Statistics/Data analysis

```
      name:  <unnamed>
       log:  /nas/longleaf/home/rayrayc/hrs_final_cog.smcl
  log type:  smcl
 opened on:  26 Nov 2022, 10:51:15

1 .
2 .
3 . ***************************

4 . *** HRS Cleaning Do File***

5 . ***************************

6 .
7 . clear

8 . * Increase max number of columns to Stata mp max of 32k.

9 . set maxvar 32000
  no; Stata matrices have not been cleared
  (type -clear matrix- to clear Stata matrices)
  r(4);

10.
11. * Install Packages, load data, and sort.

12. ssc install reghdfe
  checking reghdfe consistency and verifying not already installed...
  all files already exist and are up to date.

13. ssc install ftools
  checking ftools consistency and verifying not already installed...
  all files already exist and are up to date.

14. ssc install mdesc
  checking mdesc consistency and verifying not already installed...
  all files already exist and are up to date.

15. use "/nas/longleaf/home/rayrayc/clean1.dta"

16. sort hhidpn wave

17. xtset hhidpn wave

  Panel variable: hhidpn (unbalanced)
   Time variable: wave, 3 to 14, but with gaps
           Delta: 1 unit

18.
19. *** Summary

20. sum cogtot gender raracem rahispan  agey_m hibp bmi_miss bmi_new smoken_miss smoken_
  > new smokev_new smokev_miss raedyrs conde shltc_miss shltc_new drinkn conde pstmem ps
  > tmem mstat cesd depres cendiv effort sleepr arthr heart strok psych lung slfmem lbrf
  >  loghatotb loghspti_miss loghspti_new diab logearn wave cendiv timwlk_miss timwlk_ne
  > w puff_miss puff_new puffpos_miss puffpos_new alzhe_miss alzhe_new demen_miss demen_
  > new effort fsad going enlife whappy diab cancr phone meds_miss meds_new money shop m
  > eals map totmbi_miss totmbi_new oopmdo_miss oopmdo_new

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
      cogtot |    130,813    21.82979    5.275383         0         35
      gender |    130,813      1.5855    .4926374         1          2
     raracem |    130,813    1.237996    .5246971         1          3
    rahispan |    130,813    .0890431    .2848071         0          1
      agey_m |    130,813    71.33768    10.49015        18        109
-------------+---------------------------------------------------------
        hibp |    130,813    .6493697    .6534987         0          5
    bmi_miss |    130,813    .0126822    .1118994         0          1
     bmi_new |    130,813    27.03859    6.280797         0      103.6
 smoken_miss |    130,813    .0066813     .081466         0          1
```

smoken_new	130,813	.1144076	.3183069	0	1
smokev_new	130,813	.5596233	.4964342	0	1
smokev_miss	130,813	.0065437	.0806283	0	1
raedyrs	130,813	12.33813	3.262801	0	17
conde	130,813	2.07422	1.448444	0	8
shltc_miss	130,813	.1354682	.3422243	0	1
shltc_new	130,813	.0651006	.8314504	-4	4
drinkn	130,813	.6281562	1.2977	0	99
conde	130,813	2.07422	1.448444	0	8
pstmem	130,813	2.199674	.459773	1	3
pstmem	130,813	2.199674	.459773	1	3
mstat	130,813	3.184477	2.734842	1	8
cesd	130,813	1.428604	1.895906	0	8
depres	130,813	.1411022	.3481283	0	1
cendiv	130,813	5.037343	2.35035	1	11
effort	130,813	.2409241	.427646	0	1
sleepr	130,813	.2910032	.4542267	0	1
arthr	130,813	.6814002	.6550181	0	5
heart	130,813	.3333308	.6743214	0	6
strok	130,813	.0939127	.3596818	0	5
psych	130,813	.1946366	.5689834	0	5
lung	130,813	.1389923	.4830146	0	5
slfmem	130,813	3.003929	.9504431	1	5
lbrf	130,813	4.371614	1.662865	1	7
loghatotb	130,813	11.35005	3.048962	0	18.58324
loghspti_m~s	130,813	.0053894	.0732145	0	1
loghspti_new	130,813	.258285	.4582316	0	4.61512
diab	130,813	.2345638	.5150448	0	5
logearn	130,813	2.376611	4.250377	0	14.50866
wave	130,813	8.183277	3.469895	3	14
cendiv	130,813	5.037343	2.35035	1	11
timwlk_miss	130,813	.4459496	.4970719	0	1
timwlk_new	130,813	.6912412	1.671629	0	81
puff_miss	130,813	.4459496	.4970719	0	1
puff_new	130,813	82.26479	161.049	0	870
puffpos_miss	130,813	.4459496	.4970719	0	1
puffpos_new	130,813	.2513894	.4642369	0	3
alzhe_miss	130,813	.5998639	.4899276	0	1
alzhe_new	130,813	.0072088	.1649269	0	7
demen_miss	130,813	.5998639	.4899276	0	1
demen_new	130,813	.0108093	.1468439	0	4
effort	130,813	.2409241	.427646	0	1
fsad	130,813	.1824284	.3861986	0	1
going	130,813	.2106366	.4077623	0	1
enlife	130,813	.926307	.2612716	0	1
whappy	130,813	.8817854	.3228632	0	1
diab	130,813	.2345638	.5150448	0	5
cancr	130,813	.1763663	.4376557	0	5
phone	130,813	.0683724	.5651489	0	9
meds_miss	130,813	.0177964	.1322113	0	1
meds_new	130,813	.1057617	.8522729	0	9
money	130,813	.3441172	1.586266	0	9
shop	130,813	.3270164	1.432845	0	9
meals	130,813	.4442372	1.812295	0	9
map	130,813	1.125721	2.788343	0	9
totmbi_miss	130,813	.6482918	.4775053	0	1
totmbi_new	130,813	1.288641	2.146568	0	11
oopmdo_miss	130,813	.5998639	.4899276	0	1
oopmdo_new	130,813	1317.9	5772.14	0	634821

```
21.
22. mdesc cogtot gender raracem rahispan  agey_m hibp bmi_miss bmi_new smoken_miss smoke
  > n_new smokev_new smokev_miss raedyrs conde shltc_miss shltc_new drinkn conde pstmem
  > pstmem mstat cesd depres cendiv effort sleepr arthr heart strok psych lung slfmem lb
  > rf loghatotb loghspti_miss loghspti_new diab logearn wave cendiv timwlk_miss timwlk_
  > new puff_miss puff_new puffpos_miss puffpos_new alzhe_miss alzhe_new demen_miss deme
  > n_new effort fsad going enlife whappy diab cancr phone meds_miss meds_new money shop
  >  meals map totmbi_miss totmbi_new oopmdo_miss oopmdo_new
```

Variable	Missing	Total	Percent Missing
cogtot	**0**	**130,813**	**0.00**
gender	**0**	**130,813**	**0.00**
raracem	**0**	**130,813**	**0.00**
rahispan	**0**	**130,813**	**0.00**
agey_m	**0**	**130,813**	**0.00**
hibp	**0**	**130,813**	**0.00**
bmi_miss	**0**	**130,813**	**0.00**
bmi_new	**0**	**130,813**	**0.00**
smoken_miss	**0**	**130,813**	**0.00**
smoken_new	**0**	**130,813**	**0.00**
smokev_new	**0**	**130,813**	**0.00**
smokev_miss	**0**	**130,813**	**0.00**
raedyrs	**0**	**130,813**	**0.00**
conde	**0**	**130,813**	**0.00**
shltc_miss	**0**	**130,813**	**0.00**
shltc_new	**0**	**130,813**	**0.00**
drinkn	**0**	**130,813**	**0.00**
conde	**0**	**130,813**	**0.00**
pstmem	**0**	**130,813**	**0.00**
pstmem	**0**	**130,813**	**0.00**
mstat	**0**	**130,813**	**0.00**
cesd	**0**	**130,813**	**0.00**
depres	**0**	**130,813**	**0.00**
cendiv	**0**	**130,813**	**0.00**
effort	**0**	**130,813**	**0.00**
sleepr	**0**	**130,813**	**0.00**
arthr	**0**	**130,813**	**0.00**
heart	**0**	**130,813**	**0.00**
strok	**0**	**130,813**	**0.00**
psych	**0**	**130,813**	**0.00**
lung	**0**	**130,813**	**0.00**
slfmem	**0**	**130,813**	**0.00**
lbrf	**0**	**130,813**	**0.00**
loghatotb	**0**	**130,813**	**0.00**
loghspti_m~s	**0**	**130,813**	**0.00**
loghspti_new	**0**	**130,813**	**0.00**
diab	**0**	**130,813**	**0.00**
logearn	**0**	**130,813**	**0.00**
wave	**0**	**130,813**	**0.00**
cendiv	**0**	**130,813**	**0.00**
timwlk_miss	**0**	**130,813**	**0.00**
timwlk_new	**0**	**130,813**	**0.00**
puff_miss	**0**	**130,813**	**0.00**
puff_new	**0**	**130,813**	**0.00**
puffpos_miss	**0**	**130,813**	**0.00**
puffpos_new	**0**	**130,813**	**0.00**
alzhe_miss	**0**	**130,813**	**0.00**
alzhe_new	**0**	**130,813**	**0.00**
demen_miss	**0**	**130,813**	**0.00**
demen_new	**0**	**130,813**	**0.00**
effort	**0**	**130,813**	**0.00**
fsad	**0**	**130,813**	**0.00**
going	**0**	**130,813**	**0.00**
enlife	**0**	**130,813**	**0.00**
whappy	**0**	**130,813**	**0.00**
diab	**0**	**130,813**	**0.00**
cancr	**0**	**130,813**	**0.00**
phone	**0**	**130,813**	**0.00**
meds_miss	**0**	**130,813**	**0.00**
meds_new	**0**	**130,813**	**0.00**
money	**0**	**130,813**	**0.00**

shop	**0**	**130,813**	**0.00**
meals	**0**	**130,813**	**0.00**
map	**0**	**130,813**	**0.00**
totmbi_miss	**0**	**130,813**	**0.00**
totmbi_new	**0**	**130,813**	**0.00**
oopmdo_miss	**0**	**130,813**	**0.00**
oopmdo_new	**0**	**130,813**	**0.00**

```
23.
24. hist cogtot
  (bin=51, start=0, width=.68627451)

25.
26. *** Regression time

27. * Simple OLS

28. quietly reg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i.b
  > mi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new c
  > .drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psych
  > i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logearn
  > c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.goin
  > g i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i.m
  > eals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp#i
  > .smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust)

29. disp e(rmse)
  3.9387872

30.
31. *** Random/Ffixed Effects Test

32. * Random Effects

33. xtreg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i.bmi_mis
  > s i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new c.drink
  > n i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psych i.lung
  >  i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logearn c.timw
  > lk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.going i.en
  > life i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i.meals i
  > .map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp#i.smoke
  > n i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) re
  note: 5.hibp#1.smoken omitted because of collinearity.

  Random-effects GLS regression                   Number of obs     =    129,939
  Group variable: hhidpn                          Number of groups  =     35,497

  R-squared:                                      Obs per group:
       Within  = 0.2687                                         min =          1
       Between = 0.4929                                         avg =        3.7
       Overall = 0.4347                                         max =         12

                                                  Wald chi2(148)    =   48545.10
  corr(u_i, X) = 0 (assumed)                      Prob > chi2       =     0.0000

                                                        (Std. err. adjusted for 35,497 c
  > lusters in hhidpn)
------------------------------------------------------------------------------
             |               Robust
      cogtot | Coefficient  std. err.      z    P>|z|     [9
  > 5% con
  >       f. interval]
-------------+----------------------------------------------------------------
        wave |
           4 |   .2787761   .0456696     6.10   0.000     .1
  > 892654
  >           .3682868
           5 |  -.0464924   .0463141    -1.00   0.315    -.1
  > 372664
```

```
>           .0442817
                                    6 |  -.0353761   .0461902    -0.77   0.444    -.1
> 259073
>            .055155
                                    7 |  -.2482548   .0443021    -5.60   0.000    -.3
> 350853
>          -.1614243
                                    8 |  -.2476997   .0488947    -5.07   0.000    -.3
> 435316
>          -.1518678
                                    9 |  -.2063103    .049321    -4.18   0.000    -.3
> 029776
>           -.109643
                                   10 |  -.6361428   .0488948   -13.01   0.000    -.7
> 319749
>          -.5403108
                                   11 |  -.5560747   .0524508   -10.60   0.000    -.6
> 588764
>           -.453273
                                   12 |   -.372576   .0547943    -6.80   0.000    -.4
> 799708
>          -.2651812
                                   13 |  -.3365548   .0527712    -6.38   0.000    -.4
> 399844
>          -.2331252
                                   14 |     .01969   .0613459     0.32   0.748    -.1
> 005456
>           .1399257
                                      |
                             cendiv   |
                  2.mid atlantic      |   .2690285   .0953002     2.82   0.005     .0
> 822435
>           .4558135
                    3.en central      |   .0868302   .0921579     0.94   0.346    -.0
> 937961
>           .2674564
                    4.wn central      |   .1502177    .102082     1.47   0.141    -.0
> 498594
>           .3502947
                    5.s atlantic      |   .0253046    .088195     0.29   0.774    -.1
> 475543
>           .1981636
                    6.es central      |  -.1239729   .1067711    -1.16   0.246    -.3
> 332404
>           .0852946
                    7.ws central      |   .0258018   .0984081     0.26   0.793    -.1
> 670746
>           .2186782
                      8.mountain      |    .079143   .1059267     0.75   0.455    -.1
> 284696
>           .2867556
                       9.pacific      |   .1769097   .0948572     1.87   0.062    -.0
> 090069
>           .3628263
                11.not us/inc us terr |   .0403478   .4207313     0.10   0.924    -.7
> 842705
>           .8649661
                                      |
                            gender    |
                          2.female    |   .9053469   .0397876    22.75   0.000     .8
> 273647
>           .9833292
                                      |
                           raracem    |
           2.black/african american   |  -2.306036   .0560944   -41.11   0.000    -2.
> 415979
>          -2.196093
                             3.other  |  -1.101786   .0800653   -13.76   0.000    -1.
> 258712
>          -.9448613
                                      |
                           rahispan   |
```

```
                          1.hispanic |  -.6563356   .0731493    -8.97   0.000    -.7
> 997056
>          -.5129655
                           agey_m |   .3820324   .0146116    26.15   0.000     .3
> 533941
>           .4106707
                                  |
                            hibp  |
                          1.yes |  -1.064003   .2746809    -3.87   0.000    -1.
> 602367
>          -.5256379
     3.disp prev record and has cond |  -8.870215   8.000315    -1.11   0.268    -24
> .55054
>           6.810113
      4.disp prev record and no cond |  -.4337875   1.273105    -0.34   0.733    -2.
> 929026
>           2.061452
     5.disp prev record (dk if cond) |   3.028711    1.44647     2.09   0.036     .1
> 936827
>           5.863739
                                  |
                           1.bmi_miss |   1.600924    .268867     5.95   0.000     1.
> 073954
>           2.127893
                         1.smoken_new |    .217806   .4250355     0.51   0.608    -.6
> 152483
>            1.05086
                         1.smokev_new |   .0451046   .0392393     1.15   0.250     -.
> 031803
>           .1220122
                        1.smokev_miss |   .1973925   .3095688     0.64   0.524    -.4
> 093513
>           .8041362
                           raedyrs |   .4536965   .0086566    52.41   0.000     .4
> 367299
>            .470663
                         1.shltc_miss |  -.6138987   .0470485   -13.05   0.000    -.7
> 061121
>          -.5216854
                           shltc_new |   .0243369   .0108298     2.25   0.025     .0
> 031109
>           .045563
                            drinkn |   .0325275   .0096708     3.36   0.001     .0
> 135731
>           .0514819
                                  |
                            pstmem |
                          2.same |   .6537051   .0730472     8.95   0.000     .5
> 105353
>            .796875
                           3.worse |   .5608493   .0762709     7.35   0.000     .4
> 113612
>           .7103375
                                  |
                             mstat |
            2.married,spouse absent |  -.0514091   .1212546    -0.42   0.672    -.2
> 890638
>           .1862456
                         3.partnered |  -.1480929   .0697988    -2.12   0.034     -.
> 284896
>          -.0112899
                         4.separated |  -.3466624   .1113234    -3.11   0.002    -.5
> 648524
>          -.1284725
                          5.divorced |   .0159671   .0561507     0.28   0.776    -.0
> 940862
>           .1260204
               6.separated/divorced |  -.1389965    .105131    -1.32   0.186    -.3
> 450495
>           .0670565
                          7.widowed |  -.0378163   .0408721    -0.93   0.355    -.1
> 179242
```

```
>           .0422916
                      8.never married |  -.2703819   .0903234    -2.99   0.003    -.4
> 474126
>           -.0933512
                                      |
                               depres |
                               1.yes  |  -.3733459   .0387494    -9.63   0.000    -.4
> 492933
>           -.2973984
                                      |
                               effort |
                               1.yes  |  -.2729022   .0293646    -9.29   0.000    -.3
> 304558
>           -.2153486
                                      |
                               sleepr |
                               1.yes  |   .0811178   .0247553     3.28   0.001     .0
> 325984
>           .1296372
                                      |
                                arthr |
                               1.yes  |   .1768507   .0313222     5.65   0.000     .1
> 154602
>           .2382412
       3.disp prev record and has cond |  -.1507245   .5708064    -0.26   0.792    -1.
> 269484
>           .9680355
        4.disp prev record and no cond |  -.2956198    .095937    -3.08   0.002    -.4
> 836528
>           -.1075867
       5.disp prev record (dk if cond) |  -.2835707   .1572931    -1.80   0.071    -.5
> 918595
>           .0247181
                                      |
                                heart |
                               1.yes  |   .0810273   .0342659     2.36   0.018     .0
> 138674
>           .1481873
       3.disp prev record and has cond |   -.170868   .8962282    -0.19   0.849    -1.
> 927443
>          1.585707
        4.disp prev record and no cond |  -.1685072   .1233507    -1.37   0.172    -.4
> 102702
>           .0732557
       5.disp prev record (dk if cond) |  -.1408225    .224308    -0.63   0.530    -.5
> 804582
>           .2988131
         6.preld prob:prev had/no new  |   .0521441   .1712553     0.30   0.761    -.2
> 835101
>           .3877983
                                      |
                                strok |
                               1.yes  |  -.7624987   .0622088   -12.26   0.000    -.8
> 844258
>           -.6405716
             2.tia/possible stroke    |   .0632665   .1241756     0.51   0.610    -.1
> 801132
>           .3066461
       3.disp prev record and has cond |  -.8155534   .8334291    -0.98   0.328    -2.
> 449044
>           .8179376
        4.disp prev record and no cond |  -1.043066   .2625477    -3.97   0.000     -1
> .55765
>           -.5284819
       5.disp prev record (dk if cond) |  -.8846394   .4878883    -1.81   0.070    -1.
> 840883
>           .0716041
                                      |
                                psych |
                               1.yes  |  -.1109015   .0435479    -2.55   0.011    -.1
> 962539
>           -.0255491
```

```
      3.disp prev record and has cond |   -.222214    .565877    -0.39   0.695    -1.
> 331312
>           .8868845
       4.disp prev record and no cond |  -.0784108   .1133638    -0.69   0.489    -.3
> 005997
>           .1437782
      5.disp prev record (dk if cond) |  -.3236507   .1684242    -1.92   0.055     -.
> 653756
>           .0064546
                                      |
                                 lung |
                              1.yes   |   .1196009   .0472727     2.53   0.011     .0
> 269481
>           .2122537
      3.disp prev record and has cond |   .0927278   .5130037     0.18   0.857    -.9
> 127409
>           1.098197
       4.disp prev record and no cond |  -.0610053   .1402849    -0.43   0.664    -.3
> 359586
>            .213948
      5.disp prev record (dk if cond) |  -.2390328   .2113642    -1.13   0.258     -.
> 653299
>           .1752334
                                      |
                                 diab |
                              1.yes   |  -.2342561   .0375191    -6.24   0.000    -.3
> 077923
>          -.1607199
      3.disp prev record and has cond |  -.3064574   .7160982    -0.43   0.669    -1.
> 709984
>           1.097069
       4.disp prev record and no cond |  -.2831903   .1382693    -2.05   0.041     -.
> 554193
>          -.0121875
      5.disp prev record (dk if cond) |  -.0296179   .2891539    -0.10   0.918    -.5
> 963492
>           .5371134
                                      |
                               slfmem |
                        2.very good   |   .0501491    .049829     1.01   0.314    -.0
> 475139
>           .1478122
                             3.good   |  -.1822922   .0502757    -3.63   0.000    -.2
> 808308
>          -.0837537
                             4.fair   |  -.5008471   .0545073    -9.19   0.000    -.6
> 076794
>          -.3940147
                             5.poor   |  -1.298236   .0735961   -17.64   0.000    -1.
> 442482
>           -1.15399
                                      |
                                 lbrf |
                        2.works pt    |   .0034573   .0583268     0.06   0.953    -.1
> 108612
>           .1177758
                       3.unemployed   |   .0092733   .0907144     0.10   0.919    -.1
> 685235
>           .1870702
                  4.partly retired    |   .1337357   .0475287     2.81   0.005     .0
> 405812
>           .2268903
                        5.retired     |  -.1561991    .04643    -3.36   0.001    -.2
> 472003
>          -.0651979
                        6.disabled    |  -.3738086    .102618    -3.64   0.000    -.5
> 749362
>          -.1726811
                     7.not in lbrf    |  -.1873432   .0619168    -3.03   0.002     -.
> 308698
>          -.0659884
                                      |
```

```
                          loghatotb |   .1411193   .0058845    23.98   0.000     .1
> 295859
>           .1526528
                  1.loghspti_miss |  -.9236187   .1561202    -5.92   0.000    -1.
> 229609
>          -.6176288
                     loghspti_new |  -.1335807   .0246156    -5.43   0.000    -.1
> 818264
>           -.085335
                          logearn |   .0111913   .0036457     3.07   0.002     .0
> 040459
>           .0183368
                        timwlk_new |  -.0242686    .009001    -2.70   0.007    -.0
> 419103
>          -.0066269
                         puff_new |   .0016186   .0001582    10.23   0.000     .0
> 013085
>           .0019286
                                  |
                       puffpos_new |
                                1 |  -.5367217   .0707447    -7.59   0.000    -.6
> 753787
>          -.3980647
                                2 |  -.7624279   .1059402    -7.20   0.000    -.9
> 700668
>           -.554789
                                3 |   .0740215    .830876     0.09   0.929    -1.
> 554465
>           1.702508
                                  |
                        alzhe_new |
                                1 |  -3.774648   .2717779   -13.89   0.000    -4.
> 307323
>          -3.241973
                                3 |  -2.264374   1.930785    -1.17   0.241    -6.
> 048644
>           1.519896
                                4 |   .1548656   .4860692     0.32   0.750    -.7
> 978126
>           1.107544
                                7 |  -.8795813   .7104112    -1.24   0.216    -2.
> 271962
>            .512799
                                  |
                        demen_new |
                                1 |  -2.537169   .1858424   -13.65   0.000    -2.
> 901413
>          -2.172924
                                3 |  -.4403595   1.855945    -0.24   0.812    -4.
> 077944
>           3.197225
                                4 |  -1.338994   .3350237    -4.00   0.000    -1.
> 995628
>          -.6823593
                                  |
                           fsad   |
                         1.yes |   .0320748   .0324747     0.99   0.323    -.0
> 315744
>           .0957239
                                  |
                          going   |
                         1.yes |  -.0942919   .0280966    -3.36   0.001    -.1
> 493601
>          -.0392236
                                  |
                          enlife  |
                         1.yes |  -.1034867     .04789    -2.16   0.031    -.1
> 973493
>           -.009624
                                  |
                          whappy  |
                         1.yes |  -.1069744   .0389093    -2.75   0.006    -.1
```

```
> 832353
>          -.0307135
                                    |
                                    |
                             cancr  |
                            1.yes   |   .2520555   .0409501     6.16   0.000     .1
> 717948
>           .3323163
      3.disp prev record and has cond  |  -2.741822   1.011031    -2.71   0.007    -4.
> 723407
>          -.7602368
       4.disp prev record and no cond  |   -.168623   .2075371    -0.81   0.417    -.5
> 753882
>           .2381422
      5.disp prev record (dk if cond)  |   .0090088   .3563105     0.03   0.980     -.
> 689347
>           .7073645
                                    |
                                    |
                             phone  |
                            1.yes   |  -.7441651   .0760354    -9.79   0.000    -.8
> 931918
>          -.5951384
                          2.can't do  |  -1.751124   .3376643    -5.19   0.000    -2.
> 412934
>          -1.089314
                          9.don't do  |  -1.139032   .2018452    -5.64   0.000    -1.
> 534642
>           -.743423
                                    |
                          1.meds_miss  |  -.0037391   .0808625    -0.05   0.963    -.1
> 622268
>           .1547485
                                    |
                             meds_new  |
                                   1  |  -.8733188   .0837233   -10.43   0.000    -1.
> 037414
>          -.7092241
                                   2  |   -2.49793   .5117149    -4.88   0.000    -3.
> 500873
>          -1.494987
                                   9  |   -.219447   .1179006    -1.86   0.063    -.4
> 505278
>           .0116339
                                    |
                                    |
                             money  |
                            1.yes   |  -1.420697   .0639139   -22.23   0.000    -1.
> 545965
>          -1.295428
                          2.can't do  |  -1.863008   .1906114    -9.77   0.000      -
> 2.2366
>          -1.489417
                          9.don't do  |  -.8747398   .0643546   -13.59   0.000    -1.
> 000873
>          -.7486071
                                    |
                                    |
                              shop  |
                            1.yes   |  -.2478373   .0504769    -4.91   0.000    -.3
> 467702
>          -.1489045
                          2.can't do  |  -.4072928   .1383585    -2.94   0.003    -.6
> 784706
>          -.1361151
                          9.don't do  |   -.617117   .0744058    -8.29   0.000    -.7
> 629498
>          -.4712843
                                    |
                                    |
                             meals  |
                            1.yes   |  -.5998076    .061715    -9.72   0.000    -.7
> 207668
>          -.4788485
                          2.can't do  |  -.6429955   .1609317    -4.00   0.000    -.9
> 584159
>          -.3275751
```

```
                          9.don't do |  -.3676829   .0563392    -6.53   0.000    -.4
> 781057
>            -.25726
                                     |
                                 map |
                               1.yes |  -.5907153   .0416289   -14.19   0.000    -.6
> 723064
>          -.5091242
                          2.can't do |  -.7512596    .077564    -9.69   0.000    -.9
> 032823
>           -.599237
                          9.don't do |  -.5431549   .0407952   -13.31   0.000     -.
> 623112
>          -.4631978
                                     |
                           oopmdo_new |  -5.27e-06   2.05e-06    -2.57   0.010    -9.
> 29e-06
>          -1.25e-06
                                     |
                     c.agey_m#c.agey_m |  -.0039501   .0001079   -36.60   0.000    -.0
> 041617
>          -.0037386
                                     |
                         hibp#c.agey_m |
                               1.yes |   .0142051   .0027157     5.23   0.000     .0
> 088825
>           .0195277
       3.disp prev record and has cond |   .0889632   .0837606     1.06   0.288    -.0
> 752046
>           .2531311
        4.disp prev record and no cond |  -.0153698   .0136054    -1.13   0.259    -.0
> 420358
>           .0112963
       5.disp prev record (dk if cond) |  -.0301713   .0145581    -2.07   0.038    -.0
> 587045
>           -.001638
                                     |
                            bmi_new |   .1183918   .0152517     7.76   0.000      .
> 088499
>           .1482846
                                     |
                       hibp#c.bmi_new |
                               1.yes |  -.0012532   .0044494    -0.28   0.778    -.0
> 099739
>           .0074676
       3.disp prev record and has cond |   .0438888   .0635534     0.69   0.490    -.0
> 806735
>            .168451
        4.disp prev record and no cond |    .046446   .0189784     2.45   0.014     .0
> 092491
>           .083643
       5.disp prev record (dk if cond) |  -.0443452   .0264434    -1.68   0.094    -.0
> 961733
>           .0074829
                                     |
                         hibp#smoken |
                         0.no#1.yes |  -.3619581   .4261802    -0.85   0.396    -1.
> 197256
>           .4733398
                        1.yes#1.yes |  -.3011916   .4277975    -0.70   0.481    -1.
> 139659
>           .5372761
3.disp prev record and has cond#1.yes |  -1.474111   1.343765    -1.10   0.273    -4.
> 107841
>            1.15962
 4.disp prev record and no cond#1.yes |   .3046479   .5425475     0.56   0.574    -.7
> 587256
>           1.368021
5.disp prev record (dk if cond)#1.yes |          0  (omitted)
                                     |
                       hibp#c.raedyrs |
                               1.yes |   .0042022   .0093134     0.45   0.652    -.0
```

```
> 140518
>           .0224563
     3.disp prev record and has cond |   .1074006    .128686     0.83   0.404    -.1
> 448192
>           .3596205
      4.disp prev record and no cond |  -.0016362   .0274079    -0.06   0.952    -.0
> 553547
>           .0520823
     5.disp prev record (dk if cond) |  -.0118782   .0402942    -0.29   0.768    -.0
> 908535
>           .0670971
                                     |
                   c.bmi_new#c.bmi_new |  -.0013245   .0002428    -5.46   0.000    -.0
> 018004
>          -.0008486
                                     |
                                _cons |     6.0576   .5690844    10.64   0.000     4.
> 942215
>           7.172984
-------------------------------------+----------------------------------------------
                           sigma_u |  2.5756586
                           sigma_e |  2.9670694
                               rho |   .42973341   (fraction of variance due to u_i
> )
-------------------------------------+----------------------------------------------
```

```
34. disp e(rmse)
  2.996665

35.
36. * Fixed Effects xtreg

37. xtreg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i.bmi_mis
  > s i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new c.drink
  > n i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psych i.lung
  >  i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logearn c.timw
  > lk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.going i.en
  > life i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i.meals i
  > .map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp#i.smoke
  > n i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) fe
  note: 2.gender omitted because of collinearity.
  note: 2.raracem omitted because of collinearity.
  note: 3.raracem omitted because of collinearity.
  note: 1.rahispan omitted because of collinearity.
  note: raedyrs omitted because of collinearity.
  note: 5.hibp#1.smoken omitted because of collinearity.

  Fixed-effects (within) regression               Number of obs     =    129,939
  Group variable: hhidpn                          Number of groups  =     35,497

  R-squared:                                      Obs per group:
       Within  = 0.2761                                         min =          1
       Between = 0.0602                                         avg =        3.7
       Overall = 0.1629                                         max =         12

                                                  F(143,35496)      =     121.15
  corr(u_i, Xb) = 0.0300                          Prob > F          =     0.0000

                                                        (Std. err. adjusted for 35,497 c
  > lusters in hhidpn)
-------------------------------------+----------------------------------------------
                             cogtot | Coefficient  Robust std. err.      t    P>|t|     [9
  > 5% con
  >       f. interval]
-------------------------------------+----------------------------------------------
                              wave |
                                4 |  -.1746954   .0778605    -2.24   0.025    -.3
```

```
> 273044
>          -.0220864
                                    5 |  -.7478205   .1276009    -5.86   0.000    -.9
> 979223
>          -.4977187
                                    6 |  -1.041958   .1878178    -5.55   0.000    -1.
> 410087
>          -.6738294
                                    7 |  -1.499328   .2420662    -6.19   0.000    -1.
> 973785
>          -1.024871
                                    8 |  -1.744451   .3000172    -5.81   0.000    -2.
> 332494
>          -1.156408
                                    9 |  -1.945684   .3577568    -5.44   0.000    -2.
> 646898
>           -1.24447
                                   10 |   -2.6584   .4267068    -6.23   0.000    -3.
> 494758
>          -1.822041
                                   11 |  -2.804077   .4776163    -5.87   0.000     -3
> .74022
>          -1.867934
                                   12 |   -2.85972   .5324862    -5.37   0.000    -3.
> 903409
>           -1.81603
                                   13 |  -3.055663   .5969399    -5.12   0.000    -4.
> 225684
>          -1.885643
                                   14 |  -2.934461   .6538709    -4.49   0.000    -4.
> 216068
>          -1.652854
                                      |
                              cendiv  |
                   2.mid atlantic     |   .3124566   .2683948     1.16   0.244    -.2
> 136055
>           .8385187
                     3.en central     |   .5207847   .2639133     1.97   0.048     .0
> 035064
>           1.038063
                     4.wn central     |   .3850088   .3066765     1.26   0.209    -.2
> 160866
>           .9861041
                     5.s atlantic     |   .5173712   .2333427     2.22   0.027     .0
> 600124
>             .97473
                     6.es central     |   .0900138   .2976634     0.30   0.762    -.4
> 934156
>           .6734433
                     7.ws central     |   .3434609   .3055688     1.12   0.261    -.2
> 554633
>           .9423851
                       8.mountain     |   .4632017   .2856953     1.62   0.105    -.0
> 967699
>           1.023173
                        9.pacific     |   .5158458   .2974435     1.73   0.083    -.0
> 671526
>           1.098844
                   11.not us/inc us terr |   .2437268   .5741688     0.42   0.671    -.8
> 816617
>           1.369115
                                      |
                             gender   |
                          2.female    |          0  (omitted)
                                      |
                            raracem   |
           2.black/african american   |          0  (omitted)
                            3.other   |          0  (omitted)
                                      |
                            rahispan  |
                         1.hispanic   |          0  (omitted)
                              agey_m  |   .6869681   .0380407    18.06   0.000     .6
```

```
> 124072
>           .7615289
                                    |
                                hibp|
                              1.yes |    .1324182   .3748391     0.35   0.724     -.
> 602278
>           .8671143
      3.disp prev record and has cond |   -6.219135   8.102086    -0.77   0.443    -22
> .09947
>           9.661203
       4.disp prev record and no cond |    .2446642    1.30757     0.19   0.852    -2.
> 318214
>           2.807542
      5.disp prev record (dk if cond) |    1.476829   1.775214     0.83   0.405    -2.
> 002646
>           4.956304
                                    |
                           1.bmi_miss |     2.41916   .3806689     6.36   0.000     1.
> 673037
>           3.165283
                        1.smoken_new |    .2775209   .4792554     0.58   0.563    -.6
> 618344
>           1.216876
                        1.smokev_new |   -.5292671   .9228968    -0.57   0.566    -2.
> 338173
>           1.279639
                       1.smokev_miss |    .4707499   1.560352     0.30   0.763    -2.
> 587589
>           3.529088
                             raedyrs |          0  (omitted)
                        1.shltc_miss |   -.2561161   .0572921    -4.47   0.000    -.3
> 684103
>          -.1438219
                           shltc_new |    .0066049   .0109171     0.61   0.545    -.0
> 147929
>           .0280027
                              drinkn |    .0031873   .0148627     0.21   0.830    -.0
> 259441
>           .0323187
                                    |
                              pstmem|
                             2.same |    .4018495   .0837722     4.80   0.000     .2
> 376535
>           .5660456
                             3.worse |    .2658007    .087421     3.04   0.002     .0
> 944528
>           .4371486
                                    |
                               mstat|
            2.married,spouse absent |   -.0922093   .1372769    -0.67   0.502    -.3
> 612762
>           .1768576
                        3.partnered |    .1759875   .1091884     1.61   0.107    -.0
> 380251
>               .39
                        4.separated |   -.0580243   .1476271    -0.39   0.694     -.
> 347378
>           .2313294
                         5.divorced |     .019514   .0970335     0.20   0.841    -.1
> 706747
>           .2097027
                    6.separated/divorced |   -.1962412   .1315729    -1.49   0.136    -.4
> 541283
>           .0616458
                           7.widowed |    .0451715   .0518809     0.87   0.384    -.0
> 565166
>           .1468596
                     8.never married |   -.4329042   .2345547    -1.85   0.065    -.8
> 926386
>           .0268302
                                    |
                              depres|
```

```
                                1.yes |  -.2104482   .0420438    -5.01   0.000    -.2
> 928554
>           -.128041
                                      |
                              effort  |
                                1.yes |   .0132805   .0327466     0.41   0.685    -.0
> 509039
>           .0774649
                                      |
                              sleepr  |
                                1.yes |   .1037073   .0277052     3.74   0.000     .0
> 494042
>           .1580104
                                      |
                               arthr  |
                                1.yes |   .2222634   .0435104     5.11   0.000     .1
> 369817
>           .3075451
      3.disp prev record and has cond |   .2569985   .5687101     0.45   0.651    -.8
> 576909
>          1.371688
       4.disp prev record and no cond |  -.2050582   .0972099    -2.11   0.035    -.3
> 955926
>          -.0145238
      5.disp prev record (dk if cond) |  -.1583488   .1715755    -0.92   0.356    -.4
> 946421
>           .1779445
                                      |
                               heart  |
                                1.yes |   .0431747   .0448477     0.96   0.336    -.0
> 447281
>           .1310776
      3.disp prev record and has cond |   -.404289   .8985439    -0.45   0.653    -2.
> 165463
>          1.356885
       4.disp prev record and no cond |  -.0961705   .1247777    -0.77   0.441    -.3
> 407386
>           .1483976
      5.disp prev record (dk if cond) |  -.2008567    .252804    -0.79   0.427    -.6
> 963604
>           .2946469
        6.preld prob:prev had/no new  |   .0869303   .1827107     0.48   0.634    -.2
> 711883
>           .4450488
                                      |
                               strok  |
                                1.yes |  -.6562232   .0804728    -8.15   0.000    -.8
> 139524
>          -.4984939
            2.tia/possible stroke     |   .0345303    .133098     0.26   0.795    -.2
> 263458
>           .2954064
      3.disp prev record and has cond |  -.5887705   .8031576    -0.73   0.464    -2.
> 162984
>           .9854432
       4.disp prev record and no cond |  -.9126647   .2638007    -3.46   0.001    -1.
> 429722
>          -.3956072
      5.disp prev record (dk if cond) |   -.560041   .5430502    -1.03   0.302    -1.
> 624436
>           .504354
                                      |
                               psych  |
                                1.yes |  -.0201757   .0622207    -0.32   0.746    -.1
> 421301
>           .1017787
      3.disp prev record and has cond |  -.2684247   .6062758    -0.44   0.658    -1.
> 456744
>           .9198946
       4.disp prev record and no cond |   .0361648   .1167361     0.31   0.757    -.1
> 926415
>           .2649711
```

```
      5.disp prev record (dk if cond) |  -.2384707   .1890821    -1.26   0.207    -.6
> 090774
>           .1321361
                                      |
                                  lung|
                                1.yes |   .0977495   .0636683     1.54   0.125    -.0
> 270423
>           .2225413
      3.disp prev record and has cond |   .0793107   .5127621     0.15   0.877    -.9
> 257188
>            1.08434
       4.disp prev record and no cond |  -.0393982   .1424182    -0.28   0.782    -.3
> 185422
>           .2397459
      5.disp prev record (dk if cond) |  -.2744194   .2260287    -1.21   0.225    -.7
> 174426
>           .1686039
                                      |
                                  diab|
                                1.yes |   .0338952   .0532482     0.64   0.524    -.0
> 704729
>           .1382633
      3.disp prev record and has cond |     .05046   .7035576     0.07   0.943    -1.
> 328535
>           1.429455
       4.disp prev record and no cond |  -.1243295   .1410621    -0.88   0.378    -.4
> 008155
>           .1521565
      5.disp prev record (dk if cond) |   .3601849   .3335334     1.08   0.280    -.2
> 935509
>           1.013921
                                      |
                                slfmem|
                          2.very good |   .0768185   .0597453     1.29   0.199    -.0
> 402841
>           .1939211
                               3.good |  -.0543211   .0617003    -0.88   0.379    -.1
> 752556
>           .0666135
                               4.fair |  -.1992845   .0664947    -3.00   0.003    -.3
> 296161
>          -.0689529
                               5.poor |  -.7429306   .0861993    -8.62   0.000     -.
> 911884
>          -.5739772
                                      |
                                  lbrf|
                           2.works pt |   .1230766   .0747174     1.65   0.100    -.0
> 233718
>            .269525
                         3.unemployed |   .1807881   .1179512     1.53   0.125
> -.0504
>           .4119762
                    4.partly retired |    .193646   .0557881     3.47   0.001     .0
> 842996
>           .3029923
                          5.retired |  -.0223061   .0564999    -0.39   0.693    -.1
> 330476
>           .0884353
                          6.disabled |   .1874389   .1337122     1.40   0.161    -.0
> 746411
>           .4495189
                        7.not in lbrf |   .0969688   .0758897     1.28   0.201    -.0
> 517773
>            .245715
                                      |
                               loghatotb |   .0707162   .0083807     8.44   0.000     .0
> 542898
>           .0871426
                         1.loghspti_miss |  -.9360653   .1744792    -5.36   0.000     -1
> .27805
>          -.5940808
```

```
                      loghspti_new |  -.1149352   .0266345    -4.32   0.000    -.1
> 671397
>          -.0627306
                           logearn |  -.0011232   .0043239    -0.26   0.795    -.0
> 095981
>           .0073518
                         timwlk_new |  -.0247118   .0093367    -2.65   0.008     -.
> 043012
>          -.0064115
                          puff_new |   .0010589   .0001728     6.13   0.000     .0
> 007203
>           .0013976
                                   |
                      puffpos_new  |
                                1  |  -.3570488   .0751529    -4.75   0.000    -.5
> 043508
>          -.2097469
                                2  |  -.5785213   .1107502    -5.22   0.000    -.7
> 955951
>          -.3614476
                                3  |   .0693045    .816347     0.08   0.932    -1.
> 530761
>           1.66937
                                   |
                       alzhe_new   |
                                1  |  -3.537586   .2832718   -12.49   0.000    -4.
> 092808
>          -2.982365
                                3  |  -3.021425   1.868053    -1.62   0.106    -6.
> 682867
>           .6400167
                                4  |   .2679921   .4909959     0.55   0.585    -.6
> 943751
>           1.230359
                                7  |  -.6227737   .7189066    -0.87   0.386    -2.
> 031853
>           .7863054
                                   |
                       demen_new   |
                                1  |  -2.704962   .2017024   -13.41   0.000    -3.
> 100305
>          -2.309619
                                3  |  -.6869417   1.867588    -0.37   0.713    -4.
> 347472
>           2.973589
                                4  |  -1.360763   .3455125    -3.94   0.000    -2.
> 037978
>          -.6835479
                                   |
                         fsad      |
                        1.yes  |   .0653964   .0351004     1.86   0.062    -.0
> 034015
>           .1341944
                                   |
                        going      |
                        1.yes  |  -.061597   .0302617    -2.04   0.042    -.1
> 209108
>          -.0022831
                                   |
                       enlife      |
                        1.yes  |   .0563879   .0526223     1.07   0.284    -.0
> 467535
>           .1595293
                                   |
                       whappy      |
                        1.yes  |    .001597   .0423925     0.04   0.970    -.0
> 814937
>           .0846876
                                   |
                        cancr      |
                        1.yes  |   .2025768   .0561879     3.61   0.000     .0
> 924468
```

```
>           .3127067
     3.disp prev record and has cond | -2.591061   1.042777    -2.48   0.013    -4.
> 634937
>          -.5471854
      4.disp prev record and no cond | -.1208377   .2093345    -0.58   0.564    -.5
> 311398
>           .2894644
     5.disp prev record (dk if cond) |  .1430961   .4102811     0.35   0.727    -.6
> 610676
>           .9472597
                                     |
                           phone     |
                          1.yes      |  -.614718   .0811935    -7.57   0.000    -.7
> 738597
>          -.4555762
                       2.can't do    | -1.555775   .3732662    -4.17   0.000    -2.
> 287389
>           -.824162
                       9.don't do    | -.8068966   .2132634    -3.78   0.000    -1.
> 224899
>          -.3888939
                                     |
                       1.meds_miss   |  -.037602   .0874302    -0.43   0.667     -.
> 208968
>            .133764
                                     |
                       meds_new      |
                              1      | -.8724711   .0910948    -9.58   0.000     -1
> .05102
>          -.6939226
                              2      | -2.594315   .5948739    -4.36   0.000    -3.
> 760287
>          -1.428344
                              9      | -.1301794   .1340336    -0.97   0.331    -.3
> 928894
>           .1325307
                                     |
                           money     |
                          1.yes      | -1.195809   .0694677   -17.21   0.000    -1.
> 331967
>           -1.05965
                       2.can't do    | -1.353448   .2085446    -6.49   0.000    -1.
> 762201
>          -.9446939
                       9.don't do    | -.5883532   .0677438    -8.68   0.000    -.7
> 211331
>          -.4555734
                                     |
                            shop     |
                          1.yes      | -.2643723   .0546605    -4.84   0.000    -.3
> 715085
>          -.1572361
                       2.can't do    | -.3551954   .1528798    -2.32   0.020    -.6
> 548446
>          -.0555462
                       9.don't do    | -.4766155   .0790718    -6.03   0.000    -.6
> 315986
>          -.3216325
                                     |
                           meals     |
                          1.yes      | -.6385128   .0661483    -9.65   0.000    -.7
> 681656
>          -.5088601
                       2.can't do    | -.5193613   .1686929    -3.08   0.002    -.8
> 500045
>          -.1887181
                       9.don't do    | -.3577505   .0606133    -5.90   0.000    -.4
> 765543
>          -.2389466
                                     |
                             map     |
                          1.yes      | -.2940544   .0467898    -6.28   0.000    -.3
```

```
> 857639
>          -.2023449
                          2.can't do |  -.4149502   .0816967    -5.08   0.000    -.5
> 750783
>          -.2548221
                          9.don't do |  -.2434113   .0443857    -5.48   0.000    -.3
> 304087
>          -.1564138
                                     |
                           oopmdo_new |  -4.76e-06   2.17e-06    -2.19   0.028    -9.
> 01e-06
>          -5.05e-07
                                     |
                    c.agey_m#c.agey_m |  -.0053004   .0001613   -32.85   0.000    -.0
> 056167
>          -.0049842
                                     |
                        hibp#c.agey_m |
                               1.yes |   .0069127   .0039024     1.77   0.077    -.0
> 007362
>           .0145615
      3.disp prev record and has cond |    .068181   .0840527     0.81   0.417    -.0
> 965649
>           .2329268
       4.disp prev record and no cond |  -.0164035   .0139206    -1.18   0.239    -.0
> 436882
>           .0108812
      5.disp prev record (dk if cond) |  -.0073077   .0166213    -0.44   0.660    -.0
> 398859
>           .0252705
                                     |
                            bmi_new |   .1567332   .0213912     7.33   0.000     .1
> 148058
>           .1986605
                                     |
                        hibp#c.bmi_new |
                               1.yes |  -.0090367   .0056792    -1.59   0.112    -.0
> 201681
>           .0020947
      3.disp prev record and has cond |   .0249064   .0628397     0.40   0.692    -.0
> 982613
>           .1480742
       4.disp prev record and no cond |   .0381377   .0198178     1.92   0.054    -.0
> 007057
>           .0769811
      5.disp prev record (dk if cond) |  -.0283285   .0324936    -0.87   0.383     -.
> 092017
>           .0353599
                                     |
                          hibp#smoken |
                          0.no#1.yes |  -.1262075   .4790471    -0.26   0.792    -1.
> 065155
>           .8127397
                         1.yes#1.yes |  -.0756144   .4812459    -0.16   0.875    -1.
> 018871
>           .8676423
3.disp prev record and has cond#1.yes |  -1.563977   1.342799    -1.16   0.244    -4.
> 195904
>            1.06795
 4.disp prev record and no cond#1.yes |   .3889238   .5920372     0.66   0.511    -.7
> 714874
>           1.549335
5.disp prev record (dk if cond)#1.yes |          0  (omitted)
                                     |
                        hibp#c.raedyrs |
                               1.yes |  -.0226298   .0129483    -1.75   0.081    -.0
> 480088
>           .0027492
      3.disp prev record and has cond |   .0772702    .140377     0.55   0.582    -.1
> 978731
>           .3524134
       4.disp prev record and no cond |  -.0239872   .0286886    -0.84   0.403    -.0
```

```
> 802178
>           .0322434
     5.disp prev record (dk if cond) |  -.0287629   .0456338    -0.63   0.529    -.1
> 182065
>           .0606808
                                     |
                   c.bmi_new#c.bmi_new |  -.0014996   .0003247    -4.62   0.000     -.
> 002136
>          -.0008632
                                     |
                                _cons |  -2.100281   2.082179    -1.01   0.313    -6.
> 181417
>           1.980854
-------------------------------------+----------------------------------------------
  ------------------

                           sigma_u |  4.7236742
                           sigma_e |  2.9670694
                               rho |  .71708024   (fraction of variance due to u_i
> )
-------------------------------------+----------------------------------------------
  ------------------
```

```
38. disp e(rmse)
  2.52902

39.
40. * MLE Estimator

41. xtreg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i.bmi_mis
  > s i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new c.drink
  > n i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psych i.lung
  >  i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logearn c.timw
  > lk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.going i.en
  > life i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i.meals i
  > .map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp#i.smoke
  > n i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) mle
  note: 5.hibp#1.smoken omitted because of collinearity.

  Fitting constant-only model:
  Iteration 0:   log likelihood =  -374439.4
  Iteration 1:   log likelihood =  -374412.8
  Iteration 2:   log likelihood = -374412.72

  Fitting full model:
  Iteration 0:   log likelihood = -348192.58
  Iteration 1:   log likelihood = -347234.77
  Iteration 2:   log likelihood = -347225.76
  Iteration 3:   log likelihood = -347225.75

  Random-effects ML regression                    Number of obs    =  129,939
  Group variable: hhidpn                          Number of groups =   35,497

  Random effects u_i ~ Gaussian                   Obs per group:
                                                               min =        1
                                                               avg =      3.7
                                                               max =       12

                                                  Wald chi2(148)   = 48237.31
  Log likelihood = -347225.75                     Prob > chi2      =   0.0000

                                                     (Std. err. adjusted for 35,497 c
  > lusters in hhidpn)
-------------------------------------+----------------------------------------------
  ------------------

                             cogtot | Coefficient  Robust
                                    |             std. err.      z    P>|z|     [9
  > 5% con
  >       f. interval]
-------------------------------------+----------------------------------------------
  ------------------

                              wave  |
                                4   |  .2754327   .0456302     6.04   0.000     .1
```

> 859991
> .3648664

5	-.0499211	.0462708	-1.08	0.281

> 406102
> .040768

6	-.0399742	.0461611	-0.87	0.387

> 304482
> .0504999

7	-.2528901	.0442424	-5.72	0.000

> 396036
> -.1661765

8	-.2522077	.0488338	-5.16	0.000

> 479202
> -.1564953

9	-.2106661	.0492394	-4.28	0.000

> 071736
> -.1141585

10	-.6399533	.0488163	-13.11	0.000

> 356315
> -.5442751

11	-.5600906	.0523586	-10.70	0.000

> 627115
> -.4574697

12	-.376934	.0546872	-6.89	0.000

> 841189
> -.2697491

13	-.3398807	.0527105	-6.45	0.000

> 431914
> -.23657

14	.0165238	.0612694	0.27	0.787

> 035619
> .1366096

cendiv				
2.mid atlantic	.2674406	.0954361	2.80	0.005

> 803892
> .4544919

3.en central	.0886296	.092257	0.96	0.337

> 921909
> .2694501

4.wn central	.1518946	.1021783	1.49	0.137

> 483713
> .3521604

5.s atlantic	.0277386	.088306	0.31	0.753

> 145338
> .2008151

6.es central	-.1236002	.1068539	-1.16	0.247

> 330299
> .0858296

7.ws central	.0268003	.0985057	0.27	0.786

> 662674
> .2198679

8.mountain	.0815601	.1060458	0.77	0.442

> 262858
> .2894061

9.pacific	.1786093	.0949816	1.88	0.060

> 075512
> .3647698

11.not us/inc us terr	.0408528	.4215137	0.10	0.923

> 852988
> .8670045

gender				
2.female	.9012083	.039842	22.62	0.000

> 231194
> .9792972

raracem				
2.black/african american	-2.31222	.0561383	-41.19	0.000

> 422249
> -2.202191

3.other	-1.104249	.0800133	-13.80	0.000

```
> 261073
>          -.9474262
                                        |
                              rahispan  |
                    1.hispanic          |  -.6625132   .0731307    -9.06   0.000    -.8
> 058468
>          -.5191796
                                 agey_m |   .3855345   .0146414    26.33   0.000      .
> 356838
>           .4142311
                                        |
                                hibp    |
                                1.yes   |  -1.055192   .2750436    -3.84   0.000    -1.
> 594268
>          -.5161165
      3.disp prev record and has cond   |  -8.784224   7.993915    -1.10   0.272    -24
> .45201
>           6.883562
       4.disp prev record and no cond   |  -.4303366   1.272173    -0.34   0.735    -2.
> 923751
>           2.063077
      5.disp prev record (dk if cond)   |   2.978815   1.446731     2.06   0.039      .
> 143275
>           5.814355
                                        |
                     1.bmi_miss         |   1.613407   .2698988     5.98   0.000     1.
> 084416
>           2.142399
                    1.smoken_new        |   .2130556   .4247208     0.50   0.616    -.6
> 193817
>           1.045493
                    1.smokev_new        |   .0435937   .0392595     1.11   0.267    -.0
> 333536
>           .1205409
                   1.smokev_miss        |   .1949238   .3094258     0.63   0.529    -.4
> 115397
>           .8013872
                         raedyrs        |   .4550195    .008672    52.47   0.000     .4
> 380227
>           .4720163
                    1.shltc_miss        |  -.6061591   .0471533   -12.86   0.000    -.6
> 985779
>          -.5137404
                       shltc_new        |   .0239166   .0108169     2.21   0.027     .0
> 027158
>           .0451174
                         drinkn         |   .0320851   .0096862     3.31   0.001     .0
> 131005
>           .0510696
                                        |
                          pstmem        |
                          2.same        |   .6469471    .072988     8.86   0.000     .5
> 038932
>            .790001
                          3.worse       |   .5522421   .0762385     7.24   0.000     .4
> 028174
>           .7016668
                                        |
                            mstat       |
            2.married,spouse absent     |  -.0530136   .1213318    -0.44   0.662    -.2
> 908197
>           .1847924
                    3.partnered         |  -.1432654   .0698323    -2.05   0.040    -.2
> 801343
>          -.0063966
                    4.separated         |  -.3429268   .1112464    -3.08   0.002    -.5
> 609658
>          -.1248879
                     5.divorced         |   .0137566     .05623     0.24   0.807    -.0
> 964521
>           .1239654
          6.separated/divorced          |  -.1420955   .1050429    -1.35   0.176    -.3
```

```
> 479758
>           .0637847
                          7.widowed |  -.0369626   .0409224    -0.90   0.366    -.1
> 171691
>           .0432438
                    8.never married |  -.2747768   .0903869    -3.04   0.002     -.
> 451932
>          -.0976217
                                    |
                              depres|
                              1.yes |  -.3684731   .0387669    -9.50   0.000    -.4
> 444547
>          -.2924914
                                    |
                              effort|
                              1.yes |  -.2656994   .0293838    -9.04   0.000    -.3
> 232906
>          -.2081082
                                    |
                              sleepr|
                              1.yes |   .0807431   .0247468     3.26   0.001     .0
> 322403
>           .1292459
                                    |
                               arthr|
                              1.yes |   .1769756   .0313728     5.64   0.000     .1
> 154861
>           .2384651
      3.disp prev record and has cond |  -.1361399   .5694886    -0.24   0.811    -1.
> 252317
>           .9800373
       4.disp prev record and no cond |  -.2934268   .0958278    -3.06   0.002    -.4
> 812458
>          -.1056078
      5.disp prev record (dk if cond) |  -.2805192   .1572158    -1.78   0.074    -.5
> 886565
>            .027618
                                    |
                               heart|
                              1.yes |   .0793363    .034318     2.31   0.021     .0
> 120742
>           .1465984
      3.disp prev record and has cond |  -.1833197     .89594    -0.20   0.838     -1
> .93933
>          1.572691
       4.disp prev record and no cond |  -.1661619   .1232292    -1.35   0.178    -.4
> 076867
>            .075363
      5.disp prev record (dk if cond) |  -.1418106   .2240844    -0.63   0.527     -.
> 581008
>           .2973867
        6.preld prob:prev had/no new |   .0531843   .1711093     0.31   0.756    -.2
> 821838
>           .3885524
                                    |
                               strok|
                              1.yes |  -.7618133   .0622936   -12.23   0.000    -.8
> 839064
>          -.6397202
             2.tia/possible stroke  |   .0610462   .1241508     0.49   0.623    -.1
> 822849
>           .3043774
      3.disp prev record and has cond |  -.8105473   .8302044    -0.98   0.329    -2.
> 437718
>           .8166235
       4.disp prev record and no cond |  -1.039578   .2622193    -3.96   0.000    -1.
> 553519
>          -.5256378
      5.disp prev record (dk if cond) |  -.8803057   .4873799    -1.81   0.071    -1.
> 835553
>           .0749413
                                    |
```

```
                                psych |
                               1.yes  | -.1107721   .0436298    -2.54   0.011    -.1
> 962849
>          -.0252593
      3.disp prev record and has cond | -.2277477   .5671302    -0.40   0.688    -1.
> 339302
>           .8838072
       4.disp prev record and no cond | -.0763838   .1132461    -0.67   0.500     -.
> 298342
>           .1455744
      5.disp prev record (dk if cond) | -.3230841   .1684634    -1.92   0.055    -.6
> 532663
>           .0070982
                                      |
                                lung  |
                               1.yes  |  .1172814   .0473461     2.48   0.013     .0
> 244848
>            .210078
      3.disp prev record and has cond |  .0889602   .5122123     0.17   0.862    -.9
> 149575
>           1.092878
       4.disp prev record and no cond | -.0611342   .1401322    -0.44   0.663    -.3
> 357882
>           .2135198
      5.disp prev record (dk if cond) |  -.240392    .211056    -1.14   0.255    -.6
> 540541
>             .17327
                                      |
                                diab  |
                               1.yes  | -.2305084   .0375597    -6.14   0.000     -.
> 304124
>          -.1568929
      3.disp prev record and has cond | -.2995102   .7145634    -0.42   0.675    -1.
> 700029
>           1.101008
       4.disp prev record and no cond | -.2798312   .1381536    -2.03   0.043    -.5
> 506074
>          -.0090551
      5.disp prev record (dk if cond) | -.0216792   .2893984    -0.07   0.940    -.5
> 888896
>           .5455313
                                      |
                              slfmem  |
                          2.very good |  .0499934   .0498364     1.00   0.316    -.0
> 476841
>            .147671
                               3.good | -.1800385   .0502973    -3.58   0.000    -.2
> 786193
>          -.0814577
                               4.fair | -.4937169   .0545711    -9.05   0.000    -.6
> 006743
>          -.3867595
                               5.poor | -1.284064   .0737713   -17.41   0.000    -1.
> 428653
>          -1.139475
                                      |
                                lbrf  |
                          2.works pt  |  .0052788   .0583682     0.09   0.928    -.1
> 091206
>           .1196783
                         3.unemployed |  .0109888   .0906858     0.12   0.904    -.1
> 667521
>           .1887298
                    4.partly retired |  .1345257   .0475491     2.83   0.005     .0
> 413312
>           .2277203
                           5.retired |  -.153217    .046444    -3.30   0.001    -.2
> 442455
>          -.0621884
                           6.disabled | -.3677158   .1026505    -3.58   0.000    -.5
> 689072
>          -.1665245
```

```
                      7.not in lbrf |  -.1808423   .0619222    -2.92   0.003    -.3
> 022076
>          -.0594771
                                    |
                           loghatotb |   .1401135   .0058996    23.75   0.000     .1
> 285505
>           .1516765
                       1.loghspti_miss |  -.922326   .1561984    -5.90   0.000    -1.
> 228469
>          -.6161827
                          loghspti_new |  -.1333972   .0245954    -5.42   0.000    -.1
> 816034
>          -.0851911
                             logearn |    .010939    .003648     3.00   0.003     .0
> 037891
>           .018089
                           timwlk_new |  -.0241941   .0089833    -2.69   0.007     -.
> 041801
>          -.0065871
                            puff_new |   .0016037   .0001583    10.13   0.000     .0
> 012935
>           .001914
                                    |
                           puffpos_new |
                                   1 |  -.5321765   .0707399    -7.52   0.000    -.6
> 708241
>          -.3935288
                                   2 |  -.7572245   .1059383    -7.15   0.000    -.9
> 648599
>          -.5495892
                                   3 |   .0769248    .828974     0.09   0.926    -1.
> 547834
>           1.701684
                                    |
                           alzhe_new |
                                   1 |  -3.763572   .2717728   -13.85   0.000    -4.
> 296237
>          -3.230907
                                   3 |  -2.293576   1.928832    -1.19   0.234    -6.
> 074017
>           1.486865
                                   4 |   .1590837    .485754     0.33   0.743    -.7
> 929766
>           1.111144
                                   7 |   -.868487   .7095416    -1.22   0.221    -2.
> 259163
>            .522189
                                    |
                           demen_new |
                                   1 |  -2.541358   .1858607   -13.67   0.000    -2.
> 905638
>          -2.177078
                                   3 |  -.4487119   1.852728    -0.24   0.809    -4.
> 079992
>           3.182569
                                   4 |  -1.340247   .3350215    -4.00   0.000    -1.
> 996877
>          -.6836164
                                    |
                             fsad |
                            1.yes |   .0326285   .0324542     1.01   0.315    -.0
> 309806
>           .0962375
                                    |
                            going |
                            1.yes |  -.0938592   .0280716    -3.34   0.001    -.1
> 488786
>          -.0388399
                                    |
                           enlife |
                            1.yes |  -.0987067   .0478646    -2.06   0.039    -.1
> 925196
```

```
>          -.0048937
                                        |
                                 whappy |
                                 1.yes  |  -.1032475   .0389161    -2.65   0.008    -.1
> 795216
>          -.0269734
                                        |
                                  cancr |
                                 1.yes  |   .2510753   .0410094     6.12   0.000     .1
> 706984
>           .3314523
      3.disp prev record and has cond   |  -2.732898   1.012702    -2.70   0.007    -4.
> 717757
>          -.7480388
       4.disp prev record and no cond   |  -.1671624   .2072737    -0.81   0.420    -.5
> 734114
>           .2390866
      5.disp prev record (dk if cond)   |   .0135624   .3562047     0.04   0.970    -.6
> 845859
>           .7117107
                                        |
                                  phone |
                                 1.yes  |  -.7400398   .0759878    -9.74   0.000    -.8
> 889731
>          -.5911065
                           2.can't do   |  -1.745315   .3372367    -5.18   0.000    -2.
> 406287
>          -1.084344
                           9.don't do   |  -1.127553   .2016712    -5.59   0.000    -1.
> 522821
>          -.7322846
                                        |
                           1.meds_miss  |   -.004688   .0808155    -0.06   0.954    -.1
> 630834
>           .1537074
                                        |
                              meds_new  |
                                    1   |  -.8737816   .0836525   -10.45   0.000    -1.
> 037737
>          -.7098257
                                    2   |  -2.501437   .5119837    -4.89   0.000    -3.
> 504906
>          -1.497967
                                    9   |  -.2171956    .117906    -1.84   0.065    -.4
> 482872
>           .0138959
                                        |
                                  money |
                                 1.yes  |  -1.413692   .0639138   -22.12   0.000    -1.
> 538961
>          -1.288423
                           2.can't do   |  -1.848883   .1904314    -9.71   0.000    -2.
> 222122
>          -1.475645
                           9.don't do   |  -.8656408   .0643798   -13.45   0.000    -.9
> 918229
>          -.7394587
                                        |
                                   shop |
                                 1.yes  |  -.2499165   .0504363    -4.96   0.000    -.3
> 487698
>          -.1510632
                           2.can't do   |  -.4085845   .1382325    -2.96   0.003    -.6
> 795152
>          -.1376537
                           9.don't do   |  -.6137345   .0743573    -8.25   0.000    -.7
> 594721
>          -.4679969
                                        |
                                  meals |
                                 1.yes  |  -.6013348   .0616599    -9.75   0.000     -.
> 722186
```

```
>          -.4804836
                            2.can't do |  -.6418277    .160546    -4.00   0.000    -.9
> 564921
>          -.3271634
                            9.don't do |  -.3676783   .0562905    -6.53   0.000    -.4
> 780056
>           -.257351
                                       |
                                   map |
                                1.yes  |  -.5836733    .041684   -14.00   0.000    -.6
> 653725
>           -.501974
                            2.can't do |  -.7424686   .0774818    -9.58   0.000    -.8
> 943301
>          -.5906071
                            9.don't do |  -.5346764   .0408322   -13.09   0.000     -.
> 614706
>          -.4546467
                                       |
                             oopmdo_new |  -5.25e-06   2.05e-06    -2.56   0.011    -9.
> 27e-06
>          -1.22e-06
                                       |
                      c.agey_m#c.agey_m |  -.0039779   .0001082   -36.77   0.000    -.0
> 041899
>          -.0037658
                                       |
                           hibp#c.agey_m |
                                1.yes  |   .014195   .0027209     5.22   0.000     .0
> 088621
>           .0195279
      3.disp prev record and has cond  |   .0880642   .0836522     1.05   0.292     -.
> 075891
>           .2520194
       4.disp prev record and no cond  |  -.0152668   .0135925    -1.12   0.261    -.0
> 419077
>           .0113741
     5.disp prev record (dk if cond)   |  -.0294186   .0145262    -2.03   0.043    -.0
> 578894
>          -.0009478
                                       |
                                bmi_new |   .1190464   .0153276     7.77   0.000     .0
> 890049
>           .1490879
                                       |
                           hibp#c.bmi_new |
                                1.yes  |  -.0013485   .0044539    -0.30   0.762     -.
> 010078
>           .0073811
      3.disp prev record and has cond  |   .0436447   .0634183     0.69   0.491    -.0
> 806528
>           .1679423
       4.disp prev record and no cond  |   .0462471   .0189866     2.44   0.015      .
> 009034
>           .0834602
     5.disp prev record (dk if cond)   |  -.0439877   .0264666    -1.66   0.097    -.0
> 958613
>           .0078859
                                       |
                             hibp#smoken |
                             0.no#1.yes  |  -.3553598   .4258535    -0.83   0.404    -1.
> 190017
>           .4792977
                           1.yes#1.yes |  -.2941212   .4274765    -0.69   0.491     -1
> .13196
>           .5437174
3.disp prev record and has cond#1.yes  |  -1.473069   1.341041    -1.10   0.272    -4.
> 101462
>           1.155324
 4.disp prev record and no cond#1.yes  |   .3076197   .5423159     0.57   0.571    -.7
> 552999
>           1.370539
```

```
5.disp prev record (dk if cond)#1.yes |          0  (omitted)

                        hibp#c.raedyrs |
                                1.yes |   .0038579   .0093239     0.41   0.679    -.0
> 144165
>            .0221324
     3.disp prev record and has cond |     .10691   .1287224     0.83   0.406    -.1
> 453813
>            .3592013
      4.disp prev record and no cond |  -.0019312   .0273851    -0.07   0.944    -.0
> 556049
>            .0517425
     5.disp prev record (dk if cond) |  -.0123249   .0402366    -0.31   0.759    -.0
> 911873
>            .0665374
                                    |
                      c.bmi_new#c.bmi_new |  -.0013302   .0002441    -5.45   0.000    -.0
> 018086
>           -.0008518
                                    |
                                _cons |   5.923159   .5704436    10.38   0.000      4
> .80511
>            7.041208
------------------------------------+------------------------------------------------
                  /sigma_u |   2.661512   .0173495                      2.
> 627724
>            2.695735
                  /sigma_e |   2.980004   .0097318                      2.
> 960991
>            2.999139
                       rho |   .4437244   .0038666                      .4
> 361568
>            .4513126
------------------------------------+------------------------------------------------
```

```
42. disp e(rmse)
  .

43. predict pred100, xb
  (874 missing values generated)

44. gen resid100 = (pred100-cogtot)^2
  (874 missing values generated)

45. egen mse100 = mean(resid100)

46. gen rmse100 = sqrt(mse100)

47. mean(rmse100)

  Mean estimation                     Number of obs = 130,813

--------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+------------------------------------------------
     rmse100 |  3.973238          0            .           .
--------------------------------------------------------------
```

```
48.
49. * Between Effects reghdfe

50. quietly xtreg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, be

51. disp e(rmse)
  3.3938609

52.
53. * Correia estimator

54. quietly reghdfe cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp
  >  i.bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_n
  > ew c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.ps
  > ych i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.loge
  > arn c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.
  > going i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop
  >  i.meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hi
  > bp#i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, noabsorb vce(robust)

55. disp e(rmse)
  3.9387872

56.
57. *** Distribution Test

58. * Park test

59. quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) link(log) family(gamma)

60. predict pred0, xb
  (874 missing values generated)

61. generate lnrawresid2 = ln(pred0^2)
  (874 missing values generated)

62. predict double xbetahat, xb
  (874 missing values generated)

63. sum xbetahat

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
    xbetahat |    129,939    3.057566    .1821834    1.738108   3.424722

64.
```

```
65. * GLM

66. quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust)

67. predict pred1, xb
  (874 missing values generated)

68. gen resid1 = (pred1-cogtot)^2
  (874 missing values generated)

69. egen mse1 = mean(resid1)

70. gen rmse1 = sqrt(mse1)

71. mean(rmse1)

  Mean estimation                         Number of obs = 130,813

------------------------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+----------------------------------------------------------------
       rmse1 |   3.970345          0                .           .
------------------------------------------------------------------------------

72.
73. * GLM Poisson

74. quietly quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m
  > i.hibp i.bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.s
  > hltc_new c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.stro
  > k i.psych i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new
  > c.logearn c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.f
  > sad i.going i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money
  > i.shop i.meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_ne
  > w i.hibp#i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) family(poisson)

75. predict pred2, xb
  (874 missing values generated)

76. gen resid2 = (pred2-cogtot)^2
  (874 missing values generated)

77. egen mse2 = mean(resid2)

78. gen rmse2 = sqrt(mse2)

79. mean(rmse2)

  Mean estimation                         Number of obs = 130,813

------------------------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+----------------------------------------------------------------
       rmse2 |   19.46534          0                .           .
------------------------------------------------------------------------------
```

```
80.
81. * Negative Binomial

82. quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) family(nb)

83. predict pred4, xb
  (874 missing values generated)

84. gen resid4 = (pred4-cogtot)^2
  (874 missing values generated)

85. egen mse4 = mean(resid4)

86. gen rmse4 = sqrt(mse4)

87. mean(rmse4)

  Mean estimation                         Number of obs = 130,813

  ------------------------------------------------------------------------------
               |       Mean   Std. err.     [95% conf. interval]
  -------------+----------------------------------------------------------------
         rmse4 |  19.46563          0              .           .
  ------------------------------------------------------------------------------

88.
89. * Inverse Gaussian

90. *** Will not run.

91. * quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp
  >  i.bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_n
  > ew c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.ps
  > ych i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.loge
  > arn c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.
  > going i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop
  >  i.meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hi
  > bp#i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) family(ig)

92.
93. * Quantile try one

94. ssc install xtqreg
  checking xtqreg consistency and verifying not already installed...
  all files already exist and are up to date.

95. quietly xtqreg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp
  > i.bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_ne
  > w c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psy
  > ch i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logea
  > rn c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.g
  > oing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop
  > i.meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hib
  > p#i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, i(hhidpn)
  WARNING: 11.309922% of the fitted values of the scale function are not positive
```

```
96. predict pred5, xb
  (874 missing values generated)

97. gen resid5 = (pred5-cogtot)^2
  (874 missing values generated)

98. egen mse5 = mean(resid5)

99. gen rmse5 = sqrt(mse5)

100 mean(rmse5)

  Mean estimation                        Number of obs = 130,813

------------------------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+----------------------------------------------------------------
       rmse5 |   5.237432          0               .           .
------------------------------------------------------------------------------

101
102 * Quantile steps of .25

103 ssc install xtqreg
  checking xtqreg consistency and verifying not already installed...
  all files already exist and are up to date.

104 quietly xtqreg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp
  > i.bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_ne
  > w c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psy
  > ch i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logea
  > rn c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.g
  > oing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop
  > i.meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hib
  > p#i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, i(hhidpn) quantile(.01(.25).99)
  WARNING: 11.309922% of the fitted values of the scale function are not positive

105 predict pred6, xb
  (874 missing values generated)

106 gen resid6 = (pred6-cogtot)^2
  (874 missing values generated)

107 egen mse6 = mean(resid6)

108 gen rmse6 = sqrt(mse6)

109 mean(rmse6)

  Mean estimation                        Number of obs = 130,813

------------------------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+----------------------------------------------------------------
       rmse6 |   4.902213          0               .           .
------------------------------------------------------------------------------

110
111 * Quantile steps of .10
```

```
112 quietly xtqreg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp
  > i.bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_ne
  > w c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psy
  > ch i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logea
  > rn c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.g
  > oing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop
  > i.meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hib
  > p#i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, i(hhidpn) quantile(.01(.1).99)
  WARNING: 11.309922% of the fitted values of the scale function are not positive

113 predict pred7, xb
  (874 missing values generated)

114 gen resid7 = (pred7-cogtot)^2
  (874 missing values generated)

115 egen mse7 = mean(resid7)

116 gen rmse7 = sqrt(mse7)

117 mean(rmse7)

  Mean estimation                         Number of obs = 130,813

------------------------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+----------------------------------------------------------------
       rmse7 |   5.136621          0              .           .
------------------------------------------------------------------------------

118
119 *** Link Test

120 *** Note: GLM with gaussian family performed best.

121 * log link

122 quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) link(log)

123 predict pred8, xb
  (874 missing values generated)

124 gen resid8 = (pred8-cogtot)^2
  (874 missing values generated)

125 egen mse8 = mean(resid8)

126 gen rmse8 = sqrt(mse8)

127 mean(rmse8)

  Mean estimation                         Number of obs = 130,813

------------------------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+----------------------------------------------------------------
       rmse8 |   19.4643          0              .           .
------------------------------------------------------------------------------
```

```
128
129 * power link

130 quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) link(power)

131 predict pred10, xb
  (874 missing values generated)

132 gen resid10 = (pred10-cogtot)^2
  (874 missing values generated)

133 egen mse10 = mean(resid10)

134 gen rmse10 = sqrt(mse10)

135 mean(rmse10)

  Mean estimation                         Number of obs = 130,813

  ------------------------------------------------------------------------------
               |       Mean   Std. err.     [95% conf. interval]
  -------------+----------------------------------------------------------------
        rmse10 |   3.970345          0               .           .
  ------------------------------------------------------------------------------

136
137 * odd power link

138 quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) link(opower)
  unsupported family-link combination
  r(198);

139 predict pred11, xb
  predict is not allowed after mean
  r(301);

140 gen resid11 = (pred11-cogtot)^2
  pred11 not found
  r(111);

141 egen mse11 = mean(resid11)
  resid11 not found
  r(111);

142 gen rmse11 = sqrt(mse11)
  mse11 not found
  r(111);
```

```
143 mean(rmse11)
  variable rmse11 not found
  r(111);

144
145 * Negative Binomial link

146 quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) link(nbinomial) family(n
  > binomial)

147 predict pred12, xb
  (874 missing values generated)

148 gen resid12 = (pred12-cogtot)^2
  (874 missing values generated)

149 egen mse12 = mean(resid12)

150 gen rmse12 = sqrt(mse12)

151 mean(rmse12)

  Mean estimation                         Number of obs = 130,813

------------------------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+----------------------------------------------------------------
      rmse12 |   22.49999          0            .           .
------------------------------------------------------------------------------

152
153 * Reciprocal link

154 quietly xtgee cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i
  > .bmi_miss i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new
  >  c.drinkn i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psyc
  > h i.lung i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logear
  > n c.timwlk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.go
  > ing i.enlife i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i
  > .meals i.map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp
  > #i.smoken i.hibp#c.raedyrs c.bmi_new#c.bmi_new, vce(robust) link(reciprocal)

155 predict pred13, xb
  (874 missing values generated)

156 gen resid13 = (pred13-cogtot)^2
  (874 missing values generated)

157 egen mse13 = mean(resid13)

158 gen rmse13 = sqrt(mse13)

159 mean(rmse13)

  Mean estimation                         Number of obs = 130,813

------------------------------------------------------------------------------
             |       Mean   Std. err.     [95% conf. interval]
-------------+----------------------------------------------------------------
      rmse13 |    22.4113          0            .           .
------------------------------------------------------------------------------
```

```
160
161 *** Get margins of best model.

162 * Best model was the random effects model.

163 xtreg cogtot i.wave i.cendiv i.gender i.raracem i.rahispan c.agey_m i.hibp i.bmi_mis
  > s i.smoken_new i.smokev_new i.smokev_miss c.raedyrs i.shltc_miss c.shltc_new c.drink
  > n i.pstmem i.mstat i.depres i.effort i.sleepr i.arthr i.heart i.strok i.psych i.lung
  >  i.diab i.slfmem i.lbrf c.loghatotb i.loghspti_miss c.loghspti_new  c.logearn c.timw
  > lk_new c.puff_new i.puffpos_new i.alzhe_new i.demen_new i.effort i.fsad i.going i.en
  > life i.whappy i.diab i.cancr i.phone i.meds_miss i.meds_new i.money i.shop i.meals i
  > .map c.oopmdo_new c.agey_m#c.agey_m i.hibp#c.agey_m i.hibp##c.bmi_new i.hibp#i.smoke
  > n i.hibp#c.raedyrs c.bmi_new#c.bmi_new c.bmi_new#c.agey_m, vce(robust) re
  note: 5.hibp#1.smoken omitted because of collinearity.

  Random-effects GLS regression                   Number of obs     =    129,939
  Group variable: hhidpn                          Number of groups  =     35,497

  R-squared:                                      Obs per group:
       Within  = 0.2693                                         min =          1
       Between = 0.4932                                         avg =        3.7
       Overall = 0.4350                                         max =         12

                                                  Wald chi2(149)    =   48596.84
  corr(u_i, X) = 0 (assumed)                      Prob > chi2       =     0.0000

                                                        (Std. err. adjusted for 35,497 c
  > lusters in hhidpn)
------------------------------------------------------------------------------
  ------------------
                                  |               Robust
                       cogtot     | Coefficient  std. err.      z    P>|z|     [9
  > 5% con
  >       f. interval]
------------------------------------------------------------------------------
  ------------------
                         wave     |
                            4     |   .2775844   .0456395     6.08   0.000     .1
  > 881325
  >           .3670362
                            5     |  -.0427248    .046295    -0.92   0.356    -.1
  > 334613
  >           .0480117
                            6     |  -.0312955   .0461722    -0.68   0.498    -.1
  > 217913
  >           .0592004
                            7     |  -.2461993   .0442817    -5.56   0.000    -.3
  > 329897
  >          -.1594088
                            8     |  -.2472325   .0488752    -5.06   0.000    -.3
  > 430262
  >          -.1514388
                            9     |  -.2080517    .049302    -4.22   0.000    -.3
  > 046819
  >          -.1114215
                           10     |  -.6371398     .04887   -13.04   0.000    -.7
  > 329233
  >          -.5413563
                           11     |  -.5612226   .0524523   -10.70   0.000    -.6
  > 640272
  >           -.458418
                           12     |  -.3801962   .0548087    -6.94   0.000    -.4
  > 876193
  >          -.2727731
                           13     |  -.3396825   .0527725    -6.44   0.000    -.4
  > 431147
  >          -.2362503
                           14     |   .0054502    .061362     0.09   0.929    -.1
  > 148171
  >           .1257174
                                  |
                      cendiv      |
```

```
                        2.mid atlantic |   .2693525   .0952463     2.83   0.005     .0
> 826732
>           .4560318
                          3.en central |   .0882943   .0921108     0.96   0.338    -.0
> 922396
>           .2688281
                          4.wn central |   .1520599   .1020186     1.49   0.136    -.0
> 478928
>           .3520126
                          5.s atlantic |   .0289172   .0881516     0.33   0.743    -.1
> 438569
>           .2016912
                          6.es central |  -.1142664   .1067555    -1.07   0.284    -.3
> 235034
>           .0949705
                          7.ws central |   .0310001   .0983731     0.32   0.753    -.1
> 618075
>           .2238078
                            8.mountain |   .0845638   .1058786     0.80   0.424    -.1
> 229544
>            .292082
                             9.pacific |   .1763985   .0948155     1.86   0.063    -.0
> 094365
>           .3622336
                    11.not us/inc us terr |   .0615573   .4209398     0.15   0.884    -.7
> 634696
>           .8865842
                                          |
                                   gender |
                             2.female     |     .90297   .0397605    22.71   0.000     .8
> 250409
>           .9808992
                                          |
                                  raracem |
                  2.black/african american |  -2.294397   .0560988   -40.90   0.000    -2.
> 404349
>          -2.184445
                               3.other     |  -1.107193   .0800794   -13.83   0.000    -1.
> 264146
>          -.9502408
                                          |
                                 rahispan |
                            1.hispanic    |  -.6616021   .0731296    -9.05   0.000    -.8
> 049334
>          -.5182708
                                 agey_m   |   .3216141   .0160913    19.99   0.000     .2
> 900757
>           .3531525
                                          |
                                   hibp   |
                                 1.yes    |  -.4858919   .2830632    -1.72   0.086    -1.
> 040686
>           .0689018
          3.disp prev record and has cond |  -8.182383   8.000568    -1.02   0.306    -23
> .86321
>           7.498442
           4.disp prev record and no cond |   .1897053   1.269931     0.15   0.881    -2.
> 299314
>           2.678724
          5.disp prev record (dk if cond) |   2.913616   1.437648     2.03   0.043     .0
> 958785
>           5.731353
                                          |
                                1.bmi_miss |   1.392663   .2489149     5.59   0.000     .9
> 047987
>           1.880527
                              1.smoken_new |   .2089524    .425951     0.49   0.624    -.6
> 258962
>           1.043801
                              1.smokev_new |   .0459036   .0392285     1.17   0.242    -.0
> 309828
>             .12279
```

```
                        1.smokev_miss |   .1784639   .3099134     0.58   0.565    -.4
> 289551
>           .7858829
                              raedyrs |   .4544027   .0086583    52.48   0.000     .4
> 374328
>           .4713726
                        1.shltc_miss |  -.6031704   .0470256   -12.83   0.000    -.6
> 953389
>          -.5110019
                           shltc_new |   .0250219   .0108242     2.31   0.021     .0
> 038069
>           .0462369
                               drinkn |   .0319151   .0096738     3.30   0.001     .0
> 129548
>           .0508754
                                      |
                              pstmem  |
                             2.same   |    .654639   .0729844     8.97   0.000     .5
> 115922
>           .7976858
                             3.worse  |   .5634092   .0762054     7.39   0.000     .4
> 140494
>            .712769
                                      |
                               mstat  |
              2.married,spouse absent |  -.0548284   .1210118    -0.45   0.650    -.2
> 920071
>           .1823504
                           3.partnered |  -.1536983   .0697996    -2.20   0.028    -.2
> 905029
>          -.0168937
                           4.separated |  -.3395553    .11159    -3.04   0.002    -.5
> 582676
>           -.120843
                            5.divorced |   .0186756   .0560972     0.33   0.739     -.
> 091273
>           .1286241
                 6.separated/divorced |  -.1361617   .1050626    -1.30   0.195    -.3
> 420805
>           .0697572
                             7.widowed |  -.0365192   .0408408    -0.89   0.371    -.1
> 165657
>           .0435274
                       8.never married |  -.2561287   .0904448    -2.83   0.005    -.4
> 333972
>          -.0788602
                                      |
                              depres  |
                              1.yes   |  -.3748659    .03872    -9.68   0.000    -.4
> 507556
>          -.2989762
                                      |
                              effort  |
                              1.yes   |   -.272101   .0293437    -9.27   0.000    -.3
> 296137
>          -.2145884
                                      |
                              sleepr  |
                              1.yes   |    .081734   .0247451     3.30   0.001     .0
> 332345
>           .1302334
                                      |
                               arthr  |
                              1.yes   |   .1772659   .0312949     5.66   0.000      .
> 115929
>           .2386028
            3.disp prev record and has cond |  -.1464797    .571021    -0.26   0.798     -1
> .26566
>           .9727009
             4.disp prev record and no cond |  -.2903835   .0958456    -3.03   0.002    -.4
> 782375
>          -.1025295
```

```
      5.disp prev record (dk if cond) |  -.2807845    .157125    -1.79   0.074    -.5
> 887438
>           .0271748
                                      |
                                 heart |
                                1.yes |   .0774064   .0342245     2.26   0.024     .0
> 103276
>           .1444853
      3.disp prev record and has cond |  -.1361914   .8978226    -0.15   0.879    -1.
> 895892
>          1.623509
       4.disp prev record and no cond |  -.1713569   .1232356    -1.39   0.164    -.4
> 128943
>           .0701805
      5.disp prev record (dk if cond) |   -.130235   .2244269    -0.58   0.562    -.5
> 701036
>           .3096337
        6.preld prob:prev had/no new |   .0551123   .1712011     0.32   0.748    -.2
> 804357
>           .3906604
                                      |
                                 strok |
                                1.yes |    -.76285   .0622403   -12.26   0.000    -.8
> 848387
>          -.6408613
            2.tia/possible stroke |   .0632532   .1241718     0.51   0.610    -.1
> 801191
>           .3066255
      3.disp prev record and has cond |   -.778329   .8253288    -0.94   0.346    -2.
> 395944
>           .8392857
       4.disp prev record and no cond | -1.039592   .2626386    -3.96   0.000    -1.
> 554355
>          -.5248303
      5.disp prev record (dk if cond) |  -.8979456   .4891195    -1.84   0.066    -1.
> 856602
>           .0607111
                                      |
                                 psych |
                                1.yes |  -.1068757   .0435021    -2.46   0.014    -.1
> 921382
>          -.0216131
      3.disp prev record and has cond |  -.2364163   .5690131    -0.42   0.678    -1.
> 351661
>           .8788288
       4.disp prev record and no cond |  -.0772328   .1132726    -0.68   0.495    -.2
> 992431
>           .1447775
      5.disp prev record (dk if cond) |  -.3287011   .1684764    -1.95   0.051    -.6
> 589086
>           .0015065
                                      |
                                  lung |
                                1.yes |   .1187372   .0472349     2.51   0.012     .0
> 261586
>           .2113159
      3.disp prev record and has cond |   .0855998   .5125767     0.17   0.867     -.
> 919032
>          1.090232
       4.disp prev record and no cond |  -.0599054   .1401448    -0.43   0.669    -.3
> 345842
>           .2147735
      5.disp prev record (dk if cond) |  -.2342368   .2118746    -1.11   0.269    -.6
> 495034
>           .1810298
                                      |
                                  diab |
                                1.yes |   -.242909   .0374731    -6.48   0.000    -.3
> 163549
>           -.169463
      3.disp prev record and has cond |  -.3116607   .7205891    -0.43   0.665    -1.
> 723989
```

```
>           1.100668
      4.disp prev record and no cond |  -.2942074   .1382036    -2.13   0.033    -.5
> 650815
>          -.0233333
     5.disp prev record (dk if cond) |  -.0345258   .2889754    -0.12   0.905    -.6
> 009071
>           .5318556
                                     |
                            slfmem   |
                 2.very good         |    .050059   .0498427     1.00   0.315    -.0
> 476309
>           .1477489
                      3.good         |  -.1821626   .0502822    -3.62   0.000    -.2
> 807138
>          -.0836114
                      4.fair         |  -.5000655   .0545119    -9.17   0.000    -.6
> 069068
>          -.3932241
                      5.poor         |  -1.298125   .0735457   -17.65   0.000    -1.
> 442272
>          -1.153978
                                     |
                          lbrf       |
                  2.works pt         |  -.0098069   .0583238    -0.17   0.866    -.1
> 241194
>           .1045056
                    3.unemployed     |   .0068163   .0907146     0.08   0.940    -.1
> 709811
>           .1846136
               4.partly retired      |   .1282219   .0475027     2.70   0.007     .0
> 351184
>           .2213254
                     5.retired       |  -.1609185   .0463997    -3.47   0.001    -.2
> 518603
>          -.0699766
                     6.disabled      |  -.3695938   .1025954    -3.60   0.000    -.5
> 706771
>          -.1685105
                   7.not in lbrf     |  -.1925343   .0618284    -3.11   0.002    -.3
> 137158
>          -.0713528
                                     |
                       loghatotb     |   .1408791   .0058774    23.97   0.000     .1
> 293597
>           .1523985
                1.loghspti_miss      |  -.9226301    .155881    -5.92   0.000    -1.
> 228151
>          -.6171089
                   loghspti_new      |  -.1317708   .0246124    -5.35   0.000    -.1
> 800103
>          -.0835314
                       logearn       |   .0117404   .0036439     3.22   0.001     .0
> 045985
>           .0188822
                     timwlk_new      |  -.0263855   .0090373    -2.92   0.004    -.0
> 440983
>          -.0086728
                        puff_new     |   .0016103   .0001582    10.18   0.000     .0
> 013002
>           .0019204
                                     |
                     puffpos_new     |
                               1     |  -.5280515   .0708017    -7.46   0.000    -.6
> 668204
>          -.3892826
                               2     |  -.7694242   .1057307    -7.28   0.000    -.9
> 766526
>          -.5621958
                               3     |   .0672664   .8369163     0.08   0.936    -1.
> 573059
>           1.707592
                                     |
```

```
                              alzhe_new |
                                      1 |  -3.776453   .2705513   -13.96   0.000    -4.
> 306723
>          -3.246182
                                      3 |  -2.283953   1.951864    -1.17   0.242    -6.
> 109535
>           1.541629
                                      4 |   .1680179    .486716     0.35   0.730     -.
> 785928
>           1.121964
                                      7 |  -.8737746   .7082895    -1.23   0.217    -2.
> 261997
>           .5144473
                                        |
                              demen_new |
                                      1 |  -2.536569    .185652   -13.66   0.000     -2
> .90044
>          -2.172698
                                      3 |  -.3935778   1.854704    -0.21   0.832     -4
> .02873
>           3.241574
                                      4 |  -1.344497   .3342623    -4.02   0.000    -1.
> 999639
>          -.6893552
                                        |
                                fsad  |
                             1.yes    |   .0339958   .0324692     1.05   0.295    -.0
> 296427
>           .0976343
                                        |
                                going   |
                             1.yes      |  -.0947337   .0280688    -3.38   0.001    -.1
> 497476
>          -.0397199
                                        |
                                enlife  |
                             1.yes      |  -.1013726   .0478755    -2.12   0.034     -.
> 195207
>          -.0075383
                                        |
                                whappy  |
                             1.yes      |   -.107793   .0388949    -2.77   0.006    -.1
> 840257
>          -.0315603
                                        |
                                 cancr  |
                             1.yes      |   .2479492   .0409426     6.06   0.000     .1
> 677033
>           .3281952
      3.disp prev record and has cond   |  -2.767435   1.006671    -2.75   0.006    -4.
> 740474
>          -.7943958
       4.disp prev record and no cond   |  -.1635212   .2070642    -0.79   0.430    -.5
> 693596
>           .2423172
      5.disp prev record (dk if cond)   |   .0152414   .3566125     0.04   0.966    -.6
> 837063
>           .7141891
                                        |
                                 phone  |
                             1.yes      |  -.7447678    .075996    -9.80   0.000    -.8
> 937171
>          -.5958184
                          2.can't do    |  -1.743271   .3385147    -5.15   0.000    -2.
> 406747
>          -1.079794
                          9.don't do    |  -1.137742   .2020745    -5.63   0.000    -1.
> 533801
>          -.7416835
                                        |
                          1.meds_miss   |  -.0053388   .0808599    -0.07   0.947    -.1
> 638214
```

```
>           .1531437
                                 |
                        meds_new |
                               1 |   -.865657   .0836347   -10.35   0.000    -1.
> 029578
>          -.7017361
                               2 |  -2.479602   .5142606    -4.82   0.000    -3.
> 487534
>           -1.47167
                               9 |  -.2179603   .1176904    -1.85   0.064    -.4
> 486294
>           .0127087
                                 |
                          money  |
                          1.yes  |  -1.414129   .0638933   -22.13   0.000    -1.
> 539358
>          -1.288901
                     2.can't do  |  -1.854122   .1901028    -9.75   0.000    -2.
> 226717
>          -1.481527
                     9.don't do  |  -.8739899   .0643035   -13.59   0.000    -1.
> 000022
>          -.7479575
                                 |
                           shop  |
                          1.yes  |  -.2475193   .0504524    -4.91   0.000    -.3
> 464043
>          -.1486344
                     2.can't do  |  -.4071874    .137986    -2.95   0.003    -.6
> 776351
>          -.1367398
                     9.don't do  |  -.6128122   .0743982    -8.24   0.000      -
> .75863
>          -.4669944
                                 |
                          meals  |
                          1.yes  |  -.5977496   .0617041    -9.69   0.000    -.7
> 186874
>          -.4768119
                     2.can't do  |  -.6372311   .1607482    -3.96   0.000    -.9
> 522918
>          -.3221704
                     9.don't do  |  -.3671846   .0563389    -6.52   0.000    -.4
> 776069
>          -.2567623
                                 |
                            map  |
                          1.yes  |  -.5893413   .0416298   -14.16   0.000    -.6
> 709343
>          -.5077484
                     2.can't do  |  -.7491788   .0774852    -9.67   0.000    -.9
> 010469
>          -.5973107
                     9.don't do  |  -.5385995   .0407568   -13.21   0.000    -.6
> 184814
>          -.4587175
                                 |
                      oopmdo_new |  -5.37e-06   2.05e-06    -2.61   0.009    -9.
> 40e-06
>          -1.34e-06
                                 |
                c.agey_m#c.agey_m |   -.003806   .0001086   -35.03   0.000    -.0
> 040189
>           -.003593
                                 |
                    hibp#c.agey_m |
                          1.yes  |    .009745    .002771     3.52   0.000     .0
> 043139
>            .015176
    3.disp prev record and has cond |   .0846689   .0839793     1.01   0.313    -.0
> 799275
>           .2492654
```

```
      4.disp prev record and no cond | -.0182048   .0135677    -1.34   0.180    -.0
> 447971
>           .0083874
     5.disp prev record (dk if cond) | -.0300185   .0145123    -2.07   0.039     -.
> 058462
>           -.001575
                                     |
                            bmi_new | -.0046858   .0185943    -0.25   0.801      -
> .04113
>           .0317584
                                     |
                     hibp#c.bmi_new  |
                             1.yes   | -.0109803   .0045671    -2.40   0.016    -.0
> 199316
>          -.0020289
     3.disp prev record and has cond |  .0300574   .0632153     0.48   0.634    -.0
> 938424
>           .1539571
      4.disp prev record and no cond |  .0306258    .018593     1.65   0.100    -.0
> 058159
>           .0670675
     5.disp prev record (dk if cond) | -.0404278   .0263604    -1.53   0.125    -.0
> 920932
>           .0112375
                                     |
                       hibp#smoken   |
                       0.no#1.yes    | -.3552323   .4270959    -0.83   0.406    -1.
> 192325
>           .4818602
                      1.yes#1.yes    | -.3044558   .4287671    -0.71   0.478    -1.
> 144824
>           .5359124
3.disp prev record and has cond#1.yes | -1.586289   1.341539    -1.18   0.237    -4.
> 215657
>           1.043078
 4.disp prev record and no cond#1.yes |  .2908381   .5427359     0.54   0.592    -.7
> 729048
>           1.354581
5.disp prev record (dk if cond)#1.yes |         0  (omitted)
                                     |
                     hibp#c.raedyrs  |
                             1.yes   |  .0045362    .009316     0.49   0.626    -.0
> 137228
>           .0227952
     3.disp prev record and has cond |  .1067588   .1280061     0.83   0.404    -.1
> 441285
>           .3576461
      4.disp prev record and no cond | -.0012097   .0273429    -0.04   0.965    -.0
> 548008
>           .0523815
     5.disp prev record (dk if cond) | -.0109587   .0402468    -0.27   0.785    -.0
> 898409
>           .0679236
                                     |
              c.bmi_new#c.bmi_new    | -.0010247   .0002078    -4.93   0.000     -.
> 001432
>          -.0006174
                                     |
               c.bmi_new#c.agey_m    |  .0016346   .0001917     8.53   0.000     .0
> 012589
>           .0020104
                                     |
                            _cons    |  9.584687   .6761491    14.18   0.000     8.
> 259459
>           10.90991
-------------------------------------+----------------------------------------------
  ------------------
                          sigma_u    |  2.5749481
                          sigma_e    |  2.9661893
                              rho    |  .4297436   (fraction of variance due to u_i
> )
-------------------------------------+----------------------------------------------
```

```
. margins, dydx(*)

Average marginal effects                                  Number of obs = 129,939
Model VCE: Robust

Expression: Linear prediction, predict()
dy/dx wrt:  {res:4.wave 5.wave 6.wave 7.wave 8.wave 9.wave 10.wave 11.wave 12.wave
            13.wave 14.wave 2.cendiv 3.cendiv 4.cendiv 5.cendiv 6.cendiv 7.cendiv
            8.cendiv 9.cendiv 11.cendiv 2.gender 2.raracem 3.raracem 1.rahispan
            agey_m 1.hibp 3.hibp 4.hibp 5.hibp 1.bmi_miss 1.smoken_new 1.smokev_new
            1.smokev_miss raedyrs 1.shltc_miss shltc_new drinkn 2.pstmem 3.pstmem
            2.mstat 3.mstat 4.mstat 5.mstat 6.mstat 7.mstat 8.mstat 1.depres
            1.effort 1.sleepr 1.arthr 3.arthr 4.arthr 5.arthr 1.heart 3.heart
            4.heart 5.heart 6.heart 1.strok 2.strok 3.strok 4.strok 5.strok 1.psych
            3.psych 4.psych 5.psych 1.lung 3.lung 4.lung 5.lung 1.diab 3.diab 4.diab
            5.diab 2.slfmem 3.slfmem 4.slfmem 5.slfmem 2.lbrf 3.lbrf 4.lbrf 5.lbrf
            6.lbrf 7.lbrf loghatotb 1.loghspti_miss loghspti_new logearn timwlk_new
            puff_new 1.puffpos_new 2.puffpos_new 3.puffpos_new 1.alzhe_new
            3.alzhe_new 4.alzhe_new 7.alzhe_new 1.demen_new 3.demen_new 4.demen_new
            1.fsad 1.going 1.enlife 1.whappy 1.cancr 3.cancr 4.cancr 5.cancr 1.phone
            2.phone 9.phone 1.meds_miss 1.meds_new 2.meds_new 9.meds_new 1.money
            2.money 9.money 1.shop 2.shop 9.shop 1.meals 2.meals 9.meals 1.map 2.map
            9.map oopmdo_new bmi_new 1.smoken}

------------------------------------------------------------------------------
             |            Delta-method
             |      dy/dx   std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
        wave |
           4 |   .2775844   .0456395     6.08   0.000     .1881325    .3670362
           5 |  -.0427248    .046295    -0.92   0.356    -.1334613    .0480117
           6 |  -.0312955   .0461722    -0.68   0.498    -.1217913    .0592004
           7 |  -.2461993   .0442817    -5.56   0.000    -.3329897   -.1594088
           8 |  -.2472325   .0488752    -5.06   0.000    -.3430262   -.1514388
           9 |  -.2080517    .049302    -4.22   0.000    -.3046819   -.1114215
          10 |  -.6371398     .04887   -13.04   0.000    -.7329233   -.5413563
          11 |  -.5612226   .0524523   -10.70   0.000    -.6640272    -.458418
          12 |  -.3801962   .0548087    -6.94   0.000    -.4876193   -.2727731
          13 |  -.3396825   .0527725    -6.44   0.000    -.4431147   -.2362503
          14 |   .0054502    .061362     0.09   0.929    -.1148171    .1257174
             |
      cendiv |
2.mid atlantic |   .2693525   .0952463     2.83   0.005     .0826732    .4560318
  3.en central |   .0882943   .0921108     0.96   0.338    -.0922396    .2688281
  4.wn central |   .1520599   .1020186     1.49   0.136    -.0478928    .3520126
  5.s atlantic |   .0289172   .0881516     0.33   0.743    -.1438569    .2016912
  6.es central |  -.1142664   .1067555    -1.07   0.284    -.3235034    .0949705
  7.ws central |   .0310001   .0983731     0.32   0.753    -.1618075    .2238078
    8.mountain |   .0845638   .1058786     0.80   0.424    -.1229544     .292082
------------------------------------------------------------------------------
```

```
                        9.pacific |   .1763985   .0948155     1.86   0.063    -.0094365
>     .3622336
            11.not us/inc us terr |   .0615573   .4209398     0.15   0.884    -.7634696
>     .8865842
                                  |
                          gender  |
                       2.female   |     .90297   .0397605    22.71   0.000     .8250409
>     .9808992
                                  |
                         raracem  |
        2.black/african american  |  -2.294397   .0560988   -40.90   0.000    -2.404349
>    -2.184445
                         3.other  |  -1.107193   .0800794   -13.83   0.000    -1.264146
>    -.9502408
                                  |
                         rahispan |
                      1.hispanic  |  -.6616021   .0731296    -9.05   0.000    -.8049334
>    -.5182708
                          agey_m  |  -.1718185   .0023675   -72.57   0.000    -.1764587
>    -.1671783
                                  |
                            hibp  |
                           1.yes  |  -.0256059   .0321413    -0.80   0.426    -.0886017
>       .03739
  3.disp prev record and has cond |  -.1528127   .6030775    -0.25   0.800    -1.334823
>     1.029197
   4.disp prev record and no cond |  -.2217594   .1164949    -1.90   0.057    -.4500853
>     .0065665
  5.disp prev record (dk if cond) |  -.4155054   .1761115    -2.36   0.018    -.7606775
>    -.0703333
                                  |
                       1.bmi_miss |   1.392663   .2489149     5.59   0.000     .9047987
>     1.880527
                      1.smoken_new |          .  (not estimable)
                      1.smokev_new |   .0459036   .0392285     1.17   0.242    -.0309828
>       .12279
                    1.smokev_miss |   .1784639   .3099134     0.58   0.565    -.4289551
>     .7858829
                          raedyrs |   .4570621    .006939    65.87   0.000     .4434619
>     .4706622
                    1.shltc_miss  |  -.6031704   .0470256   -12.83   0.000    -.6953389
>    -.5110019
                       shltc_new  |   .0250219   .0108242     2.31   0.021     .0038069
>     .0462369
                          drinkn  |   .0319151   .0096738     3.30   0.001     .0129548
>     .0508754
                                  |
                          pstmem  |
                         2.same   |    .654639   .0729844     8.97   0.000     .5115922
>     .7976858
                         3.worse  |   .5634092   .0762054     7.39   0.000     .4140494
>      .712769
                                  |
                            mstat |
          2.married,spouse absent |  -.0548284   .1210118    -0.45   0.650    -.2920071
>     .1823504
                      3.partnered |  -.1536983   .0697996    -2.20   0.028    -.2905029
>    -.0168937
                      4.separated |  -.3395553    .11159    -3.04   0.002    -.5582676
>     -.120843
                       5.divorced |   .0186756   .0560972     0.33   0.739     -.091273
>     .1286241
           6.separated/divorced   |  -.1361617   .1050626    -1.30   0.195    -.3420805
>     .0697572
                       7.widowed  |  -.0365192   .0408408    -0.89   0.371    -.1165657
>     .0435274
                  8.never married |  -.2561287   .0904448    -2.83   0.005    -.4333972
>    -.0788602
                                  |
                          depres  |
                           1.yes  |  -.3748659    .03872    -9.68   0.000    -.4507556
>    -.2989762
```

```
                                 |
                          effort |
                          1.yes  |   -.272101   .0293437    -9.27   0.000    -.3296137
>    -.2145884
                                 |
                          sleepr |
                          1.yes  |    .081734   .0247451     3.30   0.001     .0332345
>     .1302334
                                 |
                           arthr |
                          1.yes  |   .1772659   .0312949     5.66   0.000      .115929
>     .2386028
3.disp prev record and has cond  |  -.1464797    .571021    -0.26   0.798     -1.26566
>     .9727009
 4.disp prev record and no cond  |  -.2903835   .0958456    -3.03   0.002    -.4782375
>    -.1025295
5.disp prev record (dk if cond)  |  -.2807845    .157125    -1.79   0.074    -.5887438
>     .0271748
                                 |
                           heart |
                          1.yes  |   .0774064   .0342245     2.26   0.024     .0103276
>     .1444853
3.disp prev record and has cond  |  -.1361914   .8978226    -0.15   0.879    -1.895892
>     1.623509
 4.disp prev record and no cond  |  -.1713569   .1232356    -1.39   0.164    -.4128943
>     .0701805
5.disp prev record (dk if cond)  |   -.130235   .2244269    -0.58   0.562    -.5701036
>     .3096337
   6.preld prob:prev had/no new  |   .0551123   .1712011     0.32   0.748    -.2804357
>     .3906604
                                 |
                           strok |
                          1.yes  |    -.76285   .0622403   -12.26   0.000    -.8848387
>    -.6408613
          2.tia/possible stroke  |   .0632532   .1241718     0.51   0.610    -.1801191
>     .3066255
3.disp prev record and has cond  |   -.778329   .8253288    -0.94   0.346    -2.395944
>     .8392857
 4.disp prev record and no cond  |  -1.039592   .2626386    -3.96   0.000    -1.554355
>    -.5248303
5.disp prev record (dk if cond)  |  -.8979456   .4891195    -1.84   0.066    -1.856602
>     .0607111
                                 |
                           psych |
                          1.yes  |  -.1068757   .0435021    -2.46   0.014    -.1921382
>    -.0216131
3.disp prev record and has cond  |  -.2364163   .5690131    -0.42   0.678    -1.351661
>     .8788288
 4.disp prev record and no cond  |  -.0772328   .1132726    -0.68   0.495    -.2992431
>     .1447775
5.disp prev record (dk if cond)  |  -.3287011   .1684764    -1.95   0.051    -.6589086
>     .0015065
                                 |
                            lung |
                          1.yes  |   .1187372   .0472349     2.51   0.012     .0261586
>     .2113159
3.disp prev record and has cond  |   .0855998   .5125767     0.17   0.867     -.919032
>     1.090232
 4.disp prev record and no cond  |  -.0599054   .1401448    -0.43   0.669    -.3345842
>     .2147735
5.disp prev record (dk if cond)  |  -.2342368   .2118746    -1.11   0.269    -.6495034
>     .1810298
                                 |
                            diab |
                          1.yes  |   -.242909   .0374731    -6.48   0.000    -.3163549
>     -.169463
3.disp prev record and has cond  |  -.3116607   .7205891    -0.43   0.665    -1.723989
>     1.100668
 4.disp prev record and no cond  |  -.2942074   .1382036    -2.13   0.033    -.5650815
>    -.0233333
5.disp prev record (dk if cond)  |  -.0345258   .2889754    -0.12   0.905    -.6009071
>     .5318556
```

slfmem						
2.very good	.050059	.0498427	1.00	0.315	-.0476309	.1477489
3.good	-.1821626	.0502822	-3.62	0.000	-.2807138	-.0836114
4.fair	-.5000655	.0545119	-9.17	0.000	-.6069068	-.3932241
5.poor	-1.298125	.0735457	-17.65	0.000	-1.442272	-1.153978
lbrf						
2.works pt	-.0098069	.0583238	-0.17	0.866	-.1241194	.1045056
3.unemployed	.0068163	.0907146	0.08	0.940	-.1709811	.1846136
4.partly retired	.1282219	.0475027	2.70	0.007	.0351184	.2213254
5.retired	-.1609185	.0463997	-3.47	0.001	-.2518603	-.0699766
6.disabled	-.3695938	.1025954	-3.60	0.000	-.5706771	-.1685105
7.not in lbrf	-.1925343	.0618284	-3.11	0.002	-.3137158	-.0713528
loghatotb	.1408791	.0058774	23.97	0.000	.1293597	.1523985
1.loghspti_miss	-.9226301	.155881	-5.92	0.000	-1.228151	-.6171089
loghspti_new	-.1317708	.0246124	-5.35	0.000	-.1800103	-.0835314
logearn	.0117404	.0036439	3.22	0.001	.0045985	.0188822
timwlk_new	-.0263855	.0090373	-2.92	0.004	-.0440983	-.0086728
puff_new	.0016103	.0001582	10.18	0.000	.0013002	.0019204
puffpos_new						
1	-.5280515	.0708017	-7.46	0.000	-.6668204	-.3892826
2	-.7694242	.1057307	-7.28	0.000	-.9766526	-.5621958
3	.0672664	.8369163	0.08	0.936	-1.573059	1.707592
alzhe_new						
1	-3.776453	.2705513	-13.96	0.000	-4.306723	-3.246182
3	-2.283953	1.951864	-1.17	0.242	-6.109535	1.541629
4	.1680179	.486716	0.35	0.730	-.785928	1.121964
7	-.8737746	.7082895	-1.23	0.217	-2.261997	.5144473
demen_new						
1	-2.536569	.185652	-13.66	0.000	-2.90044	-2.172698
3	-.3935778	1.854704	-0.21	0.832	-4.02873	3.241574
4	-1.344497	.3342623	-4.02	0.000	-1.999639	-.6893552
fsad						
1.yes	.0339958	.0324692	1.05	0.295	-.0296427	.0976343
going						
1.yes	-.0947337	.0280688	-3.38	0.001	-.1497476	-.0397199

enlife						
1.yes	-.1013726	.0478755	-2.12	0.034	-.195207	-.0075383
whappy						
1.yes	-.107793	.0388949	-2.77	0.006	-.1840257	-.0315603
cancr						
1.yes	.2479492	.0409426	6.06	0.000	.1677033	.3281952
3.disp prev record and has cond	-2.767435	1.006671	-2.75	0.006	-4.740474	-.7943958
4.disp prev record and no cond	-.1635212	.2070642	-0.79	0.430	-.5693596	.2423172
5.disp prev record (dk if cond)	.0152414	.3566125	0.04	0.966	-.6837063	.7141891
phone						
1.yes	-.7447678	.075996	-9.80	0.000	-.8937171	-.5958184
2.can't do	-1.743271	.3385147	-5.15	0.000	-2.406747	-1.079794
9.don't do	-1.137742	.2020745	-5.63	0.000	-1.533801	-.7416835
1.meds_miss	-.0053388	.0808599	-0.07	0.947	-.1638214	.1531437
meds_new						
1	-.865657	.0836347	-10.35	0.000	-1.029578	-.7017361
2	-2.479602	.5142606	-4.82	0.000	-3.487534	-1.47167
9	-.2179603	.1176904	-1.85	0.064	-.4486294	.0127087
money						
1.yes	-1.414129	.0638933	-22.13	0.000	-1.539358	-1.288901
2.can't do	-1.854122	.1901028	-9.75	0.000	-2.226717	-1.481527
9.don't do	-.8739899	.0643035	-13.59	0.000	-1.000022	-.7479575
shop						
1.yes	-.2475193	.0504524	-4.91	0.000	-.3464043	-.1486344
2.can't do	-.4071874	.137986	-2.95	0.003	-.6776351	-.1367398
9.don't do	-.6128122	.0743982	-8.24	0.000	-.75863	-.4669944
meals						
1.yes	-.5977496	.0617041	-9.69	0.000	-.7186874	-.4768119
2.can't do	-.6372311	.1607482	-3.96	0.000	-.9522918	-.3221704
9.don't do	-.3671846	.0563389	-6.52	0.000	-.4776069	-.2567623
map						
1.yes	-.5893413	.0416298	-14.16	0.000	-.6709343	-.5077484
2.can't do	-.7491788	.0774852	-9.67	0.000	-.9010469	-.5973107
9.don't do	-.5385995	.0407568	-13.21	0.000	-.6184814	-.4587175
oopmdo_new	-5.37e-06	2.05e-06	-2.61	0.009	-9.40e-06	-1.34e-06
bmi_new	.0501754	.0036958	13.58	0.000	.0429318	

> .0574191

smoken 1.yes	. (not estimable)

Note: dy/dx for factor levels is the discrete change from the base level.

```
165
166 marginsplot
```

Variables that uniquely identify margins: **_deriv**

```
167
168 margins, dydx(agey_m) at (age = (58 (1) 100))
```

Average marginal effects Number of obs = **129,939**
Model VCE: **Robust**

Expression: **Linear prediction, predict()**
dy/dx wrt: **agey_m**
1._at: agey_m = **58**
2._at: agey_m = **59**
3._at: agey_m = **60**
4._at: agey_m = **61**
5._at: agey_m = **62**
6._at: agey_m = **63**
7._at: agey_m = **64**
8._at: agey_m = **65**
9._at: agey_m = **66**
10._at: agey_m = **67**
11._at: agey_m = **68**
12._at: agey_m = **69**
13._at: agey_m = **70**
14._at: agey_m = **71**
15._at: agey_m = **72**
16._at: agey_m = **73**
17._at: agey_m = **74**
18._at: agey_m = **75**
19._at: agey_m = **76**
20._at: agey_m = **77**
21._at: agey_m = **78**
22._at: agey_m = **79**
23._at: agey_m = **80**
24._at: agey_m = **81**
25._at: agey_m = **82**
26._at: agey_m = **83**
27._at: agey_m = **84**
28._at: agey_m = **85**
29._at: agey_m = **86**
30._at: agey_m = **87**
31._at: agey_m = **88**
32._at: agey_m = **89**
33._at: agey_m = **90**
34._at: agey_m = **91**
35._at: agey_m = **92**
36._at: agey_m = **93**
37._at: agey_m = **94**
38._at: agey_m = **95**
39._at: agey_m = **96**
40._at: agey_m = **97**
41._at: agey_m = **98**
42._at: agey_m = **99**
43._at: agey_m = **100**

	dy/dx	Delta-method std. err.	z	P>|z|	[95% conf.	interval]
agey_m						
_at						
1	-.0701999	.0032343	-21.70	0.000	-.0765391	-.0638607
2	-.0778119	.0030845	-25.23	0.000	-.0838574	-.0717663
3	-.0854238	.0029431	-29.03	0.000	-.0911922	-.0796554
4	-.0930358	.0028114	-33.09	0.000	-.098546	-.0875255
5	-.1006477	.0026908	-37.40	0.000	-.1059216	-.0953739
6	-.1082597	.0025829	-41.91	0.000	-.113322	-.1031973
7	-.1158716	.0024893	-46.55	0.000	-.1207505	-.1109927
8	-.1234836	.0024117	-51.20	0.000	-.1282104	-.1187567
9	-.1310955	.0023517	-55.75	0.000	-.1357048	-.1264863
10	-.1387075	.0023106	-60.03	0.000	-.1432362	-.1341787
11	-.1463194	.0022896	-63.91	0.000	-.1508069	-.141832
12	-.1539314	.002289	-67.25	0.000	-.1584177	-.149445
13	-.1615433	.002309	-69.96	0.000	-.1660688	-.1570178
14	-.1691553	.0023489	-72.01	0.000	-.1737591	-.1645514
15	-.1767672	.0024079	-73.41	0.000	-.1814867	-.1720477
16	-.1843792	.0024846	-74.21	0.000	-.1892489	-.1795094
17	-.1919911	.0025774	-74.49	0.000	-.1970426	-.1869396
18	-.1996031	.0026845	-74.35	0.000	-.2048646	-.1943415
19	-.207215	.0028045	-73.89	0.000	-.2127117	-.2017184
20	-.214827	.0029356	-73.18	0.000	-.2205806	-.2090733
21	-.2224389	.0030765	-72.30	0.000	-.2284688	-.2164091
22	-.2300509	.0032259	-71.31	0.000	-.2363735	-.2237282
23	-.2376628	.0033827	-70.26	0.000	-.2442928	-.2310329
24	-.2452748	.0035458	-69.17	0.000	-.2522245	-.2383251
25	-.2528867	.0037145	-68.08	0.000	-.2601671	-.2456064
26	-.2604987	.0038881	-67.00	0.000	-.2681191	-.2528782
27	-.2681106	.0040658	-65.94	0.000	-.2760794	-.2601418
28	-.2757226	.0042472	-64.92	0.000	-.284047	-.2673982
29	-.2833345	.0044319	-63.93	0.000	-.2920208	-.2746482
30	-.2909465	.0046193	-62.98	0.000	-.3000002	-.2818927
31	-.2985584	.0048093	-62.08	0.000	-.3079845	-.2891323
32	-.3061704	.0050015	-61.22	0.000	-.3159732	-.2963675
33	-.3137823	.0051957	-60.39	0.000	-.3239658	-.3035989
34	-.3213943	.0053917	-59.61	0.000	-.3319618	-.3108268
35	-.3290062	.0055892	-58.86	0.000	-.3399609	-.3180516
36	-.3366182	.0057881	-58.16	0.000	-.3479627	-.3252736
37	-.3442301	.0059884	-57.48	0.000	-.3559671	-.3324931
38	-.3518421	.0061897	-56.84	0.000	-.3639737	-.3397104
39	-.359454	.0063921	-56.23	0.000	-.3719824	-.3469257
40	-.367066	.0065955	-55.65	0.000	-.3799929	-.354139
41	-.3746779	.0067997	-55.10	0.000	-.3880051	-.3613507
42	-.3822899	.0070047	-54.58	0.000	-.3960189	-.3685609
43	-.3899018	.0072104	-54.07	0.000	-.404034	-.3757696

```
169 marginsplot

  Variables that uniquely identify margins: agey_m

170
171 margins, dydx(hibp) at (age = (58 (1) 100))
  ——Break——
  r(1);
```

```
172 marginsplot
  previous command was not margins
  r(301);

173
174 margins, dydx(bmi_new) at (bmi_new = (7(1) 50))
  --Break--
  r(1);

175 marginsplot
  previous command was not margins
  r(301);

176
177
178 *** Save log as pdf.

179 log close
       name:  <unnamed>
        log:  /nas/longleaf/home/rayrayc/hrs_final_cog.smcl
   log type:  smcl
  closed on:  26 Nov 2022, 12:44:10
```