Suggested Answers Problem Set 1
Health Economic

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A program that produces the estimates below is on the class web page and is titled ps1.do.

1. 2.07% of the sample dies within 5 years of the sample date.

```
. tab diedin5;

died within |
 5 years of |
     survey |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |    193,005       97.93       97.93
          1 |      4,072        2.07      100.00
------------+-----------------------------------
      Total |    197,077      100.00
```

2. Results by education and income groups. Notice that mortality declines monotonically with education, falling from 429% for those with less than a high school education to 1.04% for people with a college degree. Results show a similar pattern for income.

```
=1 if <hs, |
2 if hs, 3 |
   if some |  died within 5 years
college, 4 |       of survey
if college |         0          1 |     Total
-----------+----------------------+----------
         1 |    32,751      1,469 |    34,220
           |     95.71       4.29 |    100.00
           |     16.97      36.08 |     17.36
-----------+----------------------+----------
         2 |    75,453      1,483 |    76,936
           |     98.07       1.93 |    100.00
           |     39.09      36.42 |     39.04
-----------+----------------------+----------
         3 |    39,454        644 |    40,098
           |     98.39       1.61 |    100.00
           |     20.44      15.82 |     20.35
-----------+----------------------+----------
         4 |    45,347        476 |    45,823
           |     98.96       1.04 |    100.00
           |     23.50      11.69 |     23.25
-----------+----------------------+----------
     Total |   193,005      4,072 |   197,077
           |     97.93       2.07 |    100.00
           |    100.00     100.00 |    100.00
```

```
. tab incomeg diedin5, row column;

     =1 if |
    <$10K, |
2=$20-20K, |
3=$20-30K, |
4=$40-40K, |  died within 5 years
5=$40-50k, |       of survey
    6>$50K |         0          1 |     Total
-----------+----------------------+----------
         1 |    17,034        825 |    17,859
           |     95.38       4.62 |    100.00
           |      8.83      20.26 |      9.06
-----------+----------------------+----------
         2 |    33,694      1,022 |    34,716
           |     97.06       2.94 |    100.00
           |     17.46      25.10 |     17.62
-----------+----------------------+----------
         3 |    38,104        820 |    38,924
           |     97.89       2.11 |    100.00
           |     19.74      20.14 |     19.75
-----------+----------------------+----------
         4 |    34,607        543 |    35,150
           |     98.46       1.54 |    100.00
           |     17.93      13.33 |     17.84
-----------+----------------------+----------
         5 |    26,382        346 |    26,728
           |     98.71       1.29 |    100.00
           |     13.67       8.50 |     13.56
-----------+----------------------+----------
         6 |    43,184        516 |    43,700
           |     98.82       1.18 |    100.00
           |     22.37      12.67 |     22.17
-----------+----------------------+----------
     Total |   193,005      4,072 |   197,077
           |     97.93       2.07 |    100.00
           |    100.00     100.00 |    100.00
```

3. The interesting results here are the results for the Hispanic paradox – death rates among whites are 1.93% -- but among Hispanics, they are 1.61%.

```
. * answer question 3;
. tab race diedin5, row column;
```

=1 if white, 2=black, 3=other, 4=hispanic	died within 5 years of survey: 0	1	Total
1	149,357	2,945	152,302
	98.07	1.93	100.00
	77.39	72.32	77.28
2	23,997	812	24,809
	96.73	3.27	100.00
	12.43	19.94	12.59
3	5,869	90	5,959
	98.49	1.51	100.00
	3.04	2.21	3.02
4	13,782	225	14,007
	98.39	1.61	100.00
	7.14	5.53	7.11
Total	193,005	4,072	197,077
	97.93	2.07	100.00
	100.00	100.00	100.00

4. Here is the table – Holding income constant, mortality rates increase nearly monotonically as we move down the table. Likewise, holding education constant, mortality rates decline as we move to the right in the table.

Means of diedin5 by Education and Income

		Income variable					
		1	2	3	4	5	6
Education variable	1	0.060	0.044	0.037	0.031	0.031	0.021
	2	0.037	0.024	0.018	0.015	0.014	0.015
	3	0.034	0.022	0.019	0.013	0.012	0.011
	4	0.017	0.016	0.013	0.010	0.008	0.009

5. Regression results for questions 5a-5d

```
. reg diedin5 age male married _I*;

      Source |       SS       df       MS              Number of obs =  197077
-------------+------------------------------           F( 14,197062) =  405.23
       Model |  111.594296    14  7.97102116           Prob > F      =  0.0000
    Residual |  3876.27014197062  .019670308           R-squared     =  0.0280
-------------+------------------------------           Adj R-squared =  0.0279
       Total |  3987.86444197076   .02023516           Root MSE      =  .14025

------------------------------------------------------------------------------
     diedin5 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0017271   .0000291    59.27   0.000       .00167    .0017842
        male |   .0129408   .0006374    20.30   0.000     .0116915    .0141902
     married |  -.0054307   .0007783    -6.98   0.000    -.0069561   -.0039052
    _Irace_2 |    .005826   .0010009     5.82   0.000     .0038643    .0077878
    _Irace_3 |  -.0026049   .0018577    -1.40   0.161    -.0062458    .0010361
    _Irace_4 |  -.0061451   .0012689    -4.84   0.000    -.0086321   -.0036582
    _Ieduc_2 |  -.0106628   .0009637   -11.06   0.000    -.0125516    -.008774
    _Ieduc_3 |  -.0093646   .0011107    -8.43   0.000    -.0115416   -.0071876
    _Ieduc_4 |  -.0140795   .0011376   -12.38   0.000    -.0163092   -.0118498
 _Iincomeg_2 |  -.0134382    .001317   -10.20   0.000    -.0160194    -.010857
 _Iincomeg_3 |  -.0185508   .0013375   -13.87   0.000    -.0211723   -.0159294
 _Iincomeg_4 |  -.0226322   .0013933   -16.24   0.000     -.025363   -.0199014
 _Iincomeg_5 |  -.0255779   .0014818   -17.26   0.000    -.0284823   -.0226735
 _Iincomeg_6 |   -.027875   .0014241   -19.57   0.000    -.0306662   -.0250838
       _cons |  -.0240059   .0018512   -12.97   0.000    -.0276342   -.0203776
------------------------------------------------------------------------------
```

a. For every 10 years of age, 5-year morality rates increase by 1.7 percentage points.
b. Married people are ½ of a percentage point less likely to die over the next five years.
c. People with incomes in excess of $50K/year are 2.7 percentage points less likely to die than someone whose income is < $10K/year
d. Moving from group 3 to group 6 will reduce your chance of dying in the next five year by (-0.0278-0.0186)=-0.0092 or ..92 percentage points.
e. Here are the results for part e. In this case, the coefficient on overweight is =-.007 meaning that mortality rates for this group are a lot lower than for people of normal weight. The 95% confidence interval for this estimate is (-0.009, -0.0061) meaning we can easily reject the null that this coefficient equals zero.

```
reg diedin5 age male married _I*
> underweight overweight obese severeobese;

      Source |       SS       df       MS              Number of obs =  197077
-------------+------------------------------           F( 18,197058) =  330.74
       Model |  116.942773    18  6.49682073           Prob > F      =  0.0000
    Residual |  3870.92167197058  .019643565           R-squared     =  0.0293
-------------+------------------------------           Adj R-squared =  0.0292
       Total |  3987.86444197076   .02023516           Root MSE      =  .14016

------------------------------------------------------------------------------
     diedin5 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0017909   .0000294    60.82   0.000     .0017332    .0018486
        male |   .0156128   .0006593    23.68   0.000     .0143206    .0169051
     married |  -.0050685   .0007783    -6.51   0.000    -.0065939   -.0035431
    _Irace_2 |   .0069912   .0010046     6.96   0.000     .0050222    .0089602
    _Irace_3 |  -.0038813   .0018584    -2.09   0.037    -.0075238   -.0002388
```

```
    _Irace_4 |  -.0052286   .0012693    -4.12   0.000    -.0077164   -.0027408
    _Ieduc_2 |  -.0106826   .0009635   -11.09   0.000    -.0125711   -.0087941
    _Ieduc_3 |  -.0095672   .0011108    -8.61   0.000    -.0117444     -.00739
    _Ieduc_4 |  -.0147268   .0011399   -12.92   0.000    -.0169609   -.0124927
 _Iincomeg_2 |  -.0131683   .0013165   -10.00   0.000    -.0157487    -.010588
 _Iincomeg_3 |   -.018219   .0013374   -13.62   0.000    -.0208404   -.0155977
 _Iincomeg_4 |  -.0223078   .0013933   -16.01   0.000    -.0250386   -.0195769
 _Iincomeg_5 |  -.0252645    .001482   -17.05   0.000    -.0281692   -.0223599
 _Iincomeg_6 |  -.0277717   .0014249   -19.49   0.000    -.0305645    -.024979
 underweight |    .017291   .0015898    10.88   0.000     .0141751     .020407
  overweight |  -.0075407   .0007337   -10.28   0.000    -.0089787   -.0061028
       obese |  -.0053127   .0011042    -4.81   0.000    -.0074769   -.0031485
 severeobese |   .0014204   .0019765     0.72   0.472    -.0024534    .0052942
       _cons |  -.0261444   .0018712   -13.97   0.000    -.0298119   -.0224768
------------------------------------------------------------------------------
```