# Package 'mapnhanespa'

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**Title** Map Quantiles for Physical Activity from 'NHANES'

**Version** 0.1.0

**Description** Maps physical activity from the National Health and Nutrition Examination Survey ('NHANES') study into population-based quantiles.

**License** MIT + file LICENSE

**Encoding** UTF-8

**Depends** R (>= 3.5)

**LazyData** true

**LazyDataCompression** xz

**URL** https://github.com/jhuwit/mapnhanespa

**BugReports** https://github.com/jhuwit/mapnhanespa/issues

**Suggests** knitr, rmarkdown, testthat (>= 3.0.0)

**Config/testthat/edition** 3

**VignetteBuilder** knitr

**Imports** dplyr, magrittr, purrr, survey

**Config/roxygen2/version** 8.0.0

**NeedsCompilation** no

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**Repository** CRAN

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`map_nhanes_pa_quantiles` *Map physical activity values to NHANES population quantiles*

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## Description

`map_nhanes_pa_quantiles()` adds a population-level quantile column to a participant-level data frame. Quantiles are evaluated from NHANES accelerometer cumulative distribution functions stratified by age category, sex/gender, measure, and optionally survey wave.

## Usage

```
map_nhanes_pa_quantiles(
  data,
  id = NULL,
  age = "age",
  sex = "sex",
  measure = "measure",
  value = "value",
  wave = NULL,
  age_category = NULL,
  quantile_col = "nhanes_quantile"
)
```

## Arguments

| | |
|---|---|
| `data` | A data frame with one row per participant-measure observation. |
| `id` | Optional participant identifier column name. The column is checked when supplied, but otherwise left unchanged. |
| `age`, `sex`, `measure`, `value` | Column names in `data` containing age in years, sex/gender, physical activity measure, and observed value. Set `age = NULL` to use the age-overall CDFs. Set `sex = NULL` to use the sex/gender-overall CDFs. Setting both to `NULL` uses the overall CDF across both dimensions. |
| `wave` | Optional NHANES wave column name or scalar value. Supported values are `7`, `8`, `"2011-2012"`, and `"2013-2014"`. If `NULL`, the combined wave CDFs are used. |
| `age_category` | Optional column name containing NHANES age categories such as `"[20,30)"` or `"Overall"`. When supplied, it is used instead of `age`. |
| `quantile_col` | Name of the output quantile column. |

## Value

`data` with an added quantile column.

## Examples

```
example_data <- data.frame(
  id = 1:2,
  age = c(25, 62),
  sex = c("Female", "Male"),
  measure = c("mims", "ssl_steps"),
  value = c(15000, 7500)
)

map_nhanes_pa_quantiles(example_data)

map_nhanes_pa_quantiles(example_data, sex = NULL)

map_nhanes_pa_quantiles(example_data, age = NULL, wave = "2011-2012")
map_nhanes_pa_quantiles(example_data, age = NULL, sex = NULL)
```

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# nhanes_measure_data *NHANES PA data*

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## Description

NHANES PA data

## Usage

```
nhanes_measure_data
```

## Format

A data frame with 87619 rows and 9 variables:

**SEQN** ID variable

**data_release_cycle** wave/data release cycle

**cat_age** age category

**gender** sex/gender designation

**wtmec4yr_adj_norm** normalized weight for surveys

**masked_variance_pseudo_psu** PSU - sampling unit

**masked_variance_pseudo_stratum** sampling stratum

**num_valid_days** number of valid days of wear >= 1396 minutes

**measure** measure that was calculated

**value** value for the measure

## Source

NHANES 2011-2012 and 2013-2014 accelerometer data.

## nhanes_pa_age_category *Convert ages to NHANES physical activity CDF age categories*

### Description

Ages are grouped into 10-year bins from `[0,10)` through `[70,80)`. Ages greater than or equal to 80 are assigned to the oldest available CDF category, `"[80,85)"`. Ages greater than 85 also map to `"[80,85)"`, with a warning by default.

### Usage

```
nhanes_pa_age_category(age, warn = TRUE)
```

### Arguments

| | |
|---|---|
| `age` | Numeric age in years. |
| `warn` | Logical. If `TRUE`, warn when non-missing ages greater than 85 are mapped into the `"[80,85)"` category. |

### Value

A character vector of NHANES age category labels.

### Examples

```
nhanes_pa_age_category(c(8, 25, 84, 90))
```

## nhanes_pa_quantile *Evaluate a single NHANES physical activity quantile*

### Description

Evaluate a single NHANES physical activity quantile

### Usage

```
nhanes_pa_quantile(
  value,
  age = NULL,
  sex = NULL,
  measure,
  wave = NULL,
  age_category = NULL
)
```

### Arguments

| | |
|---|---|
| value | Observed physical activity value. |
| age | Age in years. Set to NULL to use the age-overall CDFs. Ignored when age_category is supplied. |
| sex | Sex/gender. Common values such as "M", "male", "F", and "female" are normalized. Set to NULL to use the sex/gender-overall CDFs. |
| measure | Physical activity measure. Supported aliases include "mims", "PAXMTSM", "ssl_steps", "scsslsteps", "steps", Verisense step aliases such as "steps_stepcount_ssl", "steps_stepcount_rf", "steps_vs_original", "steps_vs_revised", "steps_sdt", and "AC". |
| wave | Optional NHANES wave. Supported values are 7, 8, "2011-2012", and "2013-2014". |
| age_category | Optional NHANES age category such as "[20,30)" or "Overall". |

### Value

A numeric quantile in [0, 1], or NA_real_ when no matching CDF is available.

### Examples

```
nhanes_pa_quantile(
  value = 15000,
  age = 25,
  sex = "Female",
  measure = "mims"
)

nhanes_pa_quantile(
  value = 15000,
  age = 25,
  sex = NULL,
  measure = "mims",
  wave = "2013-2014"
)
```

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## precompute_nhanes_pa_cdfs

*Precompute and cache NHANES PA CDFs*

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### Description

Builds every supported CDF combination and stores the result in the internal cache. This covers combined and by-wave CDFs, age-specific and age-overall strata, sex/gender-specific and sex/gender-overall strata, and the overall-overall combination for each supported measure.

### Usage

```
precompute_nhanes_pa_cdfs()
```

## Value

Invisibly returns a list with the cached combined and by-wave tables.

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