Package: codeditr (via r-universe)

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Type Package

Title Implementing Cause-of-Death Data Checks Based on the WHO CoDEdit Tool

Version 0.0.0.9000

Description The World Health Organization's CoDEdit electronic tool is intended to help producers of cause-of-death statistics in strengthening their capacity to perform routine checks on their data. This package ports the original tool built using Microsoft Access into R so as to leverage the utility and function of the original tool into a usable application program interface that can be used for building more universal tools or for creating programmatic scientific workflows aimed at routine, automated, and large-scale monitoring of cause-of-death data.

License GPL (>= 3)

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`cod_calculate_age` *Calculate age at death based on date of birth and date of death*

Description

Calculate age at death based on date of birth and date of death

Usage

```
cod_calculate_age(dob, dod, date_format = "%Y-%m-%d", codedit = TRUE)

cod_calculate_ages(dob, dod, date_format = "%Y-%m-%d", codedit = TRUE)
```

Arguments

dob	Date of birth. This should ideally be in standard ISO extended date format of *"YYYY-MM-DD"* as specified in the default value for date_format.
dod	Date of death. This should ideally be in standard ISO extended date format of *YYYY-MM_DD"* as specified in the default value for date_format.
date_format	Format for date values provided. Date formatting is handled using strptime() hence this needs to be specified based on what strptime() requires for its format argument. By default, this is set to the standard ISO extended date format expressed as *"%Y-%m-%d"* which corresponds to *"YYYY-MM-DD"*.
codedit	Logical. Should output be based on the CoDEdit version 2 coding rules. Default to TRUE.

Value

Values for age in days, months and years. IF codedit is TRUE, a tibble with age value and age type as required by CoDEdit.

Examples

```
cod_calculate_age("1977-11-05", Sys.Date())
cod_calculate_age("1965-05-20", "2023-10-03")
```

---

cod_check_age *Check age values in cause-of-death data based on CoDEdit rules*

Description

Check age values in cause-of-death data based on CoDEdit rules

Usage

```
cod_check_age(age_value, age_type, age_type_code = c("D", "M", "Y"))
```

Arguments

age_value	An integer value or vector of values for age based on the CoDEdit rules.
age_type	A vector of values for age type based on the CoDEdit rules. This should either be "D" for age in days, "M" for age in months, or "Y" for age in years. If values are different from these, then age_type_code should be specified to correspond to the day, month, and year values of age_type.
age_type_code	A character or integer vector of 3 values that indicate which values are to be considered pertaining to days (first value in the vector), to months (second value in the vector), or years (third value in the vector).

Value

A tibble with number of rows equal to length of age_value and two columns for age_check and age_check_note.

Examples

```
cod_check_age(120, "Y")
cod_check_age(28, "D")
cod_check_age(32, "D")
```

---

cod_check_code *Check cause-of-death code for code entry mistakes and/or code completeness*

Description

Check cause-of-death code for code entry mistakes and/or code completeness

Usage

```
cod_check_code(cod, version = c("icd10", "icd11"), sex, age)

cod_check_code_structure_icd10(cod)

cod_check_code_structure_icd11(cod)

cod_check_code_ill_defined_icd10(cod)

cod_check_code_ill_defined_icd11(cod)

cod_check_code_unlikely_icd10(cod)

cod_check_code_unlikely_icd11(cod)

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cod_check_code_sex_icd11_(cod, sex)

cod_check_code_sex_icd11(cod, sex)

cod_check_code_age_icd10_(cod, age)

cod_check_code_age_icd10(cod, age)
```

```
cod_check_code_age_icd11_(cod, age)

cod_check_code_age_icd11(cod, age)
```

Arguments

cod	A character value or vector of values for cause-of-death code/s.
version	A character value for ICD version used. This should be either *"icd10"* or *"icd11"*. Default is *"icd10"*.
sex	A character value or vector of values for sex of individual associated with the specified cod.
age	An integer value or vector of values for age (in years) of individual.

Value

A tibble with 2 columns/fields. First is an integer value indicating whether there is an issue with the cause-of-death code provided in relation to a potential code entry mistake and/or and issue of code completeness.

Examples

```
cod_check_code("U100", sex = 1, age = 10)
cod_check_code("2C6Z", version = "icd11", sex = 1, age = 65)
```

---

cod_check_code_summary

Summarise cause-of-death check results

Description

Summarise cause-of-death check results

Usage

```
cod_check_code_summary(cod_check, simplify = FALSE)
```

Arguments

cod_check	A data.frame output of the various cod_check_code_* functions
simplify	Logical. Should output be converted into a data.frame? Default is FALSE.

Value

If simplify is FALSE (default), a list of summary check outputs. Otherwise, a tabulated summary of check outputs.

Examples

```
cod_check_code(
  cod_data_raw_example$code, version = "icd11",
  sex = cod_data_raw_example$sex, age = cod_data_raw_example$age
) |>
  cod_check_code_summary()
```

`cod_check_codedit_input` *Check structure and values of input data to CoDEdit tool*

Description

Check structure and values of input data to CoDEdit tool

Usage

```
cod_check_codedit_input(df)
```

Arguments

`df`	A data.frame with 6 columns with names `"FreeId"`, `"Sex"`, `"Age Value"`, `"Age Type"`, `"Code"`, and `"Death Date"` and compatible with the input data required by the CoDEdit tool.

Value

A data.frame containing check codes and check notes for each row and variable identified with the `FreeId` of `df`.

Examples

```
cod_check_codedit_input(icd10_example)
```

`cod_check_dod` *Check date of death value in cause-of-death data based on CoDEdit rules*

Description

Check date of death value in cause-of-death data based on CoDEdit rules

Usage

```
cod_check_dod(dod)
```

Arguments

dod	Date of death value expressed in terms of the year death occurred.

Value

A tibble with number of rows equal to length of dod and two columns for dod_check and dod_check_note.

Examples

```
cod_check_dod("2024")
```

---

cod_check_sex *Check sex values in cause-of-death data based on CoDEdit rules*

Description

Check sex values in cause-of-death data based on CoDEdit rules

Usage

```
cod_check_sex(sex_value, sex_code = c(1, 2))
```

Arguments

sex_value	An integer value or vector of values for age based on the CoDEdit rules.
sex_code	A character or integer vector of 2 values that indicate which values are to be considered pertaining to males (first value in the vector) or to females (second value in the vector). Default is 1 for male and 2 for female.

Value

A tibble with number of rows equal to length of sex_value and two columns for sex_check and sex_check_note.

Examples

```
cod_check_sex("m", c("m", "f"))
cod_check_sex("male", c("male", "female"))
cod_check_sex(1, 1:2)
```

cod_data_raw_example *Example raw cause-of-death dataset*

Description

Example raw cause-of-death dataset

Usage

```
cod_data_raw_example
```

Format

A data frame with 6 columns and 20 rows:

Variable	Description
id	Unique identifier
sex	Sex of deceased
age	Age of diseased in years
code	ICD 11 cause-of-death code
dod	Date of death
dob	Date of birth

Examples

```
cod_data_raw_example
```

cod_recode_age_type *Recode age type of cause-of-death data based on CoDEdit rules*

Description

Recode age type of cause-of-death data based on CoDEdit rules

Usage

```
cod_recode_age_type(age_type, age_type_code = c("D", "M", "Y"))
```

Arguments

age_type	A vector of values for age type based on the CoDEdit rules. This should either be "D" for age in days, "M" for age in months, or "Y" for age in years. If values are different from these, then age_type_code should be specified to correspond to the day, month, and year values of age_type.
age_type_code	A character or integer vector of 3 values that indicate which values are to be considered pertaining to days (first value in the vector), to months (second value in the vector), or years (third value in the vector).

Value

A character value or vector of values containing either "D", "M", or "Y" for *days*, *months*, or *years* respectively.

Examples

```
cod_recode_age_type(
  age_type = c(rep("d", 3), rep("m", 2), rep("y", 3)),
  age_type_code = c("d", "m", "y")
)
```

`cod_recode_sex` *Recode sex value of cause-of-death data based on CoDEdit rules*

Description

Recode sex value of cause-of-death data based on CoDEdit rules

Usage

```
cod_recode_sex(sex_value, sex_code = c(1L, 2L), codedit = TRUE)
```

Arguments

`sex_value`	A character or integer value or vector of values signifying the sex.
`sex_code`	A character or integer vector of 2 values that indicate which values are to be considered pertaining to males (first value in the vector) or to females (second value in the vector).
`codedit`	Logical. Should output be based on the CoDEdit version 2 coding rules. Default to TRUE.

Value

An integer value or vector of values containing either 1 for males or 2 for females. If `codedit = TRUE`, values not equal to the `sex_code` values are coded as 9 (integer). Otherwise, it is coded as NA_integer_.

Examples

```
cod_recode_sex(
  sex_value = c(rep("m", 2), rep("f", 3)),
  sex_code = c("m", "f")
)
```

`cod_structure_input` *Structure cause-of-death data into CoDEdit tool input data*

Description

Structure cause-of-death data into CoDEdit tool input data

Usage

```
cod_structure_input(df, sex, sex_code = c(1, 2), dob, dod, code, id = NULL)
```

Arguments

`df`	A data.frame of raw cause-of-death data with the following required variables that contains values for sex, date of birth, date of death, and cause-of-death code.
`sex`	A character value for the variable name in `df` containing the values for sex.
`sex_code`	A character or integer vector of 2 values that indicate which values are to be considered pertaining to males (first value in the vector) or to females (second value in the vector).
`dob`	A character value for the variable name in `df` containing the values for date of birth.
`dod`	A character value for the variable name in `df` containing the values for date of death.
`code`	A character value for the variable name in `df` containing the values for cause-of-death code.
`id`	A character value for the variable name in `df` containing unique record identifiers. Default to NULL. If NULL, unique record identifiers will be generated.

Value

A tibble with 6 columns and number of rows equal to `df` with names `"FreeId"`, `"Sex"`, `"Age Value"`, `"Age Type"`, `"Code"`, and `"Death Date"`.

Examples

```
df <- data.frame(
  id = 1:3,
  sex = c(1, 1, 2),
  dob = c("1977-11-05", "1971-04-04", "2012-08-13"),
  dod = c("2024-06-28", "2023-10-11", "2023-09-25"),
  code = c("P219", "O230", "Q913")
)

cod_structure_input(df, sex = "sex", dob = "dob", dod = "dod", code = "code")
```

expand_icd10_code_range *Enumerate ICD 10 codes given a code range*

Description

Enumerate ICD 10 codes given a code range

Usage

```
expand_icd10_code_range(code_range)
```

Arguments

code_range	A character value or a vector of character values indicating a range of ICD 10 codes. See Details for syntax of code range/s.

Value

A vector of ICD 10 codes that are within the range of codes specified by code_range.

Examples

```
expand_icd10_code_range("A71.0-A71.9")
expand_icd10_code_range("F50.1,F50.3-F50.9")
```

get_age_values *Get various age values for all three age types*

Description

Get various age values for all three age types

Usage

```
get_age_values(age_value, age_type = c("D", "M", "Y"))
```

Arguments

age_value	An integer value for the age
age_type	The age type of the specified age value. Can be either *"D"* for day, *"M"* for month, or *"Y"* for year.

Value

A named list of age values in days, months, and years.

Examples

```
get_age_values(1, "Y")
```

`icd10_cod_by_sex` *Sex-specific causes of death for ICD 10*

Description

Sex-specific causes of death for ICD 10

Usage

```
icd10_cod_by_sex
```

Format

A data frame with 3 columns and 880 rows:

Variable	Description
code	ICD 10 Cause of Death code
title	Cause of death title
sex	Sex - 1 for male; 2 for female

Source

https://icd.who.int/browse10/Content/statichtml/ICD10Volume2_en_2019.pdf

Examples

```
icd10_cod_by_sex
```

`icd10_cod_child` *Child-specific cause-of-death for ICD 10*

Description

Child-specific cause-of-death for ICD 10

Usage

```
icd10_cod_child
```

Format

A data frame with 2 columns and 122 rows:

Variable	Description
code	ICD 10 Cause of Death code
title	Cause of death title

Source

https://www.icd10data.com/ICD10CM/Codes/Rules/Pediatric_Codes

Examples

```
icd10_cod_child
```

---

icd10_cod_neonate *Neonate-specific cause-of-death for ICD 10*

Description

Neonate-specific cause-of-death for ICD 10

Usage

```
icd10_cod_neonate
```

Format

A data frame with 2 columns and 42 rows:

Variable	Description
code	ICD 10 Cause of Death code
title	Cause of death title

Source

https://www.icd10data.com/ICD10CM/Codes/Rules/Newborn_Codes

Examples

```
icd10_cod_neonate
```

icd10_example *Example death records dataset with ICD10 cause-of-death coding*

Description

Example death records dataset with ICD10 cause-of-death coding

Usage

```
icd10_example
```

Format

A data frame with 6 columns and 3613 rows:

Variable	Description
FreeId	Record identifier
Sex	Sex: 1 = Male; 2 = Female; 9 = unknown
Age Value	Integer value for age
Age Type	Is the age value in days (D), months (M), or years (Y)
Code	ICD10 code for cause-of-death
Death Date	Date of death in year format

Source

https://www.who.int/standards/classifications/classification-of-diseases/services/codedit-tool

Examples

```
icd10_example
```

icd10_unlikely_cod *Unlikely causes of death for ICD 10*

Description

Unlikely causes of death for ICD 10

Usage

```
icd10_unlikely_cod
```

Format

A data frame with 2 columns and 424 rows:

Variable	Description
code	ICD 10 Cause of Death code
title	Cause of death title

Source

https://icd.who.int/browse10/Content/statichtml/ICD10Volume2_en_2019.pdf

Examples

```
icd10_unlikely_cod
```

---

icd11_cod_by_sex *Sex-specific causes of death for ICD 11*

Description

Sex-specific causes of death for ICD 11

Usage

```
icd11_cod_by_sex
```

Format

A data frame with 3 columns and 547 rows:

Variable	Description
code	ICD 11 Cause of Death code
title	Cause of death title
sex	Sex - 1 for male; 2 for female

Source

https://icdcdn.who.int/icd11referenceguide/en/html/index.html#list-of-categories-limited-to-or-more-likely-to-occur-in-female-persons

Examples

```
icd11_cod_by_sex
```

icd11_cod_child *Child-specific cause-of-death for ICD 11*

Description

Child-specific cause-of-death for ICD 11

Usage

```
icd11_cod_child
```

Format

A data frame with 2 columns and 149 rows:

Variable	Description
code	ICD 11 Cause of Death code
title	Cause of death title

Examples

```
icd11_cod_child
```

icd11_cod_neonate *Neonate-specific cause-of-death for ICD 11*

Description

Neonate-specific cause-of-death for ICD 11

Usage

```
icd11_cod_neonate
```

Format

A data frame with 2 columns and 50 rows:

Variable	Description
code	ICD 11 Cause of Death code
title	Cause of death title

Examples

```
icd11_cod_neonate
```

`icd11_example` *Example death records dataset with ICD11 cause-of-death coding*

Description

Example death records dataset with ICD11 cause-of-death coding

Usage

```
icd11_example
```

Format

A data frame with 6 columns and 244 rows:

Variable	Description
FreeId	Record identifier
Sex	Sex: 1 = Male; 2 = Female; 9 = unknown
Age Value	Integer value for age
Age Type	Is the age value in days (D), months (M), or years (Y)
Code	ICD11 code for cause-of-death
Death Date	Date of death in year format

Source

https://www.who.int/standards/classifications/classification-of-diseases/services/codedit-tool

Examples

```
icd11_example
```

icd11_unlikely_cod *Unlikely causes of death for ICD 11*

Description

Unlikely causes of death for ICD 11

Usage

```
icd11_unlikely_cod
```

Format

A data frame with 2 columns and 269 rows:

Variable	Description
code	ICD 11 Cause of Death code
title	Cause of death title

Source

https://icd.who.int/valuesets/viewer/582/en

Examples

```
icd11_unlikely_cod
```

list_ill_defined_icd11 *List ill-defined ICD 11 codes*

Description

List ill-defined ICD 11 codes

Usage

```
list_ill_defined_icd11()
```

Value

An character vector of ICD 11 codes classified as ill-defined for cause-of-death

Examples

```
list_ill_defined_icd11()
```

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