Package ‘MUACz’

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Type Package

Title Generate MUAC and BMI z-Scores and Percentiles for Children and Adolescents

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Description Generates mid upper arm circumference (MUAC) and body mass index (BMI) for age z-scores and percentiles based on LMS method for children and adolescents up to 19 years that can be used to assess nutritional and health status and define risk of adverse health events.

License GPL-3

Encoding UTF-8

LazyData true

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bmizs

Generate Body Mass Index (BMI) for age z-scores and percentiles based on LMS method for children and adolescents aged 0 to 19 years.

Description

Generates Body Mass Index (BMI) for age z-scores and percentiles based on LMS method for children and adolescents aged 0 to 19 years.

Usage

```
bmizs(
  Datafm,
  age_range = "0-24",
  digits.zscore = 2,
  digits.perc = 2,
  Notes = FALSE
)
```

Arguments

- **Datafm**: A DataFrame with variables age (in months), sex (1, 2 or "Male", "Female"), bmi (numeric: in kilograms per meter squared (kg/m^2)).
- **age_range**: age range in months. Input has to be characters. It allows "0-24" by default. Other inputs allowed are "24-60" or "61-228".
- **digits.zscore**: The number of digits for z-score variable
- **digits.perc**: The number of digits for percentile variable
- **Notes**: Is FALSE by default. If set to TRUE, 'notes' will be printed on the console about the nature, range of variables allowed and number of records processed.

Value

A DataFrame with BMI z scores for age and percentiles.

References

<https://www.who.int/childgrowth/standards/bmi_for_age/en/>

See Also

`indivmuaczs`, `muaczs`, `muacz.bmiz`, `plotmuac` and `plotbmi`. 
Examples

## Example 1: for younger age range = "0-24" months
## No need to specify age_range
## creating a hypothetical dataset

dat1 <- data.frame(age = c(5, 6, 12, 12, 18, 18, 23, 23),
                  sex = c(1, 2, 1, 2, 1, 2, 1, 2),
                  bmi = c(17.3, 18.6, 18.2, 12.7, 20.8, 20.8, 13.6, 18.4))

ans1 <- bmizs(Datafm = dat1)
ans1 <- bmizs(Datafm = dat1, Notes = TRUE) # Will also print notes
# ans1

## Example 2: specify age range = "24-60" months
## creating a hypothetical dataset

dat2 <- data.frame(age = c(25, 36, 48, 60),
                  sex = 2, bmi = c(15.7, 16.8, 20.6, 12.7))

ans2 <- bmizs(Datafm = dat2, age_range = "24-60")
# ans2

## Example 3: specify age range = "61-228" months
## creating a hypothetical dataset

dat3 <- data.frame(age = c(61, 73, 181, 217),
                  sex = 1, bmi = c(12.1, 14.1, 27.1, 35.4))

ans3 <- bmizs(Datafm = dat3, age_range = "61-228")
# ans3

---

indivmuaczs Generate MUAC z scores and percentiles for age for single individuals given their age, sex and MUAC values.

Description

Generates MUAC z-Scores and percentiles for individual subjects by entering their age (in months), sex and muac (in cm) directly. This is useful for children and adolescents aged 3 months to 19 years and to assess their nutritional and health status, and define risk of adverse health events.

Usage

indivmuaczs(
  age = 60,
  sex = 1,
  muac = 10,
  age_range = "3-60",
)
digits.zscore = 2,
digits.perc = 2,
Notes = FALSE
)

Arguments
age             a numeric value (in months) between 3 and 228 depending on the age_range.
sex             preferably numeric (1 = Male, 2 = Female). Strings can also be used.
muac            a numeric mid upper arm circumference value in cm.
age_range       age range in months. Input has to be characters. Options allowed are: "3-60" the default, or "60-228".
digits.zscore   The number of digits for z-score variable
digits.perc     The number of digits for percentile variable
Notes           Is FALSE by default. If set to TRUE, 'notes' will be printed on the console about the nature, range of variables allowed and number of records processed.

Value
A DataFrame with MUAC z-scores and percentiles.

References
<https://www.bmj.com/content/358/bmj.j3423>
<https://www.bmj.com/content/358/bmj.j3423/related#datasupp>
<https://www.who.int/childgrowth/standards/ac_for_age/en/>

See Also
muaczs, bmizs, muacz.bmiz, plotmuac and plotbmi.

Examples

test0 <- indivmuaczs(age = 70, sex = "Female", muac = 15.8,
age_range = "60-228")
# test0
test1 <- indivmuaczs(age = c(4, 40, 60), sex = "Male",
muac = c(17.2, 17.2, 19.8), age_range = "3-60")
# test1
test2 <- indivmuaczs(age = c(4, 40, 60), sex = 2,
muacz.bmiz

muac = c(14.9, 17.7, 19))

# test2

res2 <- indivmuaczs(age = 70, sex = c(1, 1, 2, 2, 2, 1),
    muac = c(23.1, 15.2, 18.4, 13.9, 19.5, 14.6),
    age_range = "60-228")

# res2

---

muacz.bmiz  

*Generate both MUAC z-scores and BMI z-scores and their percentiles for age for children/adolescents given their age, sex, MUAC, and BMI values.*

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**Description**

Generates both MUAC and BMI z-scores for age z-scores and percentiles based on LMS method for children and adolescents aged 3 months to 19 years olds.

**Usage**

```r
muacz.bmiz(
    Datafm,
    age_range.muac = "60-228",
    age_range.bmi = "61-228",
    digits.zscore = 2,
    digits.perc = 2,
    Notes = FALSE
)
```

**Arguments**

- **Datafm**  
  A DataFrame with variables including, age (in months), sex (1, 2 or "Male", "Female"), muac (numeric: in cm).

- **age_range.muac**  
  MUAC age range in months: This can be "3-60" or "60-228".

- **age_range.bmi**  
  BMI age range in months: This can be "0-24", "24-60" or "61-228".

- **digits.zscore**  
  The number of digits for z-score variable

- **digits.perc**  
  The number of digits for percentile variable

- **Notes**  
  Is FALSE by default. If set to TRUE, 'notes' will be printed on the console about the nature, range of variables allowed and number of records processed.

**Value**

A DataFrame with MUAC and BMI z-scores and their percentiles
References


<https://www.bmj.com/content/358/bmj.j3423>
<https://www.bmj.com/content/358/bmj.j3423/related#datasupp>
<https://www.who.int/childgrowth/standards/bmi_for_age/en/>
<https://www.who.int/childgrowth/standards/ac_for_age/en/>

See Also

indivmuaczs, muaczs, bmizs, plotmuac and plotbmi.

Examples

```r
## Example 1
## creating a hypothetical dataset
dat1 <- data.frame(age = c(61, 73, 181, 217), sex = 1,
                   muac = c(13.0, 15.7, 34.1, 43.9),
                   bmi = c(12.1, 14.1, 27.1, 35.4))
ans1 <- muacz.bmiz(Datafm = dat1, age_range.muac = "60-228",
                   age_range.bmi = "61-228")
# ans1

## Example 1
## creating a hypothetical dataset
dat2 <- data.frame(age = c(25, 36, 48, 60),
                   sex = 2,
                   muac = c(15, 17, 21.3, 14),
                   bmi = c(15.7, 16.8, 20.6, 12.7))
ans2 <- muacz.bmiz(Datafm = dat2, age_range.muac = "3-60",
                   age_range.bmi = "24-60")
# ans2
```

muaczs  Generate MUAC z-scores and percentiles for age for children and adolescents given their age, sex, and MUAC values.

Description

Generates mid upper arm circumference (MUAC) for age z-scores and percentiles based on LMS-method for children and adolescents aged 3 months to 19 years.
muaczs

Usage

muaczs(
  Datafm,
  age_range = "3-60",
  digits.zscore = 2,
  digits.perc = 2,
  Notes = FALSE
)

Arguments

Datafm A DataFrame with variables including pid (unique subject identification), age (in months), sex (1, 2 or "Male", "Female"), muac (numeric: in cm).
age_range age range in months. Input has to be characters. Options allowed are: "3-60" which is the default, or "60-228"
digits.zscore The number of digits for z-score variable
digits.perc The number of digits for percentile variable
Notes Is FALSE by default. If set to TRUE, 'notes' will be printed on the console about the nature, range of variables allowed and number of records processed.

Value

A DataFrame with MUAC z scores for age and percentiles.

References

<https://www.bmj.com/content/358/bmj.j3423>
<https://www.bmj.com/content/358/bmj.j3423/related#datasupp>
<https://www.who.int/childgrowth/standards/ac_for_age/en/>

See Also

indivmuaczs, bmisz, muacz.bmiz, plotmuac and plotbmi.

Examples

## Example 1: younger age range is the default: 3 months - 5 years
# Creating a hypothetical dataset
dat1 <- data.frame(age = c(3, 5, 12, 18, 23, 24, 36, 48, 60, 24, 36, 48, 60),
                   sex = c(1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2),
                   muac = c(15.6, 14.1, 15.8, 18.7, 12.9, 13,
# Run the function
ans1 <- muaczs(Datafm = dat1) # save the output
# ans1

## Example 2: For children 5-19 years old, specify their age range "61-228"
# Creating a hypothetical dataset
dat1 <- data.frame(age = c(60, 65, 90, 120, 220),
                  sex = c("Male","Female","Male","Male","Female"),
                  muac = c(20, 14.3, 15.4, 17.8, 25.1))

ans1 <- muaczs(Datafm = dat1, age_range = "60-228")
# ans1

---

**plotbmi**

*Plots BMI z-scores and percentiles on references curves.*

### Description

Plots BMI z-scores and percentiles on standardized growth references using the LMS method for children and adolescents aged 0 to 19 years.

### Usage

```r
plotbmi(
    age,
    sex,
    bmi,
    lwd = 1,
    age_range = "0-24",
    line.color = "skyblue",
    graphtype = "z-scores",
    size.label = 2,
    size.score = 4,
    line.type = "solid",
    shape = 2,
    Notes = FALSE
)
```

### Arguments

- **age**: a numeric value (in months) from 0 to 228 depending on the age_range.
- **sex**: preferably numeric (1 = Male, 2 = Female). Strings (such as "Male", "Female") can also be used.
- **bmi**: a numeric value in kilograms per meter squared (kg/m^2).
- **lwd**: Line width allows you to specify a numeric value that control the width of the line plots. By default, it is set to 1.
plotbmi

age_range  age range in months. Input has to be characters. It allows "0-24" by default. Other inputs allowed are "24-60" or "61-228".
line.color  The color of the lines. It is set to "skyblue" by default.
graphtype  A character input is required: "z-scores" or "percentiles".
size.label  size of the label for calculated z-score or percentile
size.score  refers to the size of the text for the calculated z-scores (-3,-2,-1,0,1,2,3) or the percentiles.
line.type  Type of line such as: "solid", "dotted", "dashed", "blank", "dotdash", "twodash", "longdash"
shape  of the individual point (marker)
Notes  Is FALSE by default. If set to TRUE, 'notes' will be printed on the console about the nature, range of variables allowed and number of records processed.

Value

Plots z-scores or percentiles with a mark indicating where the individual person lies within the standardized reference curves.

References

<https://www.who.int/childgrowth/standards/bmi_for_age/en/>

See Also

indivmuaczs, muaczs, bmizs, muacz.bmiz and plotmuac.

Examples

g1 <- plotbmi(age = 6, sex = 2, bmi = 18.5) # plots Z-scores
g2 <- plotbmi(age = 6, sex = 2, bmi = 18.5, graphtype = "percentiles")
g3 <- plotbmi(age = c(25, 36, 48, 60), sex = 2, bmi = c(15.7, 16.8, 20.6, 12.7),
age_range = "24-60")
g4 <- plotbmi(age = c(61, 73, 181, 217), sex = 1, bmi = c(12.1, 14.1, 27.1, 35.4),
age_range = "61-228", graphtype = "percentiles")
plotmuac

Plots MUAC z-scores and percentiles on references curves.

Description

Plots individual MUAC z-scores and percentiles on standardized growth references using the LMS method for children and adolescents aged 3 months to 19 years.

Usage

```r
plotmuac(
  age,
  sex,
  muac,
  age_range = "3-60",
  graphtype = "z-scores",
  lwd = 1,
  line.color = "skyblue",
  line.type = "solid",
  shape = 2,
  size.label = 2,
  size.score = 4,
  Notes = FALSE
)
```

Arguments

- **age**: a numeric value (in months) between 3 and 228 depending on the age_range.
- **sex**: preferably numeric (1 = Male, 2 = Female). Strings (such as "Male", "Female") can also be used.
- **muac**: a numeric mid upper arm circumference value in cm.
- **age_range**: age range in months. Input has to be characters. Options allowed are: "3-60" which is the default, or "60-228".
- **graphtype**: A character input is required: "z-scores" or "percentiles".
- **lwd**: Line width allows you to specify a numeric value that control the width of the line plots. By default, it is set to 1.
- **line.color**: The color of the lines. It is set to "skyblue" by default.
- **line.type**: Type of line such as: "solid", "dotted", "dashed", "blank", "dotdash", "twodash", "longdash"
- **shape**: of the individual point (marker)
- **size.label**: size of the label for calculated z-score or percentile
- **size.score**: refers to the size of the text for the calculated z-scores (-3,-2,-1,0,1,2,3) or the percentiles.
- **Notes**: Is FALSE by default. If set to TRUE, 'notes' will be printed on the console about the nature, range of variables allowed and number of records processed.
Value

Plots z-scores or percentiles with a mark indicating where the individual person lies within the standardized reference curves.

References


<https://www.bmj.com/content/358/bmj.j3423>
<https://www.bmj.com/content/358/bmj.j3423/related#datasupp>
<https://www.who.int/childgrowth/standards/ac_for_age/en/>

See Also

indivmuaczs, muaczs, bmizs, muacz.bmiz and plotbmi.

Examples

```r
  g1 <- plotmuac(age = 48, sex = 2, muac = 16.2, line.color = "orange")
  g2 <- plotmuac(age = 48, sex = 2, muac = 16.2, graphtype = "percentiles",
                 line.color = "orange")
  g3 <- plotmuac(age = c(24, 36, 48, 59), sex = 1, muac = c(13, 14.5, 16.1, 21.7))
  g4 <- plotmuac(age = c(24, 36, 48, 59), sex = 1, muac = c(13, 14.5, 16.1, 21.7),
                 graphtype = "percentiles")
  g5 <- plotmuac(age = c(61, 73, 181, 217), sex = 1, muac = c(13, 15.7, 34.1, 43.9),
                 age_range = "60-228")
  g6 <- plotmuac(age = c(61, 73, 181, 217), sex = 1, muac = c(13, 15.7, 34.1, 43.9),
                 age_range = "60-228", graphtype = "percentiles")
```
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