Package: svyVGAM (via r-universe)

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Title Design-Based Inference in Vector Generalised Linear Models

Version 1.2-1

Author Thomas Lumley

Description Provides inference based on the survey package for the wide range of parametric models in the 'VGAM' package.

Imports stats, methods

Depends VGAM, survey, R (>= 3.5.0)

Suggests pscl, knitr, markdown, rmarkdown

VignetteBuilder knitr

Encoding UTF-8

License GPL-3

Maintainer Thomas Lumley <t.lumley@auckland.ac.nz>

Repository https://tslumley.r-universe.dev

RemoteUrl https://github.com/tslumley/svyvgam

RemoteRef HEAD

RemoteSha 7eed207169016d00cbe52a54ad514c73b30b6495

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nhanes_sxq	*Data from NHANES: number of sex partners*

Description

These data are from the NHANES 2003-2004 survey in the US. They provide an example of overdispersed count data that motivates a two-component zero-inflation model

Usage

```
data("nhanes_sxq")
```

Format

A data frame with 2992 observations on the following 7 variables.

SDMVPSU Primary Sampling Unit

SDMVSTRA stratum

WTINT2YR weights

malepartners lifetime number of male sexual partners

RIDAGEYR age in years

DMDEDUC level of education: 1=less than high school, 2=high school, 3-more than high school, 7=refused

RIDRETH1 Race/ethnicity: 1=Mexican American, 2=Other Hispanic, 4=non-Hispanic White, 5=non-Hispanic Black, 5=Other

Source

NHANES files demo_c.xpt and sxq_c.xpt

See Also

Construction of the data set is described by https://notstatschat.rbind.io/2015/05/26/zero-inflated-poisson-fr

Examples

```
data(nhanes_sxq)
nhdes = svydesign(id=~SDMVPSU,strat=~SDMVSTRA,weights=~WTINT2YR, nest=TRUE, data=nhanes_sxq)
svy_vglm(malepartners~RIDAGEYR+factor(RIDRETH1)+DMDEDUC, zipoisson(), design=nhdes, crit = "coef")
```

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svy_vglm   *Design-based inference for vector generalised linear models*

Description

This function provides design-based (survey) inference for Thomas Yee's vector generalised linear models. It works by calling vglm with sampling weights, and then either using resampling (replicate weights) or extracting the influence functions and using a Horvitz-Thompson-type sandwich estimator.

Usage

```
svy_vglm(formula, family, design, ...)
```

Arguments

formula	Model formula, as for [vglm](#)
family	Model family, as for [vglm](#)
design	Survey design object
...	Other arguments to pass to [vglm](#)

Value

An S3 object of class svy_glm with print, coef and vcov methods, containing the design in the design component and a fitted vglm object in the fit component.

See Also

[nhanes_sxq](#)

[vglm](#)

[svydesign](#) [svrepdesign](#)

Examples

```
data(api)
dclus2<-svydesign(id=~dnum+snum, fpc=~fpc1+fpc2, data=apiclus2)

## Ordinary Gaussian regression
m1<-svyglm(api00~api99+mobility+ell, design=dclus2,family=gaussian)
## same model, but with the variance as a second parameter
m2<-svy_vglm(api00~api99+mobility+ell, design=dclus2,family=uninormal())
m1
m2
SE(m1)
SE(m2)

summary(m1)
```

```
summary(m2)

## Proportional odds model
dclus2<-update(dclus2, mealcat=as.ordered(cut(meals,c(0,25,50,75,100))))
a<-svyolr(mealcat~avg.ed+mobility+stype, design=dclus2)
b<-svy_vglm(mealcat~avg.ed+mobility+stype, design=dclus2, family=propodds())
a
b
SE(a)
SE(b) #not identical, because svyolr() uses approximate Hessian


## Zero-inflated Poisson
data(nhanes_sxq)
nhdes = svydesign(id=~SDMVPSU,strat=~SDMVSTRA,weights=~WTINT2YR,
        nest=TRUE, data=nhanes_sxq)

sv1<-svy_vglm(malepartners~RIDAGEYR+factor(RIDRETH1)+DMDEDUC,
      zipoisson(), design=nhdes, crit = "coef")
sv1
summary(sv1)

## Multinomial
## Reference group (non-Hispanic White) average older and more educated
## so coefficients are negative
mult_eth<- svy_vglm(RIDRETH1~RIDAGEYR+DMDEDUC,
      family=multinomial(refLevel=3), design=nhdes)

## separate logistic regressions are close but not identical
two_eth<-svyglm(I(RIDRETH1==1)~RIDAGEYR+DMDEDUC, family=quasibinomial,
    design=subset(nhdes, RIDRETH1 %in% c(1,3)))

summary(mult_eth)
summary(two_eth)
```

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