Package 'rcssci'

May 9, 2026

Type Package

Title Visualization of Restricted Cubic Splines

Version 0.4.0

Maintainer Zhiqiang Nie <niezhiqiang@gdph.org.cn>

Description Restricted Cubic Splines were performed to explore the shape of association form of ``U, inverted U,
L'' shape and test linearity or non-linearity base on ``Cox,Logistic,linear,quasipoisson'' regression, and auto output Restricted Cubic Splines figures.
rcssci package could automatically draw RCS graphics with Y-axis ``OR,HR,RR,beta''.
The Restricted Cubic Splines method were based on
Suli Huang (2022) <doi:10.1016/j.ecoenv.2022.113183>,Amit Kaura (2019) <doi:10.1136/bmj.l6055>,
and Harrell Jr (2015, ISBN:978-3-319-19424-0 (Print) 978-3-319-19425-7 (Online)).

Depends R (>= 4.2.0)

LazyData true

Imports pacman, rms, ggplot2, survminer, segmented, survival, dplyr,
patchwork, Cairo

Encoding UTF-8

License Artistic-2.0

BugReports https://github.com/popnie/RCSsci/issues

RoxygenNote 7.2.1

NeedsCompilation no

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Repository CRAN

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Contents

`rcssci_cox` *rcssci_cox*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

`data`	data.frame.Rdata
`knot`	knot=3-7 or automatic calculate by AIC min
`y`	outcome=0,1
`time`	censor time
`covs`	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
`prob`	position parameter,range from 0-1
`x`	main exposure and X-axis when plotting
`filepath`	path of plots output.

Details

Cox models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

message.print PH assumption and other message

Author(s)

Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

```
library(rcssci)
rcssci_cox(data=sbpdata, y = "status",x = "sbp",time = "time",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcssci_cox(knot=4,data=sbpdata, y = "status",x = "sbp",covs=c("age"),
# time = "time", prob=0.1,filepath="D:/temp")
```

`rcssci_linear` *rcssci_linear*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

`data`	data.frame.Rdata
`knot`	knot=3-7 or automatic calculate by AIC min
`y`	outcome=0,1
`covs`	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
`prob`	position parameter,range from 0-1
`x`	main exposure and X-axis when plotting
`filepath`	path of plots output.

Details

linear models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

message.print PH assumption and other message

Author(s)

Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

```
library(rcssci)
rcssci_linear(data=sbpdata, y = "sbp",x = "age",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcssci_linear(knot=4,data=sbpdata, y = "sbp",x = "age",
# covs=c("gender"),prob=0.1,filepath="D:/temp")
```

`rcssci_logistic` *rcssci_logistic*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

`data`	data.frame.Rdata
`knot`	knot=3-7 or automatic calculate by AIC min
`y`	outcome=0,1
`covs`	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
`prob`	position parameter,range from 0-1
`x`	main exposure and X-axis when plotting
`filepath`	path of plots output.

Details

logistic models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

message.print PH assumption and other message

Author(s)

Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

```
library(rcssci)
rcssci_logistic(data=sbpdata, y = "status",x = "sbp",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcssci_logistic(knot=4,data=sbpdata, y = "status",x = "sbp",
# covs=c("age","gender"),prob=0.1,filepath="D:/temp")
```

`rcssci_quasipoisson` *rcssci_quasipoisson*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

`data`	data.frame.Rdata
`knot`	knot=3-7 or automatic calculate by AIC min
`y`	outcome=0,1
`covs`	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
`prob`	position parameter,range from 0-1
`x`	main exposure and X-axis when plotting
`filepath`	path of plots output.

Details

quasipoisson models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

message.print PH assumption and other message

Author(s)

Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

```
library(rcssci)
rcssci_quasipoisson(data=sbpdata, y = "status",x = "sbp",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcssci_quasipoisson(knot=4,data=sbpdata, y = "status",x = "sbp",
# covs=c("age","gender"),prob=0.1,filepath="D:/temp")
```

rcs_cox.lshap *rcs_cox.lshap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

data	data.frame.Rdata
knot	knot=3-7 or automatic calculate by AIC min
y	outcome=0,1
time	censor time
covs	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
prob	position parameter,range from 0-1
x	main exposure and X-axis when plotting
filepath	path of plots output.

Details

Cox models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

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Author(s)

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rcs_cox.nshap *rcs_cox.nshap*

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# time = "time", prob=0.1,filepath="D:/temp")
```

rcs_cox.prob *rcs_cox.prob*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

data	data.frame.Rdata
knot	knot=3-7 or automatic calculate by AIC min
y	outcome=0,1
time	censor time
covs	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
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# time = "time", prob=0.1,filepath="D:/temp")
```

rcs_cox.ushap *rcs_cox.ushap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

data	data.frame.Rdata
knot	knot=3-7 or automatic calculate by AIC min
y	outcome=0,1
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```

rcs_linear.lshap *rcs_linear.lshap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

data	data.frame.Rdata
knot	knot=3-7 or automatic calculate by AIC min
y	outcome=0,1
covs	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
prob	position parameter,range from 0-1
x	main exposure and X-axis when plotting
filepath	path of plots output.

Details

linear models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

message.print PH assumption and other message

Author(s)

Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

```
library(rcssci)
rcs_linear.lshap(data=sbpdata, y = "sbp",x = "age",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcs_linear.lshap(knot=4,data=sbpdata, y = "sbp",x = "age",
# covs=c("gender"),prob=0.1,filepath="D:/temp")
```

rcs_linear.nshap *rcs_linear.nshap*

Description

restricted cubic splines (RCS) published in SCI.

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data	data.frame.Rdata
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rcs_linear.prob *rcs_linear.prob*

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# covs=c("gender"),prob=0.1,filepath="D:/temp")
```

`rcs_logistic.lshap` *rcs_logistic.lshap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

`data`	data.frame.Rdata
`knot`	knot=3-7 or automatic calculate by AIC min
`y`	outcome=0,1
`covs`	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
`prob`	position parameter,range from 0-1
`x`	main exposure and X-axis when plotting
`filepath`	path of plots output.

Details

logistic models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

message.print PH assumption and other message

Author(s)

Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

```
library(rcssci)
rcs_logistic.lshap(data=sbpdata, y = "status",x = "sbp",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcs_logistic.lshap(knot=4,data=sbpdata, y = "status",x = "sbp",
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```

rcs_logistic.nshap *rcs_logistic.nshap*

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data	data.frame.Rdata
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```

rcs_logistic.prob *rcs_logistic.prob*

Description

restricted cubic splines (RCS) published in SCI.

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data	data.frame.Rdata
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# covs=c("age","gender"),prob=0.1,filepath="D:/temp")
```

rcs_logistic.ushap *rcs_logistic.ushap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

data	data.frame.Rdata
knot	knot=3-7 or automatic calculate by AIC min
y	outcome=0,1
covs	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
prob	position parameter,range from 0-1
x	main exposure and X-axis when plotting
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Details

logistic models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

message.print PH assumption and other message

Author(s)

Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

```
library(rcssci)
rcs_logistic.ushap(data=sbpdata, y = "status",x = "sbp",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcs_logistic.ushap(knot=4,data=sbpdata, y = "status",x = "sbp",
# covs=c("age","gender"),prob=0.1,filepath="D:/temp")
```

rcs_quasipoisson.lshap *rcs_quasipoisson.lshap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

data	data.frame.Rdata
knot	knot=3-7 or automatic calculate by AIC min
y	outcome=0,1
covs	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
prob	position parameter,range from 0-1
x	main exposure and X-axis when plotting
filepath	path of plots output.

Details

quasipoisson models with RCS splines were performed to explore the shape linear or nonlinear(U, inverted U,J,S,L,log,-log,temporary plateau shape)

Value

message.print PH assumption and other message

Author(s)

Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

```
library(rcssci)
rcs_quasipoisson.lshap(data=sbpdata, y = "status",x = "sbp",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcs_quasipoisson.lshap(knot=4,data=sbpdata, y = "status",x = "sbp",
# covs=c("age","gender"),prob=0.1,filepath="D:/temp")
```

rcs_quasipoisson.nshap *rcs_quasipoisson.nshap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

data	data.frame.Rdata
knot	knot=3-7 or automatic calculate by AIC min
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covs	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
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# covs=c("age","gender"),prob=0.1,filepath="D:/temp")
```

rcs_quasipoisson.prob *rcs_quasipoisson.prob*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

data	data.frame.Rdata
knot	knot=3-7 or automatic calculate by AIC min
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rcs_quasipoisson.ushap *rcs_quasipoisson.ushap*

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# covs=c("age","gender"),prob=0.1,filepath="D:/temp")
```

sbpdata *A data on sbp and status.*

Description

A data on sbp and status.

Usage

```
data(sbpdata)
```

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 3621 rows and 5 columns.

Examples

```
data(sbpdata)
```

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