

Package ‘rscssi’

February 15, 2023

Type Package

Title Visualization of Restricted Cubic Splines

Version 0.4.0

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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. rscssi 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](https://doi.org/10.1016/j.ecoenv.2022.113183)>, Amit Kaura (2019) <[doi:10.1136/bmj.16055](https://doi.org/10.1136/bmj.16055)>, 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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rcssci_cox	<i>rcssci_cox</i>
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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	sensor 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	<i>rcssci_logistic</i>
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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")
```

`rcox.lshap`*rcox.lshap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

<code>data</code>	<code>data.frame.Rdata</code>
<code>knot</code>	<code>knot=3-7</code> or automatic calculate by AIC min
<code>y</code>	<code>outcome=0,1</code>
<code>time</code>	sensor time
<code>covs</code>	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
<code>prob</code>	position parameter, range from 0-1
<code>x</code>	main exposure and X-axis when plotting
<code>filepath</code>	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)
rcox.lshap(data=sbpdata, y = "status", x = "sbp", time = "time",
prob=0.1, filepath=tempdir())
# library(rcssci)
# rcox.lshap(knot=4, data=sbpdata, y = "status", x = "sbp", covs=c("age"),
# time = "time", prob=0.1, filepath="D:/temp")
```

rcox.nshap	<i>rcox.nshap</i>
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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	sensor 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)
rcox.nshap(data=sbpdata, y = "status", x = "sbp", time = "time",
prob=0.1, filepath=tempdir())
# library(rcssci)
# rcox.nshap(knot=4, data=sbpdata, y = "status", x = "sbp", covs=c("age"),
# time = "time", prob=0.1, filepath="D:/temp")
```

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

rcs_cox.ushap	<i>rcs_cox.ushap</i>
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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	sensor 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)
rcs_cox.ushap(data=sbpdata, y = "status", x = "sbp", time = "time",
prob=0.1, filepath=tempdir())
# library(rcssci)
# rcs_cox.ushap(knot=4, data=sbpdata, y = "status", x = "sbp", covs=c("age"),
# time = "time", prob=0.1, filepath="D:/temp")
```

rcs_linear.lshap	<i>rcs_linear.lshap</i>
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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	<i>rcs_linear.nshap</i>
------------------	-------------------------

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

Examples

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

rcs_linear.prob *rcs_linear.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
covs	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
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Zhiqiang Nie, <niezhiqiang@gdph.org.cn>

Examples

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

rcs_linear.ushap	<i>rcs_linear.ushap</i>
------------------	-------------------------

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
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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

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Author(s)

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

Examples

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

rsc_logistic.nshap *rsc_logistic.nshap*

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

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

rsc_logistic.ushap *rsc_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
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)
rsc_logistic.ushap(data=sbpdata, y = "status",x = "sbp",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rsc_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

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

<code>data</code>	<code>data.frame.Rdata</code>
<code>knot</code>	<code>knot=3-7</code> or automatic calculate by AIC min
<code>y</code>	<code>outcome=0,1</code>
<code>covs</code>	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
<code>prob</code>	position parameter,range from 0-1
<code>x</code>	main exposure and X-axis when plotting
<code>filepath</code>	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.nshap(data=sbpdata, y = "status",x = "sbp",
prob=0.1,filepath=tempdir())
# library(rcssci)
# rcs_quasipoisson.nshap(knot=4,data=sbpdata, y = "status",x = "sbp",
# covs=c("age","gender"),prob=0.1,filepath="D:/temp")
```

rqs_quasipoisson.pro *rqs_quasipoisson.pro*

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

`rcs_quasipoisson.ushap`*rcs_quasipoisson.ushap*

Description

restricted cubic splines (RCS) published in SCI.

Arguments

<code>data</code>	<code>data.frame.Rdata</code>
<code>knot</code>	<code>knot=3-7</code> or automatic calculate by AIC min
<code>y</code>	<code>outcome=0,1</code>
<code>covs</code>	covariables, univariate analysis without "covs" command, multivariable analysis with "covs" command
<code>prob</code>	position parameter,range from 0-1
<code>x</code>	main exposure and X-axis when plotting
<code>filepath</code>	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.ushap(data=sbpdata, y = "status", x = "sbp",
prob=0.1, filepath=tempdir())
# library(rcssci)
# rcs_quasipoisson.ushap(knot=4, data=sbpdata, y = "status", x = "sbp",
# 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

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data(sbpdata)
```

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