Package ‘obcost’

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Title Obesity Cost Database

Version 0.1.0

Description This database contains necessary data relevant to medical costs on obesity throughout the United States. This database, in form of an R package, could output necessary data frames relevant to obesity costs, where the clients could easily manipulate the output using difference parameters, e.g. relative risks for each illnesses. This package contributes to parts of our published journal named “Modeling the Economic Cost of Obesity Risk and Its Relation to the Health Insurance Premium in the United States: A State Level Analysis”. Please use the following citation for the journal: Woods Thomas, Tatjana Miljkovic (2022) “Modeling the Economic Cost of Obesity Risk and Its Relation to the Health Insurance Premium in the United States: A State Level Analysis” <doi:10.3390/risks10100197>. The database is composed of the following main tables: 1. Relative_Risks: (constant) Relative risks for a given disease group with a risk factor of obesity; 2. Disease_Cost: (obesity_cost_disease) Supplementary output with all variables related to individual disease groups in a given state and year; 3. Full_Cost: (obesity_cost_full) Complete output with all variables used to make cost calculations, as well as cost calculations in a given state and year; 4. National_Summary: (obesity_cost_national_summary) National summary cost calculations in a given year. Three functions are included to assist users in calling and adjusting the mentioned tables and they are data_load(), data_produce(), and rel_risk_fun().

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Depends R (>= 2.10)

Imports dplyr,tidyr, stats

Encoding UTF-8

LazyData true

RoxygenNote 7.1.2

NeedsCompilation no

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Repository CRAN
Description

This database contains necessary data relevant to medical costs on obesity throughout the United States. This database, in form of an R package, could output necessary data frames relevant to obesity costs, where the clients could easily manipulate the output using different parameters, e.g., relative risks for each illness.

So far the functions included in the package are:

- `data_load` generate the essential four tables that concern obesity
- `data_produce` load all critical values in a returned list format
- `rel_risk_fun` update the relative risks (or the constants) when crucial data needs updating

The database is composed of the following main tables:

- `constant` Relative risks for a given disease group with a risk factor of obesity.
- `obesity_cost_disease` Supplementary output with all variables related to individual disease groups in a given state and year.
- `obesity_cost_full` Complete output with all variables used to make cost calculations, as well as cost calculations in a given state and year.
- `obesity_cost_national_summary` National summary cost calculations in a given year.
- `full_data` Necessary raw data for generating new tables with user input

Note

Please make sure that packages of dplyr and tidyr is applied

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References


**constant**  

_Default Input of Relative Risk_

**Description**

This dataset gives default input of Relative Risk, however could be updated latter by the user

- **cvd** Relative Risk for cardiovascular disease
- **diabetes** Relative Risk for diabetes
- **cancer** Relative Risk for cancer
- **copd_asthma** Relative Risk for chronic obstructive pulmonary disease or asthma
- **osteoarthritis** Relative Risk for osteoarthritis
- **hypertension** Relative Risk for hypertension
- **kidney** Relative Risk for kidney diseases
- **g_p_l** Relative Risk for gallbladder, liver, and pancreatic diseases
- **stroke** Relative Risk for strokes

**Usage**

constant

**Format**

An object of class tbl_df (inherits from tbl, data.frame) with 9 rows and 2 columns.

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**data_load**  

_data_load function_

**Description**

The function "data_load" would load all critical values in a returned list format

**Usage**

```
data_load()
```

**Value**

A list(dataframe) of pop (population), gdp (global gdp), mi (median income), bmi (body mass index), disab (disability rate), employ (employment rate), med_cost (medical conditions cost), med_prev (medical conditions prevalence cost), natl_med_prev (national medical conditions prevalence), rel_risk (relative risk), benefits, and insurance

**Examples**

```
raw_data <- data_load()
population <- raw_data$pop
```
**Description**

The `data_produce` function would generate the essential four tables that concerns obesity including:

1. Relative Risks (constant): Relative risks for a given disease group with a risk factor of obesity.
2. Disease Cost (obesity_cost_disease): Supplementary output with all variables related to individual disease groups in a given state and year.
3. Full Cost (obesity_cost_full): Complete output with all variables used to make cost calculations, as well as cost calculations in a given state and year.

**Usage**

```r
data_produce(rr = c())
```

**Arguments**

- `rr`: the relative risks of diseases – Cardiovascular disease, diabetes, cancer, Chronic obstructive pulmonary disease or asthma, osteoarthritis, hypertension, kidney diseases, (Gallbladder, Liver, Pancreatic) diseases, and strokes.

**Value**

a list (dataframe) of constant, obesity_cost_disease, obesity_cost_full, and obesity_cost_national_summary

**Examples**

```r
new_data <- data_produce(rr = c(1,2,3,4,5,6,7,8,9.1))
cnst <- new_data$constant
```

---

**Description**

This dataset gives users opportunities to update the outputs with their own input of relative risks.

- `pop`: Population
- `gdp`: GDP 1963-2020 in millions of current dollars
- `mi`: Median Income 1967-2019
- `bmi`: BMI 1996-2019
- `disab`: Disability 1981-2019
- `employ`: Employment Rate 1950-2020
Description

This dataset gives supplementary output with all variables related to individual disease groups in a given state and year.

State  state of interest
Year  year of interest
pi_it  obesity prevalence in state i and year t
cause  disease group
rr_j  relative risk of disease group j on obesity
psi_jt  national cost of disease group j in year t
rho_jit  population-attributable risk percent of disease group j in state i and year t
DC_jit  direct cost for disease group j in state i and year t

Usage

obesity_cost_disease

Format

An object of class data.frame with 10350 rows and 8 columns.
Relevant Data for Obesity, Cost, and Diseases

**Description**

Complete output with all variables used to make cost calculations, as well as cost calculations in a given state and year.

- **State**  
  state of interest
- **Year**  
  year of interest
- **m_t**  
  median income in year $t$
- **d_t**  
  work-impacting disability prevalence in year $t$
- **e_t**  
  employment average ration in year $t$
- **b_t**  
  employment benefit in year $t$
- **p_it**  
  population in state $i$ and year $t$
- **pi_it**  
  obesity prevalence in state $i$ and year $t$
- **tau_t**  
  total employee benefits in year $t$
- **varphi_it**  
  gross domestic product of state $i$ in year $t$
- **DC_it**  
  direct cost of state $i$ in year $t$
- **M_it**  
  excess mortality cost of state $i$ in year $t$
- **A_it**  
  absenteeism cost of state $i$ in year $t$
- **D_it**  
  disability cost of state $i$ in year $t$
- **IC_it**  
  indirect cost of state $i$ in year $t$
- **TC_it**  
  total cost of state $i$ in year $t$

**Usage**

`obesity_cost_full`

**Format**

An object of class `data.frame` with 1150 rows and 16 columns.
obesity_cost_national_summary

*National summary cost calculations in a given year*

**Description**

National summary cost calculations in a given year

- **Year**: year of interest
- **DC_t**: direct cost in year t
- **M_t**: excess mortality cost in year t
- **A_t**: absenteeism cost in year t
- **D_t**: disability cost in year t
- **IC_t**: indirect cost in year t
- **TC_t**: total cost in year t
- **p_t**: total population in year t
- **pi_t**: average obesity rate in year t

**Usage**

`obesity_cost_national_summary`

**Format**

An object of class `data.frame` with 23 rows and 9 columns.

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rel_risk_fun

*rel_risk_fun function*

**Description**

The "rel_risk_fun" could update the relative risks (or the constants) when crucial data needs updating.

**Usage**

`rel_risk_fun(rr)`

**Arguments**

- **rr**: the relative risks of diseases – Cardiovascular disease, diabetes, cancer, Chronic obstructive pulmonary disease or asthma, osteoarthritis, hypertension, kidney diseases, (Gallbladder, Liver, Pancreatic) diseases, and strokes.
*rel_risk_fun*

**Value**

a list (dataframe) of relative risks

**Examples**

```r
key <- rel_risk_fun(rr = c(1,2,3,4,5,6,7,8,1.2))
key$rr
```
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