

Package ‘mapnhanespa’

August 21, 2026

Title Map Quantiles for Physical Activity from 'NHANES'

Version 0.2.0

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

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Encoding UTF-8

Depends R (>= 4.1.0)

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, purrr, survey

Config/roxygen2/version 8.0.0

NeedsCompilation no

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Repository CRAN

Date/Publication 2026-08-21 21:00:27 UTC

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

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

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

```

nhanes_measure_data	<i>NHANES PA data</i>
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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"
)
```

```
precompute_nhanes_pa_cdfs
```

Precompute and cache NHANES PA CDFs

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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