On-line Appendix

Stata code for

Morgan, Stephen L. and Jennifer J. Todd. 2008.
"A Diagnostic Routine for the Detection of
Consequential Heterogeneity of Causal Effects."
Sociological Methodology 38:231-81.

In this on-line Appendix, we provide Stata code for all steps of the diagnostic routine. Each section of code below is presented with reference to the step of the routine and the specific tables and figures in the paper.

Section 3.2: Data

Code and results for Table 1: Means and Standard Deviation of Primary Variables Used in the Demonstration

(Notes: `bystuwt` is the base-year poststratification weight provided by NCES. See the Notes for Table 1 and the Appendix on pages 276-279 for discussion.)

```
. bysort cath10: sum math10 [aw=bystuwt];

-------------------------------------------------------------------------------------------
-> cath10 = 0

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
      math10 |   12025  3167513.33    41.67916   13.97415      13.87      82.03

-------------------------------------------------------------------------------------------
-> cath10 = 1

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
      math10 |    1918  145906.045     48.9931   12.01755      16.47      79.42
```

(Notes: `byodd2wt` is the base-year poststratification weight, `bystuwt`, multiplied by our attrition-adjustment weight. See the Notes for Table 1 and the Appendix on pages 276-279 for discussion.)

```
. bysort cath10: sum math12 mathgain [aw=byodd2wt] if f1schstat==1;

-------------------------------------------------------------------------------------------
-> cath10 = 0

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
      math12 |    8842  3162321.84    47.63957    15.0481       15.2      81.31
    mathgain |    8842  3162321.84    4.655664   6.484846     -39.46      46.69
```

```
-------------------------------------------------------------------------------------------
-> cath10 = 1

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
      math12 |    1660  162627.166    56.08442   12.80229      21.29      80.53
    mathgain |    1660  162627.166    6.661287   6.057963      -21.3      30.62


> local MV "female12 black12 hisp12 asian12 natam12 multirace12
>  urban10 rural10 neast10 south10 west10 moed10 faed10 msei10 fsei10 lninc10
>  lninc2 lninc3 mf10 disability everhbgrade10 repgrade10_4 yrpalvcom10";

. bysort cath10: sum `MV' [aw=bystuwt];

-------------------------------------------------------------------------------------------
-> cath10 = 0

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
    female12 |   12025  3167513.33     .496215   .5000065          0          1
     black12 |   12025  3167513.33    .1513402   .3583951          0          1
      hisp12 |   12025  3167513.33    .1646907   .3709166          0          1
     asian12 |   12025  3167513.33    .0408824    .198026          0          1
     natam12 |   12025  3167513.33    .0101101   .1000435          0          1
-------------+--------------------------------------------------------------------
 multirace12 |   12025  3167513.33    .0430739   .2030319          0          1
     urban10 |   12025  3167513.33     .279877   .4489573          0          1
     rural10 |   12025  3167513.33    .2087265   .4064154          0          1
     neast10 |   12025  3167513.33    .1805756   .3846822          0          1
     south10 |   12025  3167513.33    .3441059   .4750956          0          1
-------------+--------------------------------------------------------------------
      west10 |   12025  3167513.33    .2340727   .4234354          0          1
      moed10 |   12025  3167513.33    13.45472   2.321533         10         20
      faed10 |   12025  3167513.33    13.58725   2.586507         10         20
      msei10 |   12025  3167513.33    44.97517   12.86473   23.07542      64.38
      fsei10 |   12025  3167513.33    44.14645   11.69561   26.22017      64.38
-------------+--------------------------------------------------------------------
     lninc10 |   12025  3167513.33     10.6025   1.091743   1.609438   12.20607
      lninc2 |   12025  3167513.33    113.6049   19.82491   2.590291   148.9882
      lninc3 |   12025  3167513.33     1225.64   295.4627   4.168912   1818.561
        mf10 |   12025  3167513.33    .7464157   .4350805          0          1
  disability |   12025  3167513.33    .1255322   .2985592          0          1
-------------+--------------------------------------------------------------------
everhbgra~10 |   12025  3167513.33    .1343397   .3056113          0          1
repgrade10_4 |   12025  3167513.33    .0047258   .0600905          0          1
 yrpalvcom10 |   12025  3167513.33    10.55691   8.001411          0         50

-------------------------------------------------------------------------------------------
-> cath10 = 1

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
    female12 |    1918  145906.045    .4750098   .4995053          0          1
     black12 |    1918  145906.045    .0613728   .2400755          0          1
      hisp12 |    1918  145906.045    .1125429   .3161156          0          1
     asian12 |    1918  145906.045    .0430502    .203023          0          1
     natam12 |    1918  145906.045    .0015803   .0397323          0          1
-------------+--------------------------------------------------------------------
 multirace12 |    1918  145906.045    .0403983   .1969429          0          1
     urban10 |    1918  145906.045    .5841034   .4930044          0          1
     rural10 |    1918  145906.045    .0098718   .0988909          0          1
     neast10 |    1918  145906.045    .3108753   .4629726          0          1
     south10 |    1918  145906.045    .2268957   .4189338          0          1
-------------+--------------------------------------------------------------------
      west10 |    1918  145906.045    .1647951   .3710923          0          1
      moed10 |    1918  145906.045     14.7656    2.21528         10         20
      faed10 |    1918  145906.045     15.2527     2.5665         10         20
      msei10 |    1918  145906.045    50.55083   12.84991      29.44      64.38
      fsei10 |    1918  145906.045    49.81253   11.70873      29.44      64.38
-------------+--------------------------------------------------------------------
```

```
     lninc10 |    1918  145906.045    11.23306    .897209   1.609438   12.20607
      lninc2 |    1918  145906.045    126.9863   17.04136   2.590291   148.9882
      lninc3 |    1918  145906.045    1441.326   267.9839   4.168912   1818.561
        mf10 |    1918  145906.045    .8373658   .3691278          0          1
  disability |    1918  145906.045    .0678801     .23488          0          1
-------------+---------------------------------------------------------------
everhbgra~10 |    1918  145906.045    .0527993   .2057801          0          1
repgrade10_4 |    1918  145906.045    .0019078   .0392602          0          1
 yrpalvcom10 |    1918  145906.045     12.8967   8.209756          0         50
```

Diagnostic Routine Stage 1: Estimate Baseline Regression Models

Diagnostic Routine Step 1: Estimate a bivariate regression model

Code and results for Table 2, Model 1, First Column (No Weight)

(Notes: `bystuwt` is the base-year poststratification weight provided by NCES. See the Notes for Table 1 and the Appendix on pages 276-279 for discussion.)

```
. reg math10 cath10 [pw=bystuwt], cluster(sch_id);
(sum of wgt is   3.3134e+06)

Linear regression                                      Number of obs =   13943
                                                       F(  1,   674) =  121.30
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0115
Number of clusters (sch_id) = 675                      Root MSE      =  13.894

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   7.313941   .6640754    11.01   0.000     6.010036    8.617847
       _cons |   41.67916   .2981731   139.78   0.000      41.0937    42.26462
------------------------------------------------------------------------------
```

(Notes: `byodd2wt` is the base-year poststratification weight, `bystuwt`, multiplied by our attrition-adjustment weight. See the Notes for Table 1 and the Appendix on pages 276-279 for discussion.)

```
. reg math12 cath10 [pw=byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.3249e+06)

Linear regression                                      Number of obs =   10502
                                                       F(  1,   673) =  130.28
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0146
Number of clusters (sch_id) = 674                      Root MSE      =  14.947

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   8.444843   .7398575    11.41   0.000     6.992136     9.89755
       _cons |   47.63957   .3320862   143.46   0.000     46.98752    48.29162
------------------------------------------------------------------------------

. reg mathgain cath10 [aw=byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.3249e+06)

Linear regression                                      Number of obs =   10502
                                                       F(  1,   673) =   79.47
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0045
```

```
Number of clusters (sch_id) = 674                     Root MSE      =  6.4648

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.005623   .2249889     8.91   0.000     1.563859    2.447388
       _cons |   4.655664   .0925708    50.29   0.000     4.473902    4.837426
------------------------------------------------------------------------------
```

Diagnostic Routine Step 2: Estimate a multiple regression model by introducing adjustment variables

Code and results for Table 2, Model 2, First Column (No Weight)

(Notes: `bystuwt` is the base-year poststratification weight provided by NCES. See the Notes for Table 1 and the Appendix on pages 276-279 for discussion.)

```
. reg math10 cath10 `MV' [pw=bystuwt], cluster(sch_id);
(sum of wgt is   3.3134e+06)

Linear regression                                     Number of obs =   13943
                                                      F( 24,   674) =  214.01
                                                      Prob > F      =  0.0000
                                                      R-squared     =  0.3351
Number of clusters (sch_id) = 675                     Root MSE      =  11.405

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.478558   .5241664     2.82   0.005     .4493623    2.507753
    female12 |  -2.152742   .2224188    -9.68   0.000    -2.589459   -1.716025
     black12 |  -9.287606   .4293024   -21.63   0.000    -10.13054   -8.444675
      hisp12 |   -6.28735   .4171259   -15.07   0.000    -7.106373   -5.468328
     asian12 |   1.813966   .7949367     2.28   0.023     .2531161    3.374816
     natam12 |  -5.849339   1.199018    -4.88   0.000    -8.203598    -3.49508
 multirace12 |  -3.325942   .6464765    -5.14   0.000    -4.595292   -2.056591
     urban10 |  -.8384863   .4223041    -1.99   0.047    -1.667676   -.0092965
     rural10 |   .0718987   .3996901     0.18   0.857    -.7128888    .8566862
     neast10 |   1.631711    .504909     3.23   0.001     .6403271    2.623094
     south10 |   .8089249   .4145898     1.95   0.051     -.005118    1.622968
      west10 |  -.3324533   .5194664    -0.64   0.522     -1.35242    .6875138
      moed10 |   .5998167   .0694212     8.64   0.000     .4635088    .7361246
      faed10 |   .5651039    .060104     9.40   0.000     .4470903    .6831174
      msei10 |   .0398686    .010743     3.71   0.000     .0187748    .0609624
      fsei10 |   .0501497   .0113697     4.41   0.000     .0278254    .0724741
     lninc10 |   .7640966   1.502569     0.51   0.611    -2.186183    3.714376
      lninc2 |  -.2975413   .2230191    -1.33   0.183    -.7354371    .1403545
      lninc3 |   .0221445   .0098042     2.26   0.024      .002894     .041395
        mf10 |   .2507764    .282776     0.89   0.375    -.3044515    .8060043
  disability |  -9.818564   .4077782   -24.08   0.000    -10.61923   -9.017896
everhbgra~10 |  -6.880233    .374652   -18.36   0.000    -7.615859   -6.144608
repgrade10_4 |   2.023408   1.458039     1.39   0.166    -.8394372    4.886254
 yrpalvcom10 |   .0160261    .013595     1.18   0.239    -.0106675    .0427198
       _cons |   25.63608   2.879705     8.90   0.000      19.9818    31.29035
------------------------------------------------------------------------------
```

(Notes: `byodd2wt` is the base-year poststratification weight, `bystuwt`, multiplied by our attrition-adjustment weight. See the Notes for Table 1 and the Appendix on pages 276-279 for discussion.)

```
. reg math12 cath10 `MV' [pw=byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.3249e+06)
```

```
Linear regression                                       Number of obs =   10502
                                                        F( 24,   673) =  181.27
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.3439
Number of clusters (sch_id) = 674                       Root MSE      =   12.21

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.129747   .6005991     3.55   0.000     .9504737    3.309021
    female12 |  -2.663471    .286022    -9.31   0.000    -3.225073   -2.101868
     black12 |  -9.678931   .5795671   -16.70   0.000    -10.81691   -8.540954
      hisp12 |  -6.301003   .5103302   -12.35   0.000    -7.303034   -5.298972
     asian12 |   2.564631   .9187913     2.79   0.005     .7605885    4.368673
     natam12 |  -6.554744   2.056704    -3.19   0.002    -10.59307   -2.516416
 multirace12 |  -3.020179   .7766975    -3.89   0.000    -4.545221   -1.495137
     urban10 |   -.458216   .5159504    -0.89   0.375    -1.471282    .5548502
     rural10 |  -.3858649   .4251721    -0.91   0.364    -1.220688    .4489585
     neast10 |    1.79709   .6023342     2.98   0.003     .6144092     2.97977
     south10 |   .8131371   .4869232     1.67   0.095    -.1429341    1.769208
      west10 |   .3362776   .5656962     0.59   0.552    -.7744642    1.447019
      moed10 |   .6292605   .0860552     7.31   0.000     .4602916    .7982295
      faed10 |   .6328537   .0768722     8.23   0.000     .4819155    .7837919
      msei10 |   .0252859   .0129917     1.95   0.052    -.0002233    .0507951
      fsei10 |    .057555   .0141408     4.07   0.000     .0297897    .0853203
     lninc10 |   2.914389   2.243275     1.30   0.194     -1.49027    7.319048
      lninc2 |  -.6048001   .3215751    -1.88   0.060    -1.236211    .0266112
      lninc3 |   .0367284   .0137469     2.67   0.008     .0097364    .0637205
        mf10 |   .4674389   .3770902     1.24   0.216    -.2729759    1.207854
  disability |  -12.09863   .5364658   -22.55   0.000    -13.15198   -11.04529
everhbgra~10 |  -7.674591   .5046506   -15.21   0.000     -8.66547   -6.683712
repgrade10_4 |   2.395614     1.9894     1.20   0.229    -1.510563    6.301791
 yrpalvcom10 |   .0111913   .0182563     0.61   0.540    -.0246549    .0470375
       _cons |   24.79839    4.48475     5.53   0.000     15.99261    33.60418
------------------------------------------------------------------------------

. reg mathgain cath10 `MV' [pw=byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.3249e+06)

Linear regression                                       Number of obs =   10502
                                                        F( 24,   673) =   10.00
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.0259
Number of clusters (sch_id) = 674                       Root MSE      =  6.4018

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.265714   .2556386     4.95   0.000     .7637693     1.76766
    female12 |  -.4225799   .1541781    -2.74   0.006    -.7253078   -.1198519
     black12 |  -.0453627   .2408048    -0.19   0.851    -.5181817    .4274563
      hisp12 |  -.0524509   .2676744    -0.20   0.845    -.5780283    .4731265
     asian12 |   .9029913   .3993743     2.26   0.024     .1188217    1.687161
     natam12 |    .337886   1.129306     0.30   0.765    -1.879501    2.555273
 multirace12 |   .5811999   .4065734     1.43   0.153    -.2171051    1.379505
     urban10 |   .0742169   .2096131     0.35   0.723    -.3373574    .4857912
     rural10 |  -.3929329   .2355273    -1.67   0.096    -.8553896    .0695239
     neast10 |   .4034381   .2574902     1.57   0.118    -.1021428    .9090189
     south10 |   .0862676   .2227263     0.39   0.699    -.3510545    .5235896
      west10 |   .3193558   .2670254     1.20   0.232    -.2049472    .8436588
      moed10 |   .0242516   .0432138     0.56   0.575    -.0605984    .1091016
      faed10 |   .1285212   .0376256     3.42   0.001     .0546434    .2023989
      msei10 |   .0048095   .0066524     0.72   0.470    -.0082524    .0178713
      fsei10 |   .0043365   .0074415     0.58   0.560    -.0102749    .0189479
     lninc10 |     .11916   1.227961     0.10   0.923    -2.291936    2.530256
      lninc2 |  -.0335534   .1855419    -0.18   0.857    -.3978641    .3307573
      lninc3 |   .0026095   .0080914     0.32   0.747     -.013278    .0184969
        mf10 |   .2601204   .2038882     1.28   0.202    -.1402131     .660454
  disability |  -1.554209   .2751391    -5.65   0.000    -2.094443   -1.013974
```

```
everhbgra~10 |  -.8714982   .2806948    -3.10   0.002    -1.422641   -.3203553
repgrade10_4 |    .770541   1.187434     0.65   0.517     -1.56098    3.102062
 yrpalvcom10 |  -.0034215   .0100885    -0.34   0.735    -.0232303    .0163873
       _cons |   1.671484   2.022683     0.83   0.409    -2.300044    5.643013
------------------------------------------------------------------------------
```

Diagnostic Routine Stage 2: Model Treatment Selection/Assignment and Construct Weights

Diagnostic Routine Steps 3 and 4: Estimate a model predicting membership in the treatment group from the adjustment variables used in the multiple regression model; Form weights as a function of the predicted probabilities of membership in the treatment group

Code and results for initial logit model and the construction of the ATT and ATC weights

(Notes: `bystuwt` is the base-year poststratification weight provided by NCES. See the Notes for Table 1 and the Appendix on pages 276-279 for discussion.)

```
. logit cath10 `MV' [pw=bystuwt], cluster(sch_id);

(sum of wgt is   3.3134e+06)
Iteration 0:   log pseudolikelihood = -2517.5726
Iteration 1:   log pseudolikelihood = -2227.1733
Iteration 2:   log pseudolikelihood = -2015.3248
Iteration 3:   log pseudolikelihood = -1994.7529
Iteration 4:   log pseudolikelihood = -1992.1165
Iteration 5:   log pseudolikelihood = -1991.9301
Iteration 6:   log pseudolikelihood = -1991.9281
Iteration 7:   log pseudolikelihood = -1991.9281

Logistic regression                                     Number of obs   =      13943
                                                        Wald chi2(23)   =     404.03
                                                        Prob > chi2     =     0.0000
Log pseudolikelihood = -1991.9281                       Pseudo R2       =     0.2088

                               (Std. Err. adjusted for 675 clusters in sch_id)
------------------------------------------------------------------------------
             |               Robust
      cath10 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    female12 |   -.098244   .1531201    -0.64   0.521     -.398354    .2018659
     black12 |  -1.173867   .2445924    -4.80   0.000    -1.653259   -.6944748
      hisp12 |  -.3054936    .226215    -1.35   0.177    -.7488669    .1378797
     asian12 |  -.4154448    .316147    -1.31   0.189    -1.035082     .204192
     natam12 |  -1.590658   .6634452    -2.40   0.017    -2.890987   -.2903294
 multirace12 |  -.3026983    .233705    -1.30   0.195    -.7607517    .1553551
     urban10 |   1.523138   .2720866     5.60   0.000     .9898576    2.056417
     rural10 |  -2.668321   1.029625    -2.59   0.010    -4.686348   -.6502928
     neast10 |   .3974147   .3340921     1.19   0.234    -.2573938    1.052223
     south10 |  -.5965174   .3353321    -1.78   0.075    -1.253756    .0607214
      west10 |  -.7124127   .3950881    -1.80   0.071    -1.486771    .0619457
      moed10 |   .0276257   .0175921     1.57   0.116    -.0068543    .0621056
      faed10 |   .0943703   .0193345     4.88   0.000     .0564753    .1322652
      msei10 |   .0067756   .0030485     2.22   0.026     .0008007    .0127506
      fsei10 |  -.0002095   .0033368    -0.06   0.950    -.0067495    .0063305
     lninc10 |  -.4222981    .776078    -0.54   0.586    -1.943383    1.098787
      lninc2 |   -.022238   .1173281    -0.19   0.850    -.2521969    .2077208
      lninc3 |   .0047462   .0050055     0.95   0.343    -.0050644    .0145569
        mf10 |  -.0808257   .0972917    -0.83   0.406    -.2715139    .1098625
  disability |  -.5237683    .154664    -3.39   0.001    -.8269041   -.2206325
everhbgra~10 |  -.5540711   .1857814    -2.98   0.003    -.9181959   -.1899463
repgrade10_4 |  -.1988405   .9543492    -0.21   0.835    -2.069331     1.67165
 yrpalvcom10 |   .0312767   .0052336     5.98   0.000     .0210191    .0415344
       _cons |  -4.420352   1.211556    -3.65   0.000    -6.794958   -2.045746
------------------------------------------------------------------------------
```

```
. predict p1;
(option p assumed; Pr(cath10))

. sum p1 [aw=bystuwt];

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
          p1 |   13943  3313419.38    .0440349   .0688229   .0000182   .8573331

. ***ATT Weights;
. gen att1bystuwt=.;
(13943 missing values generated)

.  replace att1bystuwt=bystuwt if cath10==1;
(1918 real changes made)

.  replace att1bystuwt=bystuwt *(p1/(1-p1)) if cath10==0;
(12025 real changes made)

. gen att1byodd2wt=.;
(13943 missing values generated)

.  replace att1byodd2wt=byodd2wt if cath10==1;
(1918 real changes made)

.  replace att1byodd2wt=byodd2wt *(p1/(1-p1)) if cath10==0;
(12025 real changes made)

. ***ATC Weights;
. gen atc1bystuwt=.;
(13943 missing values generated)

.  replace atc1bystuwt=bystuwt*((1-p1)/p1) if cath10==1;
(1918 real changes made)

.  replace atc1bystuwt=bystuwt if cath10==0;
(12025 real changes made)

. gen atc1byodd2wt=.;
(13943 missing values generated)

.  replace atc1byodd2wt=byodd2wt *((1-p1)/p1) if cath10==1;
(1918 real changes made)

.  replace atc1byodd2wt=byodd2wt if cath10==0;
(12025 real changes made)
```

Diagnostic Routine Step 5: Check the balance of the adjustment variables produced by the weights

For this step of the routine, we wrote two simple Stata programs to automate the evaluation of the balance. These are:

```
program define baltestmean
 version 9.0
 syntax varlist(min=1) , MWeight(varname) SWeight(varname)

  /* construct header */
       display as text "{hline 70}"
       di as text "     varname  treated   control  mean_diff  mean_diff  abs_mean_diff "
       di as text "                                                (std)          (std)    "
       di as text "{hline 70}"

       gen k = 0
       gen n = 0

       tempname m1 m0 v1s v0s mdiff mdiffst absmdiffst k n meanabs
```

```
        foreach v of varlist `varlist' {

                qui sum `v' [iw=`mweight'] if `e(depvar)' == 1
                scalar `m1' = r(mean)

                qui sum `v'  [iw=`sweight'] if `e(depvar)' == 1
                scalar `v1s' = r(Var)

                qui sum `v'  [iw=`mweight'] if `e(depvar)' == 0
                scalar `m0' = r(mean)

                qui sum `v'  [iw=`sweight'] if `e(depvar)' == 0
                scalar `v0s' = r(Var)

                scalar `mdiff' = `m1' - `m0'
                scalar `mdiffst' = (`m1' - `m0')/sqrt((`v1s' + `v0s')/2)


                scalar `absmdiffst' = abs((`m1' - `m0')/sqrt((`v1s' + `v0s')/2))

        qui replace k = k + `absmdiffst'
        qui replace n = n + 1


                #delimit ;
                di as text %12s abbrev("`v'",12) "  "  as result %7.0g `m1' "  " %7.0g `m0' "   "
                %7.0g `mdiff' "    " %7.0g `mdiffst' "   "%7.0g `absmdiffst' ;
                #delimit cr
        }


                di  _newline(1)


                scalar `meanabs' = k/n


                di as text %12s abbrev("meanabs",12) "                                                  "
as result %7.0g `meanabs'

        di as text "{hline 70}"

drop k n

end



program define baltestsd
 version 9.0
 syntax varlist(min=1) , MWeight(varname) SWeight(varname)

  /* construct header */
        display as text "{hline 70}"
        di as text "     varname  treated   control   sd_diff    sd_diff    abs_sd_diff "
        di as text "                                                (std)        (std)    "
        di as text "{hline 70}"

        gen s = 0
        gen t = 0

        tempname sd1 sd0 v1m v0m v1s v0s sddiff sddiffst abssdiffst s t sdmeanabs
        foreach v of varlist `varlist' {

                qui sum `v' [iw=`mweight'] if `e(depvar)' == 1
                scalar `sd1' = r(sd)

                qui sum `v'  [iw=`sweight'] if `e(depvar)' == 1
                scalar `v1s' = r(Var)

                qui sum `v'  [iw=`mweight'] if `e(depvar)' == 1
```

```
                scalar `v1m' = r(Var)

                qui sum `v'  [iw=`mweight'] if `e(depvar)' == 0
                scalar `sd0' = r(sd)

                qui sum `v'  [iw=`sweight'] if `e(depvar)' == 0
                scalar `v0s' = r(Var)

                qui sum `v'  [iw=`mweight'] if `e(depvar)' == 0
                scalar `v0m' = r(Var)

                scalar `sddiff' = sqrt(`v1m') - sqrt(`v0m')
                scalar `sddiffst' = (sqrt(`v1m') - sqrt(`v0m'))/sqrt((`v1s' + `v0s')/2)

                scalar `abssdiffst' = abs((sqrt(`v1m') - sqrt(`v0m'))/sqrt((`v1s' + `v0s')/2))

        qui replace s = s + `abssdiffst'
        qui replace t = t + 1


                #delimit ;
                di as text %12s abbrev("`v'",12) "  "  as result %7.0g `sd1' "  " %7.0g `sd0'
                "   " %7.0g `sddiff' "    " %7.0g `sddiffst' "   " %7.0g `abssdiffst' ;
                #delimit cr
        }


                di  _newline(1)

                        scalar `sdmeanabs' = s/t

                        di as text %12s abbrev("sdmeanabs",12) "
"  as result %7.0g `sdmeanabs'

        di as text "{hline 70}"

drop s t

end
```

These were then saved in the personal ado directory as baltestmean.ado and baltestsd.ado and called as follows:

```
. ***No Weight;
. baltestmean `MV', mw(bystuwt) sw(bystuwt);
------------------------------------------------------------------------
     varname  treated   control  mean_diff  mean_diff  abs_mean_diff
                                               (std)       (std)
------------------------------------------------------------------------
    female12   .47501   .49622   -.02121    -.04244    .04244
     black12   .06137   .15134   -.08997    -.29498    .29498
      hisp12   .11254   .16469   -.05215    -.15135    .15135
     asian12   .04305   .04088    .00217     .01081    .01081
     natam12   .00158   .01011   -.00853    -.11207    .11207
 multirace12    .0404   .04307   -.00268    -.01338    .01338
     urban10    .5841   .27988    .30423     .64534    .64534
     rural10   .00987   .20873   -.19885    -.67238    .67238
     neast10   .31088   .18058     .1303     .30618    .30618
     south10    .2269   .34411   -.11721    -.26173    .26173
      west10    .1648   .23407   -.06928    -.17403    .17403
      moed10   14.766   13.455    1.3109     .57781    .57781
      faed10   15.253   13.587    1.6655     .64649    .64649
      msei10   50.551   44.975    5.5757     .43372    .43372
      fsei10   49.813   44.146    5.6661     .48426    .48426
     lninc10   11.233   10.603    .63056     .63113    .63113
      lninc2   126.99    113.6    13.381     .72398    .72398
      lninc3   1441.3   1225.6    215.69     .76479    .76479
        mf10   .83737   .74642    .09095     .22546    .22546
  disability   .06788   .12553   -.05765    -.21466    .21466
```

```
everhbgra~10    .0528   .13434   -.08154    -.31302    .31302
repgrade10_4   .00191   .00473   -.00282    -.05553    .05553
 yrpalvcom10   12.897   10.557    2.3398     .28868    .28868


     meanabs                                            .34975
-------------------------------------------------------------------------------

. /* MV variables used for SD balance */
> local SDV "moed10 faed10 msei10 fsei10 lninc10 lninc2 lninc3";

. baltestsd `SDV', mw(bystuwt) sw(bystuwt);
-------------------------------------------------------------------------------
     varname  treated   control   sd_diff    sd_diff    abs_sd_diff
                                              (std)        (std)
-------------------------------------------------------------------------------
      moed10   2.2147   2.3214   -.10673    -.04704    .04704
      faed10   2.5658   2.5864   -.02056    -.00798    .00798
      msei10   12.847   12.864   -.01759    -.00137    .00137
      fsei10   11.706   11.695    .01059     .00091    .00091
     lninc10   .89698   1.0917   -.19472     -.1949     .1949
      lninc2   17.037   19.824   -2.7871    -.15079    .15079
      lninc3   267.91   295.45   -27.536    -.09764    .09764


   sdmeanabs                                            .07152
-------------------------------------------------------------------------------

. ***ATT Weights;
. baltestmean `MV', mw(att1bystuwt) sw(bystuwt);
-------------------------------------------------------------------------------
     varname  treated   control  mean_diff  mean_diff  abs_mean_diff
                                              (std)       (std)
-------------------------------------------------------------------------------
    female12   .47501   .47727   -.00226    -.00453    .00453
     black12   .06137   .06178   -.00041    -.00134    .00134
      hisp12   .11254   .11086    .00169     .00489    .00489
     asian12   .04305   .04493   -.00188    -.00937    .00937
     natam12   .00158   .00156    2.1e-05     .00028    .00028
 multirace12    .0404   .04433   -.00393    -.01966    .01966
     urban10    .5841   .58052    .00359     .00761    .00761
     rural10   .00987   .00987    5.5e-06     1.9e-05    1.9e-05
     neast10   .31088   .30463    .00625     .01468    .01468
     south10    .2269   .22955   -.00266    -.00593    .00593
      west10    .1648   .16694   -.00214    -.00538    .00538
      moed10   14.766   14.816   -.05017    -.02212    .02212
      faed10   15.253   15.293   -.04026    -.01563    .01563
      msei10   50.551   50.654   -.10314    -.00802    .00802
      fsei10   49.813   49.907   -.09423    -.00805    .00805
     lninc10   11.233   11.233   -.00039    -.00039    .00039
      lninc2   126.99   126.99   -.00317    -.00017    .00017
      lninc3   1441.3   1441.3    .03611     .00013    .00013
        mf10   .83737   .83622    .00114     .00283    .00283
  disability   .06788   .06695    .00093     .00345    .00345
everhbgra~10    .0528   .05131    .00149     .00573    .00573
repgrade10_4   .00191   .00215   -.00024    -.00477    .00477
 yrpalvcom10   12.897   12.904   -.00692    -.00085    .00085


     meanabs                                            .00634
-------------------------------------------------------------------------------

. baltestsd `SDV', mw(att1bystuwt) sw(bystuwt);
-------------------------------------------------------------------------------
     varname  treated   control   sd_diff    sd_diff    abs_sd_diff
                                              (std)        (std)
-------------------------------------------------------------------------------
      moed10   2.2147   2.5067   -.29202    -.12872    .12872
      faed10   2.5658   2.7945   -.22861    -.08874    .08874
      msei10   12.847   12.964   -.11717    -.00911    .00911
      fsei10   11.706   12.125   -.41972    -.03587    .03587
```

```
     lninc10   .89698   .89384    .00314     .00314    .00314
      lninc2   17.037   16.962     .0747     .00404    .00404
      lninc3   267.91   266.72    1.1991     .00425    .00425


   sdmeanabs                                             .03913
-------------------------------------------------------------------------------

. ***ATC Weights;
. baltestmean `MV', mw(atc1bystuwt) sw(bystuwt);
-------------------------------------------------------------------------------
     varname  treated   control  mean_diff  mean_diff  abs_mean_diff
                                              (std)       (std)
-------------------------------------------------------------------------------
    female12   .46023   .49622   -.03599    -.07202    .07202
     black12   .17198   .15134    .02063     .06766    .06766
      hisp12   .13722   .16469   -.02747    -.07973    .07973
     asian12   .04521   .04088    .00433      .0216     .0216
     natam12   .00297   .01011   -.00714    -.09386    .09386
 multirace12   .05627   .04307    .01319     .06598    .06598
     urban10    .2766   .27988   -.00328    -.00696    .00696
     rural10   .14393   .20873    -.0648     -.2191     .2191
     neast10   .29932   .18058    .11875     .27904    .27904
     south10   .22765   .34411   -.11646    -.26005    .26005
      west10   .20818   .23407    -.0259    -.06505    .06505
      moed10   14.112   13.455    .65762     .28987    .28987
      faed10   14.323   13.587    .73527     .28542    .28542
      msei10   47.621   44.975    2.6463     .20585    .20585
      fsei10   45.208   44.146    1.0617     .09074    .09074
     lninc10   10.655   10.603    .05215      .0522     .0522
      lninc2   114.71    113.6    1.1063     .05985    .05985
      lninc3     1243   1225.6    17.405     .06171    .06171
        mf10    .7227   .74642   -.02372     -.0588     .0588
  disability   .13006   .12553    .00453     .01686    .01686
everhbgra~10   .12994   .13434    -.0044     -.0169     .0169
repgrade10_4   .01378   .00473    .00906     .17845    .17845
 yrpalvcom10   10.449   10.557   -.10768    -.01329    .01329


     meanabs                                               .11135
-------------------------------------------------------------------------------

. baltestsd `SDV', mw(atc1bystuwt) sw(bystuwt);
-------------------------------------------------------------------------------
     varname  treated   control   sd_diff    sd_diff    abs_sd_diff
                                              (std)       (std)
-------------------------------------------------------------------------------
      moed10   2.1066   2.3214   -.21483    -.09469    .09469
      faed10   2.5147   2.5864   -.07168    -.02782    .02782
      msei10    13.37   12.864    .50617     .03937    .03937
      fsei10   11.505   11.695   -.19003    -.01624    .01624
     lninc10   1.0906   1.0917   -.00107    -.00107    .00107
      lninc2   19.609   19.824   -.21514    -.01164    .01164
      lninc3   292.53   295.45   -2.9171    -.01034    .01034


   sdmeanabs                                             .02874
-------------------------------------------------------------------------------
```

Diagnostic Routine Step 6: If the adjustment variables remain unbalanced, respecify the model predicting treatment group membership

After re-running the logit model with additional variables and checking balance, we arrived at the following logit model and associated balance. Notice that 2402 sample members are completely determined as public schools students who would never be expected to attend Catholic schools (and hence some of the coefficients are given very large and very small values). As noted in footnote 9, page 247, for subsequent weighted

regression modeling, this is tantamount to perfectly matching on some geographic characteristics (as in Morgan 2001). Because of the nature of the ATT and ATC weight definitions, this is accomplished by giving these public school respondents weights that are arbitrarily close to zero in the ATT models. In the ATC models, however, these students are retained, as their weights for the ATC models are simply 1 (see Equation 7).

```
. /* Final logit specification */
> local LS "female12 black12 hisp12 asian12 natam12 multirace12
>  urban10 rural10 neast10 south10 west10
>  moed10 faed10 msei10 fsei10 lninc10 mf10
>  disability everhbgrade10 repgrade10_4 yrpalvcom10
>  moed2 moed3 faed2 faed3 msei2 msei3 fsei2 fsei3 lninc2 lninc3
>  urbneast urbsouth urbwest rurneast
>  bmoed bfaed bmsei bfsei blninc hmoed hfaed hmsei hfsei hlninc
>  amoed afaed amsei afsei alninc nmoed nfaed nmsei nfsei nlninc
>  mmoed mfaed mmsei mfsei mlninc
>  bneast bsouth bwest hneast hsouth hwest aneast asouth awest
>  nneast nwest mneast msouth mwest
>  burban hurban aurban nurban murban mrural
>  moeddis faeddis mseidis fseidis lnincdis
>  moedhb faedhb mseihb fseihb lninchb
>  moedrep faedrep mseirep fseirep lnincrep
>  moedyr faedyr mseiyr fseiyr lnincyr";

> logit cath10 `LS' [pw=bystuwt], cluster(sch_id);

(sum of wgt is   3.3134e+06)
Iteration 0:   log pseudolikelihood = -2517.5726
Iteration 1:   log pseudolikelihood = -2091.0244
Iteration 2:   log pseudolikelihood =  -1961.744
Iteration 3:   log pseudolikelihood = -1924.8918
Iteration 4:   log pseudolikelihood = -1915.0795
Iteration 5:   log pseudolikelihood = -1912.0773
Iteration 6:   log pseudolikelihood = -1910.9345
Iteration 7:   log pseudolikelihood = -1910.5231
Iteration 8:   log pseudolikelihood = -1910.3828
Iteration 9:   log pseudolikelihood = -1910.3337
Iteration 10:  log pseudolikelihood = -1910.3158
Iteration 11:  log pseudolikelihood = -1910.3092
Iteration 12:  log pseudolikelihood = -1910.3068
Iteration 13:  log pseudolikelihood = -1910.3059
Iteration 14:  log pseudolikelihood = -1910.3056
Iteration 15:  log pseudolikelihood = -1910.3055
Iteration 16:  log pseudolikelihood = -1910.3054
Iteration 17:  log pseudolikelihood = -1910.3054
Iteration 18:  log pseudolikelihood = -1910.3054
Iteration 19:  log pseudolikelihood = -1910.3054
Iteration 20:  log pseudolikelihood = -1910.3054
Iteration 21:  log pseudolikelihood = -1910.3054

Logistic regression                               Number of obs   =      13943
                                                  Wald chi2(98)   =          .
                                                  Prob > chi2     =          .
Log pseudolikelihood = -1910.3054                 Pseudo R2       =     0.2412

                              (Std. Err. adjusted for 675 clusters in sch_id)
------------------------------------------------------------------------------
             |               Robust
      cath10 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    female12 |  -.0926188   .1552951    -0.60   0.551    -.3969915     .211754
     black12 |  -2.562615   1.413619    -1.81   0.070    -5.333256    .2080269
      hisp12 |  -3.784455   1.564027    -2.42   0.016    -6.849891   -.7190182
     asian12 |  -2.878799   1.647532    -1.75   0.081    -6.107903     .350305
     natam12 |  -14.33971   11.06655    -1.30   0.195    -36.02974    7.350325
 multirace12 |  -3.253902   1.769004    -1.84   0.066    -6.721086    .2132825
     urban10 |   1.685895   .4721596     3.57   0.000     .7604788     2.61131
     rural10 |  -20.05173   1.092838   -18.35   0.000    -22.19365   -17.90981
```

neast10	.4065815	.455698	0.89	0.372	-.4865703	1.299733
south10	-.9142558	.5959485	-1.53	0.125	-2.082293	.2537818
west10	-.8014093	.5742724	-1.40	0.163	-1.926963	.324144
moed10	1.571106	1.185465	1.33	0.185	-.7523631	3.894576
faed10	1.664164	1.097897	1.52	0.130	-.4876753	3.816004
msei10	.2234259	.219405	1.02	0.309	-.2066	.6534518
fsei10	-.0693588	.2284001	-0.30	0.761	-.5170147	.3782971
lninc10	.7032803	.7613248	0.92	0.356	-.7888889	2.19545
mf10	-.0911453	.1054659	-0.86	0.387	-.2978546	.115564
disability	-6.67041	2.175512	-3.07	0.002	-10.93433	-2.406485
everhbgra~10	-1.217	1.573793	-0.77	0.439	-4.301578	1.867577
repgrade10_4	37.85949	49.22181	0.77	0.442	-58.6135	134.3325
yrpalvcom10	.0757489	.0438454	1.73	0.084	-.0101865	.1616844
moed2	-.0856913	.0795075	-1.08	0.281	-.2415231	.0701405
moed3	.0013653	.0017533	0.78	0.436	-.0020711	.0048018
faed2	-.0868974	.0730706	-1.19	0.234	-.2301132	.0563183
faed3	.0016374	.0015893	1.03	0.303	-.0014776	.0047524
msei2	-.004761	.0047955	-0.99	0.321	-.01416	.004638
msei3	.0000335	.0000338	0.99	0.321	-.0000328	.0000998
fsei2	.0023228	.0048493	0.48	0.632	-.0071817	.0118273
fsei3	-.0000211	.0000334	-0.63	0.528	-.0000865	.0000443
lninc2	-.2197739	.1107498	-1.98	0.047	-.4368396	-.0027083
lninc3	.0132576	.0047035	2.82	0.005	.0040388	.0224763
urbneast	.3933587	.7379637	0.53	0.594	-1.053024	1.839741
urbsouth	.2194524	.726973	0.30	0.763	-1.205388	1.644293
urbwest	-.5541808	.7857228	-0.71	0.481	-2.094169	.9858076
rurneast	18.44307	.	.	.	.	.
bmoed	.1344893	.0598844	2.25	0.025	.0171181	.2518605
bfaed	-.0893092	.0464089	-1.92	0.054	-.180269	.0016506
bmsei	.003926	.009507	0.41	0.680	-.0147075	.0225594
bfsei	.0022265	.0108329	0.21	0.837	-.0190057	.0234586
blninc	.1143413	.1041859	1.10	0.272	-.0898594	.318542
hmoed	.1315923	.0522072	2.52	0.012	.0292682	.2339165
hfaed	-.0416856	.0490686	-0.85	0.396	-.1378583	.0544871
hmsei	.0170225	.0081562	2.09	0.037	.0010367	.0330084
hfsei	.0091607	.0092609	0.99	0.323	-.0089904	.0273117
hlninc	.1481553	.1218992	1.22	0.224	-.0907627	.3870733
amoed	.1464532	.0585088	2.50	0.012	.031778	.2611283
afaed	-.185059	.0767242	-2.41	0.016	-.3354357	-.0346823
amsei	.0024871	.0165672	0.15	0.881	-.029984	.0349582
afsei	.002885	.0153311	0.19	0.851	-.0271634	.0329333
alninc	.1738154	.1111817	1.56	0.118	-.0440967	.3917276
nmoed	-.6239826	.3220518	-1.94	0.053	-1.255192	.0072273
nfaed	-.1113643	.1299345	-0.86	0.391	-.3660312	.1433027
nmsei	.1464689	.0650364	2.25	0.024	.019	.2739378
nfsei	.0657527	.0905319	0.73	0.468	-.1116865	.2431919
nlninc	-.400022	.1696868	-2.36	0.018	-.7326021	-.0674419
mmoed	.100476	.0705657	1.42	0.154	-.0378304	.2387823
mfaed	.0395771	.0820103	0.48	0.629	-.1211602	.2003144
mmsei	-.013472	.0133242	-1.01	0.312	-.039587	.012643
mfsei	.0058362	.015612	0.37	0.709	-.0247627	.0364351
mlninc	.0683508	.1466843	0.47	0.641	-.2191452	.3558468
bneast	-.5924554	.5490702	-1.08	0.281	-1.668613	.4837023
bsouth	.0149814	.6876579	0.02	0.983	-1.332803	1.362766
bwest	.3944306	.6514769	0.61	0.545	-.8824408	1.671302
hneast	-1.104158	.5942215	-1.86	0.063	-2.26881	.060495
hsouth	.2026205	.5788216	0.35	0.726	-.9318489	1.33709
hwest	.3647314	.5111365	0.71	0.475	-.6370776	1.36654
aneast	-.5373613	.6641001	-0.81	0.418	-1.838974	.7642509
asouth	.1970754	.5638163	0.35	0.727	-.9079843	1.302135
awest	1.908404	.6129795	3.11	0.002	.7069862	3.109822
nneast	-.3997435	1.522096	-0.26	0.793	-3.382997	2.58351
nwest	1.491215	.9624102	1.55	0.121	-.3950742	3.377504
mneast	-.8567298	.6840289	-1.25	0.210	-2.197402	.4839423
msouth	.9272245	.597501	1.55	0.121	-.243856	2.098305
mwest	1.866395	.5820355	3.21	0.001	.7256261	3.007163
burban	-1.046372	.4762812	-2.20	0.028	-1.979866	-.1128785
hurban	-.5323668	.3762585	-1.41	0.157	-1.26982	.2050862
aurban	.4099652	.5366462	0.76	0.445	-.641842	1.461772
nurban	15.36297	.	.	.	.	.
murban	-.2708495	.4414052	-0.61	0.539	-1.135988	.5942889

```
      mrural |   2.432091     .69041     3.52   0.000     1.078912    3.785269
     moeddis |   .0532414    .087835     0.61   0.544     -.118912    .2253948
     faeddis |   -.132708   .0864919    -1.53   0.125     -.302229    .0368129
     mseidis |   .0050977   .0145368     0.35   0.726    -.0233939    .0335893
     fseidis |   .0351909   .0185913     1.89   0.058    -.0012475    .0716292
    lnincdis |   .4744217   .2400106     1.98   0.048     .0040095    .9448339
      moedhb |   .0084233   .0878418     0.10   0.924    -.1637436    .1805901
      faedhb |   .1337516   .0918326     1.46   0.145     -.046237    .3137402
      mseihb |   .0333802   .0117963     2.83   0.005       .01026    .0565005
      fseihb |  -.0161511    .020829    -0.78   0.438    -.0569752    .0246729
     lninchb |   -.198063    .154519    -1.28   0.200    -.5009147    .1047888
     moedrep |  -.3643114   .5782512    -0.63   0.529    -1.497663    .7690401
     faedrep |   .3001309   .7253487     0.41   0.679    -1.121526    1.721788
     mseirep |  -.0866045   .0861824    -1.00   0.315    -.2555189    .0823099
     fseirep |  -1.064054   1.390903    -0.77   0.444    -3.790174    1.662066
    lnincrep |    .206551   .9717192     0.21   0.832    -1.697984    2.111086
      moedyr |   .0028711   .0020587     1.39   0.163    -.0011639    .0069061
      faedyr |  -.0046279   .0023141    -2.00   0.046    -.0091635   -.0000922
      mseiyr |  -.0002976    .000339    -0.88   0.380    -.0009621    .0003669
      fseiyr |  -.0003498   .0003705    -0.94   0.345    -.0010759    .0003763
     lnincyr |   .0012887   .0037094     0.35   0.728    -.0059817     .008559
       _cons |  -24.83192   8.711923    -2.85   0.004    -41.90697   -7.756859
------------------------------------------------------------------------------

note: 2402 failures and 0 successes completely determined.

. predict p2;
(option p assumed; Pr(cath10))

. sum p2 [aw=bystuwt];

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+-----------------------------------------------------------------
          p2 |   13943  3313419.38    .0440349   .0756217   1.18e-25    .892192

. /* Figure 2 */
> gen tr=p2 if cath10==1;
(12025 missing values generated)

. gen untr=p2 if cath10==0;
(1918 missing values generated)

. label var tr "Treated";

. label var untr "Untreated";

. set scheme s1mono;

. set copycolor asis;

. twoway (kdensity untr [aweight=bystuwt], clcolor(black))
>  (kdensity tr [aweight=bystuwt], clcolor(gs6) clpattern(dash)),
>  xlabel(0(.2)1) xtitle("")
>  ylabel(0(10)30)
>  legend(off)
>  plotregion(style(none));

> ***ATT Weights;
. gen att2bystuwt=.;
(13943 missing values generated)

.  replace att2bystuwt=bystuwt if cath10==1;
(1918 real changes made)

.  replace att2bystuwt=bystuwt *(p2/(1-p2)) if cath10==0;
(12025 real changes made)

. gen att2byodd2wt=.;
(13943 missing values generated)

.  replace att2byodd2wt=byodd2wt if cath10==1;
```

```
(1918 real changes made)

.  replace att2byodd2wt=byodd2wt *(p2/(1-p2)) if cath10==0;
(12025 real changes made)

. ***ATC Weights;
. gen atc2bystuwt=.;
(13943 missing values generated)

.  replace atc2bystuwt=bystuwt*((1-p2)/p2) if cath10==1;
(1918 real changes made)

.  replace atc2bystuwt=bystuwt if cath10==0;
(12025 real changes made)

. gen atc2byodd2wt=.;
(13943 missing values generated)

.  replace atc2byodd2wt=byodd2wt *((1-p2)/p2) if cath10==1;
(1918 real changes made)

.  replace atc2byodd2wt=byodd2wt if cath10==0;
(12025 real changes made)

> ***ATT Weights;
. baltestmean `MV', mw(att2bystuwt) sw(bystuwt);
------------------------------------------------------------------------
     varname  treated   control  mean_diff  mean_diff  abs_mean_diff
                                              (std)       (std)
------------------------------------------------------------------------
    female12   .47501   .47554   -.00053    -.00106    .00106
     black12   .06137   .06187    -.0005    -.00164    .00164
      hisp12   .11254   .11109    .00145     .00421    .00421
     asian12   .04305   .04271    .00034     .00171    .00171
     natam12   .00158   .00069    .00089     .01173    .01173
 multirace12    .0404   .04178   -.00138     -.0069     .0069
     urban10    .5841   .58266    .00145     .00307    .00307
     rural10   .00987   .00993   -5.5e-05    -.00019    .00019
     neast10   .31088   .30967     .0012     .00283    .00283
     south10    .2269   .23046   -.00356    -.00795    .00795
      west10    .1648   .16195    .00285     .00715    .00715
      moed10   14.766   14.772   -.00615    -.00271    .00271
      faed10   15.253   15.254   -.00093    -.00036    .00036
      msei10   50.551   50.563   -.01187    -.00092    .00092
      fsei10   49.813   49.673    .13986     .01195    .01195
     lninc10   11.233   11.241   -.00759     -.0076     .0076
      lninc2   126.99   127.06   -.07857    -.00425    .00425
      lninc3   1441.3   1441.9   -.59095     -.0021     .0021
        mf10   .83737   .83407     .0033     .00817    .00817
  disability   .06788   .06795   -7.2e-05    -.00027    .00027
everhbgra~10    .0528   .05083    .00197     .00757    .00757
repgrade10_4   .00191   .00185    6.0e-05     .00118    .00118
 yrpalvcom10   12.897   12.937   -.04035    -.00498    .00498


     meanabs                                            .00437
------------------------------------------------------------------------

. baltestsd `SDV', mw(att2bystuwt) sw(bystuwt);
------------------------------------------------------------------------
     varname  treated   control   sd_diff    sd_diff    abs_sd_diff
                                              (std)       (std)
------------------------------------------------------------------------
      moed10   2.2147   2.2022    .01251     .00551    .00551
      faed10   2.5658   2.5659   -8.6e-05    -3.3e-05    3.3e-05
      msei10   12.847   12.773     .0738     .00574    .00574
      fsei10   11.706   11.683    .02305     .00197    .00197
     lninc10   .89698   .84412    .05285      .0529     .0529
      lninc2   17.037   16.502    .53541     .02897    .02897
      lninc3   267.91   261.93    5.9858     .02122    .02122
```

```
   sdmeanabs                                                .01662
-------------------------------------------------------------------------------

. ***ATC Weights;
. baltestmean `MV', mw(atc2bystuwt) sw(bystuwt);
-------------------------------------------------------------------------------
     varname  treated   control  mean_diff  mean_diff  abs_mean_diff
                                              (std)       (std)
-------------------------------------------------------------------------------
    female12   .52661   .49622     .0304     .06083    .06083
     black12   .19505   .15134    .04371     .14332    .14332
      hisp12   .12615   .16469   -.03854    -.11185    .11185
     asian12   .05933   .04088    .01845     .09199    .09199
     natam12    .0109   .01011    .00079     .01033    .01033
 multirace12   .04637   .04307     .0033     .01649    .01649
     urban10   .32616   .27988    .04628     .09817    .09817
     rural10   .05145   .20873   -.15727    -.53178    .53178
     neast10    .2771   .18058    .09652     .22681    .22681
     south10   .29427   .34411   -.04983    -.11128    .11128
      west10   .16105   .23407   -.07303    -.18345    .18345
      moed10   13.576   13.455     .1213     .05347    .05347
      faed10   13.803   13.587    .21606     .08387    .08387
      msei10   45.875   44.975    .90006     .07001    .07001
      fsei10   44.051   44.146   -.09588    -.00819    .00819
     lninc10   10.621   10.603    .01853     .01854    .01854
      lninc2   113.87    113.6    .26193     .01417    .01417
      lninc3   1228.9   1225.6    3.2964     .01169    .01169
        mf10   .71335   .74642   -.03307    -.08197    .08197
  disability   .13522   .12553    .00969     .03606    .03606
everhbgra~10   .11842   .13434   -.01591    -.06109    .06109
repgrade10_4   .00357   .00473   -.00116    -.02287    .02287
 yrpalvcom10    10.72   10.557     .1634     .02016    .02016


     meanabs                                                  .08993
-------------------------------------------------------------------------------

. baltestsd `SDV', mw(atc2bystuwt) sw(bystuwt);
-------------------------------------------------------------------------------
     varname  treated   control   sd_diff    sd_diff    abs_sd_diff
                                              (std)       (std)
-------------------------------------------------------------------------------
      moed10    2.345   2.3214    .02355     .01038    .01038
      faed10   2.6766   2.5864    .09023     .03503    .03503
      msei10   13.096   12.864    .23138       .018      .018
      fsei10   11.703   11.695    .00763     .00065    .00065
     lninc10   1.0298   1.0917   -.06188    -.06194    .06194
      lninc2   19.355   19.824   -.46949     -.0254     .0254
      lninc3   292.86   295.45   -2.5942     -.0092     .0092


   sdmeanabs                                                .02294
-------------------------------------------------------------------------------

. /* Table 3 */
. bysort cath10: sum `MV' [aw=att2bystuwt];

-------------------------------------------------------------------------------------------------
-> cath10 = 0

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
    female12 |   12025  145277.392    .4755392   .4994221          0          1
     black12 |   12025  145277.392    .0618729   .2409346          0          1
      hisp12 |   12025  145277.392    .1110933   .3142607          0          1
     asian12 |   12025  145277.392    .0427065   .2022031          0          1
     natam12 |   12025  145277.392    .0006873   .0262089          0          1
-------------+--------------------------------------------------------------------
 multirace12 |   12025  145277.392    .0417784   .2000907          0          1
     urban10 |   12025  145277.392    .5826571    .493141          0          1
```

```
     rural10 |   12025  145277.392    .0099269    .099142          0          1
     neast10 |   12025  145277.392    .3096713   .4623773          0          1
     south10 |   12025  145277.392    .2304567   .4211427          0          1
-------------+---------------------------------------------------------------
      west10 |   12025  145277.392    .1619484   .3684188          0          1
      moed10 |   12025  145277.392    14.77175   2.202283         10         20
      faed10 |   12025  145277.392    15.25364   2.566023         10         20
      msei10 |   12025  145277.392     50.5627   12.77329   23.07542      64.38
      fsei10 |   12025  145277.392    49.67267   11.68311   26.22017      64.38
-------------+---------------------------------------------------------------
     lninc10 |   12025  145277.392    11.24065   .8441571   1.609438   12.20607
      lninc2 |   12025  145277.392    127.0648   16.50219   2.590291   148.9882
      lninc3 |   12025  145277.392    1441.917   261.9391   4.168912   1818.561
        mf10 |   12025  145277.392    .8340688   .3720344          0          1
  disability |   12025  145277.392    .0679517   .2190503          0          1
-------------+---------------------------------------------------------------
everhbgra~10 |   12025  145277.392    .0508272   .1857222          0          1
repgrade10_4 |   12025  145277.392     .001848   .0383085          0          1
 yrpalvcom10 |   12025  145277.392    12.93705   8.963724          0         50

-------------------------------------------------------------------------------------------
-> cath10 = 1

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+---------------------------------------------------------------
    female12 |    1918  145906.045    .4750098   .4995053          0          1
     black12 |    1918  145906.045    .0613728   .2400755          0          1
      hisp12 |    1918  145906.045    .1125429   .3161156          0          1
     asian12 |    1918  145906.045    .0430502    .203023          0          1
     natam12 |    1918  145906.045    .0015803   .0397323          0          1
-------------+---------------------------------------------------------------
 multirace12 |    1918  145906.045    .0403983   .1969429          0          1
     urban10 |    1918  145906.045    .5841034   .4930044          0          1
     rural10 |    1918  145906.045    .0098718   .0988909          0          1
     neast10 |    1918  145906.045    .3108753   .4629726          0          1
     south10 |    1918  145906.045    .2268957   .4189338          0          1
-------------+---------------------------------------------------------------
      west10 |    1918  145906.045    .1647951   .3710923          0          1
      moed10 |    1918  145906.045     14.7656    2.21528         10         20
      faed10 |    1918  145906.045     15.2527     2.5665         10         20
      msei10 |    1918  145906.045    50.55083   12.84991      29.44      64.38
      fsei10 |    1918  145906.045    49.81253   11.70873      29.44      64.38
-------------+---------------------------------------------------------------
     lninc10 |    1918  145906.045    11.23306    .897209   1.609438   12.20607
      lninc2 |    1918  145906.045    126.9863   17.04136   2.590291   148.9882
      lninc3 |    1918  145906.045    1441.326   267.9839   4.168912   1818.561
        mf10 |    1918  145906.045    .8373658   .3691278          0          1
  disability |    1918  145906.045    .0678801     .23488          0          1
-------------+---------------------------------------------------------------
everhbgra~10 |    1918  145906.045    .0527993   .2057801          0          1
repgrade10_4 |    1918  145906.045    .0019078   .0392602          0          1
 yrpalvcom10 |    1918  145906.045     12.8967   8.209756          0         50


. bysort cath10: sum `MV' [aw=atc2bystuwt];

-------------------------------------------------------------------------------------------
-> cath10 = 0

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+---------------------------------------------------------------
    female12 |   12025  3167513.33     .496215   .5000065          0          1
     black12 |   12025  3167513.33    .1513402   .3583951          0          1
      hisp12 |   12025  3167513.33    .1646907   .3709166          0          1
     asian12 |   12025  3167513.33    .0408824    .198026          0          1
     natam12 |   12025  3167513.33    .0101101   .1000435          0          1
-------------+---------------------------------------------------------------
 multirace12 |   12025  3167513.33    .0430739   .2030319          0          1
     urban10 |   12025  3167513.33     .279877   .4489573          0          1
     rural10 |   12025  3167513.33    .2087265   .4064154          0          1
     neast10 |   12025  3167513.33    .1805756   .3846822          0          1
```

```
     south10 |   12025  3167513.33    .3441059   .4750956          0          1
-------------+---------------------------------------------------------------
      west10 |   12025  3167513.33    .2340727   .4234354          0          1
      moed10 |   12025  3167513.33    13.45472   2.321533         10         20
      faed10 |   12025  3167513.33    13.58725   2.586507         10         20
      msei10 |   12025  3167513.33    44.97517   12.86473   23.07542      64.38
      fsei10 |   12025  3167513.33    44.14645   11.69561   26.22017      64.38
-------------+---------------------------------------------------------------
     lninc10 |   12025  3167513.33     10.6025   1.091743   1.609438   12.20607
      lninc2 |   12025  3167513.33    113.6049   19.82491   2.590291   148.9882
      lninc3 |   12025  3167513.33     1225.64   295.4627   4.168912   1818.561
        mf10 |   12025  3167513.33    .7464157   .4350805          0          1
  disability |   12025  3167513.33    .1255322   .2985592          0          1
-------------+---------------------------------------------------------------
everhbgra~10 |   12025  3167513.33    .1343397   .3056113          0          1
repgrade10_4 |   12025  3167513.33    .0047258   .0600905          0          1
 yrpalvcom10 |   12025  3167513.33    10.55691   8.001411          0         50

-------------------------------------------------------------------------------
-> cath10 = 1

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+---------------------------------------------------------------
    female12 |    1918   2673503.2    .5266129   .4994215          0          1
     black12 |    1918   2673503.2    .1950535   .3963452          0          1
      hisp12 |    1918   2673503.2    .1261502   .3321052          0          1
     asian12 |    1918   2673503.2    .0593276   .2362985          0          1
     natam12 |    1918   2673503.2    .0108965   .1038432          0          1
-------------+---------------------------------------------------------------
 multirace12 |    1918   2673503.2    .0463714    .210343          0          1
     urban10 |    1918   2673503.2    .3261565   .4689276          0          1
     rural10 |    1918   2673503.2    .0514526   .2209767          0          1
     neast10 |    1918   2673503.2    .2770978   .4476819          0          1
     south10 |    1918   2673503.2    .2942723   .4558338          0          1
-------------+---------------------------------------------------------------
      west10 |    1918   2673503.2    .1610451   .3676684          0          1
      moed10 |    1918   2673503.2    13.57602   2.345596         10         20
      faed10 |    1918   2673503.2    13.80331   2.677332         10         20
      msei10 |    1918   2673503.2    45.87523   13.09899      29.44      64.38
      fsei10 |    1918   2673503.2    44.05057    11.7058      29.44      64.38
-------------+---------------------------------------------------------------
     lninc10 |    1918   2673503.2    10.62103   1.030086   1.609438   12.20607
      lninc2 |    1918   2673503.2    113.8668   19.35965   2.590291   148.9882
      lninc3 |    1918   2673503.2    1228.936   292.9326   4.168912   1818.561
        mf10 |    1918   2673503.2    .7133504   .4523143          0          1
  disability |    1918   2673503.2    .1352181   .3201707          0          1
-------------+---------------------------------------------------------------
everhbgra~10 |    1918   2673503.2     .118425    .290073          0          1
repgrade10_4 |    1918   2673503.2     .003565   .0463234          0          1
 yrpalvcom10 |    1918   2673503.2    10.72031   6.892971          0         50
```

Diagnostic Routine Stage 3: Estimate Weighted Regression Models and Develop a Diagnosis

Diagnostic Routine Step 7: Reestimate the initial regression models using the final weights

Code and results for Table 2, Models 1 and 2, Second and Third Columns

```
. ***ATT Weight;
. reg math10 cath10 [pw=att2bystuwt], cluster(sch_id);
(sum of wgt is   2.9118e+05)

Linear regression                                      Number of obs =   13943
                                                       F(  1,   674) =    1.95
                                                       Prob > F      =  0.1630
                                                       R-squared     =  0.0018
Number of clusters (sch_id) = 675                      Root MSE      =  12.825
```

```
------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.079431   .7729864     1.40   0.163    -.4383203    2.597182
       _cons |   47.91367   .4953978    96.72   0.000     46.94096    48.88638
------------------------------------------------------------------------------

. reg math12 cath10 [pw=att2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1189e+05)

Linear regression                                      Number of obs =   10502
                                                       F(  1,   673) =    2.53
                                                       Prob > F      =  0.1125
                                                       R-squared     =  0.0028
Number of clusters (sch_id) = 674                      Root MSE      =  13.484

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.419919   .8934019     1.59   0.112    -.3342718    3.174109
       _cons |    54.6645   .6008819    90.97   0.000     53.48467    55.84433
------------------------------------------------------------------------------

. reg mathgain cath10 [pw=att2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1189e+05)

Linear regression                                      Number of obs =   10502
                                                       F(  1,   673) =   10.59
                                                       Prob > F      =  0.0012
                                                       R-squared     =  0.0067
Number of clusters (sch_id) = 674                      Root MSE      =  6.2039

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.018292    .312867     3.25   0.001     .4039794    1.632605
       _cons |   5.642995   .2362946    23.88   0.000     5.179032    6.106959
------------------------------------------------------------------------------

. reg math10 cath10 `MV' [pw=att2bystuwt], cluster(sch_id);
(sum of wgt is   2.9118e+05)

Linear regression                                      Number of obs =   13943
                                                       F( 24,   674) =   47.64
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.2297
Number of clusters (sch_id) = 675                      Root MSE      =  11.276

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.082676   .5560116     1.95   0.052    -.0090469      2.1744
    female12 |  -2.444319   .4492164    -5.44   0.000    -3.326351   -1.562287
     black12 |  -10.33916   .9652993   -10.71   0.000    -12.23452   -8.443806
      hisp12 |  -5.844042   .6166088    -9.48   0.000    -7.054747   -4.633336
     asian12 |  -1.462063   1.297552    -1.13   0.260    -4.009793    1.085666
     natam12 |   4.725173   3.233584     1.46   0.144    -1.623937    11.07428
 multirace12 |  -3.355347    1.02833    -3.26   0.001    -5.374462   -1.336233
     urban10 |  -.3400676   .5609471    -0.61   0.545    -1.441482    .7613463
     rural10 |   2.611427    .939998     2.78   0.006     .7657504    4.457104
     neast10 |  -.2105695   .7555219    -0.28   0.781    -1.694029     1.27289
     south10 |    .033829   .7519972     0.04   0.964     -1.44271    1.510368
      west10 |  -.3199634   .7895228    -0.41   0.685    -1.870183    1.230257
      moed10 |   .6212095   .1210111     5.13   0.000     .3836055    .8588135
      faed10 |   .5175475   .1006271     5.14   0.000     .3199672    .7151278
      msei10 |   .0117702   .0170113     0.69   0.489    -.0216314    .0451717
```

```
      fsei10 |    .064022   .0193885     3.30   0.001     .0259529    .1020912
     lninc10 |  -2.693433   3.294046    -0.82   0.414    -9.161258    3.774393
      lninc2 |   .3620395   .4892409     0.74   0.460      -.59858    1.322659
      lninc3 |  -.0092301   .0208513    -0.44   0.658    -.0501715    .0317113
        mf10 |   .9196511    .556006     1.65   0.099     -.172061    2.011363
  disability |   -10.9315   1.020677   -10.71   0.000    -12.93559    -8.92741
everhbgra~10 |  -6.971843   .8486815    -8.21   0.000     -8.63822   -5.305465
repgrade10_4 |   1.448512   2.138062     0.68   0.498    -2.749552    5.646576
 yrpalvcom10 |  -.0053664   .0201988    -0.27   0.791    -.0450266    .0342937
       _cons |   27.97904   5.542384     5.05   0.000     17.09663    38.86146
------------------------------------------------------------------------------

. reg math12 cath10 `MV' [pw=att2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1189e+05)

Linear regression                                      Number of obs =   10502
                                                       F( 24,   673) =   47.27
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.2399
Number of clusters (sch_id) = 674                      Root MSE      =  11.785

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.603834   .6625604     2.42   0.016     .3028998    2.904768
    female12 |  -3.044004   .5488788    -5.55   0.000    -4.121725   -1.966283
     black12 |  -10.45904   1.068266    -9.79   0.000    -12.55657   -8.361502
      hisp12 |  -4.827466   .7162233    -6.74   0.000    -6.233767   -3.421165
     asian12 |  -1.800301   1.368759    -1.32   0.189    -4.487852    .8872501
     natam12 |   3.287924   4.281272     0.77   0.443    -5.118333    11.69418
 multirace12 |  -1.992581    1.12652    -1.77   0.077    -4.204498    .2193361
     urban10 |   .0314696   .6759545     0.05   0.963    -1.295764    1.358703
     rural10 |   5.635826   1.933279     2.92   0.004     1.839843     9.43181
     neast10 |  -.5856111   .9205589    -0.64   0.525    -2.393124    1.221902
     south10 |  -.2968426   .8735137    -0.34   0.734    -2.011982    1.418297
      west10 |  -.2589024   .8861383    -0.29   0.770    -1.998831    1.481026
      moed10 |   .6062846   .1433316     4.23   0.000     .3248537    .8877156
      faed10 |   .5783262   .1140995     5.07   0.000     .3542923    .8023601
      msei10 |   .0112804   .0213737     0.53   0.598    -.0306867    .0532475
      fsei10 |   .0646483      .0233     2.77   0.006     .0188988    .1103978
     lninc10 |  -3.208125   3.732761    -0.86   0.390    -10.53738    4.121132
      lninc2 |   .3056313   .5473474     0.56   0.577    -.7690827    1.380345
      lninc3 |  -.0019092   .0231064    -0.08   0.934    -.0472785    .0434601
        mf10 |   .3734298   .7389978     0.51   0.614    -1.077589    1.824448
  disability |  -12.47184   1.183173   -10.54   0.000      -14.795   -10.14869
everhbgra~10 |  -7.751599   1.024926    -7.56   0.000    -9.764036   -5.739163
repgrade10_4 |  -2.662778   3.597949    -0.74   0.460    -9.727334    4.401777
 yrpalvcom10 |  -.0055697   .0263488    -0.21   0.833    -.0573055    .0461661
       _cons |   36.90965   6.444458     5.73   0.000     24.25599    49.56331
------------------------------------------------------------------------------

. reg mathgain cath10 `MV' [pw=att2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1189e+05)

Linear regression                                      Number of obs =   10502
                                                       F( 24,   673) =    5.63
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0306
Number of clusters (sch_id) = 674                      Root MSE      =  6.1354

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.052474   .2908054     3.62   0.000     .4814785    1.623469
    female12 |  -.6317646   .2592065    -2.44   0.015    -1.140715   -.1228138
     black12 |  -.5267681   .3545465    -1.49   0.138    -1.222918    .1693822
      hisp12 |    .120816   .3630218     0.33   0.739    -.5919755    .8336075
     asian12 |  -.3712883   .5564207    -0.67   0.505    -1.463818     .721241
     natam12 |    -3.1545   1.894768    -1.66   0.096    -6.874868    .5658673
```

```
 multirace12 |   .2044244   .8147126     0.25   0.802     -1.39526    1.804109
     urban10 |   .0935973   .3123561     0.30   0.765    -.5197124     .706907
     rural10 |   3.741475   2.638735     1.42   0.157    -1.439669    8.922619
     neast10 |   .1527039   .3916988     0.39   0.697    -.6163947    .9218025
     south10 |   .2866854   .3438622     0.83   0.405    -.3884863    .9618571
      west10 |   .2248164    .424299     0.53   0.596    -.6082926    1.057925
      moed10 |  -.0274774   .0643364    -0.43   0.669    -.1538016    .0988467
      faed10 |   .1237494   .0620832     1.99   0.047     .0018492    .2456495
      msei10 |   .0068181   .0102694     0.66   0.507    -.0133458     .026982
      fsei10 |   .0141451   .0113026     1.25   0.211    -.0080475    .0363378
     lninc10 |  -3.794318    2.07658    -1.83   0.068    -7.871674    .2830373
      lninc2 |   .4803416   .3073302     1.56   0.119    -.1230998    1.083783
      lninc3 |  -.0173349   .0131245    -1.32   0.187    -.0431048     .008435
        mf10 |  -.5188769    .400468    -1.30   0.196    -1.305194    .2674401
  disability |   -1.93331   .4806392    -4.02   0.000    -2.877042   -.9895769
everhbgra~10 |  -1.240548   .5723264    -2.17   0.031    -2.364308   -.1167882
repgrade10_4 |   -1.62206   2.826617    -0.57   0.566    -7.172108    3.927988
 yrpalvcom10 |   .0133643    .016996     0.79   0.432    -.0200072    .0467359
       _cons |   10.23274   3.421597     2.99   0.003     3.514448    16.95103
------------------------------------------------------------------------------

. ***ATC Weights;
. reg math10 cath10 [pw=atc2bystuwt], cluster(sch_id);
(sum of wgt is   5.8410e+06)

Linear regression                                      Number of obs =   13943
                                                       F(  1,   674) =    4.33
                                                       Prob > F      =  0.0379
                                                       R-squared     =  0.0080
Number of clusters (sch_id) = 675                      Root MSE      =    13.5

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.437983   1.172039     2.08   0.038      .136697    4.739269
       _cons |   41.67916   .2981731   139.78   0.000      41.0937    42.26462
------------------------------------------------------------------------------

. reg math12 cath10 [pw=atc2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   6.1126e+06)

Linear regression                                      Number of obs =   10502
                                                       F(  1,   673) =    5.88
                                                       Prob > F      =  0.0156
                                                       R-squared     =  0.0126
Number of clusters (sch_id) = 674                      Root MSE      =  14.525

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   3.288096   1.356025     2.42   0.016     .6255475    5.950644
       _cons |   47.63957   .3320862   143.46   0.000     46.98752    48.29162
------------------------------------------------------------------------------

. reg mathgain cath10 [pw=atc2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   6.1126e+06)

Linear regression                                      Number of obs =   10502
                                                       F(  1,   673) =   29.09
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0237
Number of clusters (sch_id) = 674                      Root MSE      =  6.3361

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.974585   .3661132     5.39   0.000     1.255723    2.693446
       _cons |   4.655664   .0925708    50.29   0.000     4.473902    4.837426
```

```
------------------------------------------------------------------------------

. reg math10 cath10 `MV' [pw=atc2bystuwt], cluster(sch_id);
(sum of wgt is   5.8410e+06)

Linear regression                                      Number of obs =   13943
                                                       F( 24,   674) =  100.46
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3557
Number of clusters (sch_id) = 675                      Root MSE      =   10.89

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.415018   .5924647     4.08   0.000     1.251719    3.578316
    female12 |  -2.225599   .3951916    -5.63   0.000    -3.001553   -1.449644
     black12 |  -10.04813   1.093282    -9.19   0.000    -12.19478    -7.90148
      hisp12 |  -5.395928   .4954258   -10.89   0.000    -6.368692   -4.423165
     asian12 |   2.972783   1.478955     2.01   0.045     .0688693    5.876697
     natam12 |  -3.994024   1.307314    -3.06   0.002    -6.560921   -1.427126
 multirace12 |  -1.245854   1.600014    -0.78   0.436    -4.387466    1.895757
     urban10 |  -1.215842   .6894493    -1.76   0.078    -2.569569     .137885
     rural10 |  -.0235675   .4326672    -0.05   0.957    -.8731051    .8259701
     neast10 |   1.099939   .7345912     1.50   0.135    -.3424237    2.542301
     south10 |  -.4191336   .7913746    -0.53   0.597     -1.97299    1.134723
      west10 |  -.5109059   .6261598    -0.82   0.415    -1.740364    .7185526
      moed10 |   .6710152   .1274348     5.27   0.000     .4207982    .9212322
      faed10 |   .4747156   .0888255     5.34   0.000     .3003078    .6491235
      msei10 |   .0198583   .0260822     0.76   0.447    -.0313538    .0710703
      fsei10 |   .0226372   .0225751     1.00   0.316    -.0216887    .0669631
     lninc10 |   5.627679   2.720662     2.07   0.039     .2856855    10.96967
      lninc2 |  -.8898261   .4001363    -2.22   0.026     -1.67549   -.1041626
      lninc3 |   .0434254   .0168392     2.58   0.010     .0103617    .0764891
        mf10 |   1.338717   .4229674     3.17   0.002     .5082253     2.16921
  disability |  -10.78542   1.088385    -9.91   0.000    -12.92245   -8.648385
everhbgra~10 |  -6.663629   1.041532    -6.40   0.000    -8.708668   -4.618591
repgrade10_4 |   5.716332   2.925804     1.95   0.051    -.0284542    11.46112
 yrpalvcom10 |  -.0133813   .0245217    -0.55   0.585    -.0615294    .0347669
       _cons |   17.76622   4.304702     4.13   0.000     9.313985    26.21846
------------------------------------------------------------------------------

. reg math12 cath10 `MV' [pw=atc2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   6.1126e+06)

Linear regression                                      Number of obs =   10502
                                                       F( 24,   673) =   93.10
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3598
Number of clusters (sch_id) = 674                      Root MSE      =  11.709

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   4.012308   .7141464     5.62   0.000     2.610085    5.414531
    female12 |  -3.160708   .6035639    -5.24   0.000    -4.345803   -1.975613
     black12 |  -9.207465   1.412657    -6.52   0.000    -11.98121    -6.43372
      hisp12 |  -4.670109   .6749944    -6.92   0.000    -5.995457   -3.344761
     asian12 |   4.369471   2.120482     2.06   0.040     .2059144    8.533027
     natam12 |   -6.72774   2.002803    -3.36   0.001    -10.66023   -2.795246
 multirace12 |   .3937015   1.888599     0.21   0.835    -3.314553    4.101956
     urban10 |   -1.21742   .7953359    -1.53   0.126    -2.779058    .3442183
     rural10 |    .336877   .8073239     0.42   0.677      -1.2483    1.922054
     neast10 |   .8941994   .9918933     0.90   0.368    -1.053378    2.841777
     south10 |  -.2061531   .9269349    -0.22   0.824    -2.026185    1.613879
      west10 |  -.2576304   .7871412    -0.33   0.744    -1.803178    1.287918
      moed10 |   .4099106   .1679207     2.44   0.015     .0801992     .739622
      faed10 |   .6093011   .1401036     4.35   0.000     .3342084    .8843939
      msei10 |   .0576438    .037602     1.53   0.126    -.0161875    .1314751
      fsei10 |   .0347498   .0270423     1.29   0.199    -.0183476    .0878473
```

```
     lninc10 |   6.785245   3.842934     1.77   0.078    -.7603373    14.33083
      lninc2 |  -1.028058    .563189    -1.83   0.068    -2.133877    .0777608
      lninc3 |   .0497602   .0236599     2.10   0.036     .0033042    .0962162
        mf10 |   .9361052   .5870457     1.59   0.111    -.2165562    2.088767
  disability |  -10.46623   1.869562    -5.60   0.000     -14.1371   -6.795352
everhbgra~10 |   -9.86372    .900737   -10.95   0.000    -11.63231   -8.095127
repgrade10_4 |    2.98798   2.132978     1.40   0.162    -1.200111    7.176071
 yrpalvcom10 |   -.009794   .0287344    -0.34   0.733    -.0662138    .0466257
       _cons |    19.0273   6.347008     3.00   0.003      6.56498    31.48962
------------------------------------------------------------------------------

. reg mathgain cath10 `MV' [pw=atc2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   6.1126e+06)

Linear regression                                      Number of obs =   10502
                                                       F( 24,   673) =    7.68
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0488
Number of clusters (sch_id) = 674                      Root MSE      =  6.2608

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.060266   .4527844     4.55   0.000     1.171226    2.949306
    female12 |   -.787115   .3129428    -2.52   0.012    -1.401577   -.1726534
     black12 |    .276361   .4773677     0.58   0.563    -.6609482     1.21367
      hisp12 |   .0367391   .3752809     0.10   0.922     -.700123    .7736013
     asian12 |    .726505    .683363     1.06   0.288     -.615275    2.068285
     natam12 |   .1785437   1.055752     0.17   0.866     -1.89442    2.251508
 multirace12 |   .6792551   .6689816     1.02   0.310    -.6342869    1.992797
     urban10 |  -.0752239   .3264416    -0.23   0.818    -.7161904    .5657427
     rural10 |   .4993573   .9592897     0.52   0.603    -1.384203    2.382918
     neast10 |   .0364008   .5638388     0.06   0.949    -1.070694    1.143496
     south10 |   .1835517   .3419823     0.54   0.592     -.487929    .8550323
      west10 |  -.1071302   .4572685    -0.23   0.815    -1.004975    .7907143
      moed10 |   -.119852   .0855773    -1.40   0.162    -.2878827    .0481787
      faed10 |   .1384367   .0767218     1.80   0.072    -.0122063    .2890796
      msei10 |    .015038   .0154039     0.98   0.329    -.0152074    .0452834
      fsei10 |   .0111027    .013486     0.82   0.411     -.015377    .0375823
     lninc10 |   -.552248   2.102791    -0.26   0.793    -4.681068    3.576572
      lninc2 |   .0894385   .3183945     0.28   0.779    -.5357275    .7146046
      lninc3 |  -.0029045   .0137406    -0.21   0.833    -.0298841    .0240751
        mf10 |  -.4137108   .2905301    -1.42   0.155    -.9841652    .1567436
  disability |   .1051483   1.115045     0.09   0.925    -2.084237    2.294533
everhbgra~10 |  -2.353189   .5518054    -4.26   0.000    -3.436656   -1.269721
repgrade10_4 |    1.12431   1.323922     0.85   0.396    -1.475204    3.723824
 yrpalvcom10 |   .0120974   .0154198     0.78   0.433    -.0181793    .0423741
       _cons |   3.041225   2.960387     1.03   0.305     -2.77148     8.85393
------------------------------------------------------------------------------
```

Diagnostic Routine Step 9: Assess the stability of the preliminary diagnosis to alternative decisions about overlap and supplemental parametric adjustment

First, re-estimate regression models on the common support:

```
> /* Table 4: Common support */
> sum p2 [aweight=bystuwt];
. sum p2 [aweight=bystuwt] if public10;

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
          p2 |   12025  3167513.33     .037989   .0631177   1.18e-25   .7375239

. sum p2 [aweight=bystuwt] if cath10;

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
```

```
          p2 |    1918  145906.045    .1752875   .1592805   .0011518    .892192

. gen common=1;

.  replace common=0 if p2<=.00114911;
(2739 real changes made)

.  replace common=0 if p2>.737524;
(6 real changes made)

. ***No Weight;
. reg math10 cath10 [pw=bystuwt] if common, cluster(sch_id);
(sum of wgt is   2.6600e+06)

Linear regression                                       Number of obs =   11198
                                                        F(  1,   560) =  104.36
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.0129
Number of clusters (sch_id) = 561                       Root MSE      =  13.949

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |    7.00867   .6860858    10.22   0.000     5.661054    8.356286
       _cons |   41.93265   .3495221   119.97   0.000     41.24611    42.61918
------------------------------------------------------------------------------

. reg math12 cath10 [pw=byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   2.6724e+06)

Linear regression                                       Number of obs =    8469
                                                        F(  1,   559) =  108.43
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.0160
Number of clusters (sch_id) = 560                       Root MSE      =  14.908

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   7.973346   .7657122    10.41   0.000     6.469321    9.477371
       _cons |   48.07589   .3858443   124.60   0.000       47.318    48.83377
------------------------------------------------------------------------------

. reg mathgain cath10 [pw=byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   2.6724e+06)

Linear regression                                       Number of obs =    8469
                                                        F(  1,   559) =   65.66
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.0048
Number of clusters (sch_id) = 560                       Root MSE      =  6.3943

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |    1.85916   .2294321     8.10   0.000     1.408505    2.309814
       _cons |   4.809745   .1015807    47.35   0.000     4.610218    5.009272
------------------------------------------------------------------------------

. reg math10 cath10 `MV' [pw=bystuwt] if common, cluster(sch_id);
(sum of wgt is   2.6600e+06)

Linear regression                                       Number of obs =   11198
                                                        F( 24,   560) =  151.68
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.3350
Number of clusters (sch_id) = 561                       Root MSE      =  11.461
```

```
------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.344504   .5237586     2.57   0.011     .3157326    2.373275
    female12 |  -2.144324   .2527563    -8.48   0.000     -2.64079   -1.647857
     black12 |   -9.69809   .4713215   -20.58   0.000    -10.62386   -8.772316
      hisp12 |  -6.348193   .4528474   -14.02   0.000     -7.23768   -5.458706
     asian12 |   1.863579   .8543003     2.18   0.030     .1855548    3.541604
     natam12 |  -2.180906   2.210146    -0.99   0.324    -6.522096    2.160283
 multirace12 |  -3.709695   .7343964    -5.05   0.000    -5.152203   -2.267186
     urban10 |  -.7096586   .4324407    -1.64   0.101    -1.559063    .1397454
     rural10 |   1.197749   .8195431     1.46   0.144     -.412005    2.807503
     neast10 |   1.443231   .5869073     2.46   0.014      .290422    2.596039
     south10 |   1.060737   .4894836     2.17   0.031     .0992893    2.022186
      west10 |  -.6051486   .5754619    -1.05   0.293    -1.735476    .5251789
      moed10 |   .6202086   .0772699     8.03   0.000     .4684345    .7719828
      faed10 |   .5729115   .0674217     8.50   0.000     .4404811    .7053418
      msei10 |   .0406054   .0119733     3.39   0.001     .0170873    .0641236
      fsei10 |   .0517851   .0126469     4.09   0.000     .0269439    .0766263
     lninc10 |   -.302283   1.772707    -0.17   0.865     -3.78425    3.179685
      lninc2 |  -.0994162   .2580113    -0.39   0.700    -.6062043    .4073719
      lninc3 |   .0131141   .0111886     1.17   0.242    -.0088627    .0350909
        mf10 |   .2068126   .3212388     0.64   0.520    -.4241676    .8377927
  disability |  -10.39984   .5290653   -19.66   0.000    -11.43904   -9.360645
everhbgra~10 |  -7.205358     .44835   -16.07   0.000    -8.086011   -6.324705
repgrade10_4 |   .9401741   2.386169     0.39   0.694    -3.746761    5.627109
 yrpalvcom10 |   .0265013   .0157221     1.69   0.092    -.0043801    .0573828
       _cons |   24.99595   3.585976     6.97   0.000     17.95234    32.03955
------------------------------------------------------------------------------

. reg math12 cath10 `MV' [pw=byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   2.6724e+06)

Linear regression                                      Number of obs =    8469
                                                       F( 24,   559) =  132.85
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3411
Number of clusters (sch_id) = 560                      Root MSE      =  12.216

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.000224     .60403     3.31   0.001     .8137779     3.18667
    female12 |  -2.602428   .3217013    -8.09   0.000    -3.234319   -1.970537
     black12 |  -9.934421   .6349217   -15.65   0.000    -11.18154   -8.687297
      hisp12 |  -6.291447   .5645935   -11.14   0.000    -7.400431   -5.182463
     asian12 |   2.431313   .9893212     2.46   0.014     .4880721    4.374555
     natam12 |  -2.047301   2.885079    -0.71   0.478    -7.714221     3.61962
 multirace12 |   -3.09228    .859828    -3.60   0.000    -4.781168   -1.403391
     urban10 |  -.3830637   .5358652    -0.71   0.475    -1.435619    .6694916
     rural10 |   .2748259   .8971203     0.31   0.759    -1.487313    2.036965
     neast10 |   1.666764    .709541     2.35   0.019     .2730718    3.060457
     south10 |   1.065661   .5842777     1.82   0.069    -.0819873    2.213309
      west10 |   .1906281   .6402623     0.30   0.766    -1.066986    1.448242
      moed10 |   .6637717   .0940326     7.06   0.000     .4790712    .8484722
      faed10 |   .6398877   .0852626     7.50   0.000     .4724135    .8073619
      msei10 |   .0210005   .0142993     1.47   0.142    -.0070865    .0490875
      fsei10 |    .057462   .0159931     3.59   0.000     .0260481    .0888758
     lninc10 |  -.0114566   2.557528    -0.00   0.996    -5.034997    5.012084
      lninc2 |  -.2044376   .3606995    -0.57   0.571    -.9129296    .5040545
      lninc3 |   .0207648   .0152482     1.36   0.174    -.0091859    .0507155
        mf10 |   .4017058   .4183535     0.96   0.337    -.4200312    1.223443
  disability |  -12.34373   .6586321   -18.74   0.000    -13.63743   -11.05004
everhbgra~10 |  -8.066189   .5851948   -13.78   0.000    -9.215639    -6.91674
repgrade10_4 |  -3.356174   5.502205    -0.61   0.542     -14.1637     7.45135
 yrpalvcom10 |   .0323643   .0206286     1.57   0.117    -.0081548    .0728835
       _cons |   29.31254   5.298273     5.53   0.000     18.90558    39.71949
------------------------------------------------------------------------------
```

```
. reg mathgain cath10 `MV' [pw=byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   2.6724e+06)

Linear regression                                       Number of obs =    8469
                                                        F( 24,   559) =    7.72
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.0248
Number of clusters (sch_id) = 560                       Root MSE      =  6.3383

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |    1.24226   .2610168     4.76   0.000     .7295668    1.754954
    female12 |  -.3180714   .1636765    -1.94   0.052    -.6395675    .0034247
     black12 |  -.0261234    .269422    -0.10   0.923    -.5553265    .5030798
      hisp12 |  -.0322675   .2849805    -0.11   0.910    -.5920311    .5274961
     asian12 |   .7248979   .4155209     1.74   0.082    -.0912753    1.541071
     natam12 |    1.23893   1.884069     0.66   0.511    -2.461789     4.93965
 multirace12 |   .6295799   .4507694     1.40   0.163     -.255829    1.514989
     urban10 |   .0676325   .2146176     0.32   0.753     -.353923    .4891879
     rural10 |  -.5893177   .4096938    -1.44   0.151    -1.394045    .2154097
     neast10 |    .439928   .2923143     1.50   0.133    -.1342406    1.014097
     south10 |   .0885239   .2513994     0.35   0.725     -.405279    .5823268
      west10 |   .3966736    .286351     1.39   0.167    -.1657819    .9591291
      moed10 |   .0227755   .0463073     0.49   0.623    -.0681822    .1137331
      faed10 |   .1226553    .041044     2.99   0.003     .0420361    .2032745
      msei10 |   .0018747   .0072029     0.26   0.795    -.0122734    .0160229
      fsei10 |   .0076661   .0083722     0.92   0.360    -.0087788     .024111
     lninc10 |  -1.181263   1.478009    -0.80   0.424    -4.084394    1.721867
      lninc2 |   .1189771   .2231192     0.53   0.594    -.3192774    .5572317
      lninc3 |  -.0027935   .0096765    -0.29   0.773    -.0218004    .0162133
        mf10 |   .1801334   .2251139     0.80   0.424    -.2620392    .6223059
  disability |  -1.486746   .3456746    -4.30   0.000    -2.165726    -.807766
everhbgra~10 |  -.8280797   .3404489    -2.43   0.015    -1.496795   -.1593641
repgrade10_4 |  -1.914603    4.20516    -0.46   0.649    -10.17445    6.345243
 yrpalvcom10 |   .0024573   .0110935     0.22   0.825    -.0193327    .0242473
       _cons |   4.748051   2.347048     2.02   0.044     .1379391    9.358163
------------------------------------------------------------------------------

. ***ATT Weight;
. reg math10 cath10 [pw=att2bystuwt] if common, cluster(sch_id);
(sum of wgt is   2.9048e+05)

Linear regression                                       Number of obs =   11198
                                                        F(  1,   560) =    1.76
                                                        Prob > F      =  0.1855
                                                        R-squared     =  0.0016
Number of clusters (sch_id) = 561                       Root MSE      =  12.823

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.021769   .7707391     1.33   0.185    -.4921237    2.535662
       _cons |   47.91955   .4954702    96.72   0.000     46.94634    48.89276
------------------------------------------------------------------------------

. reg math12 cath10 [pw=att2byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1110e+05)

Linear regression                                       Number of obs =    8469
                                                        F(  1,   559) =    2.38
                                                        Prob > F      =  0.1234
                                                        R-squared     =  0.0026
Number of clusters (sch_id) = 560                       Root MSE      =   13.49

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
      cath10 |   1.378783   .8936523     1.54   0.123    -.3765443     3.13411
       _cons |   54.67045   .6009785    90.97   0.000        53.49     55.8509
------------------------------------------------------------------------------

. reg mathgain cath10 [pw=att2byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1110e+05)

Linear regression                                       Number of obs =    8469
                                                        F(  1,   559) =   10.70
                                                        Prob > F      =  0.0011
                                                        R-squared     =  0.0068
Number of clusters (sch_id) = 560                       Root MSE      =  6.2102

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.025255   .3133659     3.27   0.001     .4097363    1.640773
       _cons |    5.64365   .2363847    23.87   0.000     5.179339    6.107961
------------------------------------------------------------------------------

. reg math10 cath10 `MV' [pw=att2bystuwt] if common, cluster(sch_id);
(sum of wgt is   2.9048e+05)

Linear regression                                       Number of obs =   11198
                                                        F( 24,   560) =   48.50
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.2288
Number of clusters (sch_id) = 561                       Root MSE      =  11.282

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.054423   .5549615     1.90   0.058    -.0356371    2.144484
    female12 |  -2.449522   .4494152    -5.45   0.000    -3.332268   -1.566777
     black12 |  -10.32429   .9668327   -10.68   0.000    -12.22336   -8.425233
      hisp12 |  -5.824076   .6173656    -9.43   0.000    -7.036711    -4.61144
     asian12 |   -1.43012   1.297742    -1.10   0.271    -3.979157    1.118917
     natam12 |   .0414847   2.614935     0.02   0.987    -5.094794    5.177764
 multirace12 |  -3.338759   1.028828    -3.25   0.001    -5.359593   -1.317925
     urban10 |   -.371798   .5596752    -0.66   0.507    -1.471117    .7275211
     rural10 |   2.626396   .9379169     2.80   0.005     .7841304    4.468661
     neast10 |  -.2485549   .7531699    -0.33   0.742    -1.727938    1.230828
     south10 |    .037667   .7535267     0.05   0.960    -1.442417    1.517751
      west10 |  -.3452999   .7918634    -0.44   0.663    -1.900685    1.210085
      moed10 |   .6250809   .1201661     5.20   0.000     .3890494    .8611123
      faed10 |    .513198   .1001095     5.13   0.000     .3165621    .7098339
      msei10 |   .0115358   .0170737     0.68   0.500    -.0220004     .045072
      fsei10 |   .0644546   .0193894     3.32   0.001     .0263697    .1025395
     lninc10 |  -2.128814   3.233801    -0.66   0.511    -8.480675    4.223048
      lninc2 |   .3193171   .4841357     0.66   0.510    -.6316267    1.270261
      lninc3 |  -.0082793   .0207048    -0.40   0.689    -.0489478    .0323893
        mf10 |   .9373251   .5563522     1.68   0.093     -.155467    2.030117
  disability |  -10.91867   1.022217   -10.68   0.000    -12.92652   -8.910824
everhbgra~10 |  -6.950825   .8515701    -8.16   0.000    -8.623487   -5.278163
repgrade10_4 |   1.398222   2.145009     0.65   0.515    -2.815025    5.611469
 yrpalvcom10 |  -.0054732   .0204161    -0.27   0.789    -.0455746    .0346282
       _cons |   25.70718    5.27518     4.87   0.000     15.34562    36.06874
------------------------------------------------------------------------------

. reg math12 cath10 `MV' [pw=att2byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1110e+05)

Linear regression                                       Number of obs =    8469
                                                        F( 24,   559) =   46.97
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.2398
Number of clusters (sch_id) = 560                       Root MSE      =  11.794

------------------------------------------------------------------------------
```

```
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.585427   .6626406     2.39   0.017     .2838568    2.886996
    female12 |  -3.064574   .5500472    -5.57   0.000    -4.144986   -1.984162
     black12 |  -10.43168   1.067739    -9.77   0.000    -12.52895   -8.334406
      hisp12 |  -4.814921   .7166315    -6.72   0.000     -6.22254   -3.407301
     asian12 |  -1.774612   1.369856    -1.30   0.196    -4.465306    .9160821
     natam12 |  -3.388451   4.609214    -0.74   0.463    -12.44195    5.665045
 multirace12 |  -1.976012   1.127744    -1.75   0.080    -4.191146    .2391208
     urban10 |   .0190677   .6785989     0.03   0.978    -1.313848    1.351983
     rural10 |   5.629005   1.939762     2.90   0.004     1.818893    9.439118
     neast10 |  -.5939659   .9226404    -0.64   0.520    -2.406232      1.2183
     south10 |  -.2951564   .8744549    -0.34   0.736    -2.012775    1.422463
      west10 |  -.2913237   .8880082    -0.33   0.743    -2.035564    1.452917
      moed10 |   .6043087   .1434846     4.21   0.000     .3224737    .8861436
      faed10 |   .5802958   .1133205     5.12   0.000     .3577097    .8028819
      msei10 |   .0116912   .0213698     0.55   0.585    -.0302838    .0536662
      fsei10 |   .0650101   .0232409     2.80   0.005     .0193599    .1106603
     lninc10 |   -2.04673   3.719574    -0.55   0.582    -9.352779    5.259319
      lninc2 |   .1905027   .5450814     0.35   0.727    -.8801552    1.261161
      lninc3 |   .0018036   .0230225     0.08   0.938    -.0434176    .0470247
        mf10 |   .4077593   .7399407     0.55   0.582    -1.045645    1.861163
  disability |  -12.45616   1.18476   -10.51   0.000    -14.78329   -10.12904
everhbgra~10 |  -7.716937   1.027994    -7.51   0.000    -9.736141   -5.697734
repgrade10_4 |  -2.699806    3.60525    -0.75   0.454    -9.781298    4.381686
 yrpalvcom10 |   -.004411   .0266116    -0.17   0.868     -.056682    .0478599
       _cons |    33.0703   6.438245     5.14   0.000     20.42419    45.71641
------------------------------------------------------------------------------

. reg mathgain cath10 `MV' [pw=att2byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1110e+05)

Linear regression                                      Number of obs =    8469
                                                       F( 24,   559) =    5.77
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0310
Number of clusters (sch_id) = 560                      Root MSE      =  6.1422

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.061549    .290051     3.66   0.000     .4918263    1.631272
    female12 |  -.6317657   .2597168    -2.43   0.015    -1.141906   -.1216256
     black12 |  -.5269287   .3547866    -1.49   0.138    -1.223807    .1699492
      hisp12 |   .1210535   .3627761     0.33   0.739    -.5915173    .8336243
     asian12 |  -.3758055   .5568723    -0.67   0.500    -1.469623    .7180124
     natam12 |  -3.850644   3.011771    -1.28   0.202    -9.766415    2.065127
 multirace12 |   .2017215   .8151161     0.25   0.805    -1.399343    1.802786
     urban10 |   .1067417    .312873     0.34   0.733    -.5078087    .7212921
     rural10 |   3.733008   2.639015     1.41   0.158     -1.45059    8.916606
     neast10 |   .1685338   .3919433     0.43   0.667    -.6013279    .9383954
     south10 |   .2834762   .3440466     0.82   0.410    -.3923059    .9592583
      west10 |   .2207873   .4252865     0.52   0.604    -.6145676    1.056142
      moed10 |   -.028428   .0645413    -0.44   0.660    -.1552012    .0983451
      faed10 |   .1270255   .0620818     2.05   0.041     .0050834    .2489676
      msei10 |   .0069836    .010294     0.68   0.498    -.0132362    .0272033
      fsei10 |   .0138754   .0112952     1.23   0.220    -.0083108    .0360617
     lninc10 |  -3.559809   2.101618    -1.69   0.091    -7.687841    .5682236
      lninc2 |   .4497893   .3086189     1.46   0.146    -.1564051    1.055984
      lninc3 |  -.0161075   .0131372    -1.23   0.221    -.0419118    .0096969
        mf10 |   -.514445   .4023528    -1.28   0.202    -1.304753    .2758631
  disability |  -1.935398    .481593    -4.02   0.000    -2.881351   -.9894449
everhbgra~10 |  -1.242626   .5744585    -2.16   0.031    -2.370987   -.1142653
repgrade10_4 |  -1.617723   2.835804    -0.57   0.569    -7.187857    3.952411
 yrpalvcom10 |   .0145645   .0170851     0.85   0.394    -.0189944    .0481233
       _cons |    9.64844   3.591735     2.69   0.007     2.593494    16.70339
------------------------------------------------------------------------------

. ***ATC Weight;
```

```
. reg math10 cath10 [pw=atc2bystuwt] if common, cluster(sch_id);
(sum of wgt is   5.1880e+06)

Linear regression                                       Number of obs =   11198
                                                        F(  1,   560) =    3.39
                                                        Prob > F      =  0.0662
                                                        R-squared     =  0.0065
Number of clusters (sch_id) = 561                       Root MSE      =  13.479

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.183446   1.186343     1.84   0.066    -.1467787    4.513672
       _cons |   41.93265   .3495221   119.97   0.000     41.24611    42.61918
------------------------------------------------------------------------------

. reg math12 cath10 [pw=atc2byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   5.4607e+06)

Linear regression                                       Number of obs =    8469
                                                        F(  1,   559) =    4.33
                                                        Prob > F      =  0.0379
                                                        R-squared     =  0.0096
Number of clusters (sch_id) = 560                       Root MSE      =  14.454

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.851048   1.370421     2.08   0.038     .1592447    5.542851
       _cons |   48.07589   .3858443   124.60   0.000       47.318    48.83377
------------------------------------------------------------------------------

. reg mathgain cath10 [pw=atc2byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   5.4607e+06)

Linear regression                                       Number of obs =    8469
                                                        F(  1,   559) =   24.40
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.0204
Number of clusters (sch_id) = 560                       Root MSE      =  6.2851

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.820622   .3685729     4.94   0.000     1.096665    2.544579
       _cons |   4.809745   .1015807    47.35   0.000     4.610218    5.009272
------------------------------------------------------------------------------

. reg math10 cath10 `MV' [pw=atc2bystuwt] if common, cluster(sch_id);
(sum of wgt is   5.1880e+06)

Linear regression                                       Number of obs =   11198
                                                        F( 24,   560) =   79.67
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.3574
Number of clusters (sch_id) = 561                       Root MSE      =  10.851

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.445555   .5859326     4.17   0.000     1.294661     3.59645
    female12 |  -2.231759   .4441325    -5.02   0.000    -3.104128    -1.35939
     black12 |  -10.25362   1.197991    -8.56   0.000    -12.60672   -7.900512
      hisp12 |  -5.404815   .5438676    -9.94   0.000    -6.473085   -4.336546
     asian12 |   2.984797   1.576474     1.89   0.059    -.1117282    6.081322
     natam12 |  -1.844618   .9197469    -2.01   0.045    -3.651194   -.0380431
 multirace12 |  -1.256183   1.741379    -0.72   0.471    -4.676616     2.16425
```

```
     urban10 |  -1.191697   .6968657    -1.71   0.088    -2.560487    .1770932
     rural10 |   .2355019   .8595012     0.27   0.784    -1.452738    1.923742
     neast10 |   1.009156   .8438382     1.20   0.232    -.6483185    2.666631
     south10 |  -.4956278   .9190392    -0.54   0.590    -2.300813    1.309557
      west10 |  -.6754102   .6925833    -0.98   0.330    -2.035789    .6849683
      moed10 |   .7009571   .1426387     4.91   0.000     .4207849    .9811293
      faed10 |   .4625917   .0967027     4.78   0.000     .2726474    .6525359
      msei10 |   .0193309   .0286154     0.68   0.500    -.0368759    .0755376
      fsei10 |   .0207753   .0244578     0.85   0.396     -.027265    .0688156
     lninc10 |   6.220823   3.195038     1.95   0.052    -.0548998    12.49655
      lninc2 |  -.9312795   .4719032    -1.97   0.049    -1.858196    -.004363
      lninc3 |   .0440952   .0198545     2.22   0.027     .0050967    .0830936
        mf10 |   1.537357   .4620762     3.33   0.001     .6297422    2.444971
  disability |  -11.10626   1.276159    -8.70   0.000     -13.6129   -8.599614
everhbgra~10 |  -6.772909   1.202639    -5.63   0.000    -9.135143   -4.410675
repgrade10_4 |   8.212208   4.264232     1.93   0.055    -.1636359    16.58805
 yrpalvcom10 |  -.0119255   .0290762    -0.41   0.682    -.0690372    .0451863
       _cons |    15.1635   4.870387     3.11   0.002     5.597036    24.72996
------------------------------------------------------------------------------

. reg math12 cath10 `MV' [pw=atc2byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   5.4607e+06)

Linear regression                                       Number of obs =    8469
                                                        F( 24,   559) =   73.22
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.3592
Number of clusters (sch_id) = 560                       Root MSE      =  11.642

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   3.978418   .6690501     5.95   0.000     2.664259    5.292578
    female12 |  -3.150107   .6654904    -4.73   0.000    -4.457275    -1.84294
     black12 |  -9.206876   1.521621    -6.05   0.000    -12.19567   -6.218082
      hisp12 |  -4.479242    .731256    -6.13   0.000    -5.915588   -3.042897
     asian12 |   4.525539   2.193591     2.06   0.040     .2168506    8.834227
     natam12 |  -2.273644   3.058036    -0.74   0.457    -8.280289    3.733001
 multirace12 |   .7512683   2.052828     0.37   0.715    -3.280931    4.783468
     urban10 |  -1.273505   .8014216    -1.59   0.113     -2.84767    .3006611
     rural10 |   3.426057   2.023951     1.69   0.091     -.549422    7.401537
     neast10 |   .3784394   1.057384     0.36   0.721    -1.698493    2.455371
     south10 |  -.1833792   1.044592    -0.18   0.861    -2.235184    1.868426
      west10 |  -.4663924    .865929    -0.54   0.590    -2.167265     1.23448
      moed10 |   .4050338   .1852775     2.19   0.029     .0411085     .768959
      faed10 |   .5890541   .1457458     4.04   0.000     .3027778    .8753304
      msei10 |   .0576944   .0400293     1.44   0.150    -.0209319    .1363207
      fsei10 |   .0343174    .029242     1.17   0.241    -.0231203    .0917552
     lninc10 |   6.262201   4.522092     1.38   0.167    -2.620168    15.14457
      lninc2 |   -.956068   .6623194    -1.44   0.149    -2.257007    .3448709
      lninc3 |    .046794   .0277574     1.69   0.092    -.0077276    .1013155
        mf10 |   .9833159     .64265     1.53   0.127    -.2789881     2.24562
  disability |  -10.34056   2.139571    -4.83   0.000    -14.54314   -6.137977
everhbgra~10 |  -10.20832   .9529977   -10.71   0.000    -12.08021   -8.336423
repgrade10_4 |  -3.725125   4.960574    -0.75   0.453    -13.46877    6.018519
 yrpalvcom10 |   .0002703   .0329767     0.01   0.993    -.0645031    .0650436
       _cons |    20.3688   7.400909     2.75   0.006     5.831806    34.90579
------------------------------------------------------------------------------

. reg mathgain cath10 `MV' [pw=atc2byodd2wt] if common & f1schstat==1, cluster(sch_id);
(sum of wgt is   5.4607e+06)

Linear regression                                       Number of obs =    8469
                                                        F( 24,   559) =    6.87
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.0571
Number of clusters (sch_id) = 560                       Root MSE      =  6.1747

------------------------------------------------------------------------------
             |               Robust
```

```
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.954365    .345462     5.66   0.000     1.275803    2.632928
    female12 |  -.7484621   .3286869    -2.28   0.023    -1.394074   -.1028497
     black12 |   .3496387    .498489     0.70   0.483    -.6295018    1.328779
      hisp12 |   .1517951   .3921242     0.39   0.699    -.6184218    .9220121
     asian12 |    .848301   .6765118     1.25   0.210    -.4805149    2.177117
     natam12 |   1.023978   1.889982     0.54   0.588    -2.688356    4.736312
 multirace12 |   .7912154   .7132027     1.11   0.268    -.6096692      2.1921
     urban10 |  -.1630467   .3217554    -0.51   0.613     -.795044    .4689506
     rural10 |   4.041598   2.809164     1.44   0.151     -1.47621    9.559406
     neast10 |  -.4786851   .3965221    -1.21   0.228     -1.25754    .3001703
     south10 |   .2856387   .3719696     0.77   0.443    -.4449902    1.016268
      west10 |  -.1690004   .4912051    -0.34   0.731    -1.133834    .7958329
      moed10 |   -.137624   .0938301    -1.47   0.143    -.3219266    .0466786
      faed10 |   .1159075   .0736031     1.57   0.116    -.0286649    .2604799
      msei10 |   .0134508   .0162163     0.83   0.407    -.0184016    .0453032
      fsei10 |    .015597   .0145862     1.07   0.285    -.0130534    .0442474
     lninc10 |  -1.154614   2.400485    -0.48   0.631    -5.869687     3.56046
      lninc2 |   .1553514   .3603008     0.43   0.667    -.5523575    .8630604
      lninc3 |  -.0050588   .0154068    -0.33   0.743    -.0353211    .0252034
        mf10 |  -.5277485   .3175217    -1.66   0.097     -1.15143    .0959329
  disability |   .3085758   1.251939     0.25   0.805    -2.150504    2.767655
everhbgra~10 |  -2.468054   .5804913    -4.25   0.000    -3.608264   -1.327843
repgrade10_4 |   -1.61216   3.667957    -0.44   0.660    -8.816823    5.592504
 yrpalvcom10 |   .0213801   .0175633     1.22   0.224    -.0131181    .0558784
       _cons |   5.084994   3.431544     1.48   0.139    -1.655303    11.82529
------------------------------------------------------------------------------
```

Second, reconsider the diagnosis after introducing additional adjustment variables:

```
. /* Table 5: Means and SD of Additional Predictor Variables */
. /* Additional Variables (see Step 9, Tables 5 & 6) */
> local AV "exp10 moexp10 faexp10 pavolunt";

> bysort cath10: sum `AV' [aw=bystuwt];

-------------------------------------------------------------------------------------------
-> cath10 = 0

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
       exp10 |   12025  3167513.33    16.47081   2.246644         10         20
     moexp10 |   12025  3167513.33    16.50117   2.235703         10         20
     faexp10 |   12025  3167513.33    16.41001   2.277468         10         20
  pavolunt10 |   12025  3167513.33    .2509358   .3931455          0          1

-------------------------------------------------------------------------------------------
-> cath10 = 1

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
       exp10 |    1918  145906.045    17.42909   1.774061         10         20
     moexp10 |    1918  145906.045    17.15981   1.809058         10         20
     faexp10 |    1918  145906.045    17.15101   1.858533         10         20
  pavolunt10 |    1918  145906.045    .5176203   .4675812          0          1


. bysort cath10: sum `AV' [aw=att2bystuwt];

-------------------------------------------------------------------------------------------
-> cath10 = 0

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
       exp10 |   12025  145277.392    17.05489   2.005767         10         20
     moexp10 |   12025  145277.392    17.01062   1.950132         10         20
     faexp10 |   12025  145277.392    16.99406   1.963459         10         20
  pavolunt10 |   12025  145277.392    .3094394    .425047          0          1
```

```
-------------------------------------------------------------------------------------------
-> cath10 = 1

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
       exp10 |    1918  145906.045    17.42909   1.774061         10         20
     moexp10 |    1918  145906.045    17.15981   1.809058         10         20
     faexp10 |    1918  145906.045    17.15101   1.858533         10         20
  pavolunt10 |    1918  145906.045    .5176203   .4675812          0          1


. bysort cath10: sum `AV' [aw=atc2bystuwt];

-------------------------------------------------------------------------------------------
-> cath10 = 0

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
       exp10 |   12025  3167513.33    16.47081   2.246644         10         20
     moexp10 |   12025  3167513.33    16.50117   2.235703         10         20
     faexp10 |   12025  3167513.33    16.41001   2.277468         10         20
  pavolunt10 |   12025  3167513.33    .2509358   .3931455          0          1

-------------------------------------------------------------------------------------------
-> cath10 = 1

    Variable |     Obs      Weight        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------------------
       exp10 |    1918   2673503.2    17.26862   1.837964         10         20
     moexp10 |    1918   2673503.2    16.92641   2.137638         10         20
     faexp10 |    1918   2673503.2    16.68589   2.184571         10         20
  pavolunt10 |    1918   2673503.2    .4622317   .4461981          0          1


. /* Table 6: Model 3 */
> ***No Weight;
. reg math10 cath10 `MV' `AV' [pw=bystuwt], cluster(sch_id);
(sum of wgt is   3.3134e+06)

Linear regression                                      Number of obs =   13943
                                                       F( 28,   674) =  217.01
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3838
Number of clusters (sch_id) = 675                      Root MSE      =  10.981

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |     .79164   .5209225     1.52   0.129    -.2311862    1.814466
    female12 |  -3.235716   .2200883   -14.70   0.000    -3.667857   -2.803575
     black12 |  -9.499217   .4145489   -22.91   0.000    -10.31318   -8.685254
      hisp12 |  -6.218981   .4009248   -15.51   0.000    -7.006193    -5.43177
     asian12 |   .9356852   .7846721     1.19   0.234    -.6050105    2.476381
     natam12 |  -6.349434    1.07352    -5.91   0.000     -8.45728   -4.241588
 multirace12 |  -3.679569   .6516207    -5.65   0.000     -4.95902   -2.400119
     urban10 |   -1.06001   .4058451    -2.61   0.009    -1.856883   -.2631373
     rural10 |   .1669635    .397403     0.42   0.675    -.6133332    .9472603
     neast10 |   1.430656   .4975882     2.88   0.004     .4536465    2.407665
     south10 |   .4824966    .408806     1.18   0.238    -.3201899    1.285183
      west10 |  -.1826317   .5030904    -0.36   0.717    -1.170445    .8051812
      moed10 |   .4542956   .0668605     6.79   0.000     .3230156    .5855755
      faed10 |   .3817537   .0568072     6.72   0.000     .2702133    .4932941
      msei10 |   .0236873   .0103981     2.28   0.023     .0032708    .0441039
      fsei10 |    .045425   .0109072     4.16   0.000     .0240089    .0668412
     lninc10 |   .8066709   1.416717     0.57   0.569    -1.975039    3.588381
      lninc2 |  -.2770233   .2116509    -1.31   0.191    -.6925978    .1385511
      lninc3 |   .0200738   .0093161     2.15   0.032     .0017818    .0383658
        mf10 |   .1727771   .2857469     0.60   0.546    -.3882842    .7338383
  disability |  -8.449537   .3979403   -21.23   0.000    -9.230888   -7.668185
everhbgra~10 |   -5.77674   .3593135   -16.08   0.000    -6.482248   -5.071232
```

```
repgrade10_4 |    2.02974    1.50289     1.35   0.177    -.9211701     4.98065
 yrpalvcom10 |   .0163194   .0135111     1.21   0.228    -.0102096     .0428483
       exp10 |   1.296024   .0626952    20.67   0.000     1.172923    1.419126
     moexp10 |   .1957275    .081893     2.39   0.017     .0349314    .3565236
     faexp10 |   .1364274   .0789089     1.73   0.084    -.0185094    .2913641
  pavolunt10 |   .7179854    .274712     2.61   0.009     .1785911     1.25738
       _cons |   4.286969   2.830554     1.51   0.130    -1.270794    9.844733
------------------------------------------------------------------------------

. reg math12 cath10 `MV' `AV' [pw=byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.3249e+06)

Linear regression                                      Number of obs =   10502
                                                       F( 28,   673) =  214.04
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3941
Number of clusters (sch_id) = 674                      Root MSE      =  11.735

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.581428   .5993854     2.64   0.009     .4045381    2.758319
    female12 |  -3.817341   .2785732   -13.70   0.000    -4.364318   -3.270364
     black12 |  -9.854183   .5656618   -17.42   0.000    -10.96486   -8.743509
      hisp12 |   -6.15246   .5059089   -12.16   0.000     -7.14581   -5.159111
     asian12 |   1.658189   .8769994     1.89   0.059    -.0637947    3.380173
     natam12 |  -7.179055   2.029552    -3.54   0.000    -11.16407   -3.194039
 multirace12 |  -3.251757   .7781502    -4.18   0.000    -4.779652   -1.723863
     urban10 |  -.8073364   .4978531    -1.62   0.105    -1.784868    .1701957
     rural10 |  -.1966893   .4228584    -0.47   0.642     -1.02697    .6335912
     neast10 |   1.674016   .5974457     2.80   0.005     .5009343    2.847098
     south10 |     .53657   .4814645     1.11   0.265    -.4087831    1.481923
      west10 |   .4186652   .5567814     0.75   0.452    -.6745724    1.511903
      moed10 |   .4860069   .0817171     5.95   0.000     .3255558     .646458
      faed10 |   .4611352   .0731125     6.31   0.000     .3175792    .6046912
      msei10 |   .0111172    .012489     0.89   0.374    -.0134048    .0356393
      fsei10 |   .0556374   .0134225     4.15   0.000     .0292823    .0819925
     lninc10 |   2.967801   2.043525     1.45   0.147    -1.044649    6.980252
      lninc2 |  -.5807046   .3011135    -1.93   0.054    -1.171939    .0105303
      lninc3 |   .0342262   .0130155     2.63   0.009     .0086704    .0597821
        mf10 |   .5156598   .3670939     1.40   0.161    -.2051273    1.236447
  disability |  -10.53372   .5272948   -19.98   0.000    -11.56906    -9.49838
everhbgra~10 |  -6.696059   .4897538   -13.67   0.000    -7.657689    -5.73443
repgrade10_4 |   2.322826   1.781042     1.30   0.193    -1.174242    5.819894
 yrpalvcom10 |    .013076   .0183723     0.71   0.477    -.0229979    .0491498
       exp10 |   1.509463    .085309    17.69   0.000     1.341959    1.676966
     moexp10 |   .2716988     .10537     2.58   0.010     .0648053    .4785922
     faexp10 |   .0807479   .1086811     0.74   0.458     -.132647    .2941428
  pavolunt10 |   .3500803   .3331168     1.05   0.294    -.3039929    1.004153
       _cons |  -1.125319   3.879376    -0.29   0.772    -8.742455    6.491817
------------------------------------------------------------------------------

. reg mathgain cath10 `MV' `AV' [pw=byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.3249e+06)

Linear regression                                      Number of obs =   10502
                                                       F( 28,   673) =   10.22
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0308
Number of clusters (sch_id) = 674                      Root MSE      =  6.3869

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |    1.24454   .2607594     4.77   0.000     .7325399     1.75654
    female12 |  -.5690326   .1565064    -3.64   0.000    -.8763322    -.261733
     black12 |  -.0710474   .2426796    -0.29   0.770    -.5475475    .4054527
      hisp12 |  -.0519935   .2697117    -0.19   0.847     -.581571    .4775841
     asian12 |     .75595   .3980241     1.90   0.058    -.0255684    1.537468
```

```
     natam12 |   .2337148   1.116132     0.21   0.834    -1.957805    2.425234
 multirace12 |    .542592   .4059389     1.34   0.182    -.2544671    1.339651
     urban10 |   .0198074    .209996     0.09   0.925    -.3925187    .4321335
     rural10 |  -.3561847   .2358794    -1.51   0.132    -.8193328    .1069635
     neast10 |   .3650275   .2597875     1.41   0.160     -.145064     .875119
     south10 |   .0550348   .2224823     0.25   0.805     -.381808    .4918777
      west10 |   .3275557   .2676012     1.22   0.221     -.197878    .8529895
      moed10 |   .0110348   .0435676     0.25   0.800    -.0745099    .0965796
      faed10 |   .1079349   .0376442     2.87   0.004     .0340206    .1818491
      msei10 |   .0034685   .0066372     0.52   0.601    -.0095636    .0165006
      fsei10 |   .0039458   .0073626     0.54   0.592    -.0105107    .0184022
     lninc10 |   .1438026   1.217159     0.12   0.906    -2.246084    2.533689
      lninc2 |  -.0340246   .1841683    -0.18   0.853    -.3956381    .3275889
      lninc3 |   .0024787   .0080407     0.31   0.758    -.0133092    .0182666
        mf10 |   .2804585   .2018141     1.39   0.165    -.1158025    .6767195
  disability |   -1.34559   .2809941    -4.79   0.000    -1.897321   -.7938593
everhbgra~10 |  -.7512027   .2842092    -2.64   0.008    -1.309246   -.1931593
repgrade10_4 |     .73528   1.155041     0.64   0.525    -1.532637    3.003197
 yrpalvcom10 |  -.0025642   .0101633    -0.25   0.801    -.0225199    .0173915
       exp10 |   .2107485   .0461641     4.57   0.000     .1201056    .3013914
     moexp10 |   .0061852   .0550532     0.11   0.911    -.1019115    .1142819
     faexp10 |    .025676   .0539586     0.48   0.634    -.0802714    .1316234
  pavolunt10 |  -.2093234   .2033058    -1.03   0.304    -.6085133    .1898665
       _cons |  -1.780541      2.117    -0.84   0.401     -5.93726    2.376177
------------------------------------------------------------------------------

. ***ATT Weight;
. reg math10 cath10 `MV' `AV' [pw=att2bystuwt], cluster(sch_id);
(sum of wgt is   2.9118e+05)

Linear regression                               Number of obs =   13943
                                                F( 28,   674) =   55.31
                                                Prob > F      =  0.0000
                                                R-squared     =  0.2840
Number of clusters (sch_id) = 675               Root MSE      =  10.872

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   .2243814    .535982     0.42   0.676    -.8280139    1.276777
    female12 |  -3.176922   .4397007    -7.23   0.000     -4.04027   -2.313574
     black12 |  -10.50201   .9506204   -11.05   0.000    -12.36854   -8.635476
      hisp12 |  -5.508312   .6217244    -8.86   0.000    -6.729061   -4.287562
     asian12 |  -2.312293   1.270018    -1.82   0.069    -4.805962    .1813749
     natam12 |   1.708332   2.265854     0.75   0.451     -2.74065    6.157314
 multirace12 |  -3.813393   1.085011    -3.51   0.000      -5.9438   -1.682986
     urban10 |  -.4469627    .524946    -0.85   0.395    -1.477689    .5837635
     rural10 |   2.985779   .8066844     3.70   0.000     1.401862    4.569695
     neast10 |  -.1597848   .6888058    -0.23   0.817    -1.512248    1.192678
     south10 |  -.1630024   .7347205    -0.22   0.824    -1.605619    1.279614
      west10 |  -.0556537   .7807384    -0.07   0.943    -1.588626    1.477318
      moed10 |   .4529575   .1112374     4.07   0.000      .234544    .6713711
      faed10 |   .3559468    .095254     3.74   0.000     .1689166    .5429771
      msei10 |    .000783   .0157487     0.05   0.960    -.0301394    .0317055
      fsei10 |   .0518768   .0176646     2.94   0.003     .0171926    .0865609
     lninc10 |  -2.420712   2.994157    -0.81   0.419    -8.299709    3.458284
      lninc2 |   .3183046   .4514998     0.70   0.481    -.5682107     1.20482
      lninc3 |    -.00763   .0193633    -0.39   0.694    -.0456498    .0303897
        mf10 |   .6425477   .5264062     1.22   0.223    -.3910455    1.676141
  disability |  -9.677811   .9534649   -10.15   0.000    -11.54993   -7.805692
everhbgra~10 |  -5.806487   .8070003    -7.20   0.000    -7.391024    -4.22195
repgrade10_4 |   .7738162    2.55472     0.30   0.762    -4.242351    5.789984
 yrpalvcom10 |  -.0000504   .0200501    -0.00   0.998    -.0394186    .0393177
       exp10 |    1.44778   .1284362    11.27   0.000     1.195597    1.699963
     moexp10 |   .1363337   .1527762     0.89   0.373    -.1636408    .4363082
     faexp10 |   .1912858   .1496339     1.28   0.202    -.1025189    .4850904
  pavolunt10 |   1.273692   .4199343     3.03   0.003     .4491557    2.098229
       _cons |   4.060246   4.977773     0.82   0.415    -5.713561    13.83405
------------------------------------------------------------------------------
```

```
. reg math12 cath10 `MV' `AV' [pw=att2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1189e+05)

Linear regression                                       Number of obs =   10502
                                                        F( 28,   673) =   65.79
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.2918
Number of clusters (sch_id) = 674                       Root MSE      =  11.378

------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   .8233073   .6252815     1.32   0.188      -.40443    2.051045
    female12 |  -3.775797    .522599    -7.23   0.000    -4.801918   -2.749677
     black12 |  -10.65801     1.0488   -10.16   0.000    -12.71733   -8.598701
      hisp12 |  -4.503136   .7262394    -6.20   0.000    -5.929103   -3.077168
     asian12 |  -2.507584   1.324087    -1.89   0.059    -5.107422    .0922547
     natam12 |  -.5153996   2.813187    -0.18   0.855    -6.039079     5.00828
 multirace12 |  -2.362695   1.170136    -2.02   0.044    -4.660252   -.0651386
     urban10 |  -.1717758   .6284379    -0.27   0.785    -1.405711    1.062159
     rural10 |   6.233486   2.251369     2.77   0.006     1.812934    10.65404
     neast10 |  -.4743678   .8444666    -0.56   0.574    -2.132474    1.183738
     south10 |   -.470002   .8389305    -0.56   0.576    -2.117238    1.177234
      west10 |  -.0675837   .8543868    -0.08   0.937    -1.745168    1.610001
      moed10 |   .4316943   .1311624     3.29   0.001     .1741575    .6892311
      faed10 |   .4229846   .1090758     3.88   0.000     .2088147    .6371545
      msei10 |   .0050405   .0195133     0.26   0.796    -.0332737    .0433547
      fsei10 |   .0566605   .0212798     2.66   0.008     .0148776    .0984433
     lninc10 |  -3.785709   3.311348    -1.14   0.253    -10.28753    2.716106
      lninc2 |   .3956517   .4930495     0.80   0.423    -.5724485    1.363752
      lninc3 |  -.0062323    .020938    -0.30   0.766     -.047344    .0348795
        mf10 |   .0794259   .7003382     0.11   0.910    -1.295685    1.454537
  disability |  -11.20202   1.110572   -10.09   0.000    -13.38263   -9.021422
everhbgra~10 |  -6.801445   .9781034    -6.95   0.000    -8.721946   -4.880944
repgrade10_4 |   -2.75783   3.395861    -0.81   0.417    -9.425587    3.909926
 yrpalvcom10 |  -.0008351   .0270824    -0.03   0.975    -.0540112    .0523411
       exp10 |   1.567011   .1399144    11.20   0.000      1.29229    1.841732
     moexp10 |   .1823461   .1951133     0.93   0.350    -.2007579    .5654501
     faexp10 |   .0891166   .1879496     0.47   0.636    -.2799216    .4581547
  pavolunt10 |   1.529454   .5060241     3.02   0.003     .5358785     2.52303
       _cons |   12.29902   5.747507     2.14   0.033     1.013815    23.58422
------------------------------------------------------------------------------

. reg mathgain cath10 `MV' `AV' [pw=att2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   3.1189e+05)

Linear regression                                       Number of obs =   10502
                                                        F( 28,   673) =    5.33
                                                        Prob > F      =  0.0000
                                                        R-squared     =  0.0352
Number of clusters (sch_id) = 674                       Root MSE      =  6.1222

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |     .97705   .2887564     3.38   0.001     .4100781    1.544022
    female12 |  -.7349564   .2557991    -2.87   0.004    -1.237217    -.232696
     black12 |  -.5717414     .36206    -1.58   0.115    -1.282644    .1391617
      hisp12 |   .1467676   .3612633     0.41   0.685    -.5625712    .8561063
     asian12 |   -.482054   .5514275    -0.87   0.382    -1.564779    .6006713
     natam12 |  -3.669951   1.764369    -2.08   0.038    -7.134281   -.2056216
 multirace12 |   .1587222   .8185986     0.19   0.846    -1.448592    1.766036
     urban10 |   .0595412   .3114149     0.19   0.848    -.5519203    .6710028
     rural10 |   3.857017    2.70223     1.43   0.154    -1.448799    9.162833
     neast10 |   .1544608   .3932337     0.39   0.695    -.6176516    .9265733
     south10 |   .2754761   .3425488     0.80   0.422    -.3971169    .9480691
      west10 |   .2558487   .4258326     0.60   0.548    -.5802716    1.091969
      moed10 |  -.0538097   .0638424    -0.84   0.400     -.179164    .0715446
      faed10 |   .1084496   .0637273     1.70   0.089    -.0166787    .2335778
```

```
      msei10 |   .0063407   .0101937     0.62   0.534    -.0136746    .0263561
      fsei10 |   .0131875   .0111571     1.18   0.238    -.0087194    .0350943
     lninc10 |  -3.925139   2.038499    -1.93   0.055    -7.927722    .0774436
      lninc2 |   .4994007   .3021931     1.65   0.099     -.093954    1.092755
      lninc3 |  -.0181801   .0129226    -1.41   0.160    -.0435536    .0071933
        mf10 |  -.5456076   .3978504    -1.37   0.171    -1.326785    .2355698
  disability |  -1.746353   .4895396    -3.57   0.000    -2.707562   -.7851445
everhbgra~10 |  -1.129165   .5642157    -2.00   0.046    -2.236999   -.0213301
repgrade10_4 |  -1.616572    2.77114    -0.58   0.560    -7.057693    3.824549
 yrpalvcom10 |   .0145702   .0170879     0.85   0.394    -.0189818    .0481222
       exp10 |   .2275328   .0874908     2.60   0.010     .0557451    .3993205
     moexp10 |   .0455602   .0976347     0.47   0.641     -.146145    .2372654
     faexp10 |  -.0219909   .0954848    -0.23   0.818    -.2094749    .1654931
  pavolunt10 |   .0416609   .2783285     0.15   0.881    -.5048358    .5881577
       _cons |   6.926667    3.57507     1.94   0.053    -.0929658     13.9463
------------------------------------------------------------------------------

. ***ATC Weights;
. reg math10 cath10 `MV' `AV' [pw=atc2bystuwt], cluster(sch_id);
(sum of wgt is   5.8410e+06)

Linear regression                                      Number of obs =   13943
                                                       F( 28,   674) =  124.19
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.3933
Number of clusters (sch_id) = 675                      Root MSE      =  10.568

------------------------------------------------------------------------------
             |               Robust
      math10 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.256075   .6205188     2.02   0.043      .037693    2.474458
    female12 |   -3.19018    .405164    -7.87   0.000    -3.985715   -2.394645
     black12 |  -10.45051   1.071497    -9.75   0.000    -12.55438   -8.346636
      hisp12 |  -5.244824   .4593036   -11.42   0.000    -6.146662   -4.342986
     asian12 |    2.49714   1.699525     1.47   0.142    -.8398602    5.834139
     natam12 |  -4.946055   1.074064    -4.60   0.000    -7.054969   -2.837141
 multirace12 |  -1.619029   1.474597    -1.10   0.273    -4.514386    1.276327
     urban10 |  -1.162481   .6508453    -1.79   0.075    -2.440409     .115447
     rural10 |   .3034511   .4215036     0.72   0.472    -.5241669    1.131069
     neast10 |   1.081855   .7346498     1.47   0.141    -.3606229    2.524332
     south10 |  -.5991949   .7879675    -0.76   0.447    -2.146361    .9479714
      west10 |  -.3856777   .6243224    -0.62   0.537    -1.611528     .840173
      moed10 |   .5719848   .1289688     4.44   0.000     .3187558    .8252138
      faed10 |   .3462837   .0819803     4.22   0.000     .1853162    .5072512
      msei10 |   .0109298   .0249845     0.44   0.662     -.038127    .0599866
      fsei10 |   .0138426   .0217974     0.64   0.526    -.0289564    .0566416
     lninc10 |   4.332025   2.604378     1.66   0.097    -.7816455    9.445695
      lninc2 |  -.7001595   .3860535    -1.81   0.070    -1.458172    .0578526
      lninc3 |   .0350669   .0162834     2.15   0.032     .0030945    .0670392
        mf10 |   1.043192   .3937241     2.65   0.008     .2701185    1.816265
  disability |  -9.777017   1.204215    -8.12   0.000    -12.14148   -7.412554
everhbgra~10 |  -5.435746   .9894867    -5.49   0.000    -7.378593   -3.492899
repgrade10_4 |   5.889987   2.848341     2.07   0.039      .297298    11.48268
 yrpalvcom10 |  -.0086383   .0241475    -0.36   0.721    -.0560516     .038775
       exp10 |   1.252757   .1163083    10.77   0.000     1.024387    1.481127
     moexp10 |  -.0934316   .1681001    -0.56   0.579    -.4234945    .2366312
     faexp10 |   .1982342   .1404612     1.41   0.159    -.0775599    .4740283
  pavolunt10 |   1.453633   .5181994     2.81   0.005     .4361536    2.471112
       _cons |   1.748835   3.567245     0.49   0.624    -5.255414    8.753083
------------------------------------------------------------------------------

. reg math12 cath10 `MV' `AV' [pw=atc2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   6.1126e+06)

Linear regression                                      Number of obs =   10502
                                                       F( 28,   673) =  112.64
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.4014
Number of clusters (sch_id) = 674                      Root MSE      =  11.324
```

```
------------------------------------------------------------------------------
             |               Robust
      math12 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   2.765753   .7383261     3.75   0.000     1.316053    4.215453
    female12 |  -4.167509   .6019017    -6.92   0.000     -5.34934   -2.985678
     black12 |  -9.910518   1.332746    -7.44   0.000    -12.52736   -7.293677
      hisp12 |  -4.305068   .6824093    -6.31   0.000    -5.644976   -2.965161
     asian12 |   3.968079   2.506264     1.58   0.114    -.9529586    8.889116
     natam12 |  -7.213693   1.977098    -3.65   0.000    -11.09571   -3.331672
 multirace12 |   .1448435   1.723766     0.08   0.933    -3.239763     3.52945
     urban10 |  -1.147594   .7428027    -1.54   0.123    -2.606084    .3108953
     rural10 |   .6016782   .8865877     0.68   0.498    -1.139132    2.342489
     neast10 |   .9103309   1.008512     0.90   0.367    -1.069877    2.890539
     south10 |  -.3693379   .9177901    -0.40   0.688    -2.171414    1.432738
      west10 |  -.2809938   .7729644    -0.36   0.716    -1.798706    1.236718
      moed10 |   .3154426   .1626623     1.94   0.053     -.003944    .6348292
      faed10 |   .5080073   .1379075     3.68   0.000     .2372266     .778788
      msei10 |   .0498832   .0359872     1.39   0.166    -.0207774    .1205438
      fsei10 |   .0292784   .0277134     1.06   0.291    -.0251367    .0836935
     lninc10 |   6.595526   3.670498     1.80   0.073    -.6114796    13.80253
      lninc2 |  -1.019393   .5413591    -1.88   0.060    -2.082349    .0435635
      lninc3 |   .0494128   .0227459     2.17   0.030     .0047513    .0940743
        mf10 |    .944591   .5513671     1.71   0.087    -.1380157    2.027198
  disability |   -9.37393   1.708383    -5.49   0.000    -12.72833   -6.019529
everhbgra~10 |   -8.64439    .930562    -9.29   0.000    -10.47154   -6.817236
repgrade10_4 |   3.736766   2.001835     1.87   0.062    -.1938277     7.66736
 yrpalvcom10 |   .0076358   .0278311     0.27   0.784    -.0470104     .062282
       exp10 |   1.566094   .1542739    10.15   0.000     1.263178     1.86901
     moexp10 |   .0035748   .1534793     0.02   0.981     -.297781    .3049307
     faexp10 |  -.0882566   .1729803    -0.51   0.610    -.4279026    .2513894
  pavolunt10 |   1.548655   .6336225     2.44   0.015     .3045407     2.79277
       _cons |  -1.314255   5.464028    -0.24   0.810    -12.04285    9.414338
------------------------------------------------------------------------------

. reg mathgain cath10 `MV' `AV' [pw=atc2byodd2wt] if f1schstat==1, cluster(sch_id);
(sum of wgt is   6.1126e+06)

Linear regression                                      Number of obs =   10502
                                                       F( 28,   673) =    8.50
                                                       Prob > F      =  0.0000
                                                       R-squared     =  0.0584
Number of clusters (sch_id) = 674                      Root MSE      =  6.2304

------------------------------------------------------------------------------
             |               Robust
    mathgain |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cath10 |   1.937439    .439292     4.41   0.000     1.074891    2.799986
    female12 |  -.9970441   .3103781    -3.21   0.001     -1.60647   -.3876182
     black12 |   .0845335   .4608312     0.18   0.855    -.8203064    .9893733
      hisp12 |   .0268001   .3724063     0.07   0.943    -.7044178    .7580181
     asian12 |   .5441949   .7296563     0.75   0.456    -.8884817    1.976871
     natam12 |  -.0064057   1.035133    -0.01   0.995    -2.038883    2.026072
 multirace12 |   .6090701   .6909462     0.88   0.378    -.7475994     1.96574
     urban10 |   -.111137   .3112483    -0.36   0.721    -.7222714    .4999975
     rural10 |   .5829205   .9831343     0.59   0.553    -1.347459      2.5133
     neast10 |   .0012905     .58434     0.00   0.998    -1.146058    1.148639
     south10 |   .1507178    .329899     0.46   0.648    -.4970373    .7984729
      west10 |  -.0827796   .4447126    -0.19   0.852    -.9559707    .7904114
      moed10 |   -.139669    .084583    -1.65   0.099    -.3057473    .0264094
      faed10 |   .1422707   .0785638     1.81   0.071     -.011989    .2965305
      msei10 |   .0145094   .0150867     0.96   0.337    -.0151133    .0441321
      fsei10 |   .0097113   .0133194     0.73   0.466    -.0164413     .035864
     lninc10 |   -.477437   2.022615    -0.24   0.813    -4.448831    3.493957
      lninc2 |   .0747336   .3054966     0.24   0.807    -.5251075    .6745748
      lninc3 |  -.0022747   .0132401    -0.17   0.864    -.0282716    .0237222
        mf10 |  -.3591157    .283563    -1.27   0.206    -.9158902    .1976588
  disability |   .2948809    1.06137     0.28   0.781    -1.789113    2.378875
everhbgra~10 |  -2.166823   .5468322    -3.96   0.000    -3.240525   -1.093121
repgrade10_4 |   1.385412   1.272697     1.09   0.277    -1.113523    3.884348
```

yrpalvcom10	.0178291	.0156657	1.14	0.255	-.0129304	.0485886
exp10	.3307375	.0893847	3.70	0.000	.1552311	.5062438
moexp10	.0773423	.1178329	0.66	0.512	-.1540221	.3087067
faexp10	-.1089804	.0844903	-1.29	0.198	-.2748767	.0569159
pavolunt10	-.3362459	.4148174	-0.81	0.418	-1.150738	.4782459
_cons	-1.462384	2.524847	-0.58	0.563	-6.419909	3.495141