Package ‘MUACz’

October 12, 2022

Type Package
Title Generate MUAC and BMI z-Scores and Percentiles for Children and Adolescents
Version 2.1.0
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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
Depends R (>= 3.6.0)
Imports epiDisplay, ggplot2, dplyr, stats
SystemRequirements GNU make
RoxygenNote 7.1.0
NeedsCompilation no
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Repository CRAN
Date/Publication 2020-07-16 04:10:02 UTC

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bmizs Generate Body Mass Index z-scores for age and percentiles for children/adolescents given their age, sex, and bmi values.

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

```r
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

```r
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

```r
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
```

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### 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

```r
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.

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

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
## 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, bmizs, 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,
14.5, 16.1, 21.7, 12.7, 14.4, 16.2, 22.5))
# 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

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  
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

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.
plotmuac

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

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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