Package ‘REDCapTidieR’

June 3, 2023

Type Package
Title Extract 'REDCap' Databases into Tidy 'Tibble's
Version 0.4.0
Description Convert 'REDCap' exports into tidy tables for easy handling of 'REDCap' repeat instruments and event arms.
License MIT + file LICENSE
BugReports https://github.com/CHOP-CGTInformatics/REDCapTidieR/issues
Depends R (>= 3.5.0)
Imports checkmate, cli, dplyr, lobstr, lubridate, purrr, REDCapR (>= 1.1.0), rlang, stringi, stringr, tibble, tidyr, tidyselect, formattable
Suggests covr, httptest, knitr, labelled, lintr, openxlsx2, prettyunits, readr, rmarkdown, Skinner, testthat (>= 3.0.0), withr
VignetteBuilder knitr
Config/testthat/edition 3
Encoding UTF-8
LazyData true
RoxygenNote 7.2.3
NeedsCompilation no
Author Richard Hanna [aut, cre], Stephan Kadauke [aut], Ezra Porter [aut]
Maintainer Richard Hanna <richardshanna91@gmail.com>
Repository CRAN
Date/Publication 2023-06-03 13:50:02 UTC
R topics documented:

- add_skimr_metadata ........................................ 2
- bind_tibbles .................................................. 3
- extract_tibble ............................................... 4
- extract_tibbles .............................................. 4
- format-helpers .............................................. 5
- make_labelled ............................................... 6
- read_redcap .................................................. 7
- superheroes_supertbl ..................................... 9
- write_redcap_xlsx .......................................... 10

Index 12

---

**add_skimr_metadata**  
*Add skim metrics to a supertibble’s metadata*

**Description**

Add default skim metrics to the redcap_data list elements of a supertibble output from read_redcap.

**Usage**

```r
add_skimr_metadata(supertbl)
```

**Arguments**

- **supertbl**
  
a supertibble generated using `read_redcap()`

**Details**

For more information on the default metrics provided, check the `get_default_skimmer_names` documentation.

**Value**

A supertibble with skim metadata metrics

**Examples**

```r
superheroes_supertbl
add_skimr_metadata(superheroes_supertbl)

## Not run:
redcap_uri <- Sys.getenv("REDCAP_URI")
token <- Sys.getenv("REDCAP_TOKEN")
supertbl <- read_redcap(redcap_uri, token)
add_skimr_metadata(supertbl)
```
## End(Not run)

### Description

Take a supertibble generated with `read_redcap()` and bind its data tibbles (i.e. the tibbles in the `redcap_data` column) to an environment. The default is the global environment.

### Usage

```r
bind_tibbles(supertbl, environment = global_env(), tbls = NULL)
```

### Arguments

- `supertbl`: A supertibble generated by `read_redcap()`. Required.
- `environment`: The environment to bind the tibbles to. Default is `rlang::global_env()`.
- `tbls`: A vector of the `redcap_form_name` s of the data tibbles to bind to the environment. Default is `NULL` which binds all data tibbles.

### Value

This function returns nothing as it’s used solely for its side effect of modifying an environment.

### Examples

```r
## Not run:
# Create an empty environment
my_env <- new.env()

ls(my_env)

superheroes_supertbl

bind_tibbles(superheroes_supertbl, my_env)

ls(my_env)

## End(Not run)
**extract_tibble**

Extract a single data tibble from a REDCapTidieR supertibble

**Description**

Take a supertibble generated with `read_redcap()` and return one of its data tibbles.

**Usage**

```r
evaluate_tibble(supertbl, tbl)
```

**Arguments**

- `supertbl` A supertibble generated by `read_redcap()`. Required.
- `tbl` The `redcap_form_name` of the data tibble to extract. Required.

**Details**

This function makes it easy to extract a single instrument’s data from a REDCapTidieR supertibble.

**Value**

A tibble.

**Examples**

```r
superheroes_supertbl

extract_tibble(superheroes_supertbl, "heroes_information")
```

---

**extract_tibbles**

Extract data tibbles from a REDCapTidieR supertibble into a list

**Description**

Take a supertibble generated with `read_redcap()` and return a named list of data tibbles.

**Usage**

```r
extract_tibbles(supertbl, tbls = everything())
```

**Arguments**

- `supertbl` A supertibble generated by `read_redcap()`. Required.
- `tbls` A vector of `form_names` or a tidyselect helper. Default is `dplyr::everything()`.
Details

This function makes it easy to extract a multiple instrument’s data from a REDCapTidieR supertibble into a named list. Specifying instruments using tidyselect helper functions such as `dplyr::starts_with()` or `dplyr::ends_with()` is supported.

Value

A named list of tibbles

Examples

```r
superheroes_supertbl

# Extract all data tibbles
extract_tibbles(superheroes_supertbl)

# Only extract data tibbles starting with "heroes"
extract_tibbles(superheroes_supertbl, starts_with("heroes"))
```

format-helpers  
Format REDCap variable labels

Description

Use these functions with the `format_labels` argument of `make_labelled()` to define how variable labels should be formatted before being applied to the data columns of `redcap_data`. These functions are helpful to create pretty variable labels from REDCap field labels.

- `fmt_strip_whitespace()` removes extra white space inside and at the start and end of a string. It is a thin wrapper of `stringr::str_trim()` and `stringr::str_squish()`.
- `fmt_strip_trailing_colon()` removes a colon character at the end of a string.
- `fmt_strip_trailing_punct()` removes punctuation at the end of a string.
- `fmt_strip_html()` removes html tags from a string.
- `fmt_strip_field_embedding()` removes text between curly braces `{}` which REDCap uses for special "field embedding" logic. Note that `read_redcap()` removes html tags and field embedding logic from field labels in the metadata by default.

Usage

```r
fmt_strip_whitespace(x)
fmt_strip_trailing_colon(x)
fmt_strip_trailing_punct(x)
fmt_strip_html(x)
fmt_strip_field_embedding(x)
```
Arguments

x  a character vector

Value

a modified character vector

Examples

fmt_strip_whitespace("Poorly Spaced Label ")
fmt_strip_trailing_colon("Label:")
fmt_strip_trailing_punct("Label-")
fmt_strip_html("<b>Bold Label</b>")
fmt_strip_field_embedding("Label(another_field)"

make_labelled(supertbl, format_labels = fmt_strip_trailing_colon)

Description

Take a supertibble and use the labelled package to apply variable labels to the columns of the supertibble as well as to each tibble in the redcap_data, redcap_metadata, and redcap_events columns of that supertibble.

Usage

make_labelled(supertbl, format_labels = NULL)

Arguments

supertbl  a supertibble generated using read_redcap()
format_labels  one or multiple optional label formatting functions. A label formatting function is a function that takes a character vector and returns a modified character vector of the same length. This function is applied to field labels before attaching them to variables. One of:
  • NULL to apply no additional formatting. Default.
  • A label formatting function.
A character with the name of a label formatting function.
- A vector or list of label formatting functions or function names to be applied in order. Note that ordering may affect results.

Details

The variable labels for the data tibbles are derived from the `field_label` column of the metadata tibble.

Value

A labelled supertibble.

Examples

```r
superheroes_supertbl

make_labelled(superheroes_supertbl)

make_labelled(superheroes_supertbl, format_labels = tolower)
```

```r
## Not run:
redcap_uri <- Sys.getenv("REDCAP_URI")
token <- Sys.getenv("REDCAP_TOKEN")

supertbl <- read_redcap(redcap_uri, token)
make_labelled(supertbl)

## End(Not run)
```

---

**read_redcap**

*Import a REDCap database into a tidy supertibble*

**Description**

Query the REDCap API to retrieve data and metadata about a project, and transform the output into a "supertibble" that contains data and metadata organized into tibbles, broken down by instrument.

**Usage**

```r
read_redcap(
  redcap_uri,
  token,
  raw_or_label = "label",
  forms = NULL,
  export_survey_fields = NULL,
  export_data_access_groups = NULL,
  suppress_redcapr_messages = TRUE,
  guess_max = .Machine$integer.max
)
```
Arguments

redcap_uri
The URI/URL of the REDCap server (e.g., "https://server.org/apps/redcap/api/"). Required.
token
The user-specific string that serves as the password for a project. Required.
raw_or_label
A string (either 'raw' or 'label') that specifies whether to export the raw coded values or the labels for the options of categorical fields. Default is 'label'.
forms
A character vector of REDCap instrument names that specifies which instruments to import. Default is NULL which imports all instruments in the project.

export_survey_fields
A logical that specifies whether to export survey identifier and timestamp fields. The default, NULL, tries to determine if survey fields exist and returns them if available.

export_data_access_groups
A logical that specifies whether to export the data access group field. The default, NULL, tries to determine if a data access group field exists and returns it if available.

suppress_redcapr_messages
A logical to control whether to suppress messages from REDCapR API calls. Default TRUE.

guess_max
A positive base::numeric value passed to readr::read_csv() that specifies the maximum number of records to use for guessing column types. Default .Machine$integer.max.

Details

This function uses the REDCapR package to query the REDCap API. The REDCap API returns a block matrix that mashes data from all data collection instruments together. The read_redcap() function deconstructs the block matrix and splices the data into individual tibbles, where one tibble represents the data from one instrument.

Value

A tibble in which each row represents a REDCap instrument. It contains the following columns:

- redcap_form_name, the name of the instrument
- redcap_form_label, the label for the instrument
- redcap_data, a tibble with the data for the instrument
- redcap_metadata, a tibble of data dictionary entries for each field in the instrument
- redcap_events, a tibble with information about the arms and longitudinal events represented in the instrument. Only if the project has longitudinal events enabled
- structure, the instrument structure, either "repeating" or "nonrepeating"
- data_rows, the number of rows in the instrument's data tibble
- data_cols, the number of columns in the instrument's data tibble
- data_size, the size in memory of the instrument's data tibble computed by lobstr::obj_size()
- data_na_pct, the percentage of cells in the instrument's data columns that are NA excluding identifier and form completion columns
Examples

```r
## Not run:
redcap_uri <- Sys.getenv("REDCAP_URI")
token <- Sys.getenv("REDCAP_TOKEN")

read_redcap(
  redcap_uri,
  token,
  raw_or_label = "label"
)

## End(Not run)
```

---

**superheroes_supertbl**  
*Superheroes Data*

**Description**

A dataset of superheroes in a REDCapTidieR `supertbl` object

**Usage**

`superheroes_supertbl`

**Format**

- **heroes_information**:
  - A tibble with 734 rows and 12 columns:
    - `record_id`  REDCap record ID
    - `name` Hero name
    - `gender` Gender
    - `eye_color` Eye color
    - `race` Race
    - `hair_color` Hair color
    - `height` Height
    - `weight` Weight
    - `publisher` Publisher
    - `skin_color` Skin color
    - `alignment` Alignment
    - `form_status_complete` REDCap instrument completed?

- **super_hero_powers**:
  - A tibble with 5,966 rows and 4 columns:
    - `record_id`  REDCap record ID
    - `redcap_form_instance` REDCap repeat instance
    - `power` Super power
    - `form_status_complete` REDCap instrument completed?
write_redcap_xlsx

Source

https://www.superherodb.com/

write_redcap_xlsx  Write Supertibbles to XLSX

Description

Transform a supertibble into an XLSX file, with each REDCap data tibble in a separate sheet.

Usage

write_redcap_xlsx(
  supertbl,  
  file,  
  add_labelled_column_headers = NULL,  
  use_labels_for_sheet_names = TRUE,  
  include_toc_sheet = TRUE,  
  include_metadata_sheet = TRUE,  
  table_style = "tableStyleLight8",  
  column_width = "auto",  
  recode_logical = TRUE,  
  na_replace = "",  
  overwrite = FALSE
)

Arguments

supertbl  A supertibble generated using read_redcap().
file  The name of the file to which the output will be written.
add_labelled_column_headers  If TRUE, the first row of each sheet will contain variable labels, with variable names in the second row. If FALSE, variable names will be in the first row. The default value, NULL, tries to determine if supertbl contains variable labels and, if present, includes them in the first row. The labelled package must be installed if add_labelled_column_headers is TRUE.
use_labels_for_sheet_names  If FALSE, sheet names will come from the REDCap instrument names. If TRUE, sheet names will come from instrument labels. The default is TRUE.
include_toc_sheet  If TRUE, the first sheet in the XLSX output will be a table of contents, providing information about each data tibble in the workbook. The default is TRUE.
include_metadata_sheet  If TRUE, the final sheet in the XLSX output will contain metadata about each variable, combining the content of supertbl$redcap_metadata. The default is TRUE.
write_redcap_xlsx

**table_style**
Any Excel table style name or "none". For more details, see the "formatting" vignette of the openxlsx package. The default is "tableStyleLight8".

**column_width**
Sets the width of columns throughout the workbook. The default is "auto", but you can specify a numeric value.

**recode_logical**
If TRUE, fields with "yesno" field type are recoded to "yes"/"no" and fields with a "checkbox" field type are recoded to "Checked"/"Unchecked". The default is TRUE.

**na_replace**
The value used to replace NA values in supertbl. The default is "".

**overwrite**
If FALSE, will not overwrite file when it exists. The default is FALSE.

**Value**

An openxlsx2 workbook object, invisibly

**Examples**

```r
## Not run:
redcap_uri <- Sys.getenv("REDCAP_URI")
token <- Sys.getenv("REDCAP_TOKEN")

supertbl <- read_redcap(redcap_uri, token)

supertbl %>%
  write_redcap_xlsx(file = "supertibble.xlsx")

# Add variable labels

library(labelled)

supertbl %>%
  make_labelled() %>%
  write_redcap_xlsx(file = "supertibble.xlsx", add_labelled_column_headers = TRUE)

## End(Not run)
```
## Index

* datasets
  * superheroes_supertbl, 9

add_skimr_metadata, 2

base::numeric, 8

bind_tibbles, 3

extract_tibble, 4

extract_tibbles, 4

fmt_strip_field_embedding
  (format-helpers), 5

fmt_strip_html (format-helpers), 5

fmt_strip_trailing_colon
  (format-helpers), 5

fmt_strip_trailing_punct
  (format-helpers), 5

fmt_strip_whitespace (format-helpers), 5

format-helpers, 5

get_default_skimmer_names, 2

make_labelled, 6

read_redcap, 7

readr::read_csv(), 8

skim, 2

skimr, 2

superheroes_supertbl, 9

write_redcap_xlsx, 10