

REDCap Flex Upgrade Changelog – October 2022 Upgrade (v. 12.2.10 → v. 12.5.12)

New Features and Major Improvements

Version 12.5.0

New feature: Repeating Automated Survey Invitations (ASIs)

- Users can now set ASIs to send multiple times on a recurring basis for any repeating survey in a project. If the survey is a repeating instrument or if it exists on a repeating event, then users will see a new section "How many times to send it" in the ASI setup popup in the Online Designer. There users may set the ASI to send survey invitations repeatedly at a regular interval, in which it can repeat forever or a set number of times. This new repeating ASI feature works similarly to how recurring alerts have always worked for Alerts & Notifications.
- Note: If an instrument is not a repeating survey, then this new section will not appear for that survey in the ASI setup dialog.
- When an ASI is set up to recur for a repeating survey, the [survey-link] Smart Variable in the invitation text will always point to a different repeating instance of the survey for each time the invitation is sent. For example, if the ASI is set to recur daily, then the first day's invitation will have a link pointing to instance #1 of the survey, the next day's invitation will point to instance #2, then the next to #3, and so on.

Bug Fixes, Security Fixes, Changes, and Minor Improvements

Version 12.5.12

- Bug fix: The Record Status Dashboard might load unnecessary slowly for projects that are not using Form Display Logic and have 1000+ records.
- Bug fix: On some rare occasions in longitudinal projects, a report with filter logic might mistakenly not display its report headers on the page. Bug emerged in the previous version.
- Updates and fixes for the External Module Framework, including a fix that prevents out of memory errors if a record is not specified for the `getChoiceLabel()` method.
- Bug fix: When using Twilio telephony services for surveys, U.S. phone numbers having the area code "656" would mistakenly not work for SMS or voice calls unless the number has a "1" prepended to it.
- Bug fix: Some pages might mistakenly not function correctly due to a JavaScript error when using Internet Explorer. For example, this can cause branching logic and calculations to fail to function on survey pages and data entry forms when using IE.

- Bug fix: When performing a Data Search specifically on a project's record ID field on the "Add/Edit Records" page in a longitudinal project, some record names might mistakenly not be returned from the search, especially if no data has been saved in the first event for some of the records. (Ticket #135313)
- Bug fix: The "Phone (North America)" field validation might not correctly recognize some valid 10-digit North American phone numbers, especially if the fourth digit is a "3". (Ticket #135444)
- Bug fix: When using the Text-to-Speech survey feature, any fields initially hidden by branching logic on the survey would mistakenly not have the speaker icon displayed for it to allow participants to hear the question text audibly. (Ticket #135010)
- Bug fix: If a project is using Missing Data Codes and is also using the Secondary Unique Field, setting a missing data code for the Secondary Unique Field on a survey or data entry form might mistakenly result in the "Duplicate Value" error dialog. The uniqueness check should instead be ignoring any missing data codes for the Secondary Unique Field. (Ticket #132779)
- Bug fix: If a user is exporting data in EAV format for the Export Records API Method, and some of the data being exported exists on a repeating instrument or a repeating event, the record ID field might mistakenly get exported multiple times as identical rows, despite the fact that the first instrument is not a repeating instrument and does not exist on a repeating event. (Ticket #135154)

Version 12.5.11

- **New feature:** Download all files on a report - When viewing a report (including public reports) that contains one or more File Upload fields or Signature fields, a "Download Files (zip)" button will appear on the page to allow users to easily download all the report's uploaded files into a single zip file for those fields for the records in the report.
- **Improvement/change:** The project API page now displays the user's API token in a text box with a button next to it that, when clicked, copies the API token to the user's clipboard. (Ticket #134577)
- **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 when uploading a CSV file of alerts on the "Alerts & Notifications" page. (Ticket #134640)
- **Major bug fix:** If using certain versions of PHP 7, especially PHP 7.2, REDCap might result in only an unusable white page due to fatal PHP errors after upgrading to REDCap 12.5.9 or 12.5.10. (Ticket #134397)
- Bug fix: The title of the "None of the Above" dialog on data entry forms and survey pages would mistakenly not display correctly. (Ticket #134326)
- Bug fix: The dialog for the @NONEOFTHEABOVE action tag might mistakenly not display at all.
- Bug fix: Uploading Automated Survey Invitations settings via CSV file might mistakenly mangle some of the timestamps in the file (e.g., "Send at exact date/time:") if they are in YMD date format when the user has an MDY or DMY date format preference set for their user account on the Profile page. The CSV import will now accept dates/times in either YMD date format or the user's preferred date format. (Ticket #133727)
- Bug fix: When importing or exporting the user rights for users or roles (whether via the user interface or API), certain privileges would mistakenly be ignored, such as those pertaining to Randomization, Double Data Entry, and the Data Resolution Workflow. (Ticket #133179)
- Bug fix: When assigning projects to a Project Folder on the "My Projects" page, the project list in Step 2 of the dialog would mistakenly list projects to which the user no longer has access. This

would only happen if the projects had been assigned to that particular Project Folder sometime in the past. (Ticket #134503)

- Bug fix: In the Online Designer, when saving a Text field that was previously a Calculated field, the calculation might mistakenly not get removed from the field after being changed to a Text field, thus possibly causing issues when rendering the field on a data entry form or survey. (Ticket #134303)
- Bug fix: A calculation error might occur on a data entry form or survey page whenever a calculated field utilizes one of the [aggregate-X] Smart Variables while also utilizing other Smart Variables that result in a text string (as opposed to a number - e.g., [record-dag-label]). (Ticket #134589)
- Bug fix: When exporting a Project XML file and creating a new project using it, if the project is not longitudinal but was longitudinal at some point in the past, in which the first event (while longitudinal) was named something other than "Event 1" on Arm 1, then any Survey Queue settings from the XML file might mistakenly fail to import into the newly created project. (Ticket #134837)
- Bug fix: The "Advanced Link" option for Project Bookmarks might mistakenly return data from the API even though the user's REDCap session is no longer active. If the session has ended, the API should instead return only a value of "0".
- Bug fix: When viewing a Custom Record Status Dashboard in a longitudinal project, in which the filter logic references fields that might exist on events that contain no data for certain records, those records with no data for the event might mistakenly not get displayed on the dashboard. (Ticket #134055)
- Bug fix: When editing an alert on the Alerts & Notifications page and clicking the keyboard Enter button right after entering an invalid email address into the "manually enter emails" text boxes for the Email To, CC, or BCC settings, the error dialog would mistakenly never close but would keep popping up endlessly. This would prevent the user from fixing the email address entered and ultimately could only be resolved by refreshing the page. (Ticket #135021)

Version 12.5.10

- Bug fix: The "Add Participants" dialog on the Participant List page would mistakenly be missing some text that displays the name of the currently selected arm (only for longitudinal projects that have multiple arms). (Ticket #134086)
- Various fixes and updates for the External Module Framework, including:
 - The enable-email-hook-in-system-contexts flag must now be set to true in config.json for the redcap_email hook to run in system contexts (when a project ID is not specified).
 - External Module Framework unit tests have been refactored to significantly improve performance.
- Bug fix: When new records are being created via a data import that will trigger the scheduling of an Automated Survey Invitation that contains the Smart Variable [survey-queue-url] or [survey-queue-link] in the ASI email body, the Smart Variable would mistakenly be blank in the resulting email that gets scheduled. This does not affect existing records but only those created via data import. (Ticket #101536)
- Bug fix: Appending the Smart Variable [aggregate-count:record_id] with a parameter to filter the results by one or more specific Data Access Groups (using the either unique DAG names or "user-dag-name") would mistakenly have no effect on the result. (Ticket #132676)
- Bug fix: When opening a Calendar event, the popup might crash due to a fatal PHP error in PHP 8.0+. (Ticket #134180)

Version 12.5.9

- **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 for calculated fields on data entry forms and survey pages. (Ticket #132986)
- **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 for a certain feature on the Project Setup page and Copy Project page.
- **Improvement:** Various changes and improvements for the External Module Framework, including a new module AJAX request feature (thanks to Günther Reznicek and Mark McEver). While it has always been possible to make AJAX requests via module code, using this new framework method makes it easier and more secure. Note that for framework version 11+, logging in non-authenticated contexts must be explicitly allowed by setting the “enable-no-auth-logging” flag in “config.json”.
- Bug fix: When renaming records, the record name would mistakenly get double-decoded during the process, which is not necessary and might cause issues depending on the specific characters inside the record's record name. (Ticket #133650)
- Bug fix: Using "now" or "today" as the first parameter in the @CALCDATE action tag might mistakenly not work while viewing a data entry form or survey page if the @CALCDATE field has DMY or YMD date format. (Ticket #133677)
- Bug fix: When using the Randomization feature and randomizing a record in a project that has record auto-numbering enabled, in which the record is being randomized before the record has first been created, right after the record has been randomized, the left-hand menu link to the record's Record Home Page might mistakenly point to a new not-yet-created record instead of the record that was just randomized. (Ticket #133678)
- Bug fix: When using the biomedical ontology searching mechanism on a data entry form or survey, results in certain ontologies might not return the expected "notation" or "cui" attribute (because they do not have those attributes), thus defaulting to the using the label itself for the data value of the field. It should instead attempt to use the "@id" attribute (if available) as a tertiary measure before defaulting to using the label. (Ticket #133550)
- Bug fix: When using "OpenID Connect" or "OpenID Connect & Table-based" authentication and logging in to the server at a specific URL outside the main REDCap Home page, the user would always mistakenly be redirected back to the Home page instead of the original URL. This could cause issues in certain cases, such as when clicking the email address validation link from an email. (Ticket #133729)
- Bug fix: When using WebDAV for file storage in REDCap, very large files might be able to be uploaded into File Upload fields, but attempting to download the same large files might mistakenly result in a fatal PHP error due to memory constraints. (Ticket #133638)
- Bug fix: When viewing the dialog of Upcoming Scheduled Survey Invitations for a record on the Record Home Page, the survey title (if long) might mistakenly be truncated inside the dialog. (Ticket #133813)
- Bug fix: The "Other Export Options" page was mistakenly displaying the Tableau Export dialog contents near the top of the page instead of only displaying it inside the dialog after clicking the blue "View export instructions" button. (Ticket #133813)

- Bug fix: When using Multi-Language Management, in which a survey's text is translated, the survey might crash with a fatal PHP error in specific scenarios when using PHP 8. (Ticket #133892)
- Bug fix: When using the Data Resolution Workflow and either opening/responding to/closing a data query or verifying/de-verifying a value via the results of a Data Quality rule on the Data Quality page, that specific result's button in the Data Quality dialog might not correctly get updated with the new status icon/number of comments if the project is longitudinal but instead would incorrectly display the icon/comment count for another event's result for the same record. (Ticket #131878)

Version 12.5.8

- **Minor security fix:** The third-party JavaScript libraries Handlebars and Moment.js were updated to the latest version because they contained some security vulnerabilities.
- **Major bug fix:** When using Multi-Language Management on a survey with the e-Consent Framework enabled, the PDF displayed inline on the page to the participant at the end of the survey would mistakenly not be in the participant's chosen language but instead would be in the default language. Note: This does not affect the e-Consent PDF being stored in the File Repository, which is correctly stored in the participant's language.
- Bug fix: Fix for fatal PHP 8 error when viewing the Participant List page in specific circumstances. (Ticket #132555)
- Bug fix: The Email Logging page would mistakenly not return any logged emails if the search filter was set to return emails of type "Alerts & Notifications". This was due to emails not getting stored in the email logging database table with the correct category attribute. Thus, when using the type filter "Alerts & Notifications" going forward, it will only return results of emails sent after upgrading to this version of REDCap. (Ticket #133222)
- Bug fix: When creating a report and adding a date, datetime, or number field as a report filter in Step 3, if the field has a min or max range validation set and the user enters a value for the filter field that was outside of the field's min/max range, it would mistakenly display the out-of-range warning. This out-of-range warning is not necessary when building reports but only when entering data. The out-of-range check has been removed for report filter fields. (Ticket #133203)
- Bug fix: When a user in a Data Access Group is viewing the Logging page or calling the API Export Logging method, if the "Filter by event" filter (or "logtype" parameter in the API) was set to a record-oriented value (e.g., Record created only), certain logged events might mistakenly not be returned if the logged events were not performed by a user that explicitly belongs to the current user's DAG (e.g., a non-DAG user or a survey participant). (Ticket #133203)
- Bug fix: While reordering an event on the Define My Events page of a longitudinal project, the black popup that appears temporarily would mistakenly be located in the wrong place on the page. (Ticket #133296)
- Various updates and fixes for the External Module Framework, including:
 - Logged a stack trace instead of displaying it to avoid exposure of file paths
 - Prevented redcap_module_link_check_display() from running on surveys
 - Miscellaneous documentation updates
 - Miscellaneous Psalm scanning improvements
 - Fixed miscellaneous PHP 8 warnings
- Bug fix: A space was mistakenly missing before the URL in the "Super API Token has been deleted" email sent to the user. (Ticket #133345)

- Bug fix: When adding a new instrument to a project in development status, all users in the project would mistakenly not automatically be given "Full Data Set" data export rights to the new instrument. In certain circumstances when a new instrument is added, users would receive De-Identified export rights mistakenly, and in other situations, they would not appear to have any export rights at all for the new form until they logged in to REDCap and entered the project. This could additionally cause confusion where it might appear that the user's form-level export rights had changed if the user had not accessed the project during the time in which the new instrument was created and then the project was moved to production. (Ticket #133306)
- Bug fix: When using Multi-Language Management, the MLM setup page might mistakenly crash with a fatal PHP error in specific circumstances due to UTF-8 characters being present in some text. (Ticket #133305)
- Bug fix: When creating/editing an alert on the Alerts & Notifications page, the "Show Advanced SendGrid Settings" link inside the alert dialog would mistakenly be displayed when the SendGrid Template option is not selected and also when the SendGrid Template setting is not even enabled in the project or whole REDCap system. Bug emerged in REDCap 12.5.6 (Standard).
- Bug fix: The Duo Universal Prompt utilized in the Duo two-factor authentication in REDCap might mistakenly crash with a fatal PHP error in certain situations. (Ticket #133318)
- Bug fix: Added 11 missing LOINC codes for Clinical Data Interoperability Services (CDIS) mapping.
- Bug fix: Clicking the "Project Owners" button on the Email Users page in the Control Center might mistakenly select some users that should not be selected, especially if the users had been project owners on projects that had been marked as completed or were recently deleted.
- Bug fix: When using Azure AD authentication, specifically V1 of Azure AD, the username or email address for a B2B collaboration user object might contain an "#EXT#" identifier as text inside it in certain cases. This is problematic to have the character "#" in a user's username and email. If this occurs, the text "#EXT#" will be automatically removed. (Ticket #121605c)
- Bug fix: When a user has User Rights privileges in a project and has also been assigned to a Data Access Group, if the user goes to edit their own rights on the User Rights page and clicks "Save", it would mistakenly remove them from their current DAG without warning. (Ticket #133313)
- Bug fix: When using Twilio for sending SMS messages for survey-related activities, in some cases the Survey Invitation Log might not correctly report that the participant had opted out of receiving SMS messages. In these cases, in which the Twilio API returns the specific error message "Attempt to send to unsubscribed recipient", the invitation log now correctly notes that the invitation did not send because the participant opted out. (Ticket #105253)
- Bug fix: When a user clicks the "Delete data for THIS FORM only" button at the bottom of a data entry form, in which the form exists on a repeating event where no other forms have data (i.e., all other form status icons are a gray color), the repeating event would mistakenly still appear in reports when in fact it should no longer appear in reports. (Ticket #131790)

Version 12.5.7

- **Minor security fix:** Several Cross-site Scripting (XSS) vulnerabilities were discovered where a malicious user could potentially exploit them on specific pages by inserting HTML tags and JavaScript event attributes or by manipulating parameters in the URL, specifically when editing Project Dashboards, when uploading and viewing inline images files on forms/surveys, and when entering Missing Data Codes of the Project Setup page.
- Change: When performing a data export, the dialog now mentions more REDCap publications that might need to be cited in published manuscripts relating to the current REDCap project.

Such publications would include those for MyCap, the REDCap Mobile App, the e-Consent Framework, and CDIS.

- **Change:** The Configuration Check page now suggests that the MySQL setting "max_allowed_packet" be increased to 128 MB or higher (preferably to 1 GB) if it is currently less than 128 MB. In previous REDCap versions, it only made this recommendation if its value was less than 16 MB, which proved to be too small for certain very large projects to function normally.
- **Bug fix:** When the system-level setting "Allow reports to be made 'public'?" has been set to "No", administrators would mistakenly not be allowed to make reports public. Regardless of this setting, admins should always be able to make any report public. (Ticket #132901)
- **Bug fix:** Clicking the "View export instructions" for the Tableau Export option on the "Other Export Options" page might mistakenly fail to open the dialog, thus resulting in a JavaScript error.
- **Bug fix:** When changing the system-level language on the General Configuration page in the Control Center, the page would mistakenly not change over to the new language immediately after submitting the page but only when the page was refreshed afterward.
- **Bug fix:** The new Duo Universal Prompt utilized in the Duo two-factor authentication in REDCap might mistakenly not work for certain devices/OSs, such as iPhones and iPads. Bug emerged in REDCap 12.5.5 Standard. (Ticket #133020)
- **Bug fix:** When using Multi-Language Management, single-instrument PDF downloads would mistakenly not occur in the user's preferred language but would always be rendered in the default language. Bug emerged in REDCap 12.5.2 Standard. (Ticket #133121)
- **Bug fix:** If a user knows specific paths for the PHPQRCode third-party library in REDCap, they could call it many times at a specific URL, which might cause the web server's storage to fill up with lots of temporary files. (Ticket #132432)
- **Bug fix:** When using Form Display Logic in a longitudinal project, in which the logic references one or more fields on an event that currently has no data for a given record, the Form Display Logic would mistakenly fail to work correctly.
- **Bug fix:** When piping a date or datetime field into the max validation range check for another date/datetime field, if the field being used as the max exists on a different instrument or survey page, it would mistakenly not throw an out-of-range warning if the value was above the maximum. Note: This does not affect the min range check but only the max. (Ticket #124222b)

Version 12.5.6

- **Improvement:** When utilizing Multi-Language Management in a project, the Field Finder on the Codebook page now supports searching in translated field labels.
- **Improvement:** The date of the most recent REDCap upgrade for the system is now displayed near the bottom of the main Control Center page. (Ticket #69036)
- **Improvement:** "Project 5 (COVID-19)" was added as a new classification that is selectable under the NIH CDE Repository catalog for the Field Bank feature in the Online Designer. Project 5 (COVID-19) is a classification of NIH-Endorsed CDEs (Common Data Elements).
- **Major bug fix:** When exporting a PDF that contains a multiple choice field that has been flagged as an Identifier field, if the user has De-Identified data export rights for the field's instrument, the data for the field would mistakenly not be removed from the resulting PDF. (Ticket #132190)
- **Major bug fix:** When clicking the "Forgot your password?" link on the login page and then entering the username of a valid REDCap user, the password of the username entered would mistakenly be reset immediately after being entered, which could lock out the user if a

malicious user is randomly entering usernames to try and discover a valid username. It now only resets the user's password after they click the password reset link in the email that they receive. Additionally, in order to prevent malicious users from discovering valid usernames, the password reset page now returns the exact same message in all situations, whether the username entered is a real username or not. In the case when using one of the "X & Table-based" authentication methods, if the user entered is an external user (i.e., not a Table-based user), they will also receive an email that will inform them that they must reset their password using an external resource outside of REDCap (or it will instead display the custom password reset text that has been defined in the Control Center). (Ticket #132595)

- **Major bug fix:** When using certain external authentication methods, survey pages might sometimes mistakenly time out if the project's internal Record List Cache (a secondary list of records in the database for improving performance) had not been built yet, which is done automatically by REDCap internally. This would cause an internal API call to fail when it is made inline while loading survey pages, thus causing the survey page not to load. (Ticket #104761)
- Bug fix: The Codebook page can become very slow in certain situations when lots of fields exist in the project, especially when utilizing languages for Multi-Language Management. (Ticket #132349)
- Bug fix: When using Multi-Language Management in a project, some translations might get mistakenly overwritten when importing a CSV/JSON translation file due to an issue with case sensitivity with the language ID (e.g., "es" vs "ES"). (Ticket #132443)
- Bug fix: Some of the text inside the dialog displayed to an administrator when a project has been marked as Completed was changed in order to be less confusing about the project's status after the admin has restored it. (Ticket #132499)
- Bug fix: When using Azure AD authentication, users might mistakenly not have their first/last name and email auto-populated into their user profile after initially logging in to REDCap. This bug was supposedly fixed in the previous version but mistakenly was not. (Ticket #130664b)
- Bug fix: When using the Data Resolution Workflow feature and creating data queries based on the results of Data Quality rules, the results of the Data Quality rules might not display the correct number of comments for a given discrepancy unless it belongs to a repeating instrument. (Ticket #131878)
- Bug fix: When a user's date/time format user preference on the Profile page is set specifically to "YYYY-MM-DD and 24-hour time", some timestamps displayed in the REDCap user interface (e.g., Most recent activity on Project Home, Email Logging sent time) would mistakenly display the "seconds" component of the datetime when it should only display hours and minutes. (Ticket #132678)
- Bug fix: When using Azure AD authentication, the username for a B2B collaboration user object might contain an "#EXT#" identifier as text inside it in certain cases. This is problematic to have the character "#" in a user's username. If this occurs, the text "#EXT#" will be automatically removed from the user's username. (Ticket #121605b)
- Bug fix: By manipulating URLs and/or JavaScript variables on a REDCap project page, a user might be able to request an API token for a project in which they do not explicitly have API rights (although they would have to have access to the other project in order to do this). Even if the administrator approved the token request via the To-Do List or via the email request, the user would not be able to obtain the API token that was created for them, nor would they be able to use the token even if they could somehow obtain it. So no real harm or privacy issues could result from this. (Ticket #132778)

- Bug fix: When using Multi-Language Management and importing translations for survey settings via a CSV file, some survey settings would mistakenly fail to import successfully. (Ticket #132828)
- Bug fix: When using Multi-Language Management, the “[Reminder]” text for Automated Survey Invitation reminders was mistakenly not translatable. It can now be translated on the User Interface > Survey > Survey Emails section on the MLM setup page. (Ticket #132868)

Version 12.5.5

- **Improvement:** Admins can now provide an alternate URL that will be used for the "Contact REDCap Administrator" links on each project's left-hand menu. If admins are using a ticket system, for example, to collect questions/issues from users, they may enter the URL of the ticket system's page where new tickets can be submitted. The alternate URL can be entered on the General Configuration page of the Control Center. If left blank (its default value), the "Contact REDCap Administrator" links will function as they have in previous versions, in which clicking them will open a pre-formatted email in the user's native email client.
- **Improvement:** The Duo two-factor authentication process has been upgraded to use the new Duo Universal Prompt. This will provide a better and more reliable user experience for those institutions using Duo for two-factor authentication in REDCap. (Ticket #130859)
- **Improvement:** Two more fields (`general_practitioner` and `managing_organization`) were added to the Patient FHIR resource when using the Clinical Data Mart service for CDIS.
- **Major bug fix:** When viewing and downloading files under the "Data Export Files" tab of the File Repository, users that do not have Full Data Set data export rights to every field contained within a given export file on that page would mistakenly be able to download the export file(s). REDCap will now check to ensure that the user has Full Data Set access to every field contained within the export file, and if they do not, the user will not be able to download the data export file(s), in which it will instead display the following message on the page: "NOTICE: You are not able to download the export files here because you have either none or partial data export rights to one or more fields contained within the data export file." This bug was introduced in REDCap 12.2.0 with the advent of instrument-level data export rights.
- Bug fix: When a user attempts to submit an instrument to the REDCap Shared Library via the Online Designer, the descriptive text regarding this process mistakenly includes a dead hyperlink to a page that no longer exists. The hyperlink has been replaced with a modal dialog containing the same information. (Ticket #131617)
- Bug fix: PHP compatibility issue in some circumstances might cause the PDF export to fail with a fatal error when using PHP 8. (Ticket #131673)
- Bug fix: When using Multi-Language Management, some HTML and JavaScript might be inserted into the webpage source code too early when viewing the Survey Access Code page. (Ticket #131704)
- Bug fix: The Codebook would mistakenly not display the min/max values of slider fields on the page if the min/max range values were never explicitly set (i.e., as 0 and 100, respectively). (Ticket #131065b)
- Bug fix: When using Multi-Language Management, there might be an issue when attempting to import a system language (from the Control Center) into a project and also with exporting a language. (Ticket #131811)
- Bug fix: A user creating a new project would mistakenly not receive "Full Data Set" data export privileges on all instruments in the new project.

- Bug fix: When using the Survey Setting to provide custom text for the survey's Submit button, in which a field variable is piped into the Submit button text, it might mistakenly cause the Previous page button not to function on the survey page. (Ticket #131937)
- Change: When deleting a project via the Other Functionality page, it now displays the total number of project records inside the Delete Project dialog to give the user more context prior to deleting the project.
- Bug fix: Viewing a report might cause the page to mistakenly crash with a fatal PHP error in certain situations when running PHP 8. (Ticket #132041)
- Bug fix: If a participant is attempting to take an Adaptive or Auto-Scoring survey (i.e., downloaded from the REDCap Shared Library), in which the survey has the Survey Login feature enabled, after the participant has successfully logged in, the survey would mistakenly not display correctly because the first question and submit button would not be visible on the page, thus making it impossible to complete the survey (unless the participant refreshed the page in their browser, after which it would work correctly).
- Bug fix: When using Multi-Language Management, if a user exports a CSV language file on the MLM setup page, edits it, and then imports it back again, in certain circumstances the uploaded changes might not take effect.
- Bug fix: When using Azure AD authentication, users might mistakenly not have their first/last name and email auto-populated into their user profile after initially logging in to REDCap. (Ticket #130664)
- Change: In the Action Tag documentation, a note was added about how to escape text returned from the @CALCTEXT action tag.
- Bug fix: When using Multi-Language Management, if the survey setting checkbox "Store the translated version of the PDF" is not checked for the "Save a PDF of completed survey response to a File Upload field" setting on the Survey Settings page, the saved PDF of the response would mistakenly be stored in the language that the participant had chosen on the survey page instead of storing the PDF using the default language. (Ticket #131879)

Version 12.5.4

- **Major bug fix:** When the Protected Email Mode is enabled in a project, and a recipient clicks the link in their email to view the original email content within REDCap, they would never receive the follow-up email containing the one-time code, thus preventing them from accessing the content of their email. (Ticket #131414)
- **Major bug fix:** When an Automated Survey Invitation utilizes conditional logic with the "Ensure logic is still true" checkbox checked, and a survey invitation gets scheduled, after which the record's data is modified, thus invalidating the ASI conditional logic, the scheduled invitation would mistakenly fail to get automatically deleted. Bug emerged in REDCap 12.5.0 (Standard). (Ticket #131358)
- **Major bug fix:** When using Google OAuth2 authentication with the User Allowlist enabled, the User Allowlist would mistakenly not prevent users from logging in who were not on the allowlist. (Ticket #131346)
- **Major bug fix:** When simultaneous users are viewing the same data entry form for a record that has not yet been created, in which the same tentative record name is displayed at the top of the form for both users, if the second user attempts to lock the form after the first user has already saved the form and created the record, the second user will end up creating a record with another record name (as expected); however, instead of the second record's form getting locked, the first user's record would mistakenly be the one that gets locked. (Ticket #131431)

- Bug fix: Various PHP errors specific to PHP 8 were fixed on the Data Quality page. (Ticket #131294)
- Bug fix: Attempting to copy an instrument in the Online Designer when the instrument contains no fields (excluding the form status complete field) often results in the instrument not actually being copied or causes it to be half-copied (i.e., almost copying it but leaving some parts orphaned in the database backend). To fix this, users will no longer be able to copy an instrument if the instrument has no fields. If a user attempts to copy an instrument with no fields, a dialog will be displayed letting them know that they cannot copy the instrument until at least one field exists in the instrument. (Ticket #131273)
- Bug fix: When using the Multi-Language Management feature, selecting a language as the Fallback language in the MLM setup might prevent the user/participant from switching to the Default language on a form/survey and would instead mistakenly display the Fallback language text on the page.
- Bug fix: A fatal PHP error might occur when using a CDIS service. (Ticket #130928)
- Bug fix: When using biomedical ontology searching for a Text field, certain specific codes for very specific ontologies (e.g., SNOMEDCT) might mistakenly return a slightly incorrect code/value (typically off by a value of "1"). This appears to be extremely rare and seems to be due to a limitation with regard to how JavaScript handles large numbers. (Ticket #131406)
- Bug fix: If survey instructions or survey completion text is indented in specific ways (e.g., when the HTML <p> tag has a padding style added to it), the indentation would not appear on the survey page but only on the Survey Settings page. (Ticket #131479)
- Bug fix: When two records are about to be created on a data entry form with the same tentative record name (as is displayed at the top of the form) by two simultaneous users, and the second record being created is created via the randomization process, then the project Logging page would mistakenly list the second record's record name with an incorrect value in the "List of Data Changes" column, although the real record name in the "Action" column would be correct for the record.
- Bug fix: The "json-array" data format that was recently added to REDCap::getData might mistakenly not return the full data expected but might only return partial data when using REDCap::getData with "json-array" data format for large sets of data.
- Bug fix: When using the Data Resolution Workflow feature and creating data queries based on the results of Data Quality rules, the results of the Data Quality rules might not display the correct number of comments for a given discrepancy if it belongs to a repeating instrument or repeating event. (Ticket #130207)
- Bug fix: When upgrading to REDCap 12.1.0 or higher, in certain situations the resulting upgrade SQL script might contain some malformed "drop foreign key" queries in which the foreign key name is mistakenly blank, thus resulting in an SQL error during the upgrade. (Ticket #131519)
- Bug fix: Fixed typo on the Publication Matching page in the Control Center. (Ticket #131581)
- Bug fix: When the text of the survey Submit buttons have been translated (either via a language INI file or via the Multi-Language Management feature), the button text might mistakenly spill out of the button and not display correctly if the button text ends up being wider than 140 pixels. (Ticket #131545)

Version 12.5.3

- **Major bug fix:** The "Export Logging" API method would mistakenly allow users to export a project's logging when they do not explicitly have "Logging" privileges in the project. Note: The

method would still require API Export privileges to work. The method now requires both API Export privileges and Logging privileges. (Ticket #131089)

- **Minor security fix:** The jQuery UI library was updated from v1.13.1 to v1.13.2 due to a Cross-site Scripting (XSS) bug.
- Bug fix: When using Multi-Language Management and translating the alternative Stop Action text that appears when a survey ends via Stop Action, the alternative Stop Action text would mistakenly not appear in its translated form when displayed on the survey page. (Ticket #130689)
- Various fixes and updates to the External Module Framework, including:
 - Clarified that the button to delete modules applies only to the selected version, not all versions.
 - Fixed issue with choice labels that have commas in them getting cut off.
 - Expanded log() method docs.
- Bug fix: When using Multi-Language Management, certain items would not be translated when only one language (which differs from what is set as the project language) is used. (Ticket #130688)
- Bug fix: When an Automated Survey Invitations option "Send the invitation X before/after Y" in Step 3 is set to "the same day (beginning at midnight)...", the invitation would mistakenly not get scheduled in longitudinal projects if the survey of the invitation being scheduled exists on a different event from the event where the ASI is being triggered (e.g., if a pre-screening survey on the first event is supposed to trigger an ASI for a follow-up survey on a subsequent event). Note: There is no way for REDCap to automatically schedule any invitations that missed getting scheduled as a result of this bug, so the only way to get the invitation(s) scheduled appropriately is to run the "Re-evaluate ASIs" option in the Online Designer or instead open each record and click the "Save" button on any data entry form (or wait for the datediff+today cron job to trigger it - this only happens if datediff+today/now is used in the ASI conditional logic). Most importantly, users may need to adjust the send-time of any new invitations that get scheduled that initially missed getting scheduled due to this bug (because their scheduled date might differ from what their scheduled date should have been originally). (Ticket #131024)
- Bug fix: When using the "Save & Return Later" feature on a multi-page survey, in which the survey contains a non-hidden @CALCTEXT field whose value gets populated early in the survey, when a participant returns to the survey later, REDCap would mistakenly advance the participant to the page with the @CALCTEXT field, even if it occurs on a later page than where the participant left off. (Ticket #131056)
- Bug fix: Any embedded images (added via the rich text editor) displayed on a public report or public project dashboard would mistakenly not display successfully on the page. (Ticket #130897)
- Bug fix: Regarding the Text-To-Speech functionality for surveys, the "Arabic (Male)" voice was deprecated in the IBM Watson TTS service that is utilized by REDCap. That voice has now been removed as an option on the Survey Settings page, and any surveys using the "Arabic (Male)" voice will automatically have the Text-To-Speech functionality disabled.
- Bug fix: The Codebook would mistakenly not display the min/max values of slider fields on the page if the "Display number value?" slider setting is not checked/enabled. (Ticket #131065)
- Bug fix: When using one of the "X & Table-based" authentication methods, various processes (e.g., cron job for user auto-suspension due to inactivity) might not work correctly for some users in certain situations, and various user interfaces (e.g., Sponsor Dashboard) might not display all correct options or page elements for some users in certain situations.

Version 12.5.2

- **Major bug fix:** If survey invitations are scheduled via the Participant List or via the Survey Options on a data entry form (i.e., not using an ASI), in which one or more invitation reminders are scheduled to be sent, the reminders would mistakenly not get automatically removed from the Survey Invitation Log after the survey had been completed. This would cause the reminders to be sent to the participant even after they had completed the survey. Bug emerged in REDCap 12.5.0 (Standard).
- **Improvement:** Added "json-array" as a new option to the data formats for REDCap::getData and REDCap::saveData. It provides a way around the json data format, for the sake of computer cycles as well as for the sake of being able to pass large data structures. The "json-array" option represents the same flat data structure as decoded JSON data when using the "json" data format for these methods, but it avoids the encode/decode steps.
- **Change/improvement:** All the language displayed in the CDIS popup dialog "Key differences between Clinical Data Pull (CDP) and Clinical Data Mart (CDM)" has been abstracted and is now translatable.
- **Bug fix:** When a survey is set to use "Large" or "Very large" survey text size while some SPAN tags are located inside some H1, H2, etc. tags in the survey instructions, survey completion text, or in any other text displayed on the survey page, the text inside the SPAN tags would mistakenly appear as much smaller than they should on the page. (Ticket #130326)
- **Bug fix:** When using Azure AD authentication, the user principal name for a B2B collaboration user object might contain an "#EXT#" identifier as text inside the user's email address. This is problematic to have the character "#" in a user's email and also (if using their email address as the user's username) to have it in the username. If this occurs, the text "#EXT#" will be automatically removed from the user's email address. (Ticket #121605)
- Various fixes and changes for the External Module Framework, including...
 - Made the "required" flag work for rich text modules settings.
 - Hid the button to enable modules when config.json is missing (preventing a confusing error).
 - Clarified the error when modules do not extend AbstractExternalModule.
- **Bug fix:** When using the Multi-Language Management feature and translating the titles of surveys in a project, if a survey participant navigates to the survey queue page directly, the survey titles for the surveys listed in the survey queue would be correctly translated; however, when viewing the survey queue immediately after completing a survey, the survey titles would mistakenly not be translated into the participant's selected display language. (Ticket #130429)
- **Bug fix:** Outgoing emails would mistakenly get logged in the "redcap_outgoing_email_sms_log" database table even when the emails themselves failed to send successfully. This could cause the table to fill with emails that never actually sent, many of which might have a missing sender or recipient address in the table. (Ticket #130546)
- **Bug fix:** If data is being imported (via API, Data Import Tool, Mobile App, or REDCap::saveData) for a slider field, an erroneous message might be returned in some situations regarding the slider field's min/max specific range settings.
- **Bug fix:** If a user has instrument-level locking privileges but only has read-only data viewing privileges for an instrument when viewing the instrument that has been fully or partially completed as a survey response, the "Lock this instrument?" checkbox would mistakenly not be displayed at the bottom of the page, thus preventing the user from locking or unlocking the form. Users with locking privileges should always be able to lock or unlock a form despite whether they have edit privileges or read-only privileges for that instrument. (Ticket #130667)

- Bug fix: A fatal PHP error might occur for longitudinal projects with no instrument-event designations when navigating to the Survey Distribution Tools page when using PHP 8. (Ticket #130743)
- Bug fix: When an administrator attempts to use the Project Revision History link for a given project on the Browse Projects page in the Control Center, it would mistakenly not load and thus would not be usable.
- Bug fix: When modifying Descriptive Text fields in the Online Designer, in which a field contains an inline image attachment, the image might mistakenly not display anymore in certain cases until the page is reloaded. (Ticket #130817)
- Bug fix: When using Multi-Language Management, if a user removed the default text of an item (e.g., sets the text as blank for a field label, survey instructions, etc.) after having translated the item, the MLM setup page would mistakenly no longer display the item anymore, thus making it impossible to edit the existing translated text.
- Bug fix: User input text (e.g., field labels, survey instructions) that is rendered in downloaded PDFs might get mistakenly truncated if the text contains the less-than character "<" immediately followed by certain special characters, such as "+", "-", "'", or "*". (Ticket #130761)
- Bug fix: Embedding an image via the rich text editor into the text value of a field with the @RICHTEXT action tag on a private survey would mistakenly fail with a 404 error. (Ticket #130673)

Version 12.5.1

- **Improvement:** When using the Multi-Language Management in a project where the languages created on the MLM setup page have Language IDs that correspond to language ISO codes, if a user or participant has not yet selected their display language via the MLM language-switching choices, REDCap will use their current browser settings to auto-detect and then auto-select their preferred display language. This is meant to be an added convenience to the user/participant. Note: This only occurs if project users have set up their MLM Language IDs as ISO codes.
- **Improvement/change:** Updated the Font Awesome library from v5.15.4 to v6.1.1.
- **Improvement:** Stop Actions (for multiple choice fields) and Video Display Format settings (for Descriptive Text fields with videos) are now included in Instrument Zip files when downloading or uploading them for an instrument in the Online Designer. In previous versions, stop actions were not included, and while the video URL was included, the setting that defines if the video is displayed inline or not was not included. (Ticket #124377)
- Bug fix: When a field's action tags are displayed below it in the Online Designer, sometimes an apostrophe might mistakenly get displayed in the action tag name.
- Bug fix: Fixed issue with example HTML not displaying correctly for an item on the "Help & FAQ" page.
- Bug fix: When using the Multi-Language Management setup page, translation changes might mistakenly not get saved successfully (although they might appear to be saved) if the current user is an administrator that has "Access to all projects and data" system privileges but has not been explicitly given Project Design privileges within the project. (Ticket #130248)
- Various fixes and changes to the External Module Framework, including...
 - Improved the error message when firewalls prevent module downloads.
 - Allow deleting old versions of enabled modules.
 - Fixed a bug preventing modules containing symlinks from being deleted.
- Bug fix: A fatal PHP error might occur when accessing the Data Quality page with PHP 8.0+. (Ticket #130364)

- **New Smart Variable: [new-instance]**
 - This new Smart Variable [new-instance] can be appended to [survey-link], [survey-url], [form-link], and [form-url] to create a URL that points to a new, not-yet-created repeating instance for the current record. In this way, [new-instance] functions essentially as [last-instance]+1. This new Smart Variable works for repeating instruments and also for instruments on repeating events.
 - [new-instance] can also be used as stand-alone, in which it will return an integer. But it will only work when used within the context of a repeating instrument or repeating event, in which it will essentially return [last-instance]+1 for the current repeating context.
 - [new-instance] will auto-append "&new" to the end of the form link or survey link (when used with [form-link/url] or [survey-link/url]) and thus will cause the user/participant to be redirected to the next repeating instance if the current repeating instance (i.e., the instance number in the URL) already exists for the record. Thus, using [form-link] or [survey-link] appended with [new-instance] will ensure that you always end up on a new, not-yet-created instance. And if two participants arrive at the same repeating survey instance with both using the exact same link created by [survey-link][new-instance], then the second participant to submit the survey page will not override the first participant's response. Instead, it will add the second participant's response as another repeating instance that does not exist yet.
 - TIP: One of the main intended usages of [new-instance] is to utilize it as [survey-link:instrument][new-instance] inside the text of a recurring alert to allow users/participants to enter data easily into a repeating survey. In this way, it works very similarly to a repeating ASI. However, repeating ASIs do not need their survey link appended with [new-instance] because it is already implied from the ASI setup.
- **New feature: Embedding images in text & emails**
 - Users may now embed one or more inline images into the text of a survey invitation, an alert, or a field label on a form/survey, among other things, by clicking the image icon in the rich text editor and then by uploading an image from their local device. Anywhere that the rich text editor is used, users may embed an image into its text (with one exception: the @RICHTEXT action tag on public surveys).
 - If you wish to disable the ability to embed images in text via the rich text editor, you may disable this functionality at the system level on the Modules/Services Configuration page in the Control Center.
- **New method for plugins/hooks/modules: REDCap::storeFile** - Stores a file in REDCap when provided with the full path of a file on the local REDCap web server. Returns the doc_id from the redcap_edocs_metadata database table for the stored file. The file will be automatically stored using the defined file storage method in the system (e.g., WebDAV, S3, local). Note: The original file on the server will *not* be deleted by this process.
- **New method for plugins/hooks/modules: REDCap::copyFile** - Creates a new file in REDCap by copying a file already stored in the system when provided with the doc_id of the original file from the redcap_edocs_metadata database table in the REDCap system. Returns the doc_id for the newly created file. The new file will be automatically stored using the defined file storage method in the system (e.g., WebDAV, S3, local). Note: The original file whose doc_id is provided as a parameter will *not* be deleted by this process.

- **New method for plugins/hooks/modules: REDCap::addFileToRepository** - Adds a file to a project's File Repository when provided with the doc_id of an existing file from the REDCap system. Warning: This method should not be used for files already stored for File Upload fields or as various attachments in the system because deleting the file from the File Repository will delete it in all places where the file is utilized. Ideally, this method is meant to be paired with the method REDCap::storeFile(). If you wish to add a file to the File Repository that is already being utilized elsewhere in REDCap (e.g., as an attachment or uploaded to a File Upload field), it is recommended that you first call REDCap::copyFile() to copy the original file, and then call REDCap::addFileToRepository() afterward.
- **Improvement:** When setting up an ASI, the sub-section "When to send invitations AFTER conditions are met" now contains the new drop-down choice "the same day (beginning at midnight) that the automated invitation was triggered" in the sub-option "Send the invitation X days Y hours Z minutes before/after [drop-down]". This new choice in the drop-down allows users to schedule the invitation based on the day the ASI was triggered and provides greater control and precision with regard to when exactly the invitation will be sent. For example, if this new drop-down option is selected along with setting it to "send the invitation 1 day 8 hours after...", this will cause the invitation to be scheduled to be sent at exactly 8:00am the next morning. In previous versions, it was not possible to get this level of precision for the invitation send-time based upon ASI trigger-time unless you used a date field's value as a reference.
- Change/improvement: When setting up an Automated Survey Invitation, the setting to make the ASI "Active" or "Not Active" has been moved to the top right of the ASI setup dialog.
- Various fixes and changes for the External Module Framework, including...
 - Prevented return value warnings on external module hooks that shouldn't return values.
 - Added tags to improve Psalm scanning.
- Bug fix: The REDCap Cron Job might mistakenly output some SQL queries when running the QueueRecordsDatediffCheckerCrons job.
- Bug fix: When an Automated Survey Invitation has been set up in a longitudinal project, in which the ASI's conditional logic includes datediff()+today/now and has the "Ensure logic is still true" checkbox checked while additionally one or more of the variables in the logic are missing a prepended unique event name, the DateDiff+Today/Now cron job might mistakenly schedule a survey invitation that should not be scheduled, even though REDCap will ultimately unschedule the invitation right before trying to send it. (Ticket #129893)
- Bug fix: When a Vimeo video link is provided for the embedded video URL for a Descriptive Text field, the video would mistakenly not to be playable on the page if the URL contained extra alphanumeric characters that appear after the first set of numbers and slash in the video URL (e.g., <https://vimeo.com/637116791/709509f375>). (Ticket #118309)
- Bug fix: Missing Data Codes could mistakenly not be saved to a File Upload field during a data import (e.g., API, Data Import Tool, REDCap::saveData) despite the fact that Missing Data Codes could be saved for File Upload fields via the web interface. (Ticket #82602)
- Bug fix: If an administrator has "Manage user accounts" privileges but does not have "Access to all projects and data..." privileges, the Browse Users page might malfunction when they attempt to perform certain actions, such as suspending users, where it would mistakenly send an email to the user themselves as if they had made a request from the Sponsor Dashboard page (which they didn't). (Ticket #129830)
- Bug fix: Fixed typo in Double Data Entry error message. (Ticket #130093)
- Bug fix: If a project is using randomization with strata fields, in which the strata fields exist on the first instrument, and then a participant loads the first instrument as a survey via the public survey link, if the strata fields appear on the first page of the survey, the strata fields will

mistakenly be rendered as disabled/read-only on the public survey page if the highest-numbered record in the project has already been randomized. (Ticket #130107)

Version 12.4.5

- Bug fix: If the Custom Record Label is enabled in a project, and the current user is exporting a PDF of an instrument containing data, the fields in the Custom Record Label might all be replaced with the text [**DATA REMOVED**] at the top right of each PDF page if the user has De-Identified data export rights for just some of the fields. It would mistakenly either display the data for all the Custom Record Label fields or instead remove all of them, but not necessarily remove just some of them based on their form-level export rights. (Ticket #129822)
- Bug fix: Using the Action Tag @NOW on a Text field with "Time (HH:MM:SS)" field validation would mistakenly return a full datetime value when the page loads rather than just the time in HH:MM:SS format. (Ticket #129882)
- Bug fix: If a project is using randomization with strata fields, in which the randomization field and/or strata fields exist on a survey that has "Save & Return Later" enabled, if a participant completes part of the survey for a record that has already been randomized, then returns later to the survey but forgets their return code, then clicks the "Start Over" button on the survey, the randomization field and/or strata fields on the survey would mistakenly have their values erased. All the other field values on the survey should be erased, but the randomization field and strata field data should never get erased for records that are already randomized. (Ticket #129892)

Version 12.4.4

- **Improvement:** The Multi-Language Management setup page now has an option to "Export or import general settings". This includes which languages are set as active, default, or fallback, which fields and survey settings are excluded, as well as the settings on the Alerts tabs and Settings tab. Note: The export/import option will appear when at least one language has been created in the project. This option is available as a JSON file only for import/export.
- Bug fix: When using the calendar feed with Outlook for calendar events containing both day and time components (as opposed to those without a time component), it might mistakenly display an error in Outlook relating to a "floating DTSTART" issue and would prevent the calendar feed from syncing properly. (Ticket #128842)
- Bug fix: The popup about anonymous surveys on the Participant List page would mistakenly display some text meant to be seen only if the project is set up to use anonymous surveys. (Ticket #129540)
- Bug fix: The calendar feed URL displayed on the Calendar page would mistakenly not display the URL of the impersonated user when an administrator uses the "View Project as User" feature but instead would display the calendar feed URL of the admin impersonating the user. (Ticket #129488)
- Bug fix: The calendar feed generated from the [calendar-link] or [calendar-url] Smart Variable would mistakenly display the Data Access Group name (if the record is assigned to a DAG) in the title of the record's calendar event in the feed. The DAG name should never appear in the participant-facing calendar event feed. (Ticket #129475)

- Bug fix: When an admin is using the Email Users page, some emails to users might mistakenly not be sent successfully due to some information being truncated (and thus corrupted) when being added to the backend database. (Ticket #129254)
- Bug fix: When using Send-It to send a file from the File Repository or a file associated with a File Upload field on a record, although the email being sent would get captured in the backend email log, the email details would mistakenly not get captured in the project-level Email Logging page. (Ticket #129554)
- Bug fix: In some specific cases when using Clinical Data Mart, normal users are not allowed to fetch data more than once.
- Bug fix: When a record's Survey Queue contains more than five completed surveys, in which case it will hide all the completed surveys in the queue to conserve space on the page, the queue would mistakenly display the text "X surveys completed!" where X is mistakenly the total number of surveys in the queue and not the total number of completed surveys in the queue. (Ticket #128732)
- Bug fix: On the System Statistics page, the stats for the number of data values pulled for both the Clinical Data Mart and Clinical Data Pull were not being calculated correctly and might have been previously reporting much lower numbers by mistake.

Version 12.4.3

- **Major bug fix:** If a user attempts to delete a recurring alert on the Notification Log, the dialog would not close and would fail silently due to a PHP error.
- **Major bug fix:** A change in the code for the Multi-Language Management setup page in the previous REDCap version might mistakenly cause certain tabs on the page not to get updated when saved.
- Improvement: To improve page-loading performance of the Data Access Groups page, the DAG Switcher table at the bottom of the page will no longer be displayed when the page is initially loaded if the number of project users X the number of DAGs is greater than 5000. If the threshold is reached, then a big button saying "Display the DAG Switcher" will be displayed, and after clicking it, it will then display the DAG Switcher table. This will improve overall load time of the page in extreme cases. (Ticket #128578)
- Change/improvement: The red "Action Tags" button was added inside the Logic Editor dialog to make it easier to reference the Action Tags documentation while the Logic Editor is open. (Ticket #120079)
- Change/improvement: Below the instructional paragraph on the Participant List page, new text has been added that lists the "Survey Response Status" as being either "Anonymous*" or "Not Anonymous" along with a clickable help link that opens a dialog that discusses in-depth why/how survey responses in the project are being collected in an anonymous or non-anonymous fashion based on the project's current configuration settings. This text was added to provide more transparency and awareness to users who might not realize that they are collecting survey data in an anonymous or non-anonymous fashion, which could ultimately have implications on processes in their project later on.
- Bug fix: UTF-8 encoded names would mistakenly not display correctly on the newly improved Email Users page in the Control Center. (Ticket #129209)
- Bug fix: If a hook, plugin, or external module is calling the REDCap::saveData() method, in which parameters are passed to the method all in a single array (i.e., \$params=[...]; REDCap::saveData(\$params)), the "dataAccessGroup" parameter's value would mistakenly be ignored if included in the parameter array. (Ticket #129203)

- Bug fix: The data entry form page or Online Designer might mistakenly crash with a fatal PHP error in certain situations when using PHP 8.0+. (Ticket #129297)
- Bug fix: Documentation of the datediff() function was mistakenly inferring that the "returnSignedValue" function parameter could be provided in all caps (e.g., TRUE). However, its value must always be lower case (e.g., true). The documentation has been changed to reflect this to reduce confusion. (Ticket #129332)
- Bug fix: When using Twilio to send invitations via Automated Survey Invitations that utilize the "Participant's Preference" as the invitation type, if the ASI belongs to a survey that is a repeating instrument, it is possible that the participant's preferred invitation type might get stored incorrectly in the backend database, thus potentially causing some invitations to be sent to the participant using the wrong invitation type (e.g., sent via Email instead of via SMS). (Ticket #128878)
- Bug fix: The API method "Export Logging" would mistakenly not return the extra text for the "Reason for Data Changes(s)" if the setting "Require a 'reason' when making changes to existing records" is enabled in the project.
- Bug fix: The calendar feed or downloadable ICS file from the Calendar page might mistakenly not include calendar events that are not associated with any records if the current user belongs to a Data Access Group. All non-record calendar events should be exportable and viewable in the calendar feed so long as the user still has "Calendar" user privileges. (Ticket #129359)
- Bug fix: If using one of the "X & Table-based" authentication methods, excluding "LDAP & Table" and "AAF & Table", the User Allowlist (if enabled) would mistakenly prevent Table-based users from accessing the system.
- Bug fix: The "Survey Link Lookup" link would mistakenly still be displayed on the Control Center left-hand menu even if all survey functionality was disabled globally in the system via the "Enable the use of surveys in projects?" setting on the Modules/Services Configuration page.
- Bug fix: If the custom survey width setting is set to a percentage width of the page and is set to less than 100%, it would cause less ideal user experiences when taking the survey on a mobile device. For mobile devices (i.e., narrow screens), the custom width setting is no longer applied but will instead display the survey at full screen width. (Ticket #129429)

Version 12.4.2

- **Improvement:** New "Multi-Language Management" video (9 minutes) added to the MLM setup page and the Training Videos page.
- **Improvement:** New and improved user interface for the Email Users page in the Control Center.
- **Improvement:** A new option ("View & Edit / De-Identified") has been added to the system-level setting "Default instrument-level user access set for all project users' Data Viewing Rights and Data Export Rights whenever a new instrument is created while in production status" on the User Settings page in the Control Center. This new option will allow users to automatically have View & Edit viewing rights to all new instruments created while in production but will provide limits on their data export privileges for those new instruments.
- **Improvements for CDIS:**
 - Added RxNorm code and display fields in Clinical Data Mart (R4 and DSTU2).
 - Updated the Clinical Data Mart templates to accommodate the new data.
- **Change/improvement:** When using "OpenID Connect & Table-based" authentication, if the OIDC authentication process fails with an error that is returned to REDCap in the URL query string, the error description will now be displayed on the page for the user to see, whereas previously the error message might not be displayed on the page in certain situations. Additionally, if a Table-

based user fails to successfully log in, as a convenience the login form will now automatically be displayed again without the user having to click the "Local REDCap Login" button. (Ticket #129023)

- Bug fix: Piping would not work successfully in real-time for Dynamic SQL fields on a survey or data entry form when the displayed language is changed on the page via Multi-Language Management. (Ticket #128562)
- Bug fix: The "Add Users (Table-based Only)" page in the Control Center would mistakenly not allow Administrators to create Table-based user accounts if using "OpenID Connect & Table-based" authentication.
- Bug fix: The "Reset Password" button would mistakenly not display on the Profile page for Table-based users if using "OpenID Connect & Table-based" authentication.
- Bug fix: Added 2 missing LOINC codes for the "social history" observation category in CDIS.
- Bug fix: When changing a project's authentication method to "OpenID Connect" or "OpenID Connect & Table-based" on the "Edit A Project's Settings" page in the Control Center, it would appear not to save the new authentication setting, but it would. But if the page was reloaded and saved again, it might revert the authentication setting to another value. (Ticket #128576)
- Bug fix: The up/down sorting arrows that appear in the headers of many tables displayed throughout REDCap might mistakenly display a smaller duplicate pair of arrows that are unnecessary. (Ticket #128758)
- Bug fix: Slider fields would mistakenly not be active and functional when viewed in the Online Designer. (Ticket #128916)
- Bug fix: Project-level external module settings would mistakenly not get deleted from the "redcap_external_module_settings" database table after a project has been permanently deleted. (Ticket #128909)
- Bug fix: The Record Home Page in a longitudinal project would mistakenly display the column for an event when the current user has no access to any instruments that are designated for that event. It should instead hide the column on the page rather than displaying it as empty. (Ticket #127708b)
- Bug fix: All rich text editors would mistakenly strip out any Font Awesome icons that were added to the source code HTML of the rich text editor.
- Bug fix: When using Multi-Language Management, a piped label might fail to display its translated language when on a PROMIS instrument (adaptive, auto-scoring, or battery) that was downloaded from the REDCap Shared Library.
- Bug fix: The Moment.js library was updated since it was out of date.
- Bug fix: The Multi-Language Management setup page might mistakenly not load due to a JavaScript error in some very specific situations.
- Bug fix: When using "OpenID Connect & Table-based" authentication in which a user clicks the "Forgot your password?" link on the login page, and then they enter a username that is not a real username when attempting to reset their password, REDCap would mistakenly not display the error message "You entered an invalid user name or password!" on the page after the login failed. (Ticket #129022)
- Bug fix: When a user is attempting to reset their password via the "Forgot your password?" link on the REDCap login page, and the system is using one of the "X & Table-based" authentication methods, if they enter a valid username on that page in which the user is not a Table-based user but is a user from the external authentication system (e.g., LDAP, OIDC), REDCap would mistakenly fail to display the custom Password Recovery text or the stock text "The password cannot be reset due to one of the following reasons: 1) It is not a valid REDCap username, or 2)

The password for this user is not able to be reset in REDCap because it can only be reset using an outside authentication resource at your institution." Bug introduced in REDCap 12.3.1.

- Bug fix: When deleting the data of an entire instrument or of an entire event that includes survey responses, the survey start time (stored in the backend database) would mistakenly not get deleted along with the data, thus causing the Smart Variables [survey-date-started] and [survey-time-started] to return the start date/time of the original response(s), which no longer exist. (Ticket #129076)
- Bug fix: Prepending [previous-event-name] or [next-event-name] to the Smart Variables [survey-time-X] and [survey-date-X] might mistakenly not return a value (e.g., [previous-event-name][survey-time-completed:followup_survey]). (Ticket #128662)

Version 12.4.1 (

- **Improvement:** New two-factor authentication option - If using an "X & Table-based" authentication method, you can make non-Table-based users be exempt from 2FA. This can be set on the Security & Authentication page, in which a new setting "Enforce two-factor authentication ONLY for Table-based users?", which defaults to "No", can be enabled so that only Table-based users will have to go through the 2-step login process if the system is using an "X & Table-based" authentication method. This will be useful if 2FA is already implemented on the other non-Table authentication process - e.g., OpenID Connect, thus preventing the non-Table users from having to perform 2FA twice (once outside REDCap and then once inside REDCap). (Ticket #128474)
- **Change/improvement:** The "sub" attribute was added to the "Attribute to use for REDCap username" drop-down in the OpenID Connect authentication settings in the Control Center to provide greater compatibility with OIDC providers. (Ticket #128417)
- **Change/improvement:** When a user logs in to REDCap the first time via OpenID Connect authentication, it now automatically adds their first name, last name, and email address to their REDCap user account. (Ticket #128417b)
- Bug fix: The datediff() function might not work as expected when using different data types in the parameters (e.g., date and datetime together) for PHP-based implementations of the logic evaluation process, such as the Survey Queue, ASI conditional logic, Data Quality rule logic, etc. (Ticket #128299)
- Bug fix: If a survey that is a repeating instrument is displayed in the survey queue, if over 8 instances of the survey have been completed and the survey is to allow participants to return via Save & Return Later in order to modify completed responses, it would mistakenly display all 8+ survey instances as visible in the survey queue when instead it should display them as being collapsed on the page. (Ticket #128362)
- Bug fix: If a Descriptive Text field has an inline image attachment, in which the image's file extension does not match its true mime type (i.e., someone has renamed its file extension to something incorrect prior to uploading the image), it would mistakenly cause the PDF export to run a long time and eventually time out when attempting to export a PDF of the instrument. (Ticket #128336)
- Various updates and fixes for the External Module Framework
- Bug fix: If using the [survey-link] Smart Variable with Custom Text and with an instance Smart Variable appended to the end (e.g., [survey-link:medications:Take this survey][last-instance]), the custom text would not display correctly but would include the unique instrument name at the beginning of the custom text by mistake.

- Bug fix: The "OpenID Connect" authentication would mistakenly not work successfully if using a proxy server. (Ticket #127244)
- Bug fix: The "Add Users (Table-based Only)" link would mistakenly not be displayed on the Control Center left-hand menu if using "OpenID Connect & Table-based" authentication, thus preventing admins from being able to create Table-based user accounts. (Ticket #128472)
- Bug fix: When granting a user access to a project via the User Rights page, the new user's data export rights in the popup would mistakenly default to "Full Data Set" for all instruments when instead they should default to "De-Identified" if in development status and to "No Access" if in production status. (Ticket #128504)
- Bug fix: The ":ampm" piping parameter would mistakenly not work for datetime fields that have DMY date format. (Ticket #128507)
- Bug fix: Data Quality rule D "Field validation errors (out of range)" would mistakenly not process the min and max values for the out-of-range check correctly if a field's min/max was set as "today", "now", or as a piped variable (e.g., [other_date]).

Version 12.4.0

- **New feature:** Calendar Sync
 - Users may sync their REDCap project calendar or perform a one-time import of their project calendar events to external calendar applications such as Google Calendar, Outlook, Office 365, Zoho, Apple Calendar, or any application that supports iCal or ICS files. They may choose one of the two options below to sync or import their project calendar events to an external calendar application.
 1. Live calendar feed: Add calendar from URL/Internet - A unique web address will be displayed in a dialog on the Calendar page, in which the URL represents a real-time live feed of the REDCap project calendar. Users may copy the URL to paste it as the calendar URL in their calendar application using the option "Add calendar from URL/Internet". This will subscribe their external application to the REDCap project calendar. Privacy Note: This calendar feed URL on the Calendar page is unique to the user in the project. So if the user gets expired, removed from the project, or deleted from the system, their unique calendar feed will go blank and will not output anything anymore (for privacy purposes).
 2. One-time import: Download ICS file - Download and open the calendar ICS file below to import REDCap calendar events manually into the calendar application on your computer, or upload the file to a web-based calendar service. Notice: This is not a live feed but a one-time import. Thus, any new events added to the REDCap calendar in the future will not be automatically added to the external calendar application.
 - Disabling: The Calendar Sync feature can be disabled at the system level on the Modules/Services Configuration page in the Control Center.
 - Feed-syncing Notice: Different calendar applications have different refresh rates. So if new events are added to the calendar in REDCap, they may not immediately appear in the external application that is consuming the feed but will appear after the next refresh interval, which might be some time later that day or the next day (depending on the calendar application). Additionally, the calendar feed represents a one-way feed. This means that while changes made to the calendar in REDCap will automatically show up in the external calendar application, users will not be able to modify them in the external calendar application because they will be read-only.

- Privacy Note: When viewing events from the Calendar page’s feed or downloadable ICS file, any data from Identifier fields will be automatically removed from the feed/file (e.g., if identifier fields are included in the Custom Record Label or Secondary Unique Field, or if the record name is an identifier), in which their data will be replaced with the text “**DATA REMOVED**”.
- New calendar-specific Smart Variables
 1. [calendar-url] - The web address (URL) of the calendar feed or downloadable ICS calendar file belonging to the current record.
 2. [calendar-link:Custom Text] - The HTML web link that, when clicked, will navigate to the calendar feed or downloadable ICS calendar file belonging to the current record. 'Custom Text' is an optional parameter whereby you can specify the visible link text, and if it is not provided, it defaults to simply displaying the URL as the link text.
- **New feature:** “OpenID Connect & Table-based” authentication
 - Admins may enable this new authentication method on the Security & Authentication page. It functions exactly like “OpenID Connect” authentication, and has the added bonus of providing some users with the ability to log in via REDCap’s local Table-based authentication (if they will not log in via OIDC).
 - Additionally, admins may optionally define the display name of the OpenID Connect system (e.g., Google, NIH), which gets displayed in a button on the login page that says “Log in using [X] or [Local REDCap Login]”. If a value is not provided for this setting, it will simply output "OpenID Connect" as the button text. Clicking that button will take the user to the OIDC login page.
- **Improvement:** When the authentication method is set to "OpenID Connect" or "OpenID Connect & Table-based", you may define which OIDC attribute will serve as the REDCap user's username. Simply set the setting "Attribute to use for REDCap username" on the Security & Authentication page. It will default to "username" when installing/upgrading REDCap, but also provides the other options "nickname" and "email". Note: If the selected attribute does not have a value for the current user, it will revert to using the user's associated email address to serve as their username.
- **Improvement:** New v2 endpoint for Azure AD authentication
 - The “Additional OAuth2 Azure AD Authentication Settings” section on the Security & Authentication page now contains a new “Endpoint Version” setting, which can be set as “V1” (default) or “V2” to allow REDCap to utilize different versions of the Azure AD authentication. Previously, only V1 could be utilized in REDCap. Now V2 can also be used.
 - Thanks to Paul Ryan (University of Hawai’i at Mānoa) and Eric Wagner (The Ohio State University) for their code contributions, which made this new feature possible.
- **Improvement:** REDCap now implements a new version of the two “datediff” cron jobs that run frequently each day and are utilized for Alerts & Notifications and Automated Survey Invitations. Instead of having a single cron job for each that runs a very long time every 4 hours, the two cron jobs will now run more often in a batched mode to spread out the same amount of work in smaller batches over time. This allows the processes to be done more efficiently (and sometimes faster in many cases) without the risk of the cron jobs timing out, which has been a concern with them in the past.
- **Improvements:** The following are enhancements for the Multi-Language Management system setup page in the Control Center:

- Additional column "Initial" - this governs the language that is initially shown on the translatable non-project pages (essentially, this is only the generic Survey Access page) when no browser cookie is set yet.
 - Designates the "Default" column to identify the language that matches that from the active Language.ini file
 - Adds popups with explanations to the various columns.
- **Improvement:** When viewing a suspended user's account on the Browse Users page in the Control Center, it now displays the text "Suspended" in red next to the user's name and username to help admins more easily identify if the user is suspended or not.
- Change/improvement: When defining the footer links on the Footer Settings page in the Control Center, if the administrator fails to enter the link values correctly by forgetting to add a label for each URL, the resulting link displayed in the project footer would not be clickable. In this case, it now displays the URL as the label and will be clickable.
- Bug fix: When viewing an email using the Protected Email Mode feature, the page would mistakenly crash with a fatal PHP error if the Multi-Language Management feature is enabled in the project.
- Bug fix: The Instant Adjudication process for the Clinical Data Pull feature would mistakenly not pull a value from the EHR system when there exists a perfect timestamp match for a data value whose field has been mapped using the Near, Earliest, or Latest preselection strategies.
- Bug fix: The install page would mistakenly crash with a fatal PHP error if using PHP 8 when the database credentials in [database.php](#) are either not correct or they cannot successfully connect to the database.
- Bug fix: When using the same field two or three times (i.e., from different arms) as a Survey Login field, clicking the "Show value" checkbox in the Survey Login dialog would mistakenly cause the field to duplicate itself inside the dialog.
- Bug fix: If duplicate instances of the same cron job somehow exist in the redcap_crons database table, which should not happen, REDCap will now detect this issue automatically and remove the duplicate jobs from the table.
- Bug fix: If the Smart Variables [form-link] and [form-url] have a literal instance number appended to them (e.g., [form-link:meds][3]), they would mistakenly not get parsed correctly and would always produce a link/URL that points to the first repeating instance. (Ticket #127042)
- Bug fix: When using Multi-Language Management, @CALCTEXT and @CALCDATE fields would fail to have their values piped immediately on the page after a language switch. Additionally, when only a single language (out of multiple languages) was active on a survey, the language switch might actually fail to work.
- Bug fix: If a participant clicks the "Start Over" button on a partially completed survey that happens to be a repeating instrument or on a repeating event, the Logging page would mistakenly not explicitly state the repeating instance number to which the survey response belonged, thus making it appear as if it references instance #1 always. (Ticket #128018)
- Bug fix: When uploading a data dictionary that has calculations or branching logic that contain Smart Variables with a comma inside them (e.g., [aggregate-sum:age,age2]), it would recommend stripping out the comma during the upload process, which would not be desirable.
- Bug fix: When using CDIS services (CDP or CPM), the FHIR services might mistakenly not function successfully if the EHR endpoint contains custom port numbers in their URL (e.g., <https://example.com:8888/FHIR/DSTU2/>).
- Bug fix: If a Project Bookmark is set to only be displayed for users in specific Data Access Groups, the bookmark would mistakenly fail to display for a REDCap administrator that is using the

"View Project As User" feature to impersonate a user assigned to one of those DAGs. However, the bookmark would display correctly for the DAG-assigned users themselves. (Ticket #128093)

- Bug fix: The Survey Settings feature "Save a PDF of completed survey response to a File Upload field" would mistakenly fail to function if enabled for an Adaptive or Auto-Scoring survey that has been imported from the REDCap Shared Library. (Ticket #128156)
- Bug fix: When certain field labels or section headers utilize the rich text editor on a survey that is set to display as very wide (e.g., 100% page width), the label text would mistakenly not extend to the full width of the survey table but would instead begin wrapping to the next line when the line reached a width of 850 pixels. (Ticket #128090)
- Bug fix: In the API Playground, the Export Metadata API method would mistakenly display the Form Complete Status fields in the field drop-down list on the page. It should not display those fields in the drop-down because those fields are never included in the data dictionary, thus they would never return anything from this API method. (Ticket #127974)
- Bug fix: Fixed rare issue where the fast refreshing of the main Control Center page would mistakenly display an issue where "redcap_ztemp_X" database tables exist and need to be deleted. (Ticket #128055)
- Change: If a suspended Table-based user attempts to reset their password on the login page, it would send them the email for resetting their password, which is not useful since they can't actually log in to the system. It now tells them that an admin needs to first unsuspend them. (Ticket #128232)

Version 12.3.3

- **Improvement:** If using Two-Factor Authentication, users can be allowed to use their 6-digit 2FA one-time PIN for e-signing processes in place of their password (e.g. performing an e-signature on data entry forms or when utilizing the 'File Upload' field enhancement feature when uploading a file on a data entry form - often used for 21 CFR Part 11 compliance for FDA trials). Normally, e-signing requires a username and password, but when this system-level setting is enabled while also having REDCap's Two-Factor Authentication enabled, users can alternatively provide their username and 2FA one-time PIN to perform the e-signing. A user can obtain their one-time PIN from their Google Authenticator or Microsoft Authenticator app, or else there will be an option available to send the user the PIN via email and/or SMS whenever they need to enter it. Note: This setting is disabled by default but can be enabled in the "Two-Factor Authentication" section on the Security & Authentication page.
- Change/improvement: Hyperlinks created in the rich text editor will now default to being opened in a new tab/window rather than defaulting to being opened in the current tab/window. This default value can be changed by the user when saving/inserting the link. (Ticket #124813)
- Change/improvement: The rich text editor might be finicky when dealing with non-Latin characters, such as converting them to HTML character codes when enabling and then disabling the rich text editor in the Edit Field popup in the Online Designer.
- Bug fix: Fix for an issue in the External Modules Framework that was mistakenly converting all HTML entities in some text and causing JavaScript errors when utilizing a specific EM method that might be used by an EM. (Ticket #126891)
- Bug fix: Field labels containing HTML character codes (e.g., ¨) would mistakenly not be displayed correctly on the X or Y axis of a [line-chart] or [scatter-plot] Smart Chart. (Ticket #127516)
- Bug fix: On the "Modules/Services Configuration" page in the Control Center, the setting to globally disable the "Stats & Charts" page in every project was mistakenly still referring to the

page by its old name "Graphical Data View & Stats", which was confusing for admins. (Ticket #127597)

- Various changes and fixes to the External Module Framework, including the following: Modified the module setting export & import features to use names rather than IDs for the arm-list, event-list, user-role-list, and dag-list setting types
- Bug fix: CDIS-related fixes
 - Several missing LOINC codes were added to the CDP and CDM mapping.
 - The field "Address (district/county)" in CDM was mistakenly missing as a field in CDM projects.
 - The deceasedBoolean value in CDM was mistakenly not being saved if False.
- Bug fix: If the value of the "report_id" parameter that is passed to the Export Reports API method does not belong to the current project whose API token is being used, if the user who owns the API token has access to the project to which the report_id belongs, the API would mistakenly not return an error but would instead return a list of record names from the other project. Note: No other data from the other project would be returned other than the record names.
- 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 #122604b)
- Bug fix: When Multi-Language Management is disabled in a project, the process of a user's production draft mode changes being approved would inadvertently cause an MLM snapshot to be saved. (Ticket #127650)
- Bug fix: If the system-level setting "Enable the Graphical Data View & Stats" has been disabled and then a user is granted access to a project, the user might mistakenly be able to access parts of the "Data Reports, Exports and Stats" page, even when they do not have any data export or reports privileges. (Ticket #127597)
- Bug fix: The Record Home Page in a longitudinal project would mistakenly display the column for an event that has no instruments designated for it. It should instead hide the column on the page rather than displaying it as empty. (Ticket #127708)
- Bug fix: When branching logic contains certain Smart Variables, especially [aggregate-X] Smart Variables, it would throw a branching logic error on the survey page or data entry form. (Ticket #127741)
- Bug fix: When a user calls the API method "Export PDF file of instruments" in a longitudinal project, in which the "event" parameter is either blank or is not provided in the API request, it would return a PDF that mistakenly only contains the first event's data, when instead it should return a PDF with data for all events. (Ticket #127820)

Version 12.3.2

- **Minor security fix:** An SQL Injection vulnerability was found when submitting the Create Project page, in which a malicious user could potentially exploit it by manipulating an HTTP request on that page.
- **Improvement:** New field validation type: "Phone (UK)". This validation type supports phone numbers from the United Kingdom (e.g., +44 7911 123456, +447911123456). Note: This validation type will be disabled by default after installing or upgrading, but it can be easily enabled on the Field Validation Types page in the Control Center. Thanks to the Field Validation Committee for donating this.
- **Change:** When deleting unsent/scheduled survey invitations on the Survey Invitation Log, the checkbox "Permanently cancel these invitations?" that appears in the delete invitation dialog

now defaults to being unchecked. In previous versions, the checkbox was checked by default, which could sometimes lead to disastrous consequences if the user did not read all the text carefully before deleting the invitation. (Ticket #127156)

- Bug fix: When using [aggregate-X] Smart Functions in branching logic or calculations, in which the value being returned from the function will be blank/null, it would mistakenly cause the popup error message to display on the survey page or data entry form saying that calculation errors or branching logic errors exist. (Ticket #115235b)
- Bug fix: If an embedded date or datetime field has a @READONLY action tag, the field's Today/Now button and its clickable datepicker icon would mistakenly remain active and allow users/participants to modify the field's value.
- Bug fix: If a field being piped into an outgoing email has the @RICHTEXT action tag, the resulting email body would mistakenly not look correct, such as containing too many line breaks or malformed tables. (Ticket #127174)
- Bug fix: Some REDCap installations somehow missed the upgrade script from REDCap 9.7 that enabled the "redcap.link" URL shortener. It will now be enabled if not.
- Bug fix: When using Twilio telephony services for surveys, U.S. phone numbers having the area code "332" would mistakenly not work for SMS or voice calls unless the number has a "1" prepended to it.
- Bug fix: The Publication Matching feature in the Control Center might mistakenly fail with a fatal PHP error when using PHP 8. (Ticket #127359)
- Bug fix: If a drop-down or radio button field on a survey has the @DEFAULT action tag, when the page initially loads, it would mistakenly scroll all the way down to the field with the @DEFAULT action tag (thus skipping the fields above it) if the participant was taking the survey on a mobile device. (Ticket #127406)
- Bug fix: Fixed an issue pertaining to changes made to Multi-Language Management translations while projects are in draft mode, especially affecting Automated Survey Invitation translations, in which the submitted changes would mistakenly not save successfully.
- Bug fix: If the conditional logic for an Automated Survey Invitation in a longitudinal project was mistakenly missing prepended event names for any field variables in the logic, the ASI might mistakenly not get triggered appropriately. (Ticket #127385)

Version 12.3.1

- **Improvement:** New system-level option to disable the E-signature feature so that its checkbox option is not displayed at the bottom of data entry forms (immediately above the Submit buttons). You might wish to disable this feature if you are not using Table-based, LDAP, or LDAP+Table-based authentication since the e-signature feature will not function for certain external authentication methods (e.g., Shibboleth, OAuth2) due to its requirement for the user to re-authenticate. This feature is enabled by default but can be disabled on the "Modules/Services Configuration" page in the Control Center.
- **Improvement:** In many places that display a drop-down list of records (e.g., Logging page, Email Logging, Field Comment Log, Data Quality page, ad hoc calendar event popup, Alerts & Notifications Log, Survey Notification Log), it will display a normal drop-down list if the project contains 5000 records or less, and if the project contains more than 5000 records, it will instead automatically revert to displaying an auto-suggest textbox to allow the user to manually enter the record name (rather than attempting to display an extremely long drop-down). This should make these pages load much faster and also make them easier to use in projects containing many records.

- **Improvement/change:** Password recovery questions have been removed as a feature for Table-based authentication. Password recovery questions will no longer be utilized as a part of the process whereby Table-based users reset their password. They are an unnecessary part of that process, they only cause issues and confusion for users, and they do not add much security-wise.
- **Change/improvement:** If an [aggregate-X] Smart Function is used inside a calculation or in branching logic, the function is no longer subject to the minimum data point threshold when viewing a survey page. In previous versions, under certain situations this could lead to a calculation/branching logic error on the survey page when too few data points had been entered. Note: If the Smart Function is being utilized for piping on a survey page, it is still subject to the minimum data point threshold though (i.e., different behavior for piping vs branching/calc). (Ticket #113901)
- **Change/improvement:** A value of "0" can now be used for the setting "Minimum number of data points required to display Smart Charts..." on the system-level "User Settings" page and on the project-level "Edit a Project's Settings" page. Previous versions would not allow "0" but would allow "1" as the smallest possible value. (Ticket #113901)
- **Bug fix:** The HTML tag "code" was mistakenly not included in the ALLOWED_TAGS list of HTML tags that are allowed to be used in user input (e.g., field labels, survey instructions).
- **Bug fix:** When using the survey setting "Redirect to a URL" together with Multi-Language Management, the resulting URL would not be correct or would be malformed, thus preventing the redirection from working successfully. (Ticket #126791)
- **Bug fix:** When uploading and then downloading a file for a File Upload field on the first page of a public survey, in which a record named record "1" already exists in the project prior to loading this survey, an erroneous message would be displayed along with some JavaScript errors on the page. (Ticket #125758)
- **Bug fix:** When copying a project via the Copy Project page, many of the new survey features (e.g., custom width, font resize icons) added in REDCap 12.3.0 would mistakenly not get copied into the new project. (Ticket #126824)
- **Bug fix:** The new survey-level settings added in REDCap 12.3.0 for defining custom text for the survey Submit buttons were mistakenly not incorporated into Multi-Language Management, thus the custom button text was not able to be translated in MLM.
- **Bug fix:** When using the export->import process for Multi-Language Management via a JSON/CSV file, there might be issues with successfully importing Alerts and Automated Survey Invitations in the file.
- **Bug fix:** If a drop-down field has the "auto-complete" setting enabled, in which the drop-down contains more than 200 choices, then when viewing drop-down on a survey page or data entry form, clicking the drop-down's down-arrow would mistakenly not open the full list of choices for the drop-down. (Ticket #125257)
- **Change:** Added a "Contact REDCap administrator" link near the top of the project left-hand menu to provide a secondary place for users to easily contact their local administrator since the blue "Contact REDCap administrator" button at the bottom of the menu is often not visible on many pages if the menu is very long. Both the existing blue button and this new link function exactly the same. Note: The blue button was not removed but has been kept as a secondary way for users to contact their admin.
- **Bug fix:** Calculated fields containing form status fields (i.e. form+"_complete") mistakenly do not fire when on a survey page. (Ticket #127009)
- **Bug fix:** When importing data for a field that has the @FORCE-MINMAX action tag and also has a minimum or maximum range check value as "now", "today", or a piped variable name, out-of-

range values in the data import file would mistakenly not be flagged as errors during the import process and would be saved. (Ticket #126862)

- Bug fix: When a user requests that their project be moved to production, after the administrator approves their request, the user would mistakenly not receive a confirmation email of this approval if the "Enable email notifications for administrators" checkbox is left unchecked on the "To-Do List" page in the Control Center. (Ticket #127040)
- Change: The context under which the `redcap_module_configure_button_display()` external module hook has changed from the module list pages to an AJAX request. Any modules implementing this hook should test it to make sure it still behaves as desired.

Version 12.3.0

- **New feature:** Integration of the "MySQL Simple Admin" External Module
 - The integrated version of this EM works exactly the same way, and additionally, has the bonus feature of being able to export the query results to a CSV file. Also, the page has been renamed to "Database Query Tool".
 - Note: The upgrade process contains a migration script that will auto-migrate all existing custom queries saved in the EM, after which it will disable the EM for the system.
- **New feature:** OpenID Connect authentication method - The "Security & Authentication" page contains a section of new custom settings for using this new OpenID Connect authentication method in REDCap.
- **New feature:** Integration of many features from the "Survey UI Tweaks" External Module
 - Thanks to Andy Martin and his team at Stanford for their creation and support of the EM. Several (but not all) of the features in the Survey UI Tweaks EM have been integrated as-is. Some features from the EM have actually existed in REDCap for a while. As such, the Survey UI Tweaks EM will not be disabled for any projects or even at the system level when upgrading to this version.
 - Improvement: If custom question numbering is used on a survey page in which no questions have a custom question number defined, the extra space on the left of the questions will be removed to give the questions more room for display on the page.
 - Improvement: On the Survey Settings page, the setting "For Required fields, display the red 'must provide value' text on the survey page?" now has a new option: "Display only the red asterisk". This provides an additional option rather than having to choose between the binary options to hide or not hide the text.
 - Improvement: When taking a survey while on a mobile device, the survey page will auto-scroll whenever selecting a value for a drop-down or radio button field to help the participant scroll down the page more easily.
 - Improvement: New survey setting allows users to set a custom width of the survey displayed on the page between 50% and 100%. The default value for the setting is "Fixed width (default)".
 - Improvement: New survey setting allows users to display or hide the font resize icons at the top of the survey page. By default, it is set to display the font resize options.
 - Improvement: New survey setting allows users to show or hide the Submit buttons displayed at the bottom of every survey page (including the 'Next Page' and 'Previous Page' buttons).
 - Improvement: New survey setting allows users to provide alternative text for the 'Submit', 'Next Page', and 'Previous Page' buttons displayed at the bottom of every survey page.

- **Major bug fix:** A field's question text on a survey page might mistakenly not get recognized by certain screen reading software. Bug emerged in REDCap 12.2.2 Standard and REDCap 12.0.14 LTS. (Ticket #122843)
- Change: Renamed the "MySQL Dashboard" to "Database Activity Monitor" on the Control Center left-hand menu.
- Change: The textbox for date, time, and datetime fields are no longer displayed with full width on data entry forms or survey pages where the whole page is disabled (e.g., when locked, when initially viewing a survey response) but instead are now displayed at their typical width.
- Bug fix: The Record Status Dashboard page might crash with a fatal PHP error in specific cases when using PHP 8.0 or 8.1. (Ticket #126395)
- Bug fix: When a checkbox is set as an Identifier field and is referenced in the body of an alert, which is set to remove all identifiers from the alert body when sent, it might throw a fatal PHP error in PHP 8.0+.
- Bug fix: When using Twilio telephony services for surveys, U.S. phone numbers having the area code "346" would mistakenly not work for SMS or voice calls unless the number has a "1" prepended to it. (Ticket #126590)
- Bug fix: When using Twilio telephony services for surveys, U.S. phone numbers having the area codes "220", "223", "458" would mistakenly not work for SMS or voice calls unless the number has a "1" prepended to it. (Ticket #126741)
- Bug fix: Clicking certain hyperlinks on a survey page might mistakenly add the green highlighted background to the field if the link exists inside a field that is a container for embedded fields. (Ticket #105242b)
- Bug fix: If a line-chart or scatter-plot Smart Variable contains a third field used for categorization, the plot might mistakenly not display but would appear blank if some choices for the categorization field are not all presented in the plot's data.
- Bug fix: When importing data in JSON format (including via the REDCap::saveData method), if a single record is represented in the imported data as multiple items/rows (i.e., when importing longitudinal events or repeating instances), if one of the rows for a record contained a leading or trailing space in the record name while other items/rows for that same record did not, the spaces would mistakenly not get trimmed off of the record name but instead would cause the record to end up in a split state in the project, in which it would appear ultimately as separate records. (Ticket #126035)

Version 12.2.11

- **Improvement:** The "Email Users" page in the Control Center now sends emails using a cron-job based queueing process. This means that emails are no longer sent in real time on the page, and thus there is no longer a need for the admin sending the email to stay on the page while all the emails are sent. This makes the process much faster and easier for admins using this page.
- **Improvement:** When using S3 for file storage, you may now specify a custom S3 endpoint URL on the "File Upload Settings" page in the S3 section. This helps support the use of alternative S3 destinations. (Ticket #62790)
- Bug fix: If using the Multi-Language Management feature, changing the language on the page would mistakenly not alter the URL of embedded video in a descriptive text field if a translated/alternative version of the video URL was provided for a language in the project. (Ticket #125502)

- Bug fix: When the Survey Queue is enabled in a project, a fatal PHP error might occur in some specific cases when using PHP 8.0 or 8.1 while exporting the Project XML file or while performing other Survey Queue related activities. (Ticket #126079)
- Bug fix: When one or more suspended users have access to a project that contains Data Access Groups, the User Rights page might mistakenly still display a placeholder for a suspended user's DAG assignment in the user/role table even if the users' usernames are hidden on the User Rights page. Bug emerged in REDCap 12.2.9. (Ticket #126081)
- Bug fix: When a project's language is set to be different from the system language, the popup dialogs in a project that display documentation for piping, field embedding, and special functions would mistakenly always be shown in the system language. (Ticket #126117)
- Bug fix: Using the action tag @READONLY (including @READONLY-SURVEY and @READONLY-FORM) on a Notes field that also has the action tag @RICHTEXT would mistakenly cause the Notes field not to be disabled/readonly but would still be editable. Going forward, any of the @READONLY action tags will negate @RICHTEXT on a field. (Ticket #126097)
- Bug fix: If a user assigned to a Data Access Group attempts to view a data entry form for a record not assigned to their DAG (e.g., by manipulating the URL in order to navigate to the record), it would mistakenly not display the "Record X belongs to another Data Access Group" error message and would display mostly a blank page due to a JavaScript error.
- Bug fix: When using the Mailgun service for sending outgoing emails while utilizing the "Universal FROM Email Address" setting, the Reply-To header would mistakenly fail to be set correctly for all outgoing emails. (Ticket #126173)
- Bug fix: If a user had downloaded an Adaptive or Auto-Scoring instrument from the REDCap Shared Library, they would mistakenly be allowed to translate the instrument via the Multi-Language Management setup page. Since Adaptive or Auto-Scoring instruments are validated, they should not be able to be translated because such would cause them to no longer be validated. So all Adaptive or Auto-Scoring instruments will be disabled on the MLM setup page, thus preventing users from translating them.
- Bug fix: If a user has downloaded an instrument from the REDCap Shared Library, whether it was a curated instrument or not, it now displays a warning when attempting to translate the instrument on the Multi-Language Management setup page that the user should first check to see if the instrument is validated. And if so, they should not translate the instrument because such might cause it to no longer be validated.
- Bug fix: When using Multi-Language Management, the survey termination option "Redirect to a URL" would mistakenly not use the translated URL. (Ticket #126255)
- Bug fix: When creating a project via Project XML import, the process might crash with a fatal PHP error if using PHP 8.0 or 8.1. (Ticket #126268)
- Bug fix: Fields with a @READONLY or @READONLY-X action tag would mistakenly not be disabled on the page if the fields were embedded. (Ticket #126276)
- Bug fix: The @IF action tag will mistakenly not evaluate correctly on a survey page or data entry form if the record does not yet exist (e.g., when viewing the first page of a public survey).
- Bug fix: The @IF action tag might mistakenly not get parsed correctly in certain instances when using Multi-Language Management.
- Bug fix: When using Multi-Language Management, the UI text displayed below a field when using the @CHARLIMIT or @WORDLIMIT action tags would mistakenly not be translatable on the MLM setup page.
- Bug fix: On the Survey Settings page, if the option "Send Confirmation Email" is enabled along with the option "Include PDF of completed survey as attachment" while using Multi-Language Management, the PDF of the survey response attached to the confirmation email would

mistakenly always be in the default language when instead it should be in the language in which the respondent took the survey. (Ticket #126341)

- Bug fix: When a user assigned to a Data Access Group is performing a data import for a project with Record Auto-Numbering enabled, in which the import setting "Yes, rename all records" has been set for the data import, the import process will mistakenly time out and never fully complete. (Ticket #126160)