Analysis for Project

Contents

Introduction

Back to top

Use this R Markdown to perform the main analysis for the project. I use this basically as a lab notebook. It contains the main analysis and a variety of sensitivity analysis. The code in this documents serves as a baseline for the eventual tables and figures that will go into the paper. At the same time it will serve as a record of all supplementary analyses performed.

Analysis

First, I want to see the proportions of health insurance I'm working with.

```
##
##     IHS    None Private  Public
##   28195  421393 2896447  586594
```

```
##
##         IHS        None     Private      Public
## 0.007169504 0.107153001 0.736516717 0.149160778
```

```
##
##    Covered NotCovered
##    3501893     430736
```

```
##
##    Covered NotCovered
##  0.8904712  0.1095288
```

```
##
##       NH White       NH Black       Hispanic         NH API        NH AIAN
##        2603952         390232         578405         239564          36213
## NH Other/Multi
##          84263
```

```
##
##       NH White       NH Black        Hispanic          NH API         NH AIAN
##    0.662140263    0.099229294    0.147078456    0.060917010    0.009208344
## NH Other/Multi
##    0.021426633
```

```
##                          Estimate Std. Error  z value Pr(>|z|)
## (Intercept)                 2.460      0.002 1068.968        0
## racecomboNH Black          -0.755      0.005 -151.050        0
## racecomboHispanic          -1.214      0.004 -310.881        0
## racecomboNH API             0.099      0.008   12.033        0
## racecomboNH AIAN           -1.445      0.012 -119.309        0
## racecomboNH Other/Multi    -0.423      0.011  -38.347        0
```

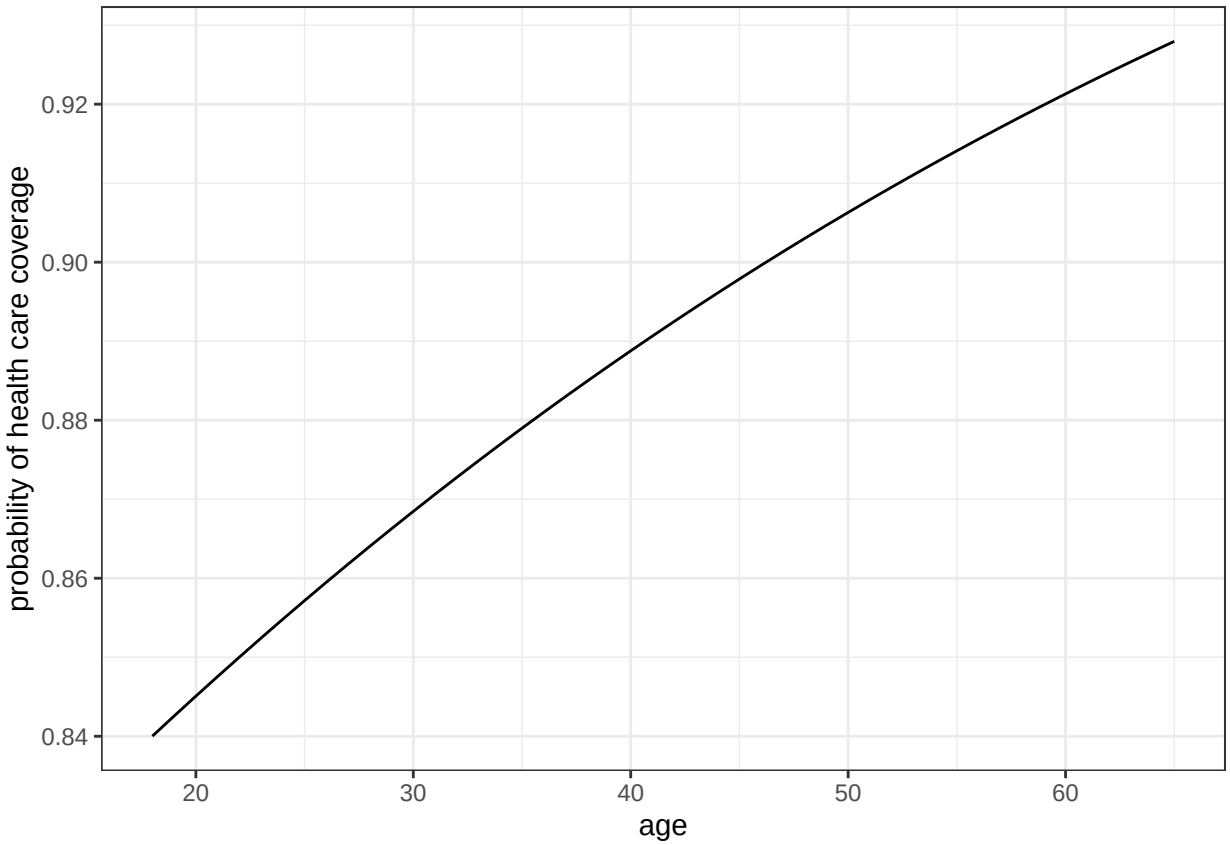
```
##             (Intercept)       racecomboNH Black       racecomboHispanic
##              11.7067917               0.4699857               0.2968732
##         racecomboNH API        racecomboNH AIAN racecomboNH Other/Multi
##               1.1042590               0.2356978               0.6551688
```

The race model, before exponentiating and converting these values to probabilities, I can see that whites (the reference category) have the highest probabilty of having any health insurance. AIANs, on the other hand, have by far the lowest probability of having any health insurance coverage.

```
## (Intercept)         age
##  1.31468100  0.01909152
```

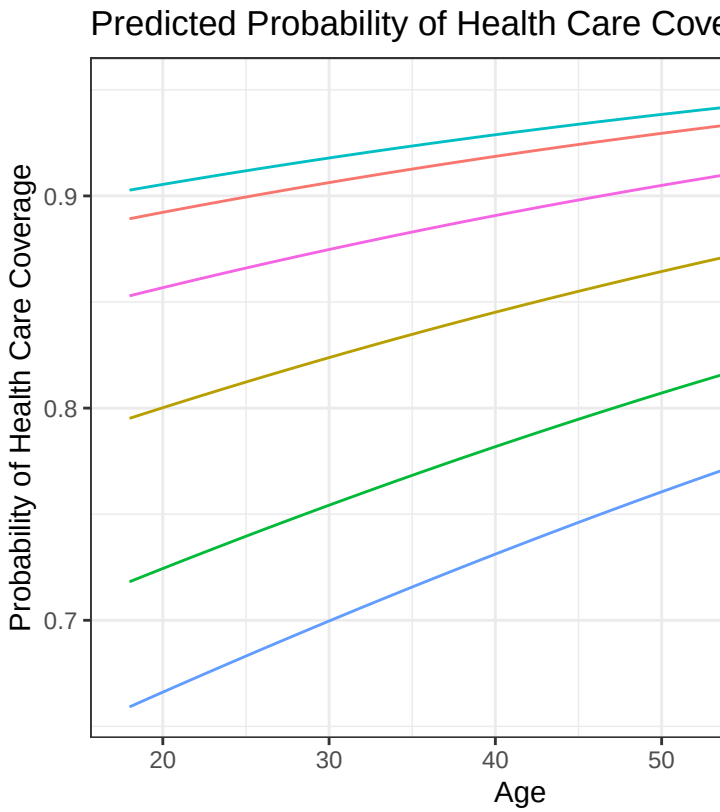
```
## (Intercept)         age
##    3.723563    1.019275
```

The age model shows that a one year increase in age is associated with an increase in the predicated probability of healthcare coverage.




```
## (Intercept)         age
##    3.723563    1.019275
```

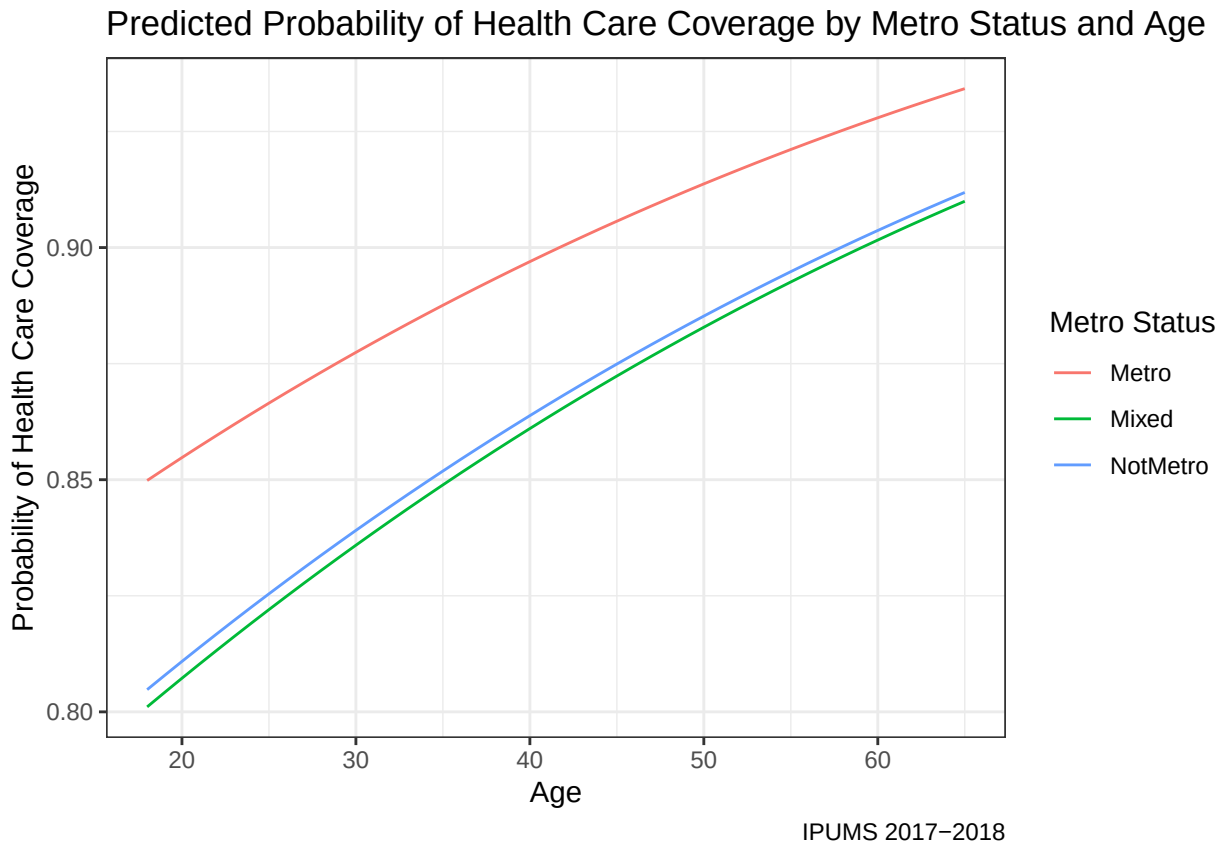
The age model shows an increase in the predicted probability of health care coverage as age increases. The average 18 year old, without taking any other independent variables into account, has a. A one year increase



**Why are the numbers different between age graph + model?

```
##              (Intercept)                       age       racecomboNH Black
##                6.0747317                 1.0156158                 0.4835139
##       racecomboHispanic         racecomboNH API         racecomboNH AIAN
##                0.3173805                 1.1558170                 0.2409097
## racecomboNH Other/Multi
##                0.7221836
```

The combined age and race model still shows an increase in the predicted probability of health care coverage as age increases, but has vastly differenct effects for race.




```
##    (Intercept)            age    metrosMixed metrosNotMetro
##      3.9783126      1.0197721      0.7115937      0.7284631
```

The metro status and age model still shows an increase in the predicted probability of health care coverage as age increases, but mixed metro and non-metro status and non-metro status have far a far lower predicted probability of having health care coverage.

```
##                                    Estimate Std. Error  z value Pr(>|z|)
## (Intercept)                          -2.427      0.003 -709.618    0.000
## I(age - 42)                          -0.019      0.000 -145.862    0.000
## I((age - 42)^2)                      -0.001      0.000 -103.554    0.000
## metrosMixed                           0.507      0.006   88.699    0.000
## metrosNotMetro                        0.490      0.007   75.155    0.000
## racecomboNH Black                     0.740      0.006  124.349    0.000
## racecomboHispanic                     1.246      0.005  276.590    0.000
## racecomboNH API                      -0.041      0.009   -4.627    0.000
## racecomboNH AIAN                      1.306      0.021   62.269    0.000
## racecomboNH Other/Multi               0.333      0.013   25.350    0.000
## metrosMixed:racecomboNH Black         0.193      0.014   14.047    0.000
## metrosNotMetro:racecomboNH Black      0.325      0.017   19.103    0.000
## metrosMixed:racecomboHispanic         0.024      0.013    1.805    0.071
## metrosNotMetro:racecomboHispanic     -0.058      0.016   -3.500    0.000
## metrosMixed:racecomboNH API           0.096      0.038    2.498    0.012
## metrosNotMetro:racecomboNH API        0.220      0.048    4.612    0.000
## metrosMixed:racecomboNH AIAN         -0.038      0.030   -1.251    0.211
```

```
## metrosNotMetro:racecomboNH AIAN          -0.067      0.030   -2.260    0.024
## metrosMixed:racecomboNH Other/Multi       0.242      0.030    8.128    0.000
## metrosNotMetro:racecomboNH Other/Multi    0.159      0.036    4.372    0.000
```

```
##                              (Intercept)                              I(age - 42)
##                                0.0882968                                0.9811529
##                           I((age - 42)^2)                              metrosMixed
##                                0.9989550                                1.6603140
##                             metrosNotMetro                       racecomboNH Black
##                                1.6324872                                2.0968630
##                           racecomboHispanic                         racecomboNH API
##                                3.4753594                                0.9602433
##                            racecomboNH AIAN                 racecomboNH Other/Multi
##                                3.6902416                                1.3948855
##          metrosMixed:racecomboNH Black       metrosNotMetro:racecomboNH Black
##                                1.2126951                                1.3842467
##          metrosMixed:racecomboHispanic       metrosNotMetro:racecomboHispanic
##                                1.0246080                                0.9439176
##            metrosMixed:racecomboNH API         metrosNotMetro:racecomboNH API
##                                1.1003454                                1.2464382
##           metrosMixed:racecomboNH AIAN        metrosNotMetro:racecomboNH AIAN
##                                0.9626232                                0.9349788
##    metrosMixed:racecomboNH Other/Multi metrosNotMetro:racecomboNH Other/Multi
##                                1.2735963                                1.1724062
```

This a very complex model.

```
## [1] -29675.59
```

```
## [1] -124111.9
```

```
## [1] -153787.5
```

The BIC comparison shows a preference for the complex healthcare model with a result of -29675.59. Both the race and age and complex healthcare model are preffered to the null BIC' model.

```
##
## Call:
## glm(formula = anyhins ~ racecombo + metros + racecombo:metros,
##     family = binomial(logit), data = ipumsdata)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -2.3197   0.3749   0.3749   0.4726   0.8715
##
## Coefficients:
##                                    Estimate Std. Error  z value Pr(>|z|)
## (Intercept)                        2.620275   0.002933  893.483  < 2e-16
## racecomboNH Black                 -0.762285   0.005930 -128.553  < 2e-16
## racecomboHispanic                 -1.321346   0.004470 -295.621  < 2e-16
## racecomboNH API                   -0.022946   0.008745   -2.624  0.00869
## racecomboNH AIAN                  -1.321357   0.020836  -63.416  < 2e-16
```

```
## racecomboNH Other/Multi                -0.427334   0.013084  -32.661  < 2e-16
## metrosMixed                            -0.484330   0.005693  -85.076  < 2e-16
## metrosNotMetro                         -0.461802   0.006494  -71.112  < 2e-16
## racecomboNH Black:metrosMixed          -0.201458   0.013644  -14.765  < 2e-16
## racecomboHispanic:metrosMixed          -0.042259   0.013391   -3.156  0.00160
## racecomboNH API:metrosMixed            -0.110358   0.038161   -2.892  0.00383
## racecomboNH AIAN:metrosMixed            0.017006   0.030238    0.562  0.57384
## racecomboNH Other/Multi:metrosMixed    -0.220067   0.029628   -7.428 1.11e-13
## racecomboNH Black:metrosNotMetro       -0.332484   0.016904  -19.669  < 2e-16
## racecomboHispanic:metrosNotMetro        0.036606   0.016394    2.233  0.02555
## racecomboNH API:metrosNotMetro         -0.229256   0.047593   -4.817 1.46e-06
## racecomboNH AIAN:metrosNotMetro         0.038376   0.029544    1.299  0.19396
## racecomboNH Other/Multi:metrosNotMetro -0.142900   0.036231   -3.944 8.01e-05
##
## (Intercept)                            ***
## racecomboNH Black                      ***
## racecomboHispanic                      ***
## racecomboNH API                        **
## racecomboNH AIAN                       ***
## racecomboNH Other/Multi                ***
## metrosMixed                            ***
## metrosNotMetro                         ***
## racecomboNH Black:metrosMixed          ***
## racecomboHispanic:metrosMixed          **
## racecomboNH API:metrosMixed            **
## racecomboNH AIAN:metrosMixed
## racecomboNH Other/Multi:metrosMixed    ***
## racecomboNH Black:metrosNotMetro       ***
## racecomboHispanic:metrosNotMetro       *
## racecomboNH API:metrosNotMetro         ***
## racecomboNH AIAN:metrosNotMetro
## racecomboNH Other/Multi:metrosNotMetro ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 2717675  on 3932628  degrees of freedom
## Residual deviance: 2592537  on 3932611  degrees of freedom
## AIC: 2592573
##
## Number of Fisher Scoring iterations: 5
```