Supplementary Material

STATA code

**** Descriptive statistics ****

```
.
. summarize Ageinyearsatscreening, detail

                    Ageinyearsatscreening
-------------------------------------------------------------
      Percentiles      Smallest
 1%           18           18
 5%           24           18
10%           29           18       Obs               1,042
25%           41           18       Sum of wgt.       1,042

50%           57                    Mean           54.83109
                      Largest       Std. dev.      17.53888
75%           69           80
90%           79           80       Variance       307.6122
95%           80           80       Skewness      -.3528762
99%           80           80       Kurtosis       2.081169
```

```
. tab RaceHispanicorigin
```

RaceHispanicorigin	Freq.	Percent	Cum.
1	116	11.13	11.13
2	94	9.02	20.15
3	419	40.21	60.36
4	223	21.40	81.77
5	190	18.23	100.00
Total	1,042	100.00	

```
. tab Maritalstatus
```

Maritalstatus	Freq.	Percent	Cum.
1	520	51.08	51.08
2	141	13.85	64.93
3	139	13.65	78.59
4	42	4.13	82.71
5	107	10.51	93.22
6	68	6.68	99.90
77	1	0.10	100.00
Total	1,018	100.00	

```
. tab EducationlevelAdults20
```

EducationlevelAdults20	Freq.	Percent	Cum.
1	65	6.39	6.39
2	76	7.47	13.85
3	208	20.43	34.28
4	364	35.76	70.04
5	304	29.86	99.90
7	1	0.10	100.00
Total	1,018	100.00	

```
. summarize Ageinyearsatscreening if VitaminDD2D3mcg >= 15
```

Variable	Obs	Mean	Std. dev.	Min	Max
Ageinyears~g	695	58.67626	16.26767	18	80

```
. summarize Ageinyearsatscreening if VitaminDD2D3mcg < 15
```

Variable	Obs	Mean	Std. dev.	Min	Max
Ageinyears~g	347	47.12968	17.47907	18	80

```
. tabulate RaceHispanicorigin if VitaminDD2D3mcg >= 15
```

RaceHispanicorigin	Freq.	Percent	Cum.
1	65	9.35	9.35
2	67	9.64	18.99
3	320	46.04	65.04
4	128	18.42	83.45
5	115	16.55	100.00
Total	695	100.00	

```
. tabulate RaceHispanicorigin if VitaminDD2D3mcg <
>  15
```

RaceHispanicorigin	Freq.	Percent	Cum.
1	51	14.70	14.70
2	27	7.78	22.48
3	99	28.53	51.01
4	95	27.38	78.39
5	75	21.61	100.00
Total	347	100.00	

```
. tabulate Maritalstatus if VitaminDD2D3mcg >=15
```

Maritalstatus	Freq.	Percent	Cum.
1	347	50.51	50.51
2	107	15.57	66.08
3	103	14.99	81.08
4	30	4.37	85.44
5	59	8.59	94.03
6	41	5.97	100.00
Total	687	100.00	

```
.
. tabulate Maritalstatus if VitaminDD2D3mcg <15
```

Maritalstatus	Freq.	Percent	Cum.
1	173	52.27	52.27
2	34	10.27	62.54
3	36	10.88	73.41
4	12	3.63	77.04
5	48	14.50	91.54
6	27	8.16	99.70
77	1	0.30	100.00
Total	331	100.00	

```
. tabulate EducationlevelAdults20 if VitaminDD2D3m
> cg >=15
```

EducationlevelAdults20	Freq.	Percent	Cum.
1	52	7.57	7.57
2	46	6.70	14.26
3	154	22.42	36.68
4	232	33.77	70.45
5	203	29.55	100.00
Total	687	100.00	

```
. tabulate EducationlevelAdults20 if VitaminDD2D3m
> cg < 15
```

EducationlevelAdults20	Freq.	Percent	Cum.
1	13	3.93	3.93
2	30	9.06	12.99
3	54	16.31	29.31
4	132	39.88	69.18
5	101	30.51	99.70
7	1	0.30	100.00
Total	331	100.00	

```
.
```

Modeling

* Unadjusted

```
. logit obesity zincvalue

Iteration 0:  Log likelihood = -706.63408
Iteration 1:  Log likelihood = -706.61642
Iteration 2:  Log likelihood = -706.61642

Logistic regression                                     Number of obs =  1,042
                                                        LR chi2(1)    =   0.04
                                                        Prob > chi2   = 0.8509
Log likelihood = -706.61642                             Pseudo R2     = 0.0000

------------------------------------------------------------------------------
     obesity | Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
   zincvalue |   .1269525   .6737893     0.19   0.851    -1.19365    1.447555
       _cons |   -.350096    .063183    -5.54   0.000    -.4739323   -.2262597
------------------------------------------------------------------------------
```

```
. logit obesity vitdvalue

Iteration 0:  Log likelihood = -706.63408
Iteration 1:  Log likelihood = -702.08645
Iteration 2:  Log likelihood = -702.08434
Iteration 3:  Log likelihood = -702.08434

Logistic regression                                     Number of obs =  1,042
                                                        LR chi2(1)    =   9.10
                                                        Prob > chi2   = 0.0026
Log likelihood = -702.08434                             Pseudo R2     = 0.0064

------------------------------------------------------------------------------
     obesity | Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
   vitdvalue |   .3951364   .1317754     3.00   0.003     .1368612    .6534115
       _cons |  -.5989156   .1055785    -5.67   0.000    -.8058456   -.3919856
------------------------------------------------------------------------------
```

* Adjusted:

```
. logistic obesity zincvalue has_diabetes exercise_status Ageinyearsatscreening RaceHispanicorigin Atleastoneco
> morbidity Smokedatleast100cigarettesi Totalfatgm

Logistic regression                                     Number of obs =  1,042
                                                        LR chi2(8)    =  92.88
                                                        Prob > chi2   = 0.0000
Log likelihood = -660.19392                             Pseudo R2     = 0.0657

------------------------------------------------------------------------------
             obesity | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------+--------------------------------------------------------
           zincvalue |   1.388456   1.020027     0.45   0.655     .3290021    5.85957
         has_diabetes |   2.134013   .3973421     4.07   0.000     1.481521    3.073876
       exercise_status |   .6241467   .0856736    -3.43   0.001     .4769208    .8168212
  Ageinyearsatscreening |   .9873396   .0043984    -2.86   0.004     .9787565     .995998
     RaceHispanicorigin |   .8239199   .0464234    -3.44   0.001     .7377759    .9201223
  Atleastonecomorbidity |   2.374435   .4183824     4.91   0.000     1.681033    3.353857
Smokedatleast100cigarettesi |   .7810849   .1130189    -1.71   0.088      .588212      1.0372
           Totalfatgm |   1.007719   .0077212     1.00   0.316     .9926992    1.022967
                _cons |   2.324803   .9669036     2.03   0.043      1.02888    5.253001
------------------------------------------------------------------------------
Note: _cons estimates baseline odds.
```

```
. logistic obesity vitdvalue has_diabetes exercise_status Ageinyearsatscreening RaceHispanicorigin Atleastoneco
> morbidity Smokedatleast100cigarettesi Totalfatgm

Logistic regression                                     Number of obs =  1,042
                                                        LR chi2(8)    =  95.51
                                                        Prob > chi2   = 0.0000
Log likelihood = -658.88039                             Pseudo R2     = 0.0676

------------------------------------------------------------------------------
             obesity | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------+--------------------------------------------------------
           vitdvalue |   1.283883   .1914106     1.68   0.094     .9585658    1.719605
         has_diabetes |   2.130892   .3972902     4.06   0.000     1.478634    3.070875
       exercise_status |   .6188041   .0851158    -3.49   0.000     .4725758    .8102797
  Ageinyearsatscreening |   .9854628   .0045345    -3.18   0.001     .9766154    .9943904
     RaceHispanicorigin |   .8261525   .0465558    -3.39   0.001     .7397634    .9226301
  Atleastonecomorbidity |   2.328913   .4100714     4.80   0.000     1.649206    3.288755
Smokedatleast100cigarettesi |   .7824051   .1133129    -1.69   0.090     .5890541    1.039222
           Totalfatgm |   1.008889   .0076965     1.16   0.246     .9939168    1.024088
                _cons |   2.192196   .9162738     1.88   0.060     .9662777    4.973438
------------------------------------------------------------------------------
Note: _cons estimates baseline odds.
```