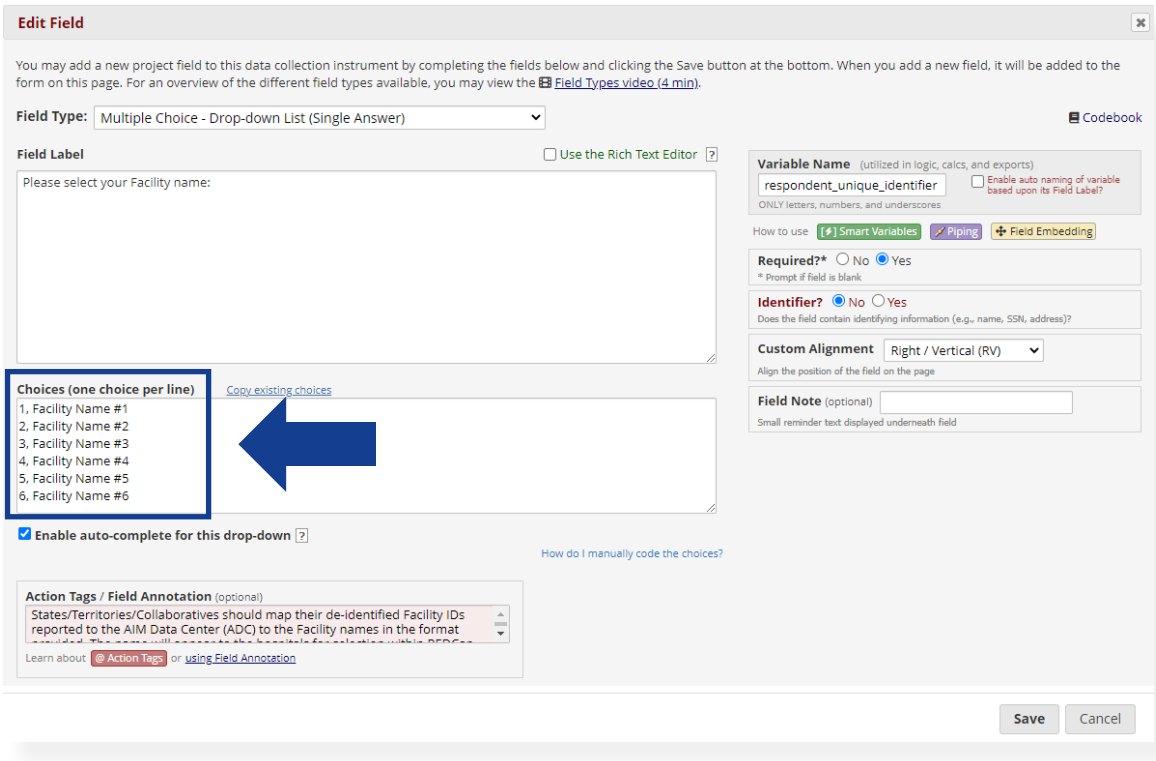
Customizing the Project: Hospital Names and Confidential IDs

Steps to Customize Birth Facility Names and Confidential IDs

1. In the REDCap® Designer, select the first form and edit the variable *respondent_unique_identifier*. The name of the first form may vary.
2. Replace the information in the Choices box with your confidential IDs, which should be the same as your facility unique identifiers in the AIM Data Center, and corresponding Facility names using the same format of one choice per line. Each line should have a confidential numeric ID followed by the Facility name and separated by a comma. See Figure 2 below.

Note: The preconfigured AIM Data Center Export Report will only output the confidential ID and not the Facility name.

Figure 2: Customizing Facility Names and IDs, Designer Interface



Customizing the Project: Removing Unused Race/Ethnicity or Payor Fields from Facility-Level Measure Tables

*(You may skip to the **next section** if reporting on all AIM sub-categories for race, ethnicity, & payor, or if you are using a partial facility level form.)*

Steps to Remove Unused Race/Ethnicity or Payor Fields from Facility-Level Measure Tables

1. As an AIM state/jurisdiction team with knowledge of your birth volume and population demographics, decide which race, ethnicity, or payor categories you will report on in addition to the total population. Remember to review any cell size restrictions in any relevant data use agreements.
   - The AIM category variable names are *all* (total population), *asian*, *african_american*, *hispanic*, *multi_racial*, *native_american*, *native_hawaiian_pacific_islander*, *white*, *other*, *race_not_reported*, *unknown*, *and (for payor) medicaid*, *private*, *other_public*, and *uninsured*. Teams should refer to **Appendix I** for additional guidance on collecting race and ethnicity data.
2. If you plan to report on a subset of the AIM categories, examine the Project forms to determine where you will need to make edits. These will often be measures requiring reporting of aggregated numerator and denominators in a tabular format as shown in Figure 3 below.
3. Delete the **table rows** for categories on which you will not report. This is often best done using the REDCap® Designer interface. See Figure 4 below.
4. Add the @HIDDEN tag from the fields on which you will not report. This is often best done by editing the Data Dictionary. The fields you are retaining in the table should not have the @HIDDEN action tag.
5. ***Do not delete* the hidden fields** on which you will not report in case they are needed in the future. These will not affect the performance.

Figure 3 below is a screenshot of the facility-level user survey interface for CPPPSUD Outcome Measure #1. Notice that, in addition to the total population, all AIM sub-categories for disaggregation are displayed. If you are only reporting on the total, or a subset of the AIM categories, you may remove the unneeded rows from the table and hide the associated variables following the steps above. Remember that this is only necessary if you are using a *facility-level* project to collect measures where disaggregation using the AIM categories is recommended. This step is not necessary if you are collecting these data using the patient-level project.

Figure 3: Outcome Reporting Table, User Survey Interface

CPPPSUD O1

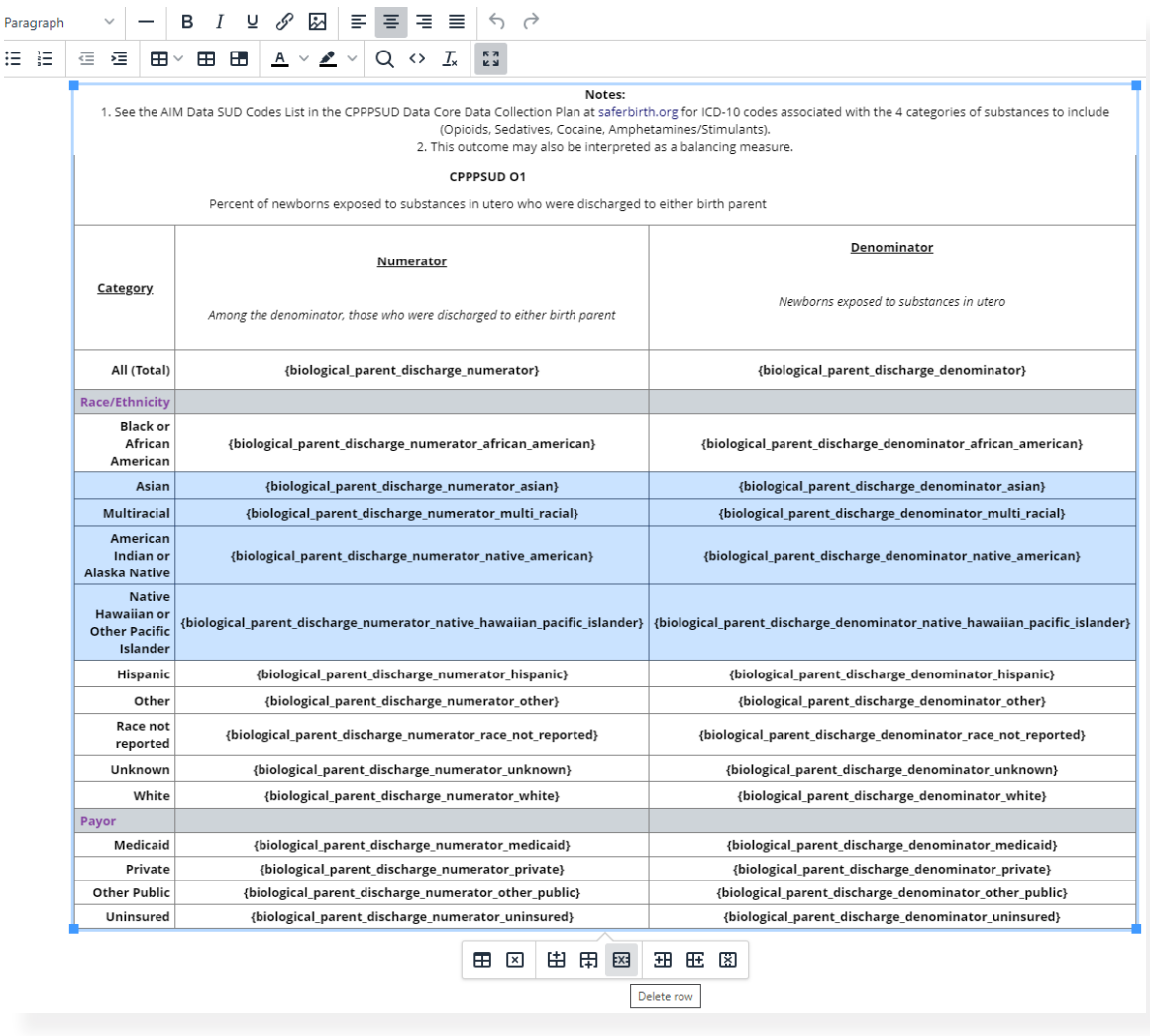
Percent of newborns exposed to substances in utero who were discharged to either birth parent

Category	Numerator *Among the denominator, those who were discharged to either birth parent*	Denominator *Newborns exposed to substances in utero*
All (Total)		
Race/Ethnicity		
Black or African American		
Asian		
Multiracial		
American Indian or Alaska Native		
Native Hawaiian or Other Pacific Islander		
Hispanic		
Other		
Race not reported		
Unknown		
White		
Payor		
Medicaid		
Private		
Other Public		
Uninsured		

Notes:
1. See the AIM Data SUD Codes List in the CPPPSUD Data Core Data Collection Plan at saferbirth.org for ICD-10 codes associated with the 4 categories of substances to include (Opioids, Sedatives, Cocaine, Amphetamines/Stimulants).
2. This outcome may also be interpreted as a balancing measure.

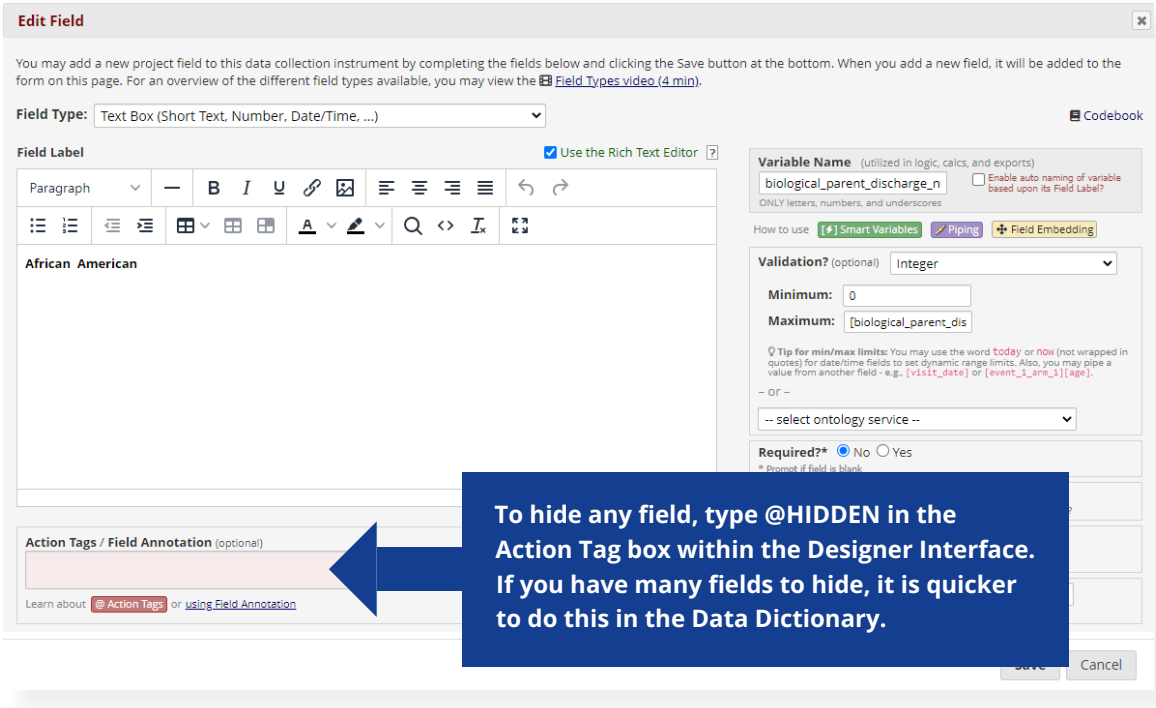
You may delete rows of the table by editing the variable of interest (in this example of CPPPSUD Outcome #1, the variable is *biological_parent_discharge_table*) within the Designer interface of REDCap®. Do not delete the entire table or the separate field(s). Just edit the table and delete the rows you do not need. Each category in the *Figure 4* example below is associated with two variables (numerator and denominator). A hypothetical subset of rows has been selected and the Delete Row icon is shown at the bottom of the screen. The Delete Row icon only displays after selecting the rows you want to delete. Prior to deleting rows, make a note of the field names you are deleting (2 per row, in this example).

Figure 4: CPPPSUD Outcome #1, Designer Interface



You now simply need to add the @HIDDEN action tag to the corresponding numerator and denominator fields using the REDCap® Designer or Data Dictionary. The variable names that need the @HIDDEN tags added are in your note from the previous step (above). While the table editing is most easily done within the REDCap® Designer, you will likely find it more efficient to add the @HIDDEN action tags by downloading, editing, and then uploading the edited Data Dictionary. Please refer to the standard REDCap® documentation for more information on this process. Figure 5 shows where to add the @HIDDEN action tag in the Designer interface of REDCap®.

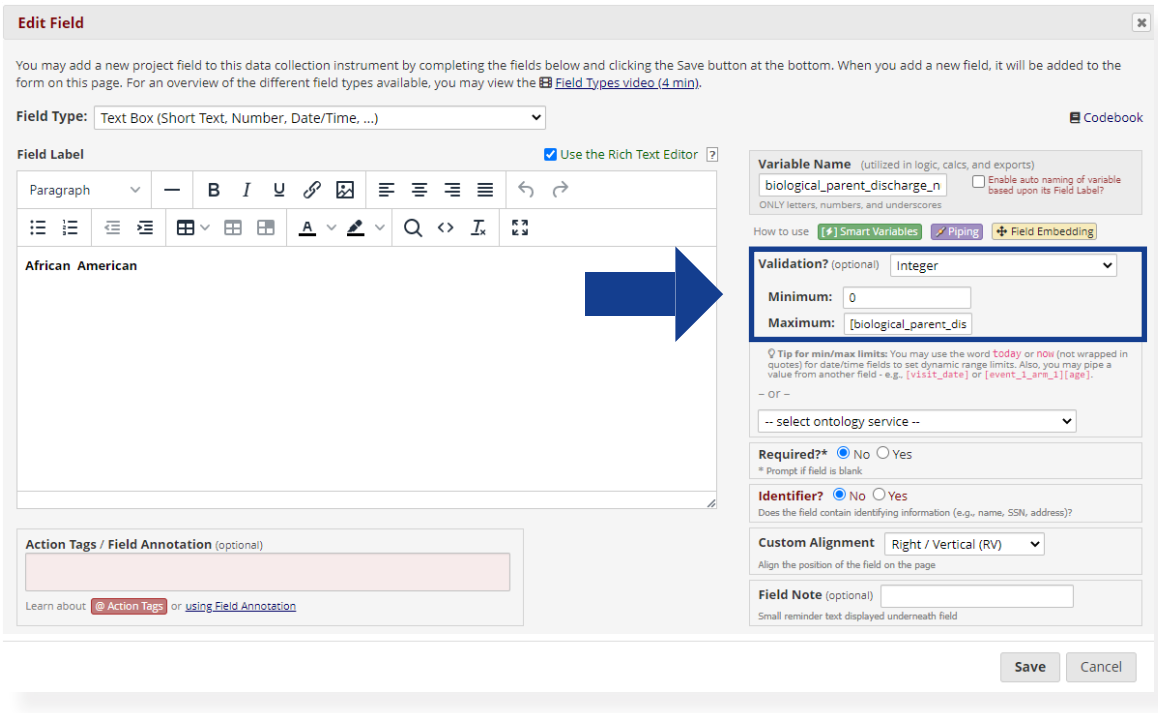
Figure 5: Hiding unused fields, Designer Interface



Customizing the Project: Data Validation

Several fields have data validation in place to help ensure data quality; however, you may want to alter the settings according to your needs. For example, numerator validation is typically set to Integer with a minimum of zero and a maximum of the denominator value. See Figure 6 below for an example. It is recommended that you **examine** and **test** all fields in use to be certain the validation meets your needs.

Figure 6: Data Validation, Designer Interface



Customizing the Project: Reporting Period Configuration

AIM teams choose to report to the AIM Data Center monthly or quarterly. This choice is usually made during onboarding to the AIM Data Center. The reporting periods can be customized to match your needs.

Steps to Configure the Reporting Period

1. Examine the *reporting_period* field and **edit** the Choices to match your needs. The field may be found in the first form within each Project. Maintain the format of the original choices. Make a note of the values associated with each period. This process is similar to the editing of the facility names and IDs described in **a previous section**.
   a. Do not make edits that change the reporting frequency (i.e. monthly or quarterly) that is already built into the form. You may edit the periods available for users to select. For example, if reporting quarterly, you might want to have the first period available be Q1 2023 instead of Q1 2022.
2. Each project also contains an additional two hidden calculated fields that provide start and end dates in the format needed for upload to the AIM Data Center:
   a. *period_start_date*
   b. *period_end_date*

   Edit the corresponding start and end date field formulas to align with any changes you made in the reporting period field above. Each numeric choice from the reporting period field must align with the correct start and end dates. For example, if the choice "Q3 2022" is associated with a value of "1", this value should map to a start date of 07/01/2022 and an end date of 09/30/2022 in the corresponding 2 calculated fields. If reporting by month, the date values will correspond with the first and last dates of each month. Maintain the format of the original formulas.
3. **Test** the formulas to be sure your changes produce the intended result.

Customizing the Project: Carry Forward Denominators

In some instances, teams may want to carry forward denominators to reduce the reporting burden and ensure consistency in denominators for data quality purposes. Only do this if you are confident that the denominators will not change across measures. Carry forward coding is built into the AIM REDCap® Projects. This section and the accompanying appendix describe how to configure this in the REDCap® Designer interface if your team decides this functionality is desired and/or you wish to make changes.

Steps to Add Carry Forward Denominators

1. Determine which denominators are the same and can be carried forward. Refer to the AIM Core Data Collection Plan for the bundle you are implementing. Please also see **Appendix IIb**.
2. Use the @CALCTEXT action tag to carry forward the denominators.
3. Refer to the more detailed explanation in **Appendix IIa: Carry Forward Denominators Detail if needed**.

Customizing Data Export Reports for the AIM Data Center

Depending on the custom modifications you made to the original AIM REDCap® Project, you may need to edit the built-in report that creates an extract formatted for the AIM Data Center.

Steps to Customize Data Export Reports for the AIM Data Center

1. If you made no modifications other than customizing the birth hospital names and reporting period start and end dates following the instructions in this guide, there are **no report edits** needed. Unused (e.g., @HIDDEN) fields in the report will not cause errors when uploading to the AIM Data Center if they are left null.
2. If you made changes to the calculations for race/ethnicity fields as described in **Appendix I**, **check** to be sure those fields are still appropriately included in the report using the standard AIM variable names. For example, if your team uses custom fields for reporting race/ethnicity categories, you may need to add those fields to the report using the variable names provided by AIM.
3. If you need support customizing data export reports to match upload requirements to the AIM Data Center, please contact **aimdatasupport@acog.org**.

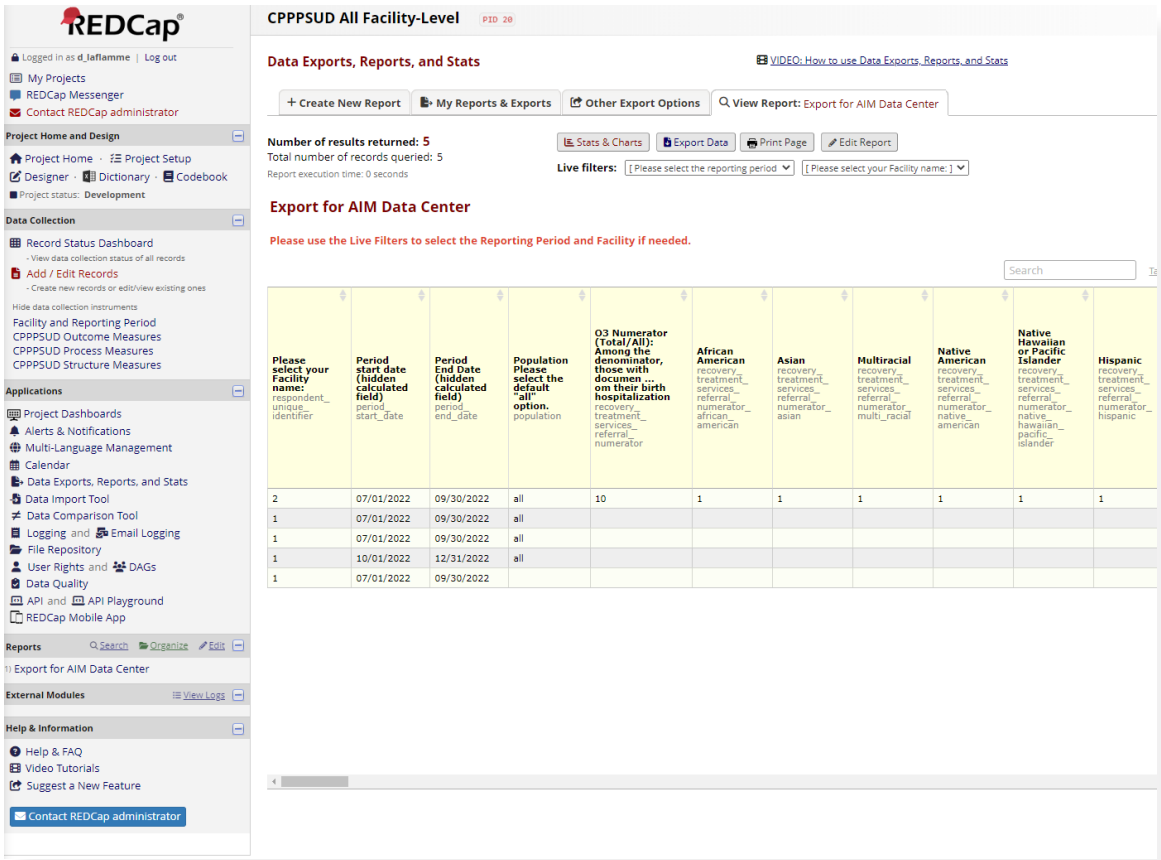
Exporting Data for the AIM Data Center: Facility-Level Projects

A pre-configured facility-level Export for the AIM Data Center can be found under the menu item *Data Exports, Reports, and Stats* within your instance of REDCap® for users with the appropriate permissions in place. This export has been tested and successfully uploaded to the AIM Data Center with no editing necessary when the report is run for a single reporting period. Blank (null) cells for variables you are not reporting on will not cause errors in the upload process. You must use the CSV file format option.

After configuring the Project according to your needs, this report should be tested and reconfigured if needed as described in the previous section.

Figure 7 shows an example of the reporting interface. Notice that there is a Live Filter available to select the reporting period in this facility-level report.

Figure 7: Exporting Facility-level Data, Data Exports, Reports, and Stats interface



Exporting Data for the AIM Data Center: Patient-Level Projects

If using a patient-level project, you will need to make some simple changes to the report after exporting it as a CSV file. The report outputs patient-level data and the AIM Data Center only accepts aggregated data. You can also find screenshots of the process in **Appendix III**.

Steps to aggregate the patient-level file export

1. After exporting the report as a CSV file, open it in MS Excel.
2. The first four columns are required and should be the same for every row if you intend to upload data for a single facility (hospital) **and** reporting period. If you want to upload multiple hospitals and/or reporting periods, you will need to aggregate the data accordingly by adapting the instructions below.
3. Assuming you are aggregating a report for a single facility and reporting period, select the empty row below the last row of data in your file. Do not select cells A-D in this row as they do not contain data that should be summed. Select all other cells containing data above them *in this row*.
4. Click the AutoSum function icon in the Home group of Excel. You should now have totals for all data columns other than the first four columns.
5. Copy all cells containing the sums you just created.
6. Right click on the first cell below the sums in column E.
7. Choose Paste Value (the icon with "123" on it). You should now have a second row of the same sums.
8. Highlight the last two rows of columns A – D only.
9. Drag the anchor at the bottom right of your selection to copy the values down to your second row of sums where you pasted values only.
10. Delete all rows of data except your last row of sums. Do not delete the header row.
11. Remember to examine your file for small cell sizes and remove them (delete values, do not set to zero) if required by any data use agreements.

A Note about Survey Question Prompts

While every effort has been made to provide prompts that clearly indicate the information desired, the AIM Data Team recognizes that state and jurisdiction teams may feel the need to tweak survey items. We ask that you document all changes made and describe the rationale. This will allow us to assure alignment with measurement intention and consider updates to the AIM-developed Projects based on your suggestions. Please contact us at **aimdatasupport@acog.org**.

Feedback or Questions?

Good, bad, or somewhere in between…we would love to hear from you about your experience using AIM REDCap® Projects and this guide. Specific suggestions for edits or additional content are welcome. Please contact us at **aimdatasupport@acog.org**.

Appendix I: Classifying Race and Ethnicity

Classifying Race and Ethnicity for AIM Reporting Purposes

Case Identification and Selection

The purposes of this appendix is to provide an example via the standard birth worksheet race and ethnicity categories on how to map racial and ethnic categories onto AIM racial and ethnic categories for reporting. For the purpose of facilitating smooth data collection and upload to the AIM Data Center and reasonable alignment of race and ethnicity data please follow these guidelines when preparing your data for upload to the AIM Data Center.

Comparing the standard birth worksheet categories to the AIM standard categories

Each state or jurisdiction team should determine which racial and ethnic groups for which they would like to report data that are more granular than the AIM reporting categories based on their priorities and needs. Once these priorities and needs are determined, teams may construct tables similar to the example below that uses the standard birth worksheet as an example. After mapping your fields similarly to the first table, build your classification algorithm by constructing the second table aligned with your data needs. Finally, examine all race and ethnicity fields in REDCap® to determine which calculations may need editing to match your algorithm. Use the existing calculations as examples.

INITIAL MAPPING OF FIELDS	
U.S. standard certificate of live birth worksheet	**AIM Standard Categories***
MOTHER OF HISPANIC ORIGIN? (Check the box that best describes whether the mother is Spanish/Hispanic/Latina. Check the "No" box if mother is not Spanish/Hispanic/Latina)	
Yes, Mexican, Mexican American, Chicana	Hispanic
Yes, Puerto Rican	
Yes, Cuban	
Yes, other Spanish/Hispanic/Latina (Specify_____)	
No, not Spanish/Hispanic/Latina	
MOTHER'S RACE (Check one or more races to indicate what the mother considers herself to be)	
White	Non-Hispanic White
Black or African American	Non-Hispanic Black or African American
American Indian or Alaska Native (Name of the enrolled or principal tribe_____)	Non-Hispanic American Indian or Alaskan Native
Asian Indian	Non-Hispanic Asian
Chinese	
Filipino	
Japanese	
Korean	
Vietnamese	
Other Asian (Specify_____)	
Native Hawaiian	Non-Hispanic Native Hawaiian or Other Pacific Islander
Guamanian or Chamorro	
Samoan	
Other Pacific Islander (Specify_____)	
Other (Specify_____)	Non-Hispanic Other
	Non-Hispanic Two or more races
	Hispanic Origin and Race not reported in HDD or BC files
	Hispanic Origin and Race not known

* Please refer to the Appendix C of the AIM Data Upload Guide for variable names and additional description of the AIM standard categories. **Saferbirth.org**
Additional resource for rolling up categories: https://www.ahrq.gov/research/findings/final-reports/iomracereport/reldataaptabe1.html

ALGORITHM TO CLASSIFY RECORDS ACCORDING TO THE AIM RACE AND ETHNICITY FIELDS FOR THE PURPOSE OF REPORTING DATA TO THE AIM DATA CENTER		
These steps should be done to help improve data collection and quality. When a record is classified by an earlier step, it should not be re-classified by any later steps.		
Step	**If...** *(birth worksheet)*	**Then...Else (next step)** *(AIM categories)*
1	If the Hispanic origin response is missing AND the race response is missing... → Notice that the standard worksheet Hispanic Origin categories AND the standard worksheet Race categories do NOT include specific Not Reported or Unknown response options that align exactly with the AIM reporting standard categories.	Classify record as Unknown*
2	If Hispanic Origin response is one or more of these: • Yes, Mexican, Mexican American, Chicana • Yes, Puerto Rican • Yes, Cuban • Yes, other Spanish/Hispanic/Latina	Classify record as Hispanic
3	If multiple race responses are present...	Classify record as Multi-racial
4	If a single race response was reported...	Classify record according to response.
	White	Non-Hispanic White
	Black or African American	Non-Hispanic Black or African American
	American Indian or Alaska Native (Name of the enrolled or principal tribe_____)	Non-Hispanic American Indian or Alaskan Native
	Asian Indian	Non-Hispanic Asian
	Chinese	
	Filipino	
	Japanese	
	Korean	
	Vietnamese	
	Other Asian, Specify _____	
	Native Hawaiian	Non-Hispanic Native Hawaiian or Other Pacific Islander
	Guamanian or Chamorro	
	Samoan	
	Other Pacific Islander, (Specify _____)	
	Other, (Specify _____)	Non-Hispanic Other

* https://www.cdc.gov/nchs/data/dvs/birth-edit-specifications.pdf

Appendix IIa: Carry Forward Denominators Detail

The first task is to assess which denominator definitions are the same to identify candidates for carry forward. The table below provides an example of an assessment of the Outcome and Process measures that use a numerator/denominator format within the CPPPSUD bundle Core Data Collection Plan.

Table 2

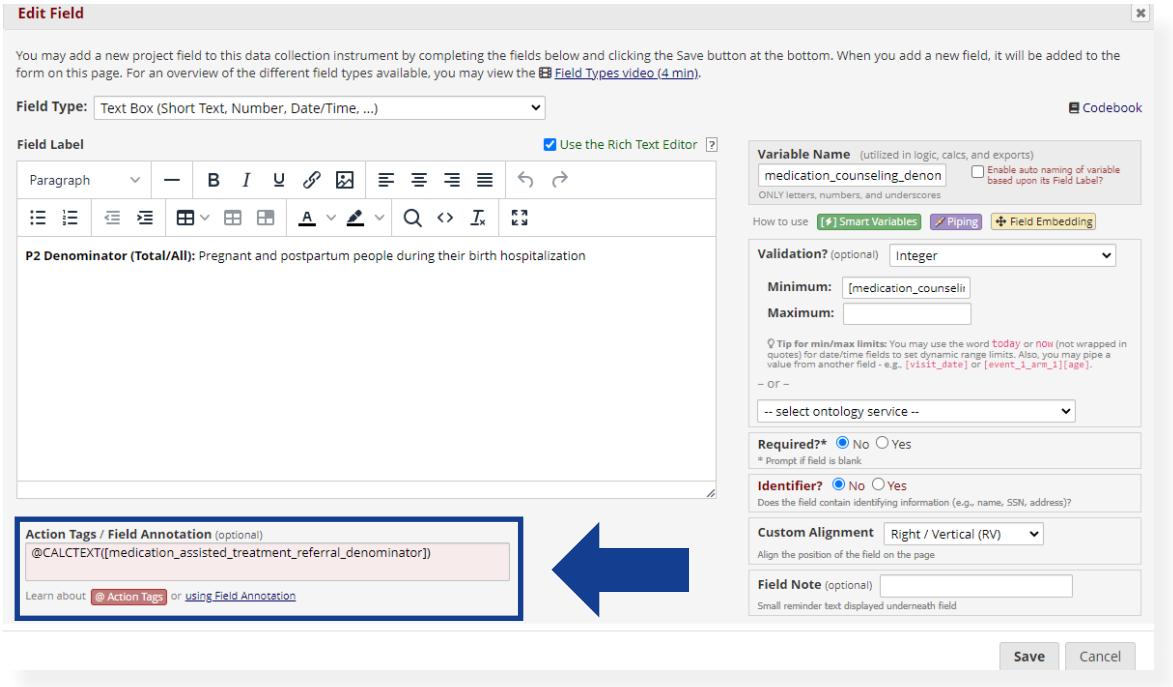
Measure	Denominator	Denominator Same	Variable or calculation	Test value entered	Carried Forward
O1	Newborns exposed in utero	A	n/a (unique denominator)		
O2	Pregnant and postpartum people with a diagnosis of opioid use disorder	B	medication_assisted_ treatment_referral_ denominator	101	
O3	Pregnant and postpartum people with a diagnosis of substance use disorder, including opioid use disorder	C	recovery_treatment_ services_referral_ denominator	102	
O4	Pregnant and postpartum people with a diagnosis of substance use disorder	C	@CALCTEXT([recovery_ treatment_rervices_ referral_dominator])		102
P1	Pregnant and postpartum people during their birth hospitalization	D	n/a (unique denominator)		
P2	Pregnant and postpartum people with a diagnosis of opioid use disorder during their birth hospitalization	B	@CALCTEXT([medication_ assisted_treatment_ referral_denominator])		101
P3	Pregnant and postpartum people with a diagnosis of substance use disorder, including opioid use disorder during their birth hospitalization	C	@CALCTEXT([recovery_ treatment_services_ referral_denominator])		102
P4	Pregnant and postpartum people with a diagnosis of substance use disorder during their birth hospitalization	C	@CALCTEXT([recovery_ treatment_services_ referral_denominator])		102

The measure identifier is seen in the first column, followed by the denominator description in the second column. This denominator description comes directly from the Core Data Collection Plan for the CPPPSUD bundle in this example.

The third column assigns a letter to each unique denominator. In this example, you can see that "A" and "D" (Outcome Measure #1 and Process Measure #1) are unique and not repeated across any of the other measures. However, the denominator description for "B" (Outcome Measure #2) matches the denominator for Process Measure #2 (blue rows). Similarly, the denominator description for "C" (Outcome Measure #3) exactly matches the denominators for Outcome Measure #4 and Process Measures #3 and #4 (green rows). In each case, we may want to carry forward the denominators from the first occurrence within each set once data have been entered. For example, if we enter a denominator value of 102 for Outcome Measure #3, we might want that denominator to be automatically carried forward to O4, P3, and P4. To do this, you could use the action tag @CALCTEXT followed by the source variable name. The source variable name is the denominator in the field where it was first entered within a series of matching denominator descriptions.

For example, you can see that the first occurrence of the denominator we have labeled "B" occurs for the measure O3 with the variable name *medication_assisted_treatment_referral_denominator*. For the second occurrence of this denominator, we could carry forward the denominator by putting @CALCTEXT([medication_assisted_treatment_referral_denominator]) in the Action Tag box of the variable medication_counseling_denominator as shown in *Figure 6* below.

Carry-Forward Denominator Example, Designer Interface



This same method can be used for all the sub-categories of race/ethnicity and payor if desired. Just remember to carefully examine the AIM Core Data Collection Plan to be certain that the denominator definitions are the same. See **Appendix IIb** below for a bundle-specific assessment of denominators eligible for carry-forward.

Appendix IIb: Carry Forward Denominators by Bundle

HEM

Measure	Denominator	Denominator Same	Variable or calculation	Test value entered	Carried Forward
ALL O1	All qualifying pregnant and postpartum people during their birth admission	A	n/a (unique denominator)		
HEM O2	All qualifying pregnant and postpartum people during their birth admission who experienced an obstetric hemorrhage	B	n/a (unique denominator)		
HEM P3	All birth admissions, whether from sample or entire population	C	hem_risk_assessment_ denominator	101	
HEM P5	All birth admissions, whether from sample or entire population	C	@CALCTEXT([hem_ risk_assessment_ denominator])		101
HEM P4	Pregnant and postpartum people with ≥ 1,000 ml blood loss during the birth admission	D	n/a (unique denominator)		

CCOC

Measure	Denominator	Denominator Same	Variable or calculation	Test value entered	Carried Forward
CCOC O1	Among people with cardiac conditions, those with live births who have their first birth ≥ 37 completed weeks gestation and have a singleton in vertex (Cephalic) position	A	n/a (unique denominator)		
CCOC O2	Singleton live births among people with cardiac conditions	B	n/a (unique denominator)		
CCOC P1	Patients with cardiac conditions diagnosed prior to their birth admission	C	standardized_pregnancy_ risk_assessment	101	
CCOC P2	Patients with cardiac conditions diagnosed prior to their birth admission	C	@CALCTEXT([standard_ pregnancy_risk_ assessment)]		101

SOC

Measure	Denominator	Denominator Same	Variable or calculation	Test value entered	Carried Forward
ALL O1	All qualifying pregnant and postpartum people during their birth admission	A	n/a (unique denominator)		
SEP P2	All diagnosed instances of obstetric patients with sepsis during the reporting period, including those that occurred prenatally, during the birth admission, and postpartum	B	n/a (unique denominator)		

Severe Hypertension in Pregnancy

Measure	Denominator	Denominator Same	Variable or calculation	Test value entered	Carried Forward
ALL O1	All qualifying pregnant and postpartum people during their birth admission	A	n/a (unique denominator)		
SHTN O1	All qualifying pregnant and postpartum people during their birth admission with preeclampsia, eclampsia, and HELLP syndrome	B	n/a (unique denominator)		
SHTN P1	Pregnant and postpartum people with acute-onset severe hypertension that persists for 15 minutes or more, including those with preeclampsia, gestational or chronic hypertension	C	severe_htn_treatment	101	
SHTN P2A	Pregnant and postpartum people during their birth admission with acute-onset severe hypertension that persists for 15 minutes or more, including those with preeclampsia, gestational or chronic hypertension	D	n/a (unique denominator)		
SHTN P2B	Pregnant and postpartum people during their birth admission with a documented diagnosis of preeclampsia, gestational or chronic hypertension, excluding those who experienced persistent severe hypertension during their birth admission (see SHTN P2A)	E	n/a (unique denominator)		

SHTN OP1	Pregnant and postpartum people with acute-onset severe hypertension that persists for 15 minutes or more, including those with preeclampsia, gestational or chronic hypertension	C	@CALCTEXT ([severe_htn_treatment])		101

Postpartum Discharge Transition

Measure	Denominator	Denominator Same	Variable or calculation	Test value entered	Carried Forward
PPDT SS1	All documented birth admissions	A	postpartum_readmissions	101	
PPDT SS2	Live births among state residents	B	n/a (unique denominator)		
PPDT SS3	All documented birth admissions	A	@CALCTEXT ([postpartum_readmissions])		101
PPDT P3	All maternal discharges following a live birth	C	postpartum_visit_scheduling	102	
PPDT P4	All maternal discharges following a live birth	C	@CALCTEXT ([postpartum_visit_scheduling])		102
PPDT P5	All maternal discharges following a live birth	C	@CALCTEXT ([postpartum_visit_scheduling])		102

Perinatal Mental Health Conditions

Measure	Denominator	Denominator Same	Variable or calculation	Test value entered	Carried Forward
PMHC SS1	All qualifying pregnant and postpartum people during their birth admission	A	pmhc_among_pregnant_postpartum_denominator	101	
PMHC SS2	All qualifying pregnant and postpartum people during their birth admission with PMHC	B	n/a (unique denominator)		
PMHC O1	Pregnant and postpartum people with a diagnosis of PMHC	C	n/a (unique denominator)		
PMHC P2	All qualifying pregnant and postpartum people during their birth admission, wheather from sample or entire population	A	pmhc_patient_education		

Cesarean Section

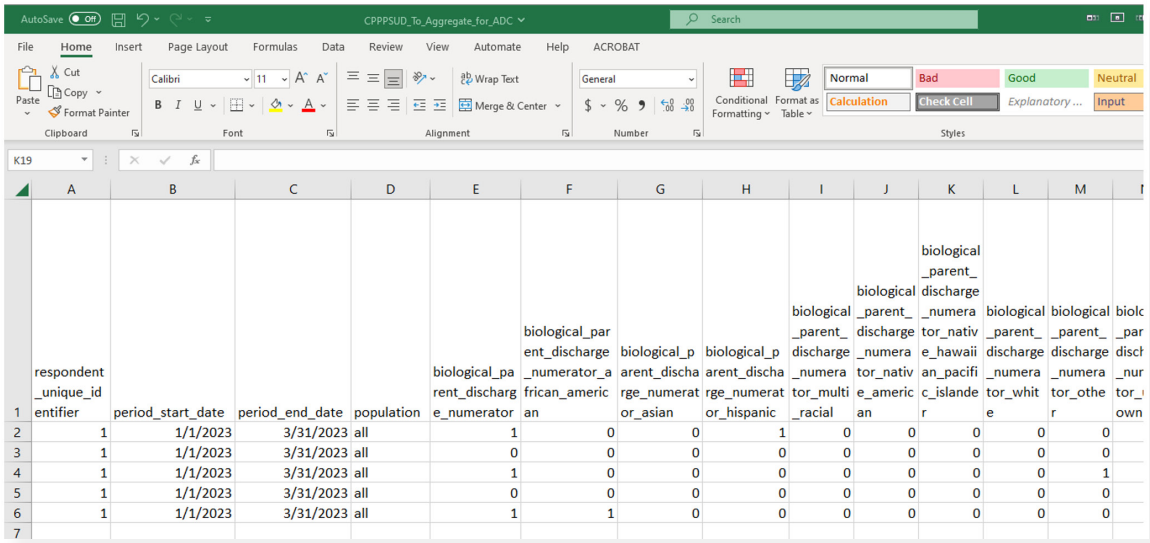
Measure	Denominator	Denominator Same	Variable or calculation	Test value entered	Carried Forward
CS P1A	All NTSV Cesarean births for dystocia or arrest of labor in the active phase	A	dystocia_in_active_phase		
CS P1B	All NTSV Cesarean births with an induction of labor, inclusive of cervical ripening, for dystocia or arrest of labor before 6 cm dilation	B	arrest_in_latent_phase		
CS P1C	All NTSV Cesarean births for an abnormal or indeterminate fetal heart rate pattern	C	abnormal_fetal_heart_rate		

CPPPSUD

Please see the table in **Appendix IIa**.

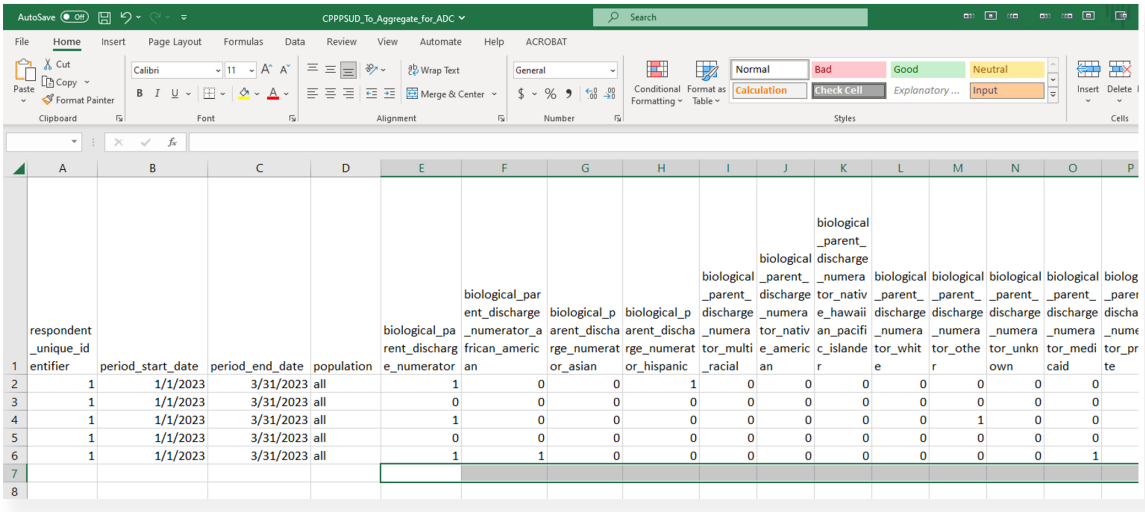
Appendix III: Formatting the Patient-level REDCap® Report for Upload to the AIM Data Center

1. After exporting the report as a CSV file, open it in MS Excel.
2. The first four columns are required and should be the same for every row if you intend to upload data for a single facility (hospital) **and** reporting period. If you want to upload multiple hospitals and/or reporting periods, you will need to aggregate the data accordingly by adapting these instructions.



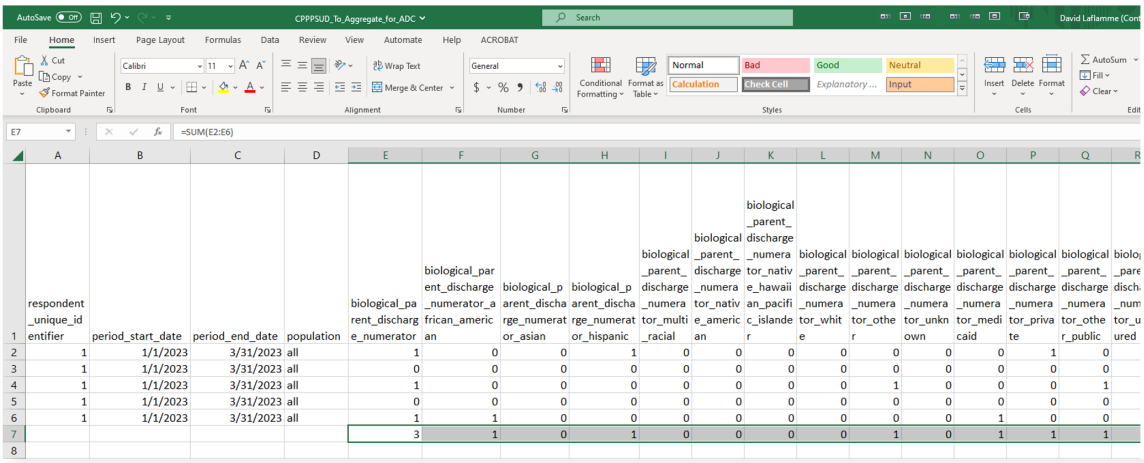
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	respondent_unique_identifier	period_start_date	period_end_date	population	biological_parent_discharge_numerator	biological_parent_discharge_numerator_african_american	biological_parent_discharge_numerator_asian	biological_parent_discharge_numerator_hispanic	biological_parent_discharge_numerator_multi_racial	biological_parent_discharge_numerator_native_american	biological_parent_discharge_numerator_native_hawaiian_pacific_islander	biological_parent_discharge_numerator_white	biological_parent_discharge_numerator_other
2	1	1/1/2023	3/31/2023	all	1	0	0	1	0	0	0	0	0
3	1	1/1/2023	3/31/2023	all	0	0	0	0	0	0	0	0	0
4	1	1/1/2023	3/31/2023	all	1	0	0	0	0	0	0	0	1
5	1	1/1/2023	3/31/2023	all	0	0	0	0	0	0	0	0	0
6	1	1/1/2023	3/31/2023	all	1	1	0	0	0	0	0	0	0
7													

3. Assuming you are aggregating a report for a single facility and reporting period, select the empty row below the last row of data in your file. Do not select cells A-D in this row as they do not contain data that should be summed. Select all other cells containing data above them *in this row*. Be sure to scroll to the right. The screenshot below is truncated on the right side for clarity.



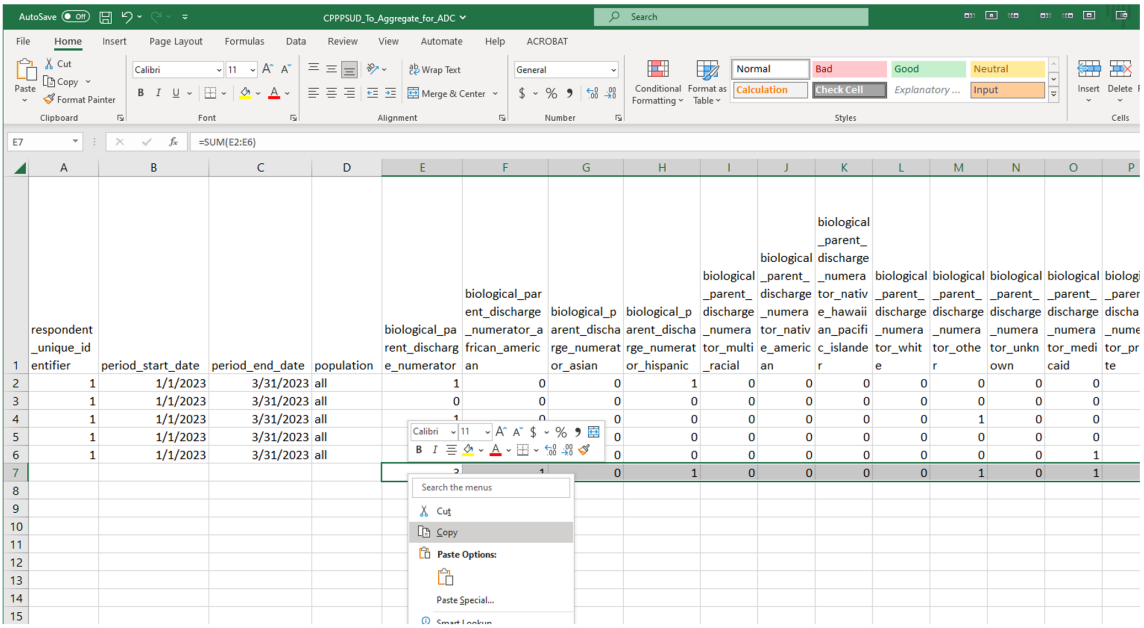
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	respondent_unique_identifier	period_start_date	period_end_date	population	biological_parent_discharge_numerator	biological_parent_discharge_numerator_african_american	biological_parent_discharge_numerator_asian	biological_parent_discharge_numerator_hispanic	biological_parent_discharge_numerator_multi_racial	biological_parent_discharge_numerator_native_american	biological_parent_discharge_numerator_native_hawaiian_pacific_islander	biological_parent_discharge_numerator_white	biological_parent_discharge_numerator_other	biological_parent_discharge_numerator_unknown	biological_parent_discharge_numerator_medicaid
2	1	1/1/2023	3/31/2023	all	1	0	0	1	0	0	0	0	0	0	0
3	1	1/1/2023	3/31/2023	all	0	0	0	0	0	0	0	0	0	0	0
4	1	1/1/2023	3/31/2023	all	1	0	0	0	0	0	0	0	1	0	0
5	1	1/1/2023	3/31/2023	all	0	0	0	0	0	0	0	0	0	0	0
6	1	1/1/2023	3/31/2023	all	1	1	0	0	0	0	0	0	0	0	1
7															
8															

4 While the cells described above are selected, click the AutoSum function icon in the Home group of Excel. You should now have totals for all data columns other than the first four columns.



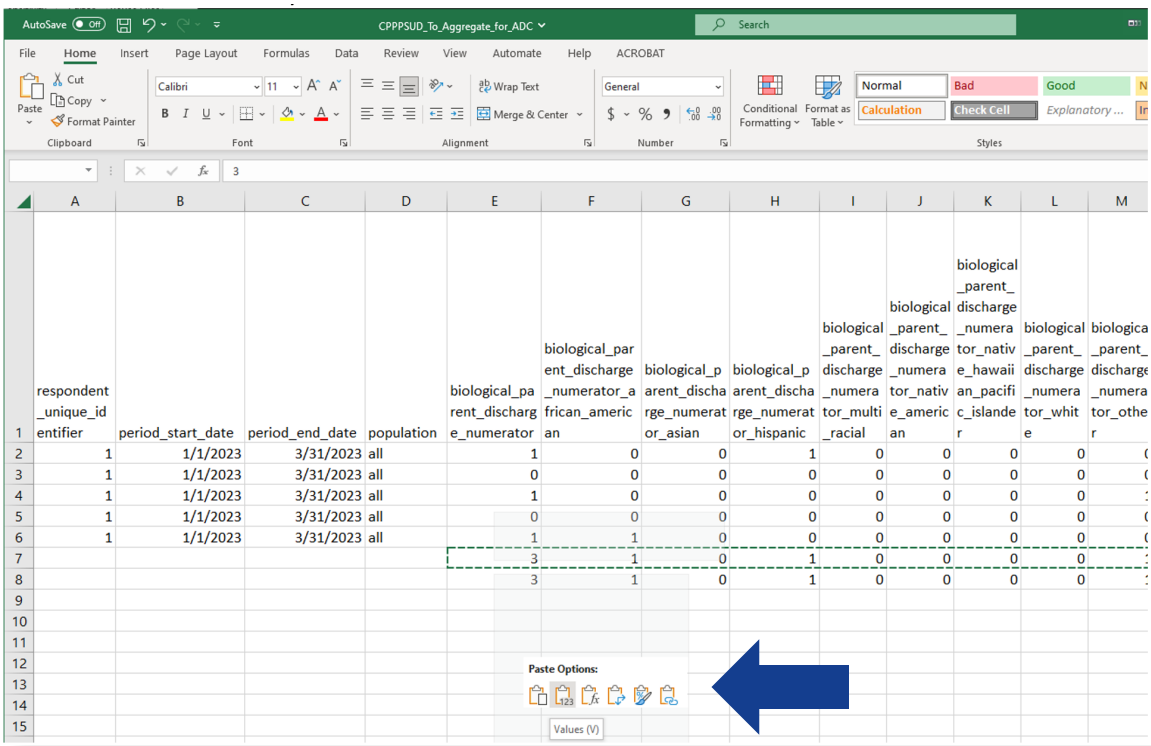
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	respondent_unique_identifier	period_start_date	period_end_date	population	biological_parent_discharge_numerator	biological_parent_discharge_numerator_african_american	biological_parent_discharge_numerator_asian	biological_parent_discharge_numerator_hispanic	biological_parent_discharge_numerator_multi_racial	biological_parent_discharge_numerator_native_american	biological_parent_discharge_numerator_native_hawaiian_pacific_islander	biological_parent_discharge_numerator_white	biological_parent_discharge_numerator_other	biological_parent_discharge_numerator_unknown	biological_parent_discharge_numerator_medicaid	biological_parent_discharge_numerator_private	biological_parent_discharge_numerator_other_public	biolo
2	1	1/1/2023	3/31/2023	all	1	0	0	1	0	0	0	0	0	0	0	1	0	
3	1	1/1/2023	3/31/2023	all	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	1	1/1/2023	3/31/2023	all	1	0	0	0	0	0	0	0	1	0	0	0	1	
5	1	1/1/2023	3/31/2023	all	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	1	1/1/2023	3/31/2023	all	1	1	0	0	0	0	0	0	0	0	1	0	0	
7					3	1	0	1	0	0	0	0	1	0	1	1	1	
8																		

5 Copy all cells containing the sums you just created. You may do this by right-clicking on the selected cells and choosing Copy as shown below.



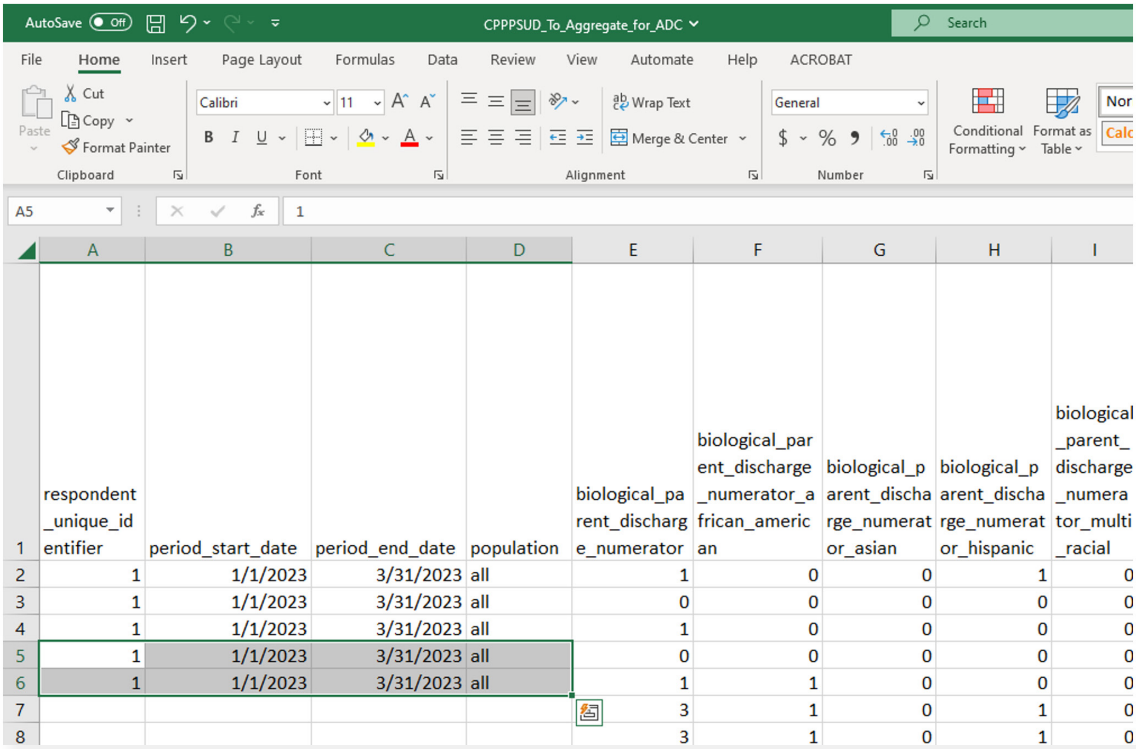
6 Right click on the first cell below the sums in column E.

7 Choose Paste Value (the icon with "123" on it). You should now have a second row of the same sums that do not rely on the SUM function like the row above.



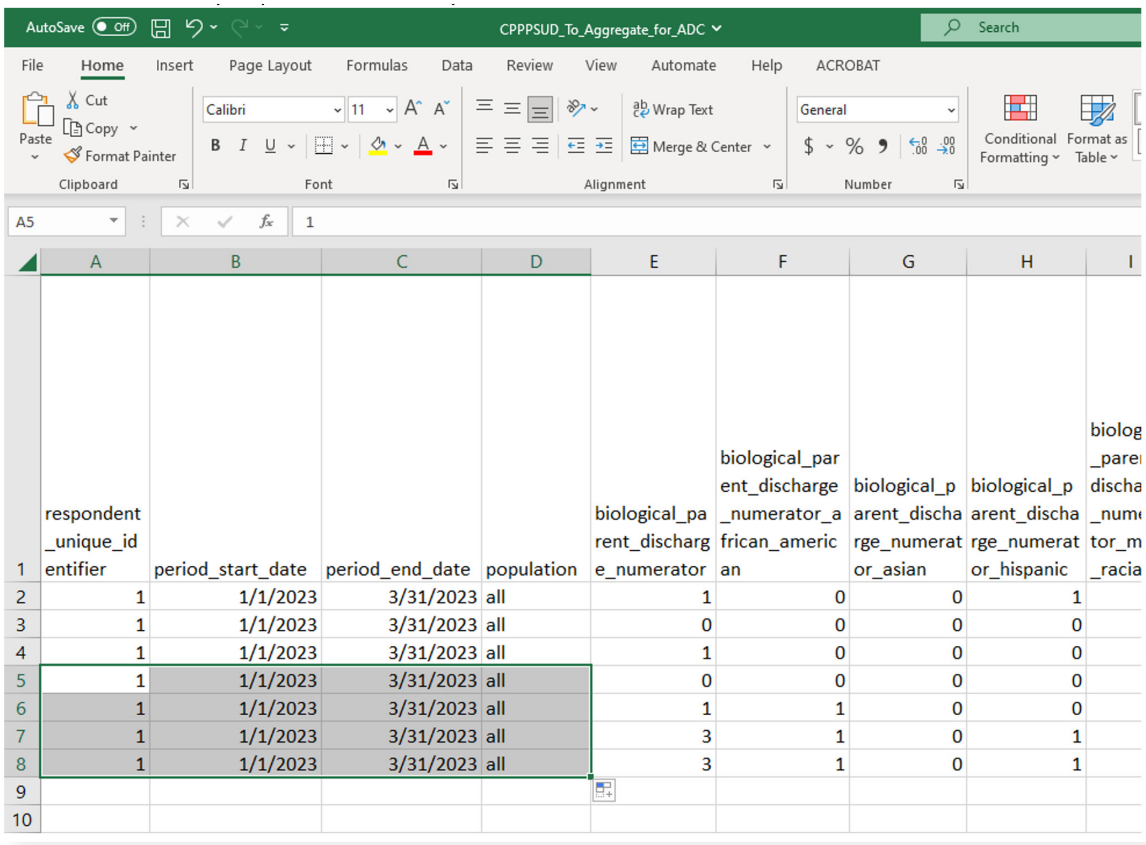
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	respondent_unique_identifier	period_start_date	period_end_date	population	biological_parent_discharge_numerator	biological_parent_discharge_numerator_african_american	biological_parent_discharge_numerator_asian	biological_parent_discharge_numerator_hispanic	biological_parent_discharge_numerator_multi_racial	biological_parent_discharge_numerator_native_american	biological_parent_discharge_numerator_native_hawaiian_pacific_islander	biological_parent_discharge_numerator_white	biological_parent_discharge_numerator_other
2	1	1/1/2023	3/31/2023	all	1	0	0	1	0	0	0	0	0
3	1	1/1/2023	3/31/2023	all	0	0	0	0	0	0	0	0	0
4	1	1/1/2023	3/31/2023	all	1	0	0	0	0	0	0	0	1
5	1	1/1/2023	3/31/2023	all	0	0	0	0	0	0	0	0	0
6	1	1/1/2023	3/31/2023	all	1	1	0	0	0	0	0	0	0
7					3	1	0	1	0	0	0	0	1
8					3	1	0	1	0	0	0	0	1

8 Highlight the last two rows of columns A – D only.



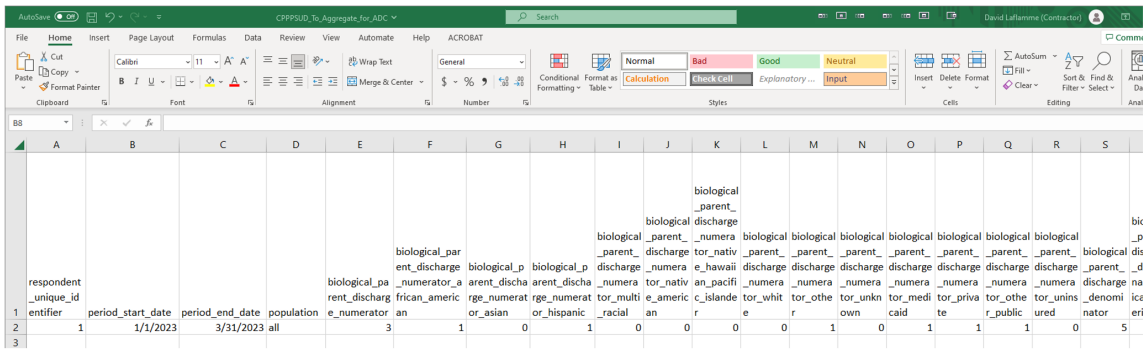
	A	B	C	D	E	F	G	H	I
1	respondent_unique_identifier	period_start_date	period_end_date	population	biological_parent_discharge_numerator	biological_parent_discharge_numerator_african_american	biological_parent_discharge_numerator_asian	biological_parent_discharge_numerator_hispanic	biological_parent_discharge_numerator_multi_racial
2	1	1/1/2023	3/31/2023	all	1	0	0	1	0
3	1	1/1/2023	3/31/2023	all	0	0	0	0	0
4	1	1/1/2023	3/31/2023	all	1	0	0	0	0
5	1	1/1/2023	3/31/2023	all	0	0	0	0	0
6	1	1/1/2023	3/31/2023	all	1	1	0	0	0
7					3	1	0	1	0
8					3	1	0	1	0

9 Drag the anchor at the bottom right of your selection to copy the values down to your second row of sums where you pasted values only.



1	respondent_unique_id entifier	period_start_date	period_end_date	population	biological_parent_discharge_numerator	biological_parent_discharge_numerator_african_american	biological_parent_discharge_numerator_asian	biological_parent_discharge_numerator_hispanic	biolog_parent_discha_numerator_racia
2	1	1/1/2023	3/31/2023	all	1	0	0	1	
3	1	1/1/2023	3/31/2023	all	0	0	0	0	
4	1	1/1/2023	3/31/2023	all	1	0	0	0	
5	1	1/1/2023	3/31/2023	all	0	0	0	0	
6	1	1/1/2023	3/31/2023	all	1	1	0	0	
7	1	1/1/2023	3/31/2023	all	3	1	0	1	
8	1	1/1/2023	3/31/2023	all	3	1	0	1	
9									
10									

10 Delete all rows of data except your last row of sums. Do not delete the header row.

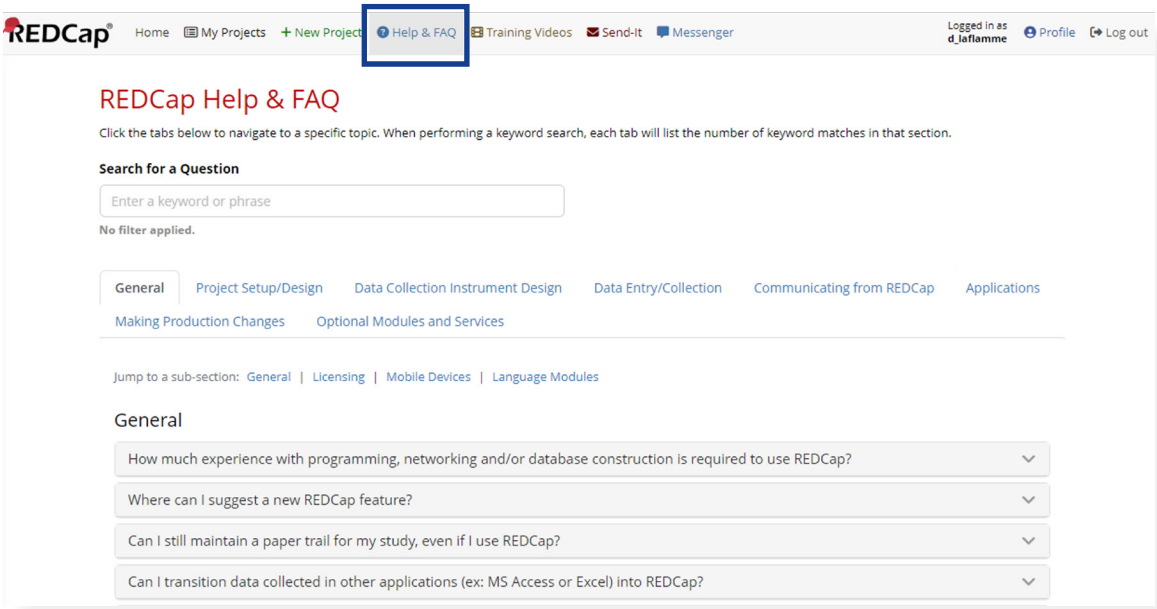


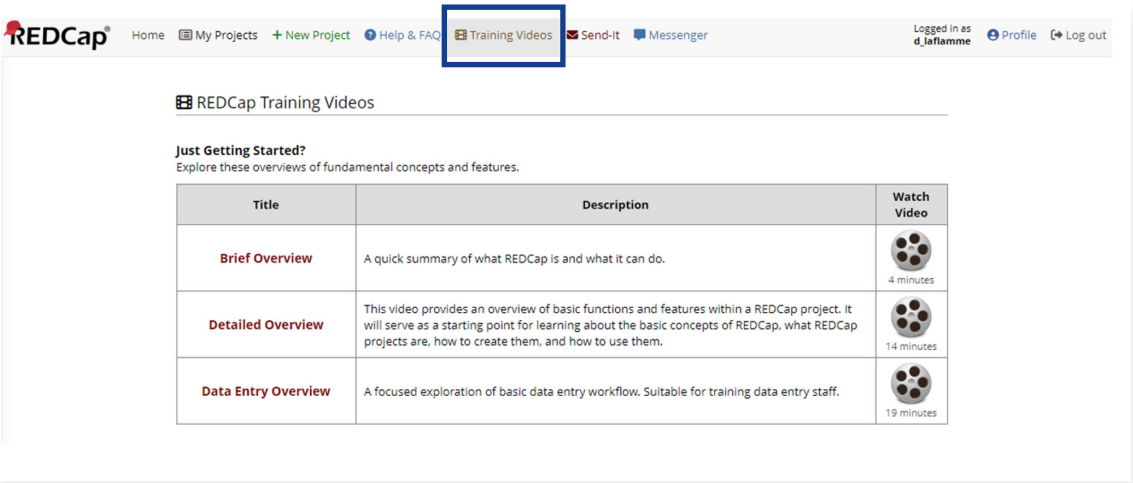
1	respondent_unique_id entifier	period_start_date	period_end_date	population	biological_parent_discharge_numerator	biological_parent_discharge_numerator_african_american	biological_parent_discharge_numerator_asian	biological_parent_discharge_numerator_hispanic	biological_parent_discharge_numerator_multiracial	biological_parent_discharge_numerator_native_american	biological_parent_discharge_numerator_native_hawaiic_islander	biological_parent_discharge_numerator_white	biological_parent_discharge_numerator_other	biological_parent_discharge_numerator_unknown	biological_parent_discharge_numerator_medicaid	biological_parent_discharge_numerator_private	biological_parent_discharge_numerator_other_public	biological_parent_discharge_numerator_uninsured	biological_parent_discharge_denominator	bio_p_dis_na_ica_eri
2	1	1/1/2023	3/31/2023	all	3	1	0	1	0	0	0	0	1	0	1	1	1	0	5	
3																				

11 Remember to examine your file for small cell sizes and remove them (delete values, do not set to zero) if required by any data use agreements.

Appendix IV: REDCap® Training Resources

Your organization's REDCap® server contains two menu links containing useful training resources. If you are new to REDCap®, the *Help and FAQ and Training Videos* menu items contain a wealth of information to assist you in getting started.





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