Tobacco

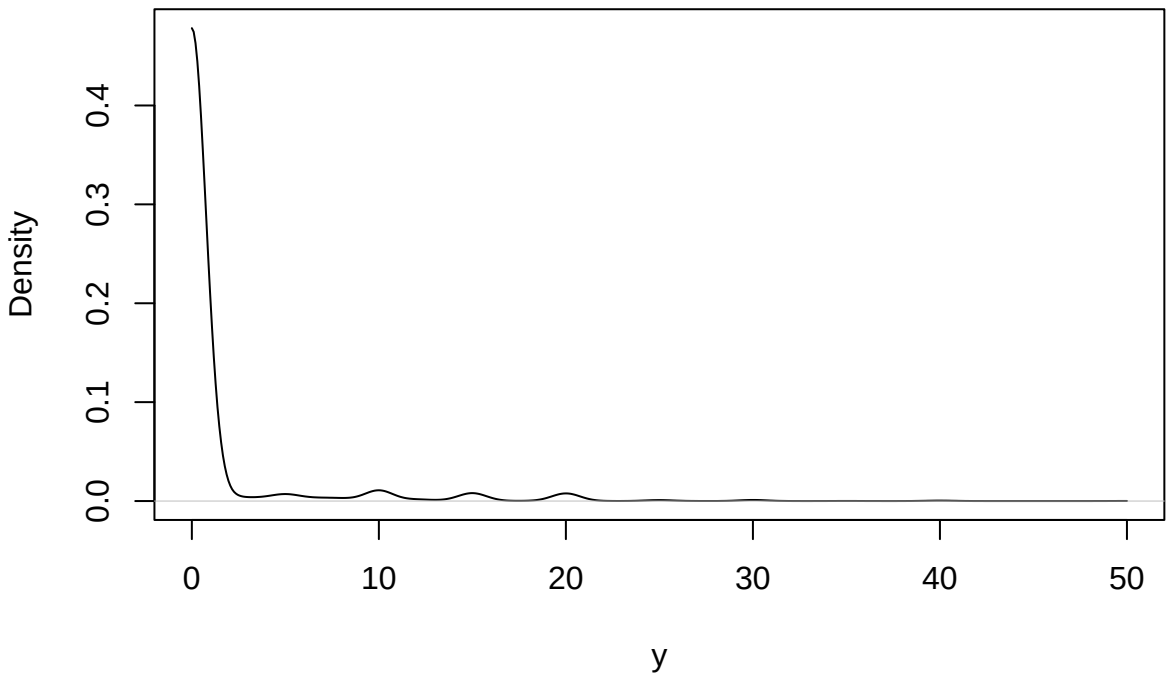
Tobacco

Number of cigarettes consumed is an indicator of several mental illnesses including anxiety (Lawrence et al. 2010).

Data

What variables are included? Why is this output chosen. What explanatory variables are used and why are they chosen

```
counts_density("data/transitions/ncigs/zip/ncigs_2018_2019.rds", "y")
```



Methods

The number of zero inflated values is higher than expected for a count distribution such as a poisson distribution. This inflation occurs naturally as a large proportion (over 50%) of the population do not

smoke. There are two sources of cigarette consumption that can be modelled using zero inflated models. In this case a zero-inflated poisson (ZIP) is used. Two models are fitted simulatenously. One is a logistic regression that estimates whether a person smokes cigarettes or not. This provides a simple probability of smoking or not. The second is a poisson counts model estimating the number of cigarettes consumed.

Data

Two set of variables are needed for the logistic and poisson parts of the ZIP model respectively.

Variables that predict how much a person smokes.

age. persons age. generally older people and very young smoke. SF_12. wellbeing estimates number of cigarettes smoked. labour_state. whether a person is employed or not. ethnicity. certain ethnicities more likely to smoke cigarettes. education_state. highest qualification. job_sec job quality hh_income household income ncigs previous number consumed.

Variables that predict whether a person smokes

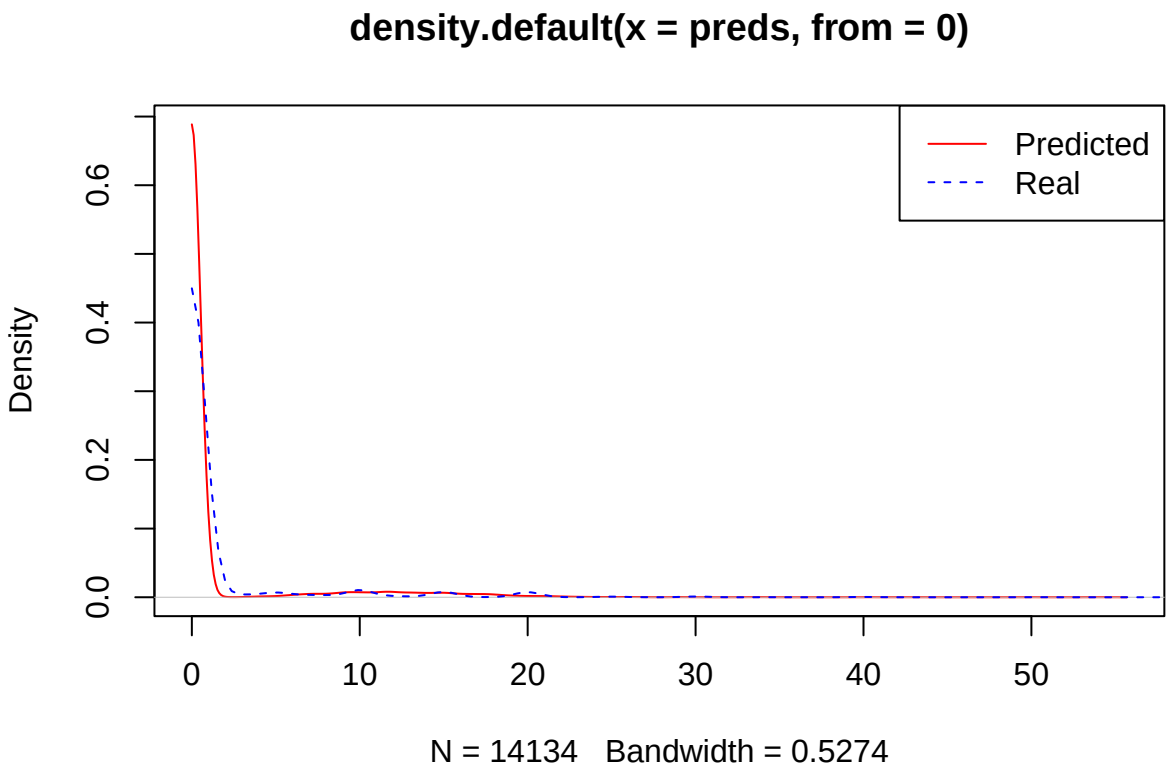
ethnicity. certain ethnicities more likely to smoke cigarettes. labour_state. whether a person is employed or not. age SF_12. wellbeing estimates number of cigarettes smoked. ncigs previous number consumed.

Results

Almost all coefficients significant. Particularly prevous consumption of cigarettes. Good estimation of the number of non-smokers in the population at around 55%. Counts of smoking are underdispersed and fail to estimate consumption over 20 cigarettes.

```
##
## Call:
## zeroinfl(formula = formula, data = dat.subset, weights = weight, dist = "pois", link = "logit")
##
## Pearson residuals:
##      Min       1Q   Median       3Q      Max
## -0.22590 -0.02780 -0.01848  0.00000  3.90660
##
## Count model coefficients (poisson with log link):
##                                            Estimate Std. Error z value Pr(>|z|)
## (Intercept)                                1.826e+00         NA      NA       NA
## age                                        1.364e-02         NA      NA       NA
## factor(sex)Male                            5.071e-02         NA      NA       NA
## relevel(factor(education_state), ref = "3")0  3.819e-02         NA      NA       NA
## relevel(factor(education_state), ref = "3")1  3.870e-01         NA      NA       NA
## relevel(factor(education_state), ref = "3")2  9.921e-02         NA      NA       NA
## relevel(factor(education_state), ref = "3")5 -3.817e-02         NA      NA       NA
## relevel(factor(education_state), ref = "3")6 -2.838e-01         NA      NA       NA
## relevel(factor(education_state), ref = "3")7  2.962e-01         NA      NA       NA
## SF_12                                      -3.491e-03         NA      NA       NA
## relevel(factor(job_sec), ref = "3")1         8.265e-02         NA      NA       NA
## relevel(factor(job_sec), ref = "3")2         7.372e-01         NA      NA       NA
## relevel(factor(job_sec), ref = "3")4         1.603e-01         NA      NA       NA
## relevel(factor(job_sec), ref = "3")5         1.904e-01         NA      NA       NA
## relevel(factor(job_sec), ref = "3")6         1.211e-01         NA      NA       NA
## relevel(factor(job_sec), ref = "3")7         1.474e-01         NA      NA       NA
## relevel(factor(job_sec), ref = "3")8         2.507e-01         NA      NA       NA
```

```
## hh_income                                        4.793e-05         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")BAN   -5.872e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")BLA   -5.784e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")BLC   -5.287e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")CHI   -4.005e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")IND   -5.132e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")MIX   -2.855e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")OAS   -4.219e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")OBL   -7.849e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")OTH    7.849e-02         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")PAK   -6.763e-01         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")WHO   -3.410e-02         NA      NA       NA
##
## Zero-inflation model coefficients (binomial with logit link):
##                                                 Estimate Std. Error z value Pr(>|z|)
## (Intercept)                                    1.3968641         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")BAN -0.0665143         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")BLA  0.7077274         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")BLC -0.8377246         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")CHI  0.2628890         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")IND  1.4577262         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")MIX -0.2970005         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")OAS  1.0415864         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")OBL  0.3374910         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")OTH -0.8345472         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")PAK -0.0972652         NA      NA       NA
## relevel(factor(ethnicity), ref = "WBI")WHO -0.2608373         NA      NA       NA
## relevel(factor(job_sec), ref = "3")1        0.4389168         NA      NA       NA
## relevel(factor(job_sec), ref = "3")2        0.5864644         NA      NA       NA
## relevel(factor(job_sec), ref = "3")4       -0.1661200         NA      NA       NA
## relevel(factor(job_sec), ref = "3")5       -0.2828293         NA      NA       NA
## relevel(factor(job_sec), ref = "3")6       -0.8209764         NA      NA       NA
## relevel(factor(job_sec), ref = "3")7       -0.7934972         NA      NA       NA
## relevel(factor(job_sec), ref = "3")8       -0.7788828         NA      NA       NA
## hh_income                                   0.0002134         NA      NA       NA
## SF_12                                       0.0179618         NA      NA       NA
##
## Number of iterations in BFGS optimization: 90
## Log-likelihood: -84.87 on 50 Df
```



References

Lawrence, David, Julie Considine, Francis Mitrou, and Stephen R Zubrick. 2010. "Anxiety Disorders and Cigarette Smoking: Results from the Australian Survey of Mental Health and Wellbeing." *Australian & New Zealand Journal of Psychiatry* 44 (6): 520–27.