

REDCap Flex Upgrade Changelog – May 2022 Upgrade (v. 11.4.4 → v. 12.2.10)

New Features and Major Improvements

Version 12.0.0

- **New feature: Multi-Language Management**

- Summary: Users can create and configure multiple display languages for their projects for surveys, data entry forms, alerts, survey invitations, etc. Users can design data collection instruments and have them be displayed in any language that they have defined and translated so that their survey participants or data entry persons can view the text in their preferred language. This eliminates the need to create multiple instruments or projects to handle multiple languages. NOTE: The MLM feature will not auto-translate text, but provides tools so that users may easily translate them themselves.
- Usage: When entering data on a data entry form or survey, users and participants will be able to choose their language from a drop-down list or buttons on the page to easily switch to their preferred language for the text displayed on the page. This feature allows users to translate all text related to the data entry process, both for surveys and for data entry forms. Even various survey settings and email text can be translated. For users on data entry forms, if a language is selected, that selection is stored in the user's user account settings internally (in the REDCap backend database), whereas a survey participant's selected language will be stored in a cookie in their web browser as a way to remember their language preference if they return in the future (and also to maintain their selected language from page to page). The language can be pre-selected for a participant, if desired, using the "Language preference field" setting on the MLM page in the project or via the @LANGUAGE-FORCE action tags (seen below).
- User Rights: Users must have Project Design/Setup privileges in a project in order to see the link to the Multi-Language Management page on the left-hand menu.
- System-level Configuration: The MLM feature can be completely disabled at the system level, if desired, via the MLM page in the Control Center (on the Settings tab). On this page in the Control Center, admins can optionally seed any User Interface (i.e., stock language) translations for the entire REDCap installation, in which users could import any activated User Interface translations into their project. This will only import the User Interface elements (since those are universal to each project), but it can be a big time saver to prevent the user from having to translate those common elements in their project. These can be imported via the Create New Language process in a project (or via the Edit Language setting also).
- Note: The MLM feature works seamlessly with SMS messages sent via Twilio. Additionally, the MLM feature works with the e-Consent Framework, in which the archived PDF of the

participant's consent form will be stored in the File Repository in the same language in which the participant took the survey.

- Note: When a project is in production, the MLM page and all translations can only be modified when the project is in Draft Mode. So if the user desires to make edits or additions to their translations, they must first enable Draft Mode via the Online Designer, and then return to the MLM page to make translation changes while in Draft Mode. When the drafted changes are approved, their translation changes made while in Draft Mode will automatically be approved together with them.
- **New Action Tags for Multi-Language Management**
 1. **@LANGUAGE-CURRENT-FORM** - Allows you to capture the currently used language in projects where multilingual data is enabled on data entry forms. The **@LANGUAGE-CURRENT-FORM** action tag can be used on fields of type 'Text Box' (no validation), and 'Drop-down List', or 'Radio Buttons' (these need to have choices whose codes correspond to the IDs of the defined languages - e.g., 'en'). This action tag is only active on data entry forms and will always, when possible, set the field's value to the currently active language.
 2. **@LANGUAGE-CURRENT-SURVEY** - Same as **@LANGUAGE-CURRENT-FORM**, but works only on survey pages. For multi-page surveys, **@LANGUAGE-CURRENT-SURVEY** needs to be used on a field of each page where capture of the language is relevant (e.g. for performing branching).
 3. **@LANGUAGE-FORCE** - When used on a field, the data entry form or survey on which the field is located will be rendered in the specified language (which must have been set up using the Multi-Language Management feature). The format must follow the pattern **@LANGUAGE-FORCE="???"**, in which the ID of the desired language should be inside single or double quotes - e.g., **@LANGUAGE-FORCE="de"**. Piping is supported - e.g., **@LANGUAGE-FORCE="[field_name]"**. When the language is forced successfully (i.e., it exists and is active), the language selector is hidden. Using this together with **@LANGUAGE-CURRENT-FORM/SURVEY** on the source field for **@LANGUAGE-FORCE** may be used to 'lock in' a user to their selected language.
 4. **@LANGUAGE-FORCE-FORM** - Same as **@LANGUAGE-FORCE**, but the effect is limited to data entry forms (i.e. this does not affect surveys).
 5. **@LANGUAGE-FORCE-SURVEY** - Same as **@LANGUAGE-FORCE**, but the effect is limited to surveys (i.e. this does not affect data entry forms).
 6. **@LANGUAGE-SET** - When used on a Drop-down or Radio Button field only, this action tag will allow the field's value to control the currently shown language (in the same way as switching the language via the buttons at the top of the page). Tip: When used in a survey, this field could be prepopulated (and thus auto-selected) by embedding a participant's language ID in the survey URL itself (for details, see the FAQ's "How to pre-fill survey questions" section).
- Thanks to Günther Rezniczek for all his work to help us build the new Multi-Language Management feature.
- **New feature: Form Display Logic**

- Form Display Logic is an advanced feature that provides a way to use conditional logic to disable specific data entry forms that are displayed on the Record Status Dashboard, Record Home Page, or the form list on the left-hand menu. You might think of it as 'form-level branching logic'. Form Display Logic can be very useful if you wish to prevent users from entering data on a specific form or event until certain conditions have been met. The forms will still be displayed on the page, but they will be disabled in order to prevent users from accessing them. Below you may define as many conditions as you want. A form may be selected in multiple conditions, but if so, please note that the form will be enabled if at least one of the conditions is met. The Form Display Logic does not impact data imports but only operates in the data entry user interface to enable/disable forms. Additionally, Form Display Logic is not utilized by the Survey Queue at all but can affect the behavior of the Survey Auto-Continue feature if the checkbox for it is enabled in the setup dialog. The Form Display Logic setup can be found by clicking the "Form Display Logic" button at the top of the instrument list in the Online Designer.
- This feature serves as the official integration of the Form Render Skip Logic external module created by Philip Chase and his team. Thanks to them for their work on this module. Note: When upgrading REDCap to v12.0.0 or higher, if the Form Render Skip Logic is installed and is being used by any projects, all the configuration settings for the module will automatically be translated into the new Form Display Logic settings format, after which the external module will be disabled for each project and also for the entire system (since it will no longer be needed). This all happens automatically during the upgrade.
- **New feature: Design Checker for the Clinical Data Mart (CDM)** - The "Data Mart Design Checker" is a new tool available in the Data Mart fetch page that will report any issue related to the design of the current Data Mart project. Based on the most recent Data Mart XML template available in REDCap, the tool will check, list, and fix any of these issues: missing forms, variables, revisions, or section headers, the lack/presence of repeatability in a form, variables included in the wrong form, etc. An administrator or a user with Project Setup/Design privileges can use the tool to review and automatically fix all reported issues. This tool will mainly be utilized when users have modified the structure of an existing Data Mart project or if new forms and data types have been added to the Data Mart feature itself since the users initially created their Data Mart project.
- **Improvement:** Errors displayed in the Survey Invitation Log when sending SMS or Voice Calls via Twilio will now display the full error message returned by Twilio's API to provide the user with more information regarding why the SMS/Voice Call failed to send successfully.

Version 12.0.3

- **Improvement/change:** When using Multi-Language Management on a survey, the current language name is now displayed next to the globe icon at the top right of the survey page so that participants more intuitively understand what the current language is and to click it to change the language.

- **Improvement/change:** The Online Designer now denotes whether a field on the instrument contains embedded fields inside its label, choices, notes, etc. by displaying a blue box saying "Contains embedded fields", similar to the green "Field is embedded elsewhere on page" boxes for embedded fields themselves. This will provide users with visual cues to know when and where field embedding is occurring.
- **Improvement:** The Design Checker feature for Clinical Data Mart now has improved descriptions of changes that will be made, including the severity of the design issue.

Version 12.0.4

- Change/improvement: A link to the "Language File Creator/Updater" page was added to the Control Center's left-hand menu in the Administrator Resources section.
- Change/improvement: When printing a report, the "Number of results returned" and "Total number of records queried" counts are now included in the printout of the page.

Version 12.0.5

- **New feature:** New design for the "Help & FAQ" page.
- **New Smart Variable: [event-number]** - The current event's ordinal number as listed on the Define My Events page that denotes the order of the event within a given arm. (Ticket #70973)
- **Improvement/change:** The Define My Events page now displays a new column to display each event's Event ID number. Also, the Smart Variable corresponding to each column in the table on the Define My Events page (e.g., [event-number], [event-label]) are displayed in small gray text below the header text in the table to help users more easily learn where the values of those Smart Variables originate. (Ticket #115791)
- **Improvement:** When using OAuth2 Azure AD Authentication, you may now specify a different AD attribute whose value determines the REDCap user's username. By default, it uses the AD attribute "userPrincipalName", which often resolves to the user's email address. The Security & Authentication page has a new drop-down setting to allow admins to alternatively specify the AD attribute "samAccountName", which would resolve to something like "pharris", for example. This provides an option if the institution prefers not to use a user's email address as their REDCap username. Note that this setting does not change the Azure AD login name, which is still the user's email address / userPrincipalName. Administrators may want to select the samAccountName to help retain account usernames when transitioning from LDAP to Azure AD, or if samAccountName is considered an immutable (and thus more reliable) user ID at your institution.

Version 12.1.0

- **New feature: Conditional logic for Survey Auto-Continue** - When enabling Survey Auto-Continue on the Survey Settings page for a survey, users may now optionally specify conditional logic to determine whether or not the auto-continue should be applied. As such, REDCap will auto-continue to the next survey *only* if the conditional logic is TRUE or if the logic textbox has

been left blank. This new option can be used as a simpler alternative to the Survey Queue, which can require more complex instrument-event level configurations for longitudinal projects.

- **New feature: Dynamic min/max range limits for fields** - Instead of using exact values as the minimum or maximum range of Textbox fields (e.g., "2021-12-07"), you may now also use "today" and "now" as the min or max so that the current date or time is always used. These can be used to prevent a date/time field from having a value in the past or in the future. Additionally, you can now pipe a value from another field into the field's min or max range setting - e.g., [visit_date] or [event_1_arm_1][age]. This can help ensure that a Textbox field (whether a date, time, or number) has a larger or smaller value than another field, regardless of whether the field is on the same instrument or not.
- **New action tag: @FORCE-MINMAX** - The action tag @FORCE-MINMAX can be used on Textbox fields that have a min or max validation range defined so that no one will not be able to enter a value into the field unless it is within the field's specified validation range. This is different from the default behavior in which out-of-range values are permissible. Note: @FORCE-MINMAX is also enforced for data imports to ensure the value is always within the specified range.
- **New field validation: "Time (HH:MM:SS)"** - This new time-based field validation (unique name "time_hh_mm_ss") will be added automatically and enabled by default during the upgrade process. This validation forces users/participants to enter a time value that contains the hour, minute, and second components. It also includes the usage of the "Now" button and the timepicker popup widget, both of which are displayed next to the field on the survey page or data entry form. Note: Fields with this field validation can be utilized inside the datediff() function. (Thanks to the Field Validation Committee for this addition.)
 - **Improvement:** For projects using the Clinical Data Interoperability Services (CDIS), a new observation category "social history" was added for both CDM and CDP projects, thus allowing them to import this new type of EHR data into REDCap.
 - **Improvement:** New CDIS panel on the left-hand project menu to display information and links that are relevant to projects using either Clinical Data Pull or Clinical Data Mart.

Version 12.2.0

- **New feature: Instrument-level Data Export Rights**
 - Users may specify instrument-level privileges regarding a user's data export capabilities on the User Rights page in a project. A user may be given "No Access", "De-Identified", "Remove All Identifier Fields", or "Full Data Set" data export rights for EACH data collection instrument. This improvement will make it much easier to match a user's Data Exports Rights with their Data Viewing Rights, if you wish, and will give users more granular control regarding what data a user can export from your project.
 - Note: Whatever a user's data export right was in the previous version, that export right will be subsequently extrapolated to all instruments after upgrading. Thus, their export privileges will behave exactly the same as before.
 - Improvement: The table displayed on the User Rights page that lists all users' privileges now includes an instrument count for each category for both Data Viewing Rights and Data

Export Rights - e.g., "3 No access, 2 Full Data Set". This helps provide summary information regarding the user's instrument-level rights.

- Improvement: When adding/editing a user's or user role's privileges in the popup on the User Rights page, as a convenience, users may click the table headers for each Data Export Rights setting or Data Viewing Rights setting to set that setting for all instruments in the project (i.e., as a "check all checkboxes").
- Note: When adding a new data collection instrument to a project, if the project is in development status, all users will automatically receive "Full Data Set" data export rights for that new instrument. Whereas if the project is in production, all users will automatically receive "No Access" data export rights for the new instrument. This behavior matches how instrument-level rights currently work for Data Viewing Rights when adding a new instrument.
- Change: When importing or exporting users and/or user roles (whether as a CSV file on the User Rights page or via the API), the new instrument-level data export rights are represented as a new column named "forms_export" and are formatted exactly how instrument-level Data Viewing Rights ("forms") are currently formatted in comma-delimited fashion - e.g., "demographics:1,baseline_data:2,prescreening:3". In this format, the following represents each data export rights level: 0=No Access, 2=De-Identified, 3=Remove Identifier Fields, 1=Full Data Set.
- **New feature: Survey Start Time and related Smart Variables**
 - REDCap now collects when participants begin a survey (i.e., the initial time the survey page is opened). Going forward, any responses collected (partial or completed) will have their start time displayed at the top of the data entry form when viewing the response. NOTE: If the start time is a blank value, it implies that the response began while on an earlier version of REDCap when start times were not yet collected.
 - New Smart Variables for Survey Start Date/Time: Users can access the start time via piping by using the new Smart Variables [survey-time-started:instrument] and [survey-date-started:instrument], which can be used inside the @DEFAULT or @CALCTEXT action tags, among other places. If users wish to have them return the raw value, which will be in 'YYYY-MM-DD HH:MM:SS' format and would be more appropriate for conditional logic or calculated fields, simply append ':value' after the unique instrument name - e.g., [survey-date-started:instrument:value].
 - New Smart Variables for Survey Duration: Users can obtain the total amount of time that has elapsed since the survey was started (in seconds, minutes, etc.) by using [survey-duration:instrument:units] and [survey-duration-completed:instrument:units]. The Smart Variable [survey-duration] represents the difference between the survey's start time and either its 1) completion time (if completed) or 2) the current time (if not completed), whereas [survey-duration-completed] represents the difference between the survey's start time and completion time, in which a blank value will be returned if the survey has not been completed. Options for 'units': 'y' (years, 1 year = 365.2425 days), 'M' (months, 1 month = 30.44 days), 'd' (days), 'h' (hours), 'm' (minutes), 's' (seconds).

- **Improvement:** When performing a keyword search on the "Help & FAQ" page, it now displays in red a count of keyword matches for each category in the tabs near the top of the page. Previously, the user would have to click on each tab in order to know if there were any keyword matches in that particular category.

Version 12.2.2

- **Improvement:** Each tab on the "Help & FAQ" page now has a drop-down list of subsections that, when selected, will auto-scroll the webpage down to that subsection on the page.
- **New feature:** When using the survey setting "Save a PDF of completed survey response to a File Upload field", users can now optionally set this feature to store the translated version of the PDF if the Multi-language Management feature is being utilized for the survey. This can be enabled by checking the "Store the translated version of the PDF" checkbox below the "Save a PDF..." setting on the Survey Settings page for the desired survey. (Ticket #121955)

Version 12.2.3

- **Improvement:** The Codebook now contains a "Field Finder" to allow users to quickly search for a field by keyword or phrase in the field label or by variable name. Also, the gray "Instrument Name" rows in the table will float at the top of the page while scrolling so that it is always apparent the instrument to which a field belongs. Additionally, when scrolling down the page, an up-arrow image will appear at the bottom right of the page that (when clicked) will quickly scroll the page back to the top.
- **Improvement:** When using Multi-Language Management, it will now display a list of possible issues to users when entering the page if any elements have been modified since they have been translated. For example, if a field label is translated, and then a user modifies the Default language text via the Online Designer, the MLM page will display a warning in a popup dialog that will ask the user to confirm that the current translation is okay or else to provide a new translation to match the updated Default text. This will help notify users about potential issues with their translations to keep them updated if they are still modifying the Default language text in the project.
- **Improvement:** Piping can now be performed inside the value of the @PLACEHOLDER action tag - e.g., @PLACEHOLDER="[first_name] [last_name]".

Version 12.2.4

- **Improvement:** When using Multi-Language Management, in which some of the Default language text has changed since the text was translated, the new "Review Changed Items" dialog on the MLM page will now display an "Export" option to export as JSON or CSV all the translated items that need to be reviewed and/or retranslated.
- **Improvement:** If the Multi-Language Management feature is disabled for a project, it will now show a red notice at the top of the MLM page.

Version 12.2.5

- **Improvement:** Sub-sections on the “Help & FAQ” page can now be accessed via hyperlinks near the top of each section. Previously there was a drop-down for this, which was slightly slower. Having sub-section links near the top of the page should make it faster for users to jump to a specific section.
- **Improvement:** The Multi-Language Management setup page now displays a download option for each instrument under the Forms/Surveys tab to allow users to export->import the translations for that single instrument to another project that has the same instrument with the same fields and variable names.
- **Improvement:** The Multi-Language Management setup page now displays the Default text above (rather than below) the input text box for each translatable item. This reversal appears to be more intuitive for users as they translate each element.
- **Improvement:** In the "Compose Survey Invitations" dialog on the Participant List page, the Actions drop-down for auto-selecting checkboxes for participants in the participant list now contains a new option: "Check Not Responded and Partial Response".

Version 12.2.5

- **Improvement:** Sub-sections on the “Help & FAQ” page can now be accessed via hyperlinks near the top of each section. Previously there was a drop-down for this, which was slightly slower. Having sub-section links near the top of the page should make it faster for users to jump to a specific section.
- **Improvement:** The Multi-Language Management setup page now displays a download option for each instrument under the Forms/Surveys tab to allow users to export->import the translations for that single instrument to another project that has the same instrument with the same fields and variable names.
- **Improvement:** The Multi-Language Management setup page now displays the Default text above (rather than below) the input text box for each translatable item. This reversal appears to be more intuitive for users as they translate each element.
- **Improvement:** In the "Compose Survey Invitations" dialog on the Participant List page, the Actions drop-down for auto-selecting checkboxes for participants in the participant list now contains a new option: "Check Not Responded and Partial Response".

Version 12.2.6

- **Improvement:** When scrolling down the page in the Online Designer when adding/editing fields, an up-arrow image will appear at the bottom right of the page that (when clicked) will quickly scroll the page back to the top.

Version 12.2.8

- **Improvement:** Concurrent user checks have now been added to the Multi-Language Management setup page to prevent multiple simultaneous users from affecting each others' work while on the page.

Bug Fixes, Security Fixes, Changes, and Minor Improvements

Version 12.0.0

- **Major bug fix:** When a field is embedded on a multi-page survey, in which the embedded field's parent field is used in branching logic on a later page, the embedded field's value might mistakenly get erased when a later survey page is submitted if the embedded field is set as a Required field. (Ticket #117620)
- Bug fix: The cron job that sends email notifications for REDCap Messenger might mistakenly send multiple emails repeatedly to users. (Ticket #97084b)
- Bug fix: The x-axis of a [scatter-plot] Smart Chart would mistakenly not display in the correct sorted fashion. (Ticket #117202b)
- Bug fix: Clicking the "Today" or "Now" button for a date or datetime field, respectively, would mistakenly add the green highlighted background to the field if that field is embedded. Embedded fields should never get highlighted as green like regular fields do. (Ticket #105242)
- Bug fix: When using the "Copy multiple fields" feature in the Online Designer, on some occasions the process might mistakenly fail for some fields selected and would display them on the page as fields with empty variable names. (Ticket #117339)
- Change: The text for the "Example code" link at the bottom of the API Playground was modified for clarity. (Ticket #117797)
- Bug fix: When using specific PHP versions, the Clinical Data Pull (CDP) service might mistakenly throw a fatal PHP error when attempting to fetch data from the EHR. (Ticket #117953)
- Change: When drafted changes are auto-approved in a production project, the "Changes Were Made Automatically" dialog now provides extra text reminding the user that if any new instruments were just added, by default no users in the project have access to any newly created instruments. Thus they might need to grant users access to the new instruments.
- Bug fix: When creating a new project or copying an existing one, the users that are initially granted access to the project would mistakenly not get logged as having been added to the project on the project logging page, thus making it very difficult for an auditor to determine exactly when and by whom the initial users had been given access.
- Bug fix: A fatal PHP error would occur that prevented an administrator from creating a Data Mart project on behalf of a user. (Ticket #117929)
- Bug fix: When using the Data Resolution Workflow in a project, the Resolve Issues page would mistakenly display data queries for fields that exist on instruments to which the user does not have data viewing privileges. (Ticket #118026)
- Bug fix: If a value is piped into a Descriptive Text field which is itself embedded in another field, then in some specific instances the Descriptive Text field's label would mistakenly not get embedded but only the piped value would get embedded. (Ticket #117925)

Version 12.0.1

- **Major bug fix:** When using Twilio SMS or Voice Call functionality on a survey, field labels or section headers might mistakenly not get included in the SMS message or Voice Call message unless one or more languages have been defined and are active on the Multi-Language Management page.
- Bug fix: When using Twilio SMS or Voice Call functionality on a survey, the choices for some multiple choice fields would mistakenly not appear in the correct translated language when one or more languages have been defined and are active on the Multi-Language Management page.
- Bug fix: When using Twilio SMS or Voice Call functionality on a survey, the survey instructions and completion text might mistakenly not appear in the correct translated language when one or more languages have been defined and are active on the Multi-Language Management page.
- Bug fix: Some rare adaptive PROMIS instruments that contain checkbox or textbox field types (e.g., PROMIS Sexual Function v2 Brief Profile (Female)) would crash in certain instances and prevent the participant from completing the survey whenever a participant attempts to answer a checkbox or textbox field on the survey page.

Version 12.0.2

- Change: The Control Center now recommends using PHP 7.4, 8.0, or 8.1, which are the only currently supported versions of PHP (by the PHP Team).
- Bug fix: The "Add/Edit Records" page would display a green button with the incorrect text "Add new record for the arm selected above" for projects that do not have multiple arms. The button instead should say "Add new record".
- Bug fix: When upgrading from a version prior to REDCap 11.4.1, the upgrade SQL script might mistakenly fail when dropping an index on the `redcap_user_roles` table.
- Bug fix: When copying a project where Twilio is enabled, the various Twilio configuration settings would mistakenly not get copied. Note: The Twilio feature will still be disabled in the newly created project. (Ticket #118265)
- Bug fix: When using a Project Bookmark as an "Advanced Link", the API call that should return the various parameters (e.g., username, project_id) would mistakenly default to "xml" as the return format when instead it should default to "csv" if the "format" API parameter is not provided in the API request.

Version 12.0.3

- **Major bug fix:** When the "Enable support for Survey Auto-Continue" option is checked in the Form Display Logic setup dialog, the feature might mistakenly fail to evaluate the logic correctly during the Survey Auto-Continue process. Thus, it could cause some surveys to get skipped unintentionally.

- Bug fix: When using vertical sliders on forms/surveys, the “Change the slider above to set a response” text would have a translucent background that might mistakenly cover part of the text field displaying the number value. (Ticket #118330)
- Bug fix: When using the Sponsor Dashboard or Browse Users->View User List By Criteria pages and clicking the "Time of latest password reset" link on the page, the resulting error message might be confusing if the user selects users in the table in which none of those select users log in via Table-based authentication (assuming the system authentication is LDAP+Table or Shibboleth+Table). More text has been added to the error message to inform the user that at least one Table-based authentication user must be selected in order to perform this action. (Ticket #118200)
- Bug fix: If an admin has "Modify System Configuration Pages" admin rights but does not have "Access to all projects and data with maximum user privileges" admin rights, then if the system was taken offline, the admin would mistakenly not be able to restore the system back to online status. (Ticket #118540)
- Bug fix: The “Save your changes?” prompt that is displayed when attempting to leave a Data Entry Form via closing the current window/tab might mistakenly cause a JavaScript error rather than displaying the prompt.
- Bug fix: When using Missing Data Codes for an embedded field with the ":icons" parameter set (e.g., {field1:icons}), the list of Missing Data Codes would fail to display after clicking the "M" icon for the embedded field. (Ticket #118636)
- Bug fix: When using Missing Data Codes for an embedded field with the ":icons" parameter set (e.g., {field1:icons}), in which the field is a Radio Button field, if the user clicks the "reset" link to reset the value of the field, it would mistakenly throw a JavaScript error. It would still correctly remove the value of the field and reset it, but it would appear to the user as if it did not.
- Bug fix: The Smart Variables [survey-time-completed] and [survey-date-completed] might not get evaluated correct when used in Survey Queue conditional logic. (Ticket #118452)
- Bug fix: When attempting to save a custom Record Status Dashboard in a non-longitudinal project, in which one or more instruments are selected for the "Select instruments" option, it would fail to save the selected instruments, thus resulting in displaying all instruments on the custom dashboard instead of only the selected ones.
- Change: To the right of the REDCap/PHP/MySQL versions listed at the top of the main Control Center page, a "copy" icon was added to allow administrators to easily copy those that version information text so that they may paste them elsewhere, such as when posting a question or bug report on REDCap Community.
- Bug fix: When a multi-arm longitudinal project does not have "arm 1" defined but has higher-numbered arms defined, it can cause certain things not to work correctly, such as branching logic, calculations, or action tags.
- Change: In the "Add Field"/"Edit Field" dialog in the Online Designer, it is no longer possible to tab into the Action Tags text box. This was changed because users found it a bit jarring for the Logic Editor dialog to automatically display as they are tabbing through the fields inside the "Add Field"/"Edit Field" dialog.

- Change: Light gray square brackets are now displayed around the variable name for each field on the Data Dictionary Codebook to aid users when searching for a specific field on the page (because it may sometimes be hard to find a field on the page if it is used in lots of branching logic or calculations).
- Bug fix: When attempting to do a fresh install of REDCap on PHP 8.0, the install page might mistakenly crash with a blank white page.
- Bug fix: When a public survey is completed and the "Save & Return Later" feature is not enabled for the survey, references to the survey link via the Smart Variable [survey-link] might mistakenly allow participants to return to the completed survey when instead it should prevent them and thus display the "Thank you for your interest, but you have already completed this survey" message. This could cause further confusion if a participant attempted to download a file for a File Upload field on that survey, in which it would prevent them from downloading it (via an error message); however, this might be confusing since the participant could access the survey page (via this bug) but not the downloadable file on the survey. (Ticket #118314)

Version 12.0.4

- Bug fix: The "RTL" dialog on the Multi-Language Management page in the Control Center would mistakenly be empty instead of having the appropriate text.
- Bug fix: A PHP fatal error would be thrown when attempting to edit a field in the Online Designer if using PHP 7.2. (Ticket #118919)
- Bug fix: When using newer versions of MySQL or MariaDB, the Easy Upgrade or Automatic Upgrade features might mistakenly fail in certain instances if the REDCap MySQL user does not have "REFERENCES" privileges for the MySQL database. (Ticket #119033)
- Bug fix: When pulling EHR data from the Conditions R4 endpoint for Clinical Data Pull or Clinical Data Mart, the condition's date value might mistakenly fail to get imported into the REDCap project.
- Changes and various bug fixes for the External Module Framework, including the following: Included cron start & end times in the cron log, Improved unit testing & psalm scanning (of the framework itself), and Improved performance of the "Logs" page.
- Bug fix: The variable name displayed for fields on the Codebook page would mistakenly display a square bracket after the branching logic instead of before it. (Ticket #119302)
- Bug fix: If a user is in a Data Access Group, the Participant List would display an incorrect count of how many visible participants are in the Participant List, and it might show some pages of the Participant List as being empty. (Ticket #119056)
- Bug fix: If records are named a specific way in a project (e.g., ABC-1, ABC-2), they might appear out of order when displayed in certain contexts, such as if the record list spans multiple pages on the Record Status Dashboard. (Ticket #119189)

- Bug fix: If a calculated field is using a datediff() function with a datetime field and with "today" as the first two parameters, it would mistakenly throw an error on the page that a calculation error exists. (Ticket #119049)
- Bug fix: When sending an SMS via Twilio, in which the Twilio API returns the error message "violates a blacklist rule", the survey invitation log would mistakenly not flag this error correctly with reason_not_sent = 'PARTICIPANT OPTED OUT' but instead would revert to the default reason_not_sent of 'ERROR SENDING SMS'.
- Bug fix: If HTML tags are used inside the Custom Labels for Repeating Instruments, whenever the dialog is reopened to edit the Custom Labels for Repeating Instruments, the HTML tags will have been automatically removed. It should not remove the HTML tags that have been already saved. (Ticket #119244)
- Bug fix: When clicking the "export" link to download the results after running Data Quality rule A or B, it would be impossible to determine which field had the missing value for a given row/record if more than one field had a missing value for the whole set of results exported. To remedy this issue, the export file no longer lists each variable name as a separate column (like other DQ rules) but instead has a new "field" column that will list the variable name of the field with the missing value in each row. (Ticket #119276)
- Bug fix: When upgrading to REDCap 12.0.0 or higher and when the Form Render Skip Logic external module is being utilized for one or more projects, the upgrade script to auto-migrate all the FRSL settings into the new Form Display Logic feature might be slightly incorrect for some FRSL configurations (only affecting longitudinal projects). If the FRSL checkbox setting "Restrict this rule to specific events" is not checked but one or more events have been selected (which is not expected), the resulting behavior from the Form Display Logic would cause the form to be disabled for the selected event, whereas the FRSL module beforehand would disable the form on every event. The auto-migration script now has been changed to match the behavior of the FRSL module for this particular misconfiguration of the FRSL module. (Ticket #118353)
- Change: For new REDCap installations, the global setting "Minimum number of data points required to display Smart Charts, Smart Tables, or Smart Functions" has been changed from "11" to "5" since the previous default value was regarded as too conservative by many. For existing installations, this value can easily be changed on the User Settings page in the Control Center and additionally can be overridden for any project via the Edit A Project's Settings page.
- Bug fix: When displaying Smart Charts on a public Project Dashboard, in which the chart is grouped via a secondary field, in some specific cases where data is missing for the first field in the chart but not for the grouping field, the chart might mistakenly get displayed (instead of displaying the message "[INSUFFICIENT AMOUNT OF DATA FOR DISPLAY]") even when it does not meet the minimum data point criteria. (Ticket #119348)
- Bug fix: Custom Data Quality rules whose logic utilizes fields from repeating instruments might mistakenly return results that are duplicates or not relevant, such as displaying the base/non-repeating instance when all the fields in the logic exist on a repeating instrument. (Ticket #72996)

- Change: Although REDCap sets the cookie "samesite" attribute to "Lax" by default, the "samesite" attribute can be overridden by adding the following line of code in the REDCap [database.php](#) file on the web server: `$GLOBALS['cookie_samesite'] = "None"; //`
Possible values: "None", "Lax", or "Strict".
- Bug fix: After a participant clicks the "Save & Return Later" button on a survey and then attempts to send themselves the survey link for returning, the resulting confirmation dialog titled "Email sent!" would mistakenly have the word "undefined" inside the dialog rather than the correct stock language text "The email was successfully sent to:". (Ticket #119438)
- Bug fix: Various JavaScript-driven messages displayed on data entry forms and survey pages would mistakenly display "undefined" instead of the correct text.
- Bug fix: REDCap now automatically sets `mysqli_report` to OFF for better compatibility with PHP 8.1, which defaults this setting to `MYSQLI_REPORT_ERROR | MYSQLI_REPORT_STRICT`. Without setting this, PHP might fail with a fatal error whenever a query to MySQL fails, but this only occurs for certain configurations of PHP 8.1.
- Bug fix: Typo in Shibboleth authentication settings in the Control Center.
- Bug fix: When using OAuth2 Azure AD Authentication, the usernames set on the Security & Authentication page for Primary Admin and Secondary Admin were case-sensitive. They are now case-insensitive so that the admin usernames can be entered in any case and will still work.
- Bug fix: When using certain versions of MySQL or MariaDB, the Easy Upgrade or Automatic Upgrade features might mistakenly not be allowed, in which REDCap might think that the REDCap MySQL user does not have "DROP" privileges for the database. (Ticket #119577)
- Bug fix: If records are named a specific way in a project, they might appear out of order when displayed in certain contexts, such as if the record list spans multiple pages on the Record Status Dashboard. (Ticket #119189b)
- Bug fix: When uploading an allocation file on the Randomization page, it might mistakenly allow the user to upload multiple allocation files while on the same page. This should not be allowed. (Ticket #119640)
- Bug fix: When using the Multi-language Management feature to translate the choice labels of Yes/No and True/False fields, those choice labels would mistakenly not appear translated in downloaded PDFs of an instrument (both with and without data).
- Bug fix: If a "<>" operator is used in a field's Field Annotation/Action Tags, then the operator would mistakenly not be displayed in the Codebook. (Ticket #119705)
- Bug fix: In situations where slider fields should be disabled on a data entry form (e.g., user has read-only Data Viewing Rights for the instrument), sliders could mistakenly become editable on the page if clicked. Note: Since the user cannot submit the page in this situation, it does not affect data, but can be confusing. (Ticket #119760)
- Bug fix: When utilizing [aggregate-X] Smart Variables in a calculated field or @CALCTEXT field, if the user is entering data on a form or survey, the calculation might mistakenly not get updated if fields used inside the [aggregate-X] Smart Variable exist on a different instrument or event. However, the calc/@CALCTEXT field would get correctly updated when running Data Quality rule H or when performing a data import.
- Bug fix: An error message would mistakenly be displayed when attempting to pipe a field variable into the "Redirect to a URL" textbox on the Survey Settings page.

- Change: Added user's REDCap username to the email subject for REDCap Messenger email notifications to help distinguish them if the same primary email address is used for multiple users.
- Bug fix: The cron job that sends email notifications for REDCap Messenger might mistakenly send multiple emails repeatedly to users. (This is an additional fix to the same bug fix from one month ago.)
- Bug fix: When using the Data Resolution Workflow, the DRW dialog would mistakenly not allow the user to reassign the data query to another user if the data query had been opened immediately after the field's data value had been "Verified". (Ticket #119758)

Version 12.0.6

- Change/improvement: New CDIS setting - "Identity provider (optional)" - If specified on the Clinical Data Interoperability Services page in the Control Center, the identity provider will be used in the OAuth2 authorization process to identify the server that will exchange the FHIR access token with REDCap. This setting should only be set if the real FHIR base URL of the EHR system is different from the one specified on this page (e.g., the EHR system is behind a proxy).
- Bug fix: If database table structure issues exist, in which REDCap provides the SQL to fix the issue, the generated SQL might fail when executed on some versions of MySQL/MariaDB if the SQL contains queries to drop Primary Keys that are being used as Foreign Keys in other tables. The generated SQL now includes queries to drop the Foreign Key before dropping the Primary Key, and then also the SQL to re-add the Foreign Key after fixing the Primary Key.
- Bug fix: When using Clinical Data Pull or Clinical Data Mart and utilizing the "Break the Glass" feature, an authentication error might occur when attempting to use one's credentials to break the glass of a patient record, specifically when using LDAP authentication.
- Bug fix: When using the ":value" modifier when piping a field value while also referencing the unique event name and an X-instance Smart Variable (e.g., [c_hmcdarc_visit_re_arm_1][cog_behav_status:value][last-instance]), the label of the multiple choice field option mistakenly might get piped instead of the value of the selected choice. (Ticket #119879)
- Bug fix: Depending on the naming conventions of the records in the project, the records in the record drop-down list on the "Add/Edit Records" page might appear slightly out of order if Record Auto-Numbering was enabled after non-numerical record names had already been created in the project.
- Bug fix: The @RICHTEXT action tag would mistakenly not work on survey pages. (Ticket #119996)
- Bug fix: When making a call to REDCap::saveData() or to the "Import Records" API method to import record data for records that have been assigned to a Data Access Group, if the data being imported is for a longitudinal event that currently has no data for the record, then the project's Logging page might mistakenly denote the record as being created during the import process, despite the fact that the record already exists and has data in other events. In some

very rare cases, this might additionally cause the record to get unassigned from its current DAG with no logging to indicate that this happened.

- Bug fix: Fields with the @CALCDATE or @CALCTEXT action tags could mistakenly be chosen as the Secondary Unique Field in the project, although this should not be allowed because it could cause the field not to perform its calculation correctly, especially if the field exists on a repeating instrument/event. As calc fields have never been allowed for use as the Secondary Unique Field, neither should @CALCDATE or @CALCTEXT fields. (Ticket #119773)
- Bug fix: Fields with the @CALCTEXT action tag might mistakenly (in specific situations) return an incorrect result if values with leading zeros are utilized in the equation, in which the value "007" would be returned as "7". This would mostly occur when evaluating radio or drop-down fields that have leading zeros for one or more choice codes but do not have any choice codes that contain letters. (Ticket #120024)

Version 12.0.7

- **Security improvement:** Any third-party (i.e., external service) API keys/secrets that are currently stored in the redcap_config database table via a System Configuration page in the Control Center (e.g., AWS S3 secret key, Twilio Auth Token for two-factor authentication) will now have its value stored in encrypted format in the redcap_config table instead of being stored as plain text. This will occur automatically and transparently after upgrading. This will prevent anyone from obtaining these keys/secrets if they view the contents of the redcap_config table.
- **Minor security fix:** Updated "Axios" third party JavaScript package due to reported vulnerabilities.
- Change: The dialog that is displayed when editing a field's branching logic in the Online Designer, in which one or more fields have the exact same branching logic as the current field, contains different text to better explain what clicking "Yes" will do.
- Bug fix: When using specific configurations of the Survey Queue while running a specific PHP version on the REDCap web server (PHP 8.0 or 8.1?), it might cause the survey page to suddenly crash with a fatal PHP error after completing a survey. (Ticket #120211)
- Bug fix: A calculation error would occur (displaying the error popup) on a survey page or data entry form if the @CALCDATE action tag is used on an MDY or DMY formatted date or datetime field, in which the first parameter of @CALCDATE contains an if() function where the first field used inside the if() is not a date or datetime field. (Ticket #119510)
- Bug fix: When an Ad Hoc calendar event is viewed in the calendar popup in a longitudinal project, it would mistakenly display the instruments designated for the first event in the Data Entry Forms list inside the calendar popup. Ad Hoc events should not display any forms in the calendar popup. (Ticket #120224)
- Updates and various fixes for the External Module Framework, such as the following: Fixed multiple issues with survey & NOAUTH CSRF protection, Added support for hidden subsettings, Improved log display performance, and Added project IDs to error emails.
- Bug fix: [scatter-plot] Smart Charts might not display their x-axis in correct numeric order for slider fields or some other fields with numeric data. Additionally, for this same situation [line-

chart] Smart Charts might mistakenly display their x-axis as a categorical-type display rather than a linear-type display. (Ticket #120214)

Version 12.1.0

- **Medium security fix:** A Cross-site Scripting (XSS) vulnerability was discovered where a malicious user could potentially exploit it by inserting HTML tags and/or JavaScript event attributes in a very specific way as user-defined text in various places.
- **Minor security fix:** If a field contains integer values (e.g., Textbox, Radio, Drop-down) for a record, and then the field is changed to be a File Upload field, viewing a data entry form or a report that contains that field might (depending on the pre-existing integer value of the field) mistakenly expose the filename of files that have been uploaded to other File Upload fields, including possibly those from other projects. Users are not able to download these uploaded files or view their contents, but can view the filename of the file on a data entry form or a report.
- **Minor security fix:** A Blind SQL Injection vulnerability was found on the Cron Jobs page in the Control Center, in which a malicious user could potentially exploit it by manipulating an HTTP request on that page.
- **Minor security fix:** A Cross-site Scripting (XSS) vulnerability was discovered where a malicious user could potentially exploit it by inserting HTML tags and/or JavaScript event attributes in a very specific way into the URL on the API Tokens page in the Control Center and also on the API page in a project.
- **Major bug fix:** In a longitudinal project with Data Access Groups, importing data via the "Import Records" API method for an existing record that is assigned to a DAG, in which the API parameters `format="json"` and `overwriteBehavior="overwrite"` are used, if the JSON data being imported contains a non-blank value for the `"redcap_data_access_group"` field for one event while another event of data (for the same record) does not contain the `"redcap_data_access_group"` field at all in the JSON, REDCap would mistakenly perceive the absent `"redcap_data_access_group"` field as a blank value and thus would un-assign the record from the DAG (due to the `overwriteBehavior="overwrite"` parameter being used). When this occurs, the DAG unassignment event would also not get logged on the project Logging page.
 - Change: When using the Auto-adjudication feature in a Clinical Data Pull (CDP) project, in which it has been set to notify the user via REDCap Messenger whenever a record has been auto-adjudicated by the system, REDCap now automatically deletes all previous auto-adjudication Messenger threads for this project for the user. In previous versions, the user might receive thousands of Messenger notifications, which could cause REDCap itself to become sluggish for the user. Now it only keeps the latest notification for the user.
 - Various updates and changes to the External Module Framework, including a slight change to the EM link on the left-hand project menu (i.e., the "External Modules" link was replaced with "Manage" further down the project menu).
 - Change: In the database backend, the `"redcap_log_view"` database table will be renamed to `"redcap_log_view_old"`, and an empty replacement table (named `"redcap_log_view"`) will be created in its place. The old table and its contents will no longer be used in the application except for very specific, seldom-used functionality (e.g., viewing Page View events on a

project's Logging page). The new table will have a slightly different structure, such as a BIGINT primary key (instead of INT) and better/more indexes to improve query performance for the table. The retiring/renaming of the old table should not have any effect on plugin/hook/module developers unless you are performing direct queries on the "redcap_log_view" table to pull information from months or years in the past, in which case you would want to also query the "redcap_log_view_old" for such information. Note: During the upgrade process, the last 30 minutes worth of activity from redcap_log_view will be automatically transferred to the new table in order to maintain continuity within the application for before and after the upgrade, especially if the system is not taken offline during the upgrade.

- Bug fix: Drop-down fields using the auto-complete option would cause the webpage to be slow/laggy when typing a value into the field's textbox or when clicking the down-arrow button for the field to view the full list of choices if the field has hundreds or thousands of choices defined. This slowness was due to the auto-complete feature not being set up correctly in the underlying JavaScript. Note: Clicking the down-arrow button for an auto-complete drop-down with 1000+ choices when the field has no value will now display a notice next to the field that the full list of choices cannot be displayed and instead encourages the user to type a value to search all options.
- Bug fix: When referencing a Smart Variable inside conditional logic (e.g., Data Quality rules, ASI logic) in which the Smart Variable is appended with a colon+parameter while also being prepended with a unique event name (e.g., [event_1_arm_1][survey-date-completed:form_1]), the logic might fail to be successfully evaluated. This could cause Data Quality rules to throw an error or could cause survey invitations for ASIs not to get sent in specific cases. (Ticket #120543)
- Bug fix: When a multi-page survey contains required fields that exist on pages after page 1, in some specific scenarios it might mistakenly display the "Some fields are required!" prompt for fields on later pages after submitting the first page. Note: The participant would still be allowed to continue to the next page after the initial submission of page 1. (Ticket #120518)

Version 12.1.1

- **Major bug fix:** The new "Time (HH:MM:SS)" field validation might not have been stored correctly (and thus would not work successfully) if you previously upgraded to REDCap 12.1.0.
- **Major bug fix:** Some installations (depending on MySQL/MariaDB version) might mistakenly have a database structure issue involving the table "redcap_log_view_requests" after upgrading to REDCap 12.1.0. (Ticket #120622)
- Bug fix: The field drop-down for the "Designate a Secondary Unique Field" setting in the "Additional Customizations" popup on the Project Setup page would mistakenly not include some Textbox fields (notably those with no Action Tags or Field Annotation).
- Bug fix: When using Smart Variables that utilize the parameters ":fields" or ":instrument" in a calculated field or @CALCTEXT field, if the user is entering data on a form or survey, the calculation might mistakenly not get updated if fields used inside the Smart Variable exist on a different instrument or event.

- Bug fix: For certain server configurations, the REDCap cron job might mistakenly crash due to a floating point precision issue when creating a timestamp. This occurrence is fairly rare. (Ticket #120688)
- Bug fix: When using certain Smart Variables inside a calculation or @CALCTEXT field, a calculation error message might mistakenly appear on the data entry form or survey page and thus would prevent calculations from occurring on that page. (Ticket #120660)
- Bug fix: When a report contains data from a repeating instrument and/or repeating event, in which the report's checkbox setting "Include the repeating instance fields (redcap_repeat_instrument, redcap_repeat_instance) in the report and data export?" is not checked, viewing the Stats & Charts page for the report would display the charts and tables correctly unless a user selects a Live Filter for the report, in which it would mistakenly cause all/most tables and charts not to display at all on the page. (Ticket #120408)

Version 12.1.2

- Bug fix: A project dashboard with custom access settings might mistakenly not be accessible to administrators using the "View project as user" feature.
- Bug fix: When creating or editing a Project Dashboard that has been set as "public", the option to create a custom public link would mistakenly not be displayed on the page (assuming that the URL Shortening Service is enabled at the system level).
- Bug fix: When creating or editing a report that has been set as "public", the option to create a custom public link would mistakenly not be displayed on the page (assuming that the URL Shortening Service is enabled at the system level).
- Bug fix: If using the @CALCTEXT action tag on a datetime field, in which the [survey-time-completed] Smart Variable is referenced inside @CALCTEXT(), the resulting value might cause the calculation error popup to display on a survey or data entry form, and the value might not save correctly on the form/survey, via data import, or via running Data Quality rule H. This issue occurs mostly when using field validation with formatting H:M (rather than H:M:S) and also with formatting MDY or DMY (rather than YMD).
- Bug fix: If a date or datetime field was using the @HIDEBUTTON action tag, the date format label (e.g., "M-D-Y") would mistakenly not be displayed on the right.
- Bug fix: The Concurrent Users chart on the Activity Graphs page in the Control Center would mistakenly not display all past data in the chart. (Ticket #120921)
- Bug fix: PHP error occurs for PHP 8.0 or 8.1 when downloading Automated Survey Invitations as a CSV file in the Online Designer. (Ticket #120965)
- Bug fix: When piping data on an instrument for a field from another instrument while also using the Multi-language Management feature for the current instrument, the piped value might mistakenly not display on the page.
- Bug fix: When performing calculations for a @CALCTEXT field (whether on a data entry form, survey page, data import, or Data Quality rule H), some dynamically-created regular expressions in PHP that search for other calculated fields or @CALCTEXT fields that are used within the original @CALCTEXT field might cause an overload due to the regular expression being too long, thus possibly resulting in not accurately determining dependent fields used inside the

@CALCTEXT field's equation. This means that some @CALCTEXT fields might possibly not get their value updated successfully.

- Bug fix: Some long-running reports might mistakenly return the error message "An unknown error has caused the REDCap page to halt..." in specific edge cases.
- Bug fix: If an alert has an [aggregate-X] Smart Variable piped into the alert's email body, it might cause the cron job to crash when attempting to send the alert. (Ticket #120561)

Version 12.2.0

- Improvement/change: To improve server performance, Descriptive Text fields that have image attachments will have their images loaded on the page incrementally with a slight delay between each to prevent the web server from getting overloaded with many simultaneous requests when the data entry form or survey page initially loads.
- Bug fix: If a file is being imported via API for a File Upload field, in which the field's instrument is a repeating instrument, then it might make the instrument inaccessible in the user interface (e.g., Record Home Page, Record Status Dashboard) if no other field on the instrument contains any data for that instance. (Ticket #120354)
- Bug fix: Issues might occur (e.g., blank white page) when installing REDCap on PHP 8.1 due to the setting "mysqli_report", which defaults to "MYSQLI_REPORT_ERROR | MYSQLI_REPORT_STRICT" in that version. This will also require replacing the [redcap_connect.php](#) non-versioned file on the REDCap web server.
- Bug fix: When attempting to send a File Upload field's file via Send-It from a data entry form, the popup window would display a blank page if using PHP 8.0 or higher. (Ticket #121163)
- Bug fix: Remediated PHP 8.X-specific errors that occur when users alter URLs in unexpected ways.
- Bug fix: The mouseover text displayed when hovering over the "Members: Everyone" text in the General Notifications channel in REDCap Messenger would mistakenly display the wrong text. (Ticket #121312)
- Bug fix: When performing calculations for a @CALCTEXT field (whether on a data entry form, survey page, data import, or Data Quality rule H), some dynamically-created regular expressions in PHP that search for other calculated fields or @CALCTEXT fields that are used within the original @CALCTEXT field might cause an overload due to the regular expression being too long, thus possibly resulting in not accurately determining dependent fields used inside the @CALCTEXT field's equation. This means that some @CALCTEXT fields might possibly not get their value updated successfully. (NOTE: This is a very similar but slightly different fix for the bug fix with the same description in the previous version.)
- Bug fix: When using the Auto-Archiver or e-Consent Framework on a survey while also setting the Stop Action survey option to "Do not save the survey response", when a participant triggers a stop action on the survey, it would mistakenly display the error message "X is not an existing record in this project!" at the bottom of the page. (Ticket #121166)
- Bug fix: When an administrator is approving a To-Do List request to make a user's report "public", after clicking the "Click here" link to view the report while inside the approval dialog, it would cause the dialog to flash and then go white, thus preventing the admin from approving the

request (unless they went into the project manually and viewed that report before returning to the To-Do List request). (Ticket #120893)

- Bug fix: Small change to text in the Two-Factor Authentication settings on the "Security & Authentication" page to improve clarity of the option IP Exception setting used for 2FA.
- Bug fix: When loading the Participant List inside the "Compose Survey Invitations" popup, it would mistakenly take an unnecessarily large amount of time to load a list of thousands or more participants for certain surveys.
- Bug fix: If using WebDAV as the File Storage Method for the following system-level settings 1) 'File Upload' field enhancement: Password verification & automatic external file storage, 2) Record-level Locking Enhancement: PDF confirmation & automatic external file storage, or 3) e-Consent Framework: PDF External Storage Settings (for all projects), these features may no longer be storing files successfully to the external server. A new "authentication type" setting for WebDAV only has been added to all 3 settings on the "Modules/Services Configuration" page in the Control Center to allow an administrator to set the WebDAV authentication as "Basic", "NTLM", or "Digest" (depending on the local configuration of the WebDAV server being used). Setting the WebDAV authentication type appropriately for each of the 3 settings (if being utilized) should fix this issue.
- Bug fix: The Google OAuth2 authentication would fail to work in PHP 8.0 and 8.1, thus resulting in a fatal PHP error when attempting to log in. (Ticket #121050)
- Bug fix: For some projects, the Multi-language Management page might get stuck during its initialization, thus preventing users from using it. (Ticket #118463)
- Bug fix: In some situations when clicking the table headers of the Participant List table, all cells in the Participant Identifier column that were previously editable would mistakenly become no longer editable.
- Bug fix: The Multi-Language Management feature would mistakenly not say that "100%" of all translatable phrases/words were translated, even though they were. (Ticket #121497)
- Bug fix: When using the Multi-language Management feature, some embedded multiple choice fields might mistakenly not appear in the expected translated language on a data entry form or survey page. (Ticket #121557)

Version 12.2.1

- **Minor security fix:** A Cross-site Scripting (XSS) vulnerability was discovered where a malicious user could potentially exploit it by inserting HTML tags and/or JavaScript event attributes in a very specific way for certain features of REDCap Messenger.
- **Minor security fix:** A Cross-site Scripting (XSS) vulnerability was discovered where a malicious user could potentially exploit it by inserting HTML tags and/or JavaScript event attributes in a very specific way into the title of a project.
 - Change/improvement: The Configuration Check page will now provide a new recommendation to increase the "max_allowed_packet" setting in MySQL if it has a value below 16 MB. Having a lower value for that setting could cause some large data exports or reports to fail to load.

- Bug fix: Some of the example R code in the API Playground mistakenly referenced a function named "fileUpload()" when it should instead be "upload_file()". (Ticket #101454b)
- Bug fix: Data Quality rule E was mistakenly using the median and not the mean for the field when determining if the value was an outlier (e.g., two standard deviations from the mean). (Ticket #121704)
- Bug fix: Some password-related configuration settings for Table-based authentication might mistakenly contain trailing spaces in their value, thus possibly preventing the settings from working as expected. (Ticket #121716)
- Bug fix: The REDCap cron job might crash unexpectedly when attempting to send an Alert containing a [survey-link] Smart Variable when the project does not have any surveys enabled. This only occurs in PHP 8.0 and 8.1. (Ticket #121644)
- Bug fix: For date-validated Textbox fields that utilize the @FORCE-MINMAX action tag with "today" as the min or max range value, it might be possible to bypass the min/max range check if users/participants use the datepicker widget a specific way, such as clicking the calendar icon to open the datepicker but then click on another part of the page.
- Bug fix: Image attachments on Descriptive Text fields would mistakenly not display inline on the page when viewing them in the Online Designer. Bug emerged in REDCap 12.2.0.
- Change: For automated survey invitations and alerts that are using the date/datetime field option that determines the timing of when the invitation/alert should be sent, some extra clarifying text has been added to the popup/popover instructions that explains that modifying the value of the date/datetime field will have no effect on invitations/alerts that have already been scheduled.
- Bug fix: Survey Queue settings in the "Set Up Survey Queue" popup would mistakenly not get saved for a survey that is currently set to "offline" status. (Ticket #121668)
- Bug fix: When a user assigned to a Data Access Group is using the Data Resolution Workflow, the Resolution Metrics page would mistakenly display the "Average time for query response (by user in days)" chart when instead it should only display the chart for users who do not belong to a DAG. (Ticket #121527)
- Bug fix: When an alert or an automated survey invitation has conditional logic that contains datediff+today/now, in which Smart Variables are used in the logic but no real field variables are used, the alert/ASI would mistakenly fail to be scheduled/sent by the datediff+today/now cron jobs that run every 4 hours. (Ticket #121276)

Version 12.2.2

- **Minor security fix:** A Cross-site Scripting (XSS) vulnerability was discovered where a malicious user could potentially exploit it by inserting HTML tags and/or JavaScript event attributes in a very specific way into the values of Text Box and Notes Box fields that are piped somewhere else on the same page as where the field exists. This does not occur if they are piped into a different instrument, different event, or elsewhere in the project.
- Bug fix: A field's question text on a survey page might mistakenly not get recognized by certain screen reading software, especially if the survey has the "enhanced radio buttons and checkboxes" setting enabled. (Ticket #121765)

- Bug fix: When attempting to upload a data dictionary with calculated fields or @CALCTEXT fields that contain Smart Variables inside their calculation, REDCap might mistakenly return an error message saying that the Smart Variables are not real variables, thus preventing the user from uploading the data dictionary.
- Bug fix: In some edge cases when viewing the user table on the User Rights page, a user might mistakenly not have Data Export Rights for any instruments prior to modifying their privileges. In this case, it will simply revert them to having No Access export rights.
- Bug fix: Too many Google services were mistakenly included during the recent bundling of the Google PHP API Client Services library, thus causing REDCap's resulting code to bloat unnecessary by an extra 15,000 files.
- Bug fix: The contents of the email sent to a participant after clicking the "Save & Return Later" option in a survey were mistakenly not translatable via the Multi-language Management feature.
- Bug fix: When adding a field to a project in production while in draft mode, an incorrect error message is displayed if the field is being added below a section header. (Ticket #122044)
- Bug fix: A fatal PHP error might be thrown in very specific instances when using PHP 8.0+. (Ticket #122182)
- Bug fix: Users that have "No Access" data export rights for a given instrument would mistakenly not be able to download a PDF with no data for that instrument either on the Online Designer or at the top of a data entry form when viewing the instrument.
- Bug fix: A fatal PHP error may occur on the Online Designer page for PHP 8.0+ in certain situations. (Ticket #122108)
- Bug fix: The table displaying user privileges on the User Rights page might mistakenly display incorrect counts under "Data Export Rights" and "Data Viewing Rights" due to some instruments having been deleted or orphaned.
- Bug fix: Resolved some potential upgrade issues occurring with SQL queries failing in some particular situations when upgrading to REDCap 11.2.0 or higher. (Ticket #121952)
- Bug fix: When a project has record auto-numbering enabled, and a user creates a record, renames it, and then deletes it, the next record to be created would mistakenly not have the same record name as the one deleted (assuming no other records had been created during the interim). It is assumed that the next record would have the same name as the deleted one. (Ticket #122090)
- Bug fix: When piping the value of a MDY or DMY formatted date or datetime field into the min or max validation range attribute of another date or datetime field, in which the field being piped exists on a different instrument or event, the out-of-range error message would fail to display to the user when the value is out of range and would thus result in a JavaScript error. (Ticket #121964)
- Bug fix: When adding hyperlinks into a field label, survey instructions, etc., in which the hyperlink URL contains "on" and also "=" somewhere inside it, the URL might mistakenly get mangled when output on the page in which "onXXXXX=" will be replaced with the word "replaced=". (Ticket #121691)
- Bug fix: For date-validated Textbox fields that utilize the @FORCE-MINMAX action tag with "today" as the min or max range value, it might be possible to bypass the min/max range check

if users/participants use the datepicker widget a specific way, such as clicking the calendar icon to open the datepicker but then click the submit button on the page.

- Bug fix: When uploaded files are being copied on the server (e.g., when copying a project containing Descriptive Text fields with file attachments), if the file somehow can't be found or accessed on the server, it would throw a fatal PHP error in PHP 8.0+. (Ticket #122496)
- Bug fix: When required fields are left empty on a data entry form that is submitted, thus displaying the required fields popup, and then the page is refreshed, it would mistakenly keep displaying the required fields popup to the user even when the required fields might have been given values in the interim. (Ticket #122480)
- Bug fix: When using [survey-date-completed] or similar Smart Variables inside the conditional logic for Automated Survey Invitations, it might cause the page to crash when submitting a survey or data entry form, resulting in a fatal PHP error. (Ticket #122473)
- Bug fix: If an instrument is exported as a PDF with data, in which the instrument contains slider fields that display the slider value next to it, the slider's value displayed in the box next to the field in the PDF would mistakenly always be normalized to be between 0 and 100, rather than displaying the literal value as-is. (Ticket #122035)
- Bug fix: Data Quality rule F might mistakenly return false positives for fields that exist on repeating instruments in a longitudinal project, especially when the field's instrument is also utilized as a non-repeating instrument in another event. (Ticket #121343)
- Bug fix: When running PHP 8.0+, the Stats & Charts page might fail with a fatal PHP error if number/integer fields somehow contain non-numeric values. (Ticket #122604)
- Bug fix: When upgrading to REDCap 11.4.1 or higher, the SQL upgrade script might mistakenly crash with an error on a certain query. (Ticket #122565)
- Bug fix: When using Multi-Language Management and translating a survey that has Stop Actions, the User Interface text for the title of the Stop Action popup (i.e., "End the survey?") would mistakenly not appear in its translated form. (Ticket #122644)
- Bug fix: When importing the JSON or CSV language file for Multi-Language Management, labels might mistakenly not get updated to their translated form for option choices for some multiple choice fields. (Ticket #122636)
- Bug fix: Some text was changed in the Tableau section of the "Other Export Options" tab on the "Data Exports, Reports, and Stats" page because it could be confusing to users if certain institutions have special licensing and/or policy with regard to the installation of Tableau. (Ticket #122618)
- Bug fix: If a user is assigned to a Data Access Group, the "Select a previously sent email" drop-down list in the "Compose Survey Invitations" popup on the Participant List page would mistakenly not filter out previously-sent emails pertaining to records that belong to other DAGs. (Ticket #122495)
- Bug fix: If more than 500 instances of the @IF action tag are used for a field, whether nested or used in parallel, all the @IFs listed after the 500th @IF would mistakenly not get processed, thus causing the @IFs not to function correctly on the field.
- Bug fix: The "Break the Glass" feature in Clinical Data Pull (CDP) was mistakenly not able to perform a successful login for the user, thus was not able to break the glass for a record.

- Bug fix: When creating a new project using a Project XML file with an API super token, in some particular use cases depending on the exact setup of the project and its data, the API request might mistakenly crash or might not complete the process if any record data exists inside the Project XML file. (Ticket #121579)
- Bug fix: Clicking a slider field to initialize it would mistakenly not immediately trigger its value to be piped if the slider is piped elsewhere on the same page. It would only pipe if the slider's value was modified after its initialization. (Ticket #122704)
- Bug fix: A warning message would mistakenly be returned when attempting to upload a data dictionary containing checkboxes with a dot/period in a checkbox choice coded value, in which that checkbox choice was being referenced in a calculation or branching logic. Notes: Dots/periods are allowed in a checkbox choice code. (Ticket #122581)
- Bug fix: When uploading a file for a File Upload field via the API Import File method, the resulting logged event on the project logging page would only display the field name when it should instead display the field_name and back-end edoc ID value for the file in the logged event description. This was changed because it was inconsistent with the logging produced when uploading a file via the user interface. (Ticket #122272)
- Bug fix: Text Box fields with the @SETVALUE action tag would always display the red bar on the side of the field (regardless of the value) when instead the red bar should only be displayed when the saved value is different from the displayed value.

Version 12.2.3

- **Minor security fix:** A vulnerability was discovered where malicious user could potentially exploit it by manipulating an HTTP request for the project Calendar page popup, in which some minimal amount of data from the calendar event could be exposed to a REDCap user for a project to which they do not have access.
 - Change/improvement: Two new LOINC codes added to CDIS mapping.
 - Various fixes and improvements for the External Module Framework.
 - Bug fix: A new system-level configuration setting was added to the User Settings page in the Control Center to allow admins to select the default instrument-level user access that gets set for all project users' Data Viewing Rights and Data Export Rights whenever a new instrument is created while in production status. The available options are "No Access" (default) and "View & Edit/Full Data Set". Many administrators have noted that the sudden change in REDCap 11.3.0 for default instrument-level user access for new instruments while in production has caused quite a lot of confusion for users and has thus greatly increased the support workload of administrators. Despite being a new system-level option, this is considered a bug fix because it serves to restore continuity with previous versions by allowing admins (if desired) to revert the behavior back to the way it behaved in pre-11.3.0 versions. (Ticket #120976)
 - Bug fix: Fixed some inaccurate instructional text at the top of the "Help & FAQ" page.
 - Bug fix: When processing REDCap logic, in some specific instances with specific logic, which may also be dependent upon PHP version, a fatal PHP error might occur and might crash the page. (Ticket #122418)

- Bug fix: When using Multi-Languagement Management and defining a Fallback language that is different from the Default language, any User Interface text on a survey page or data entry form might mistakenly be displayed in the Fallback language when the Default language has been selected as the display language.
- Bug fix: If an external module utilizes the "redcap_pdf" hook while the system-level "redcap_pdf" hook (in the hook functions file) is also being utilized to perform custom tasks on the server, the results returned from the EM PDF hook would mistakenly not get utilized downstream. (Ticket #122775)
- Various fixes and improvements for Clinical Data Interoperability Services, including the following:
 - Improved logs for all FHIR interactions with the EHR system.
 - Better error messages for all CDIS apps.
 - Mapping helper link in the CDIS panel (only for users allowed to use it).
- Bug fix: The datepicker widgets used for the time window search on the Email Logging page in a project would mistakenly not stay visible in certain cases when trying to use them. (Ticket #122811)
- Bug fix: The URL for the example Login Page logo used on the REDCap Install page mistakenly pointed to a non-existent image/URL.
- Bug fix: When attempting to send outgoing emails (e.g., survey invitations, alerts), if the email subject is left empty, it might prevent the email from sending successfully.
- Bug fix: In certain situations with longitudinal projects, the Form Display Logic might mistakenly not function correctly to enable/disable the right instruments. (Ticket #122974)
- Bug fix: When creating a longitudinal project via a Project XML file, the form-event mapping might mistakenly not get saved during the project creation process.
- Bug fix: When exporting and then importing a Project XML file to create a new project that has some Form Display Logic defined, if the project is longitudinal and has some Form Display Logic conditions that references an instrument on "[All Events]", those Form Display Logic conditions might mistakenly not get saved during the project creation process.
- Bug fix: When viewing the table of user privileges on the User Rights page, the Data Viewing Rights column would mistakenly display "Hidden (No Access)" for any users that have "View & Edit" rights along with the "Edit survey responses" checkbox checked for one or more instruments. If the "Edit survey responses" checkbox is not checked, it would correctly display "View & Edit" in the table.
- Bug fix: When editing an existing report that has fields selected via the drop-down lists in Step 3 (Filters), then the user clicks the "Use advanced logic" link, then the user clicks the "Use simple logic (choose fields from list)" link, then if they select a field in the first filter field drop-down (which has no field selected), it would mistakenly not display a new field/row immediately below that row. Thus, the user is not able to add more than one filter field for the report in this scenario unless they save the report and reload it to edit it again. (Ticket #18065)

- **Major bug fix:** When using Multi-Language Management, system-provided languages could not be successfully imported and/or might cause issues downstream, such as displaying all User Interface items mistakenly in the "Review Changed Items" dialog.
- Bug fix: In some specific scenarios when using PHP 8.0 or 8.1 with some longitudinal project, the Online Designer might mistakenly crash with a fatal PHP error. (Ticket #123103)
- Bug fix: When piping field variables into the value of a @PLACEHOLDER action tag, if the Multi-Language Management feature is enabled on that particular instrument, some HTML tags might mistakenly appear inside the placeholder text for that field.
- Bug fix: When using Multi-Language Management and changing an enumerated value (e.g., choices, Action Tags), the "reference change tracker" was wrongly highlighting some items on the page.
- Bug fix: When a Secondary Unique Field is designated in a project while its two display-related checkbox sub-options are left unchecked, then when viewing a data entry form for an instrument that was completed via survey (as opposed to via data entry form), the value and/or label of the SUF would mistakenly be displayed at the top of the data entry form. (Ticket #123127)

Version 12.2.5

- Change: Minor updates to CDIS-related settings: 1) Updated the text of the automatic message sent to the user via REDCap Messenger when a CDIS cron job has no FHIR tokens that it can use for a specific project, and 2) When a CDIS automatic message is sent to the user via REDCap Messenger, in order to prevent possibly hundreds or thousands of messages from clogging up the user's Messenger inbox, it now deletes all previous messages of the same type except for the last one.
- Bug fix: In some specific scenarios while using PHP 8.0 or 8.1, the System Statistics page in the Control Center might mistakenly throw a fatal PHP error when making the AJAX request to obtain the web server space usage. (Ticket #123238)
- Bug fix: If some branching logic, conditional logic, or calculations have incorrect syntax in a specific way, depending on the logic/calculation itself, it could result in a fatal PHP error when being processed. (Ticket #123229)
- Bug fix: When using the Smart Variable [stats-table] in the content of an outgoing email (i.e., survey invitation or alert), the table would mistakenly be missing all the styling applied to it when viewed in the REDCap application. (Ticket #123207)
- Bug fix: When using the Smart Variable [stats-table] in the content of an outgoing email (i.e., survey invitation or alert), the "Export table" link that is normally displayed below the table might mistakenly get included in the email body, which might occasionally cause the link to be removed from the email message by the email client or might cause the entire email message to be flagged as spam and therefore not received by the recipient.
- Various fixes and updates for the External Module Framework.
- Bug fix: When multiple choice fields have choice values of "0" and "00", and a record has either choice selected and saved on an instrument, if that instrument is then exported as a PDF with data, both choices would mistakenly appear checked as seen in the PDF. (Ticket #123282)

- Bug fix: When using Twilio telephony services for surveys, U.S. phone numbers having the area code "667" would mistakenly not work for SMS or voice calls unless the number has a "1" prepended to it. (Ticket #123291)
- Bug fix: When using a Custom Record Label that contains Smart Variables but not field variable names, the Custom Record Label would mistakenly not display at all in certain places where the record name is displayed. (Ticket #123187)
- Bug fix: The Multi-Language Management setup page would mistakenly fail to load/display any fields on the instrument-level translation tab if a multiple choice field on the instrument contained zero choices. (Ticket #123371)
- Bug fix: When exporting data via the user interface, API, or REDCap::getData(), depending on the structure of a project, an error might mistakenly be returned due to hitting the PHP memory_limit threshold and thus throwing a fatal PHP error. This was due to REDCap's internal batch process, which is completely transparent to the user, having too large a value for the size of a given batch.
- Bug fix: When the "Filter by records in a DAG" drop-down filter has been selected on the Logging page, and the user then clicks the "Export all pages using current filters" button at the top of the page, the DAG filter would mistakenly not be applied in the resulting CSV export file. (Ticket #123472)
- Bug fix: When a project is being created via a Project XML file, and the Secondary Unique Field in the XML file is a calculated field or a @CALCTEXT field, which are not allowed to be set as the Secondary Unique Field, it would mistakenly set the field as the Secondary Unique Field when creating the project. In this case it will now instead unset the Secondary Unique Field setting for the newly created project. (Ticket #123099)
- Bug fix: The Multi-Language Management feature would mistakenly display Yes/No or True/False field choices as blank labels when viewing a survey page or instrument for a given translated language. (Ticket #123371b)
- Bug fix: When using the Field Finder feature on the Codebook page, some random JSON might mistakenly appear in the search results in certain cases when UTF-8 encoded text is used in field labels.
- Bug fix: Resolved issues where UTF-8 encoded text in field labels gets truncated and displayed in various places throughout REDCap, in which it would sometimes mistakenly display a black-diamond-with-question-mark character at the point of truncation in the label.
- Bug fix: The logged event "Change participant invitation preference" (when using Twilio) would mistakenly not be tied to the record name when filtering the logging results by a specific record. (Ticket #123515)

Version 12.2.6

- **Major bug fix:** When a user is assigned to a Data Access Group and is attempting to import a record whose record name is the same as an existing record that belongs to another DAG, if the "force record auto-numbering" setting is not enabled as an option during the import process, the

user would mistakenly be allowed to import the data with the record name as-is, thus overwriting data to the existing record that does not belong to their DAG. (Ticket #123593)

- Bug fix: When using Multi-Language Management, there are scenarios when a form/survey is set to only a subset of languages (but not including the fallback), in the case of a missing translation, the default language would mistakenly be applied instead of the fallback language.
- Change/bug fix: Performance improvements and improved cron job management for CDIS-related activities, especially the CDP Auto-Adjudication process.
- Bug fix: If the "Email Logging" feature has been disabled at the system level, the Email Logging link on the left-hand project menu would mistakenly still be displayed. (Ticket #123563)
- Bug fix: When Multi-Language Management is enabled for a specific instrument, and a user/participant fails to enter a value for all required fields, the "Some fields are required" popup would mistakenly fail to be displayed on the page after the page is reloaded. (Ticket #123641)
- Bug fix: When using Multi-Language Management, the matrix field floating/stick headers would mistakenly not appear in the desired translated language. (Ticket #123704)
- Bug fix: When a Smart Chart uses a unique report name as a parameter, in which a checkbox field is utilized in the Smart Chart and the report has the checkbox option "Combine checkbox options into single column..." checked, the resulting Smart Chart would not be displayed correctly. (Ticket #123574)
- Bug fix: When viewing the Training Videos page while not logged in to REDCap, the tables and icons on the page would be displayed, but the text on the page would mistakenly appear invisible. (Ticket #123751)
- Various bug fixes for Multi-Language Management.
- Bug fix: A participant could inject some JavaScript code into their browser's console that would allow them to bypass the Required Field check (specifically for drop-down fields only), thus mistakenly allowing them to complete the survey page or complete the whole survey without actually entering a value for such drop-down fields. (Ticket #123585)

Version 12.2.7

- Bug fix: When using Multi-Language Management, the text of field validation errors and their associated names/labels displayed in the error popup would mistakenly not be displayed in the translated language.
- Bug fix: If an administrator is impersonating a user via the "View Project as User" feature, the admin would mistakenly see all Project Bookmarks on the left-hand menu when instead they should only see the Project Bookmarks that the user being impersonated should see. (Ticket #124021)
- Bug fix: Permission-related issues for certain directories on the REDCap web server could lead to fatal PHP errors for some functions throughout REDCap that attempt to list files in specific directories.
- Bug fix: A fatal PHP error might occur in certain situations when a participant is submitting a survey while using PHP 8.0+ on the web server. (Ticket #124146)
- Bug fix: If a user uses the syntax [field:value] in logic or a calculation, even though this is not correct syntax for logic/calcs (because it is implied that only the raw value should ever be used),

it is allowed for compatibility reasons. However, while this syntax works for calculated fields on the same page, it would mistakenly not work for data imports, nor would it work for cross-instrument or cross-event calculations. This syntax will now work in all contexts. (Ticket #124182)

- Bug fix: When clicking a table header to sort the column in a DataTables table on any particular REDCap page, the up/down arrow icon in the column header would mistakenly disappear due to a CSS error. (Ticket #124177)
- Bug fix: If a field has the @HIDDEN, @HIDDEN-FORM, or @HIDDEN-SURVEY action tag, it would fail to hide the field if the field is embedded in another field on the page.
- Bug fix: 18 Laboratory fields and their associated LOINC codes were not originally included on the field mapping page for Clinical Data Pull and Clinical Data Mart.
- Bug fix: Line breaks are mistakenly not preserved in the equation of a calculated field when saving the field via the Online Designer. (Ticket #124341)
- Bug fix: When piping a datetime field into the min/max validation range check for another datetime field, if the fields being used as the min or max exist on the same page, it would mistakenly throw an out-of-range error if the datetime fields are in MDY or DMY format. Note: This issue does not occur for date fields but only for datetime or datetime w/ seconds fields. (Ticket #124222)

Version 12.2.8

- **Minor security fix:** A Cross-site Scripting (XSS) vulnerability was discovered where a malicious user could potentially exploit it by inserting HTML tags and/or JavaScript event attributes in a very specific way into the URL on the API Tokens page in the Control Center and also on the API page in a project.
- **Security improvement:** REDCap now automatically enables HSTS (HTTP Strict Transport Security) headers if the REDCap web server is using SSL. This will help protect against man-in-the-middle attacks such as protocol downgrade attacks and cookie hijacking.
- **Minor security fix:** Updated the Guzzle library due to a security vulnerability reported for that package. (Ticket #125337)
 - Bug fix: Minor issue with Medication data being pulled from the EHR using a CDIS service.
 - Bug fix: When using Twilio for surveys in a project, in which a participant is taking a survey and clicks the "Save & Return Later" button followed by clicking "Send survey link", an error would mistakenly be thrown if the preferred contact mode for the participant was set to SMS_INVITE_WEB (i.e., send the survey link via SMS). The phone number would mistakenly be used instead of a valid email in the "from" property of the email. (Ticket #124472)
 - Bug fix: When using PHP 8.0+ and an API Supertoken is used in the API to retrieve the REDCap version, an error would be thrown. (Ticket #124562)
 - Bug fix: The "RemoveTempAndDeletedFiles" cron job might mistakenly fail in certain cases with a fatal PHP error if using WebDAV as the File Storage method for REDCap. (Ticket #124802)

- Bug fix: When using Multi-Language Management, if the @LANGUAGE-CURRENT-X action tag was used on a drop-down field, branching logic would mistakenly not fire after the value was changed. (Ticket #124748)
- Bug fix: The Survey Queue's UI text would mistakenly not display the translated text when using Multi-Language Management. (Ticket #124855)
- Bug fix: When searching for users on the Browse Project page, typing the letter "b" might mistakenly cause HTML to be displayed in the auto-complete output. (Ticket #124935)
- Bug fix: The @LANGUAGE-SET action tag would mistakenly not get applied when the corresponding survey field is prefilled from a url parameter. (Ticket #124976)
- Bug fix: Using the datepicker widget on a survey page or data entry form might allow users to bypass the field validation on the field if immediately switching to using the datepicker widget on another field on the page. (Ticket #124909)
- Bug fix: In some specific scenarios, such as when symlinks exist in the file system on the REDCap web server, the System Statistics page in the Control Center might mistakenly throw a fatal PHP error or be real slow when making the AJAX request to obtain the web server space usage. (Ticket #124710)
- Bug fix: Apostrophes that occur in the output of Smart Variables like [user-role-label], [user-dag-label], and [record-dag-label] would mistakenly not get escaped and thus cause JavaScript errors to occur when used in calculated fields. (Ticket #125187)
- Bug fix: Fixed typo in @READ-ONLY action tag description.
- Bug fix: Leading/trailing pipe characters "|" in the choice option column of an uploaded data dictionary would mistakenly create empty/null multiple choice options. (Ticket #125166)
- Bug fix: IP addresses in IPv6 format for users would mistakenly get logged as NULL in the redcap_log_view database table. (Ticket #124944)
- Bug fix: When using the @CALCDATE action tag with PHP 8.0+, the correct value may be seen as calculated on the survey page or data entry form, but the value may mistakenly get erased upon saving the page afterward. (Ticket #124619)
- Bug fix: When a field is embedded and is a required field, the field's value might mistakenly not get saved when submitting a survey page or data entry form if the field also has an @HIDDEN action tag.
- Bug fix: When a field contains the @IF action tag and also contains other non-action tag text inside the Field Annotation text, it might cause the @IF action tag not to get interpreted correctly. (Ticket #124974)

Version 12.2.9

- **Medium security fix:** A Cross-site Scripting (XSS) vulnerability was discovered where a malicious user could potentially exploit it by inserting HTML tags and/or JavaScript event attributes in a very specific way as user-defined text in various places. (Ticket #125900)
- **Minor security fix:** A Cross-site Scripting (XSS) vulnerability was discovered where a malicious user could potentially exploit it on the Data Quality page and Data Comparison Tool page by inserting HTML tags and/or JavaScript event attributes into the name of a record. (Ticket #125952)

- Improvement/change: The Multi-Language Management setup page is slightly less restrictive now while in production status. For example, users may now export language configurations while in production even when not in draft mode.
- Improvement/change: If any suspended users have access to a project, the User Rights page will display a button to easily show/hide suspended users on the User Rights page. Initially, all suspended users will be displayed, but if the button is clicked, then all suspended users will remain hidden on the User Rights page of *any* project until the button is clicked again. (Ticket #75652)
- Bug fix: Several actions on the Multi-Language Management setup page were mistakenly not getting logged on the Logging page. (Ticket #125513)
- Bug fix: When using Multi-Language Management, the piping of choices in a drop-down field works inside the same instrument but mistakenly does cross-pipe into different instruments in the same project. (Ticket #125546)
- Bug fix: When using Multi-Language Management, the text for the "Duplicate Value" warning popup was mistakenly not available to be translated. (Ticket #125557)
- Bug fix: When using Twilio telephony services for surveys, U.S. phone numbers having the area code "534" would mistakenly not work for SMS or voice calls unless the number has a "1" prepended to it. (Ticket #125591)
- Bug fix: The API documentation for the "Delete User" method mistakenly had "dags" as a parameter when instead it should have said "users" as the parameter name. (Ticket #125497)
- Bug fix: For full compatibility with all stats packages during a data export, the syntax file for data exports that contain a field with a blank field label will have the field variable name used in place of the field label. (Ticket #125436)
- Bug fix: If the Secondary Unique Field is enabled and also has the @HIDDEN action tag, the AJAX call to check the uniqueness of its value might mistakenly get triggered if the field is the first field on a data entry form. (Ticket #125020)
- Bug fix: If Twilio is enabled at the system-level, the phone number fields would mistakenly not be displayed on a user's Profile page unless Two-Factor authentication was enabled on the system. Even when not using Two-Factor, it will now display the phone number fields on the Profile page when Twilio is enabled in order to allow users to use their account-associated phone numbers for outgoing Alerts & Notifications via Twilio. (Ticket #124440)
- Bug fix: An HTTP 500 error might occur in some cases when using PHP 8.1 if the database connection fails to the REDCap database server. This requires a replacement of the non-versioned file "[redcap_connect.php](#)".
- Bug fix: When a user clicks the "Erase all data" button or if deleting all records while moving the project to production, the log entries listed on the Email Logging page would mistakenly not be deleted during this process. It now properly deletes all items on the Email Logging page in both of these cases. (Ticket #125656)
- Bug fix: Some contexts that employ a user rights check might mistakenly throw a fatal PHP error in some specific cases when using PHP 8.0 or 8.1. (Ticket #125914, #125923)
- Bug fix: If a user selects a record from the drop-down list on the Logging page to filter by record, it might mistakenly display non-record related events on the page, such as events related to creating/editing/deleting user roles in the project. (Ticket #124825)

- Bug fix: If a calc or @CALCTEXT field on a non-repeating instrument has a cross-form calculation that utilizes a calc/@CALCTEXT field from a repeating instrument, the calc/@CALCTEXT field on the non-repeating instrument would mistakenly not get triggered or calculated when performing manual data entry on a survey page or data entry form, although it would get calculated correctly when running Data Quality rule H. (Ticket #125456)

Version 12.2.10

- Major bug fix: Some contexts that employ a user rights check might mistakenly throw a fatal PHP error in some specific cases when using PHP 8.0 or 8.1. (Ticket #125951)