



Iowans Speak Out on Their Health

The Rural-Urban Divide

Appendix A

Rural-Urban Classification
and Multivariable Models

Rural-Urban Classification

Iowa's 99 counties were divided into rural and urban strata using the 2003 USDA Rural-Urban Continuum Codes. This classification system distinguishes metropolitan counties by population size and non-metropolitan counties by their degree of urbanization and proximity to metropolitan counties. The codes divide the continuum into three metropolitan and six non-metropolitan categories. Two of the three metro categories and all six non-metro categories are found in the State of Iowa. The two metro categories were defined as "Urban" and the six non-metro categories were defined as "Rural" for all analyses in this report.

Rural Counties					
County Name	2003 Rural-urban Continuum Code	2000 Population	County Name	2003 Rural-urban Continuum Code	2000 Population
Adair County	8	8,243	Jackson County	6	20,296
Adams County	9	4,482	Jasper County	6	37,213
Allamakee County	6	14,675	Jefferson County	7	16,181
Appanoose County	7	13,721	Keokuk County	8	11,400
Audubon County	8	6,830	Kossuth County	7	17,163
Boone County	6	26,224	Lee County	5	38,052
Buchanan County	6	21,093	Louisa County	8	12,183
Buena Vista County	7	20,411	Lucas County	6	9,422
Butler County	8	15,305	Lyon County	8	11,763
Calhoun County	9	11,115	Mahaska County	7	22,335
Carroll County	7	21,421	Marion County	6	32,052
Cass County	6	14,684	Marshall County	4	39,311
Cedar County	6	18,187	Mitchell County	7	10,874
Cerro Gordo County	5	46,447	Monona County	6	10,020
Cherokee County	6	13,035	Monroe County	7	8,016
Chickasaw County	6	13,095	Montgomery County	6	11,771
Clarke County	6	9,133	Muscatine County	4	41,722
Clay County	7	17,372	O'Brien County	7	15,102
Clayton County	8	18,678	Osceola County	7	7,003
Clinton County	4	50,149	Page County	7	16,976
Crawford County	6	16,942	Palo Alto County	7	10,147
Davis County	9	8,541	Plymouth County	6	24,849
Decatur County	9	8,689	Pocahontas County	9	8,662
Delaware County	6	18,404	Poweshiek County	7	18,815
Des Moines County	5	42,351	Ringgold County	9	5,469
Dickinson County	7	16,424	Sac County	9	11,529
Emmet County	7	11,027	Shelby County	6	13,173
Fayette County	6	22,008	Sioux County	6	31,589
Floyd County	7	16,900	Tama County	6	18,103
Franklin County	7	10,704	Taylor County	9	6,958
Fremont County	8	8,010	Union County	6	12,309
Greene County	6	10,366	Van Buren County	9	7,809
Hamilton County	6	16,438	Wapello County	5	36,051

Hancock County	7	12,100	Wayne County	9	6,730
Hardin County	6	18,812	Webster County	5	40,235
Henry County	7	20,336	Winnebago County	7	11,723
Howard County	7	9,932	Winneshiek County	7	21,310
Humboldt County	7	10,381	Worth County	9	7,909
Ida County	8	7,837	Wright County	7	14,334
Iowa County	8	15,671			

Urban Counties					
County Name	2003 Rural-urban Continuum Code	2000 Population	County Name	2003 Rural-urban Continuum Code	2000 Population
Benton County	3	25,308	Linn County	3	191,701
Black Hawk County	3	128,012	Madison County	2	14,019
Bremer County	3	23,325	Mills County	2	14,547
Dallas County	2	40,750	Polk County	2	374,601
Dubuque County	3	89,143	Pottawattamie County	2	87,704
Grundy County	3	12,369	Scott County	2	158,668
Guthrie County	2	11,353	Story County	3	79,981
Harrison County	2	15,666	Warren County	2	40,671
Johnson County	3	111,006	Washington County	3	20,670
Jones County	3	20,221	Woodbury County	3	103,877

‡Source: USDA Economic Research Service. Rural-Urban Continuum Codes

<http://www.ers.usda.gov/Data/RuralUrbanContinuumCodes/>

2 = County in metro area of 250,000 to 1 million population

3 = County in metro area of fewer than 250,000 population

4 = Non-metro county with urban population of 20,000 or more, adjacent to a metro area

5 = Non-metro county with urban population of 20,000 or more, not adjacent to a metro area

6 = Non-metro county with urban population of 2,500-19,999, adjacent to a metro area

7 = Non-metro county with urban population of 2,500-19,999, not adjacent to a metro area

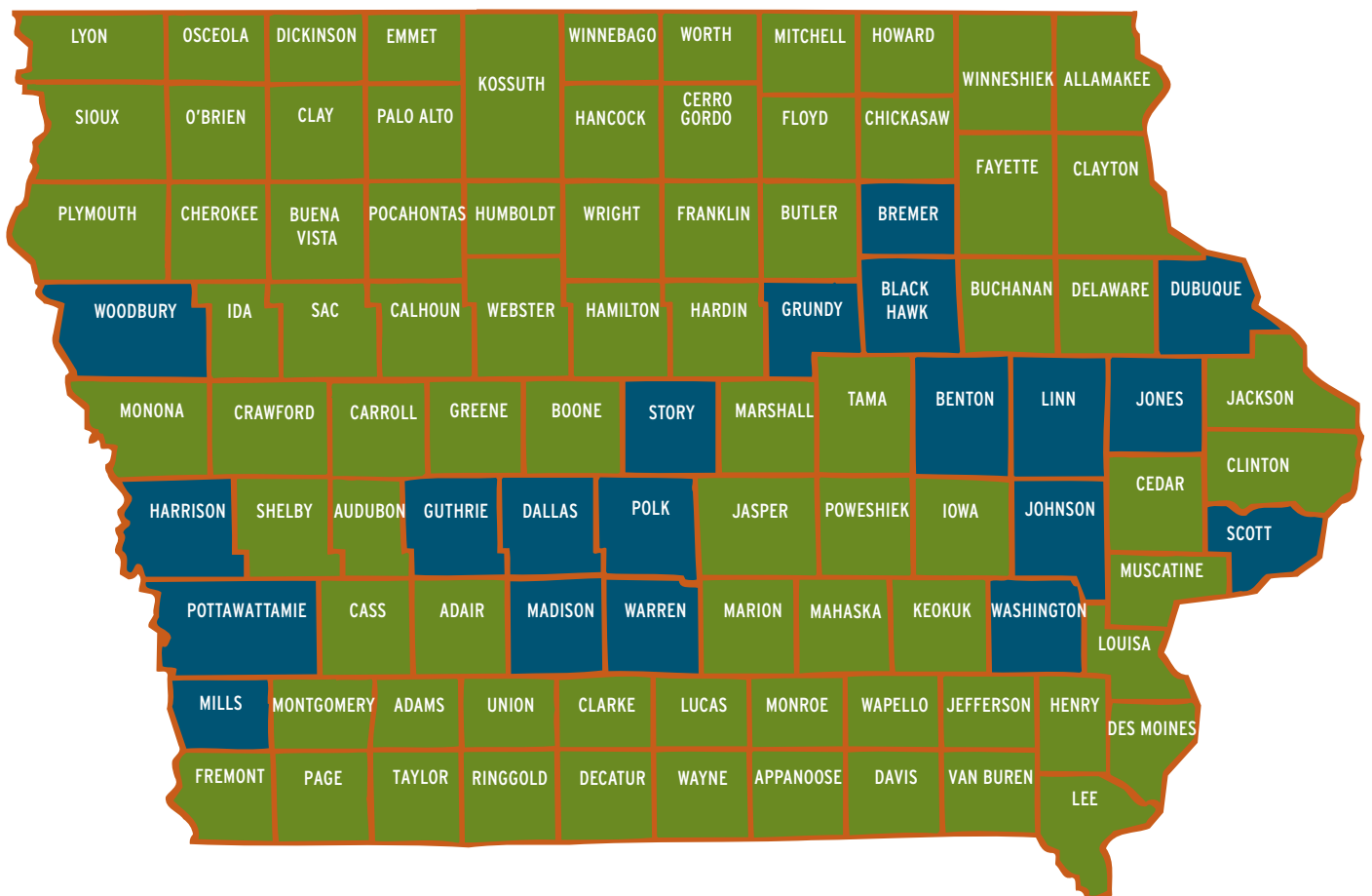
8 = Non-metro county completely rural or less than 2,500 urban population, adj. to metro area

9 = Non-metro county completely rural or less than 2,500 urban population, not adj. to metro area

IOWA STATE MAP

(Color Coded for Rural-Urban Counties)

■ Rural Counties ■ Urban Counties



MULTIVARIABLE MODELING

Associations between independent (predictor) behavioral and demographic variables and the dependent (response) variables displayed in the tables and figures and described in the text were evaluated using stepwise logistic regression analysis. While the tables in the full report show all possible responses, the dependent (response) variables were dichotomized in order to perform logistic regression. The analysis sequentially selects from among a list of potential predictor variables. The strength and direction of those effects are summarized as odds ratio estimates. Odds ratio can be interpreted as follows: for a one unit change in the predictor variable, the probability for a modeled response is expected to change by the respective “point estimate,” given the other variables in the model are held constant. Thus an odds ratio greater than one means the response is more likely; whereas an odds ratio less than one means the response is less likely (i.e, the predictor is protective). All analyses were conducted with SAS, version 9.2 (SAS Institute, Inc., Cary, NC).

Table 6. Would you say that, in general, your health is excellent/very good?

Response	Total Frequency	Percent
No	366	34.2%
Yes	704	65.8%

Probability modeled is 'No'.

Effect	Odds Ratio Estimates		
	Point Estimate	95% Wald Confidence Limits	
Male gender	1.464	1.103	1.942
Age (years)	1.028	1.015	1.042
Are you self-employed?	0.690	0.485	0.982
Have you attended college?	0.693	0.506	0.950
Have never smoked	0.442	0.297	0.656
Ex-smoker	0.620	0.399	0.963
Household income less than \$35,000	1.559	1.066	2.282
Household income \$75,000 or more	0.609	0.444	0.834
Body Mass Index	1.102	1.075	1.130

Table 7. In the past 30 days have there been days when your mental health was not good?

Response	Total Frequency	Percent
No	370	34.7%
Yes	697	65.3%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	0.564	0.428	0.743
Resident of a rural county	0.676	0.503	0.909
Do you have a college degree?	1.487	1.115	1.983
Current Smoker	1.666	1.150	2.414
Household income less than \$35,000	1.455	1.010	2.097
Household income \$75,000 or more	0.661	0.486	0.899
Body Mass Index	1.031	1.009	1.054

Table 8. In the past 30 days have there been days when your health kept you from usual activities?

Response	Total Frequency	Percent
Yes	173	16.2%
No	897	83.8%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	0.616	0.429	0.883
Resident of a rural county	0.581	0.402	0.840
Have never smoked	0.677	0.483	0.949
Household income \$75,000 or more	0.586	0.402	0.854
Body Mass Index	1.056	1.030	1.084

Table 9. In the past 30 days have there been days in which you felt sad, blue or depressed?

Response	Total Frequency	Percent
Yes	373	35.0%
No	692	65.0%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Is your household income between \$50,000 and \$75,000?	0.622	0.451	0.857
Household income \$75,000 or more	0.508	0.376	0.687
Body Mass Index	1.024	1.002	1.046

Table 10. In the past 30 days have there been days in which you felt worried, tense or anxious?

Response	Total Frequency	Percent
Yes	639	59.9%
No	428	40.1%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	0.679	0.527	0.874
Household income \$75,000 or more	0.634	0.491	0.818

Table 11. In the past 30 days have there been 6 or more days in which you did not get enough sleep?

Response	Total Frequency	Percent
Yes	470	43.9%
No	600	56.1%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Is your household income between \$50,000 and \$75,000?	0.622	0.451	0.857
Household income \$75,000 or more	0.508	0.376	0.687
Body Mass Index	1.024	1.002	1.046

Figure 3. Do you have a primary care doctor, or doctor you usually see when you need medical help?

Response	Total Frequency	Percent
No	138	12.9%
Yes	928	87.1%

Probability modeled is 'No'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	2.084	1.425	3.048
Age (years)	0.953	0.938	0.968
Are you self-employed?	3.039	1.600	5.769
Current smoker	2.645	1.674	4.179
Household income less than \$35,000	1.839	1.169	2.892
Is your organization size less than 20 employees?	0.469	0.265	0.832

Figure 4. Did you visit your primary care doctor in the past 12 months?

Response	Total Frequency	Percent
No	141	15.2%
Yes	784	84.8%

Probability modeled is 'No'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	1.807	1.252	2.607
Age (years)	0.979	0.964	0.995
Is your organization size 250 employees or more?	0.635	0.410	0.985

Figure 5. Is your personal financial situation getting worse?

Response	Total Frequency	Percent
Yes	260	24.4%
No	806	75.6%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Age (years)	1.019	1.005	1.032
Current smoker	1.608	1.095	2.363
Is your household income between \$50,000 and \$75,000?	0.576	0.407	0.815
Household income \$75,000 or more	0.295	0.206	0.423
Body Mass Index	1.056	1.030	1.084

Figure 6. Do you currently have health insurance coverage?

Response	Total Frequency	Percent
No	72	6.7%
Yes	997	93.3%

Probability modeled is 'No'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Age (years)	0.962	0.941	0.984
Current smoker	3.097	1.711	5.606
Household income less than \$35,000	14.784	7.202	30.348
Is your household income between \$35,000 and \$50,000?	6.684	3.116	14.334
Is your organization size less than 20 employees?	6.550	3.345	12.827
Is your organization size between 20 to 49 employees?	2.732	1.112	6.715

Table 12. Cost of Health insurance is increasing dramatically

Response	Total Frequency	Percent
Yes	210	22.1%
No	742	77.9%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Resident of a rural county	1.949	1.284	2.958
Current smoker	1.773	1.123	2.798
Are you self-employed?	2.073	1.322	3.251
Is your household income between \$35,000 and \$50,000?	1.501	1.024	2.200
Is your organization size less than 20 employees?	2.071	1.347	3.184
Is your organization size between 20 to 49 employees?	1.771	1.076	2.914

Table 13. As a result of health insurance cost increases, are you making sacrifices?

Response	Total Frequency	Percent
Yes	358	51.8%
No	333	48.2%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Have never smoked	0.630	0.456	0.871
Household income less than \$35,000	3.870	2.236	6.697
Is your household income between \$35,000 and \$50,000?	1.807	1.218	2.680
Is your organization size 250 employees or more?	0.613	0.436	0.862

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: Decided not to go to the doctor when you felt you needed to because of cost

Response	Total Frequency	Percent
Yes	166	42.7%
No	223	57.3%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Resident of a rural county	1.707	1.013	2.874
Household income \$75,000 or more	0.407	0.252	0.655
Is your organization size between 50 and 250 employees?	2.042	1.229	3.393

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: Stopped taking medication to avoid the cost of prescription drugs

Response	Total Frequency	Percent
Yes	79	20.8%
No	300	79.2%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	0.449	0.250	0.807
Do you have a college degree?	0.502	0.279	0.905
Current smoker	2.062	1.098	3.869
Is your organization size less than 20 employees?	0.469	0.266	0.826
Body Mass Index	1.100	1.050	1.152

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: **Cut back the dose of prescription drugs to help make the drugs last longer**

Response	Total Frequency	Percent
Yes	74	19.5%
No	306	80.5%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	0.370	0.201	0.681
Is your organization size less than 20 employees?	0.487	0.276	0.860
Body Mass Index	1.090	1.041	1.141

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: **Decided not to fill prescriptions given to you by your doctor because of cost**

Response	Total Frequency	Percent
Yes	86	22.6%
No	294	77.4%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Current smoker	1.902	1.066	3.394

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: **Not scheduled tests your doctor has suggested in order to save on cost**

Response	Total Frequency	Percent
Yes	107	27.9%
No	277	72.1%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Age (years)	1.025	1.003	1.049
Household income less than \$35,000	1.782	1.026	3.093
Household income \$75,000 or more	0.540	0.304	0.958

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: **Waited longer to see a doctor when you are sick with hopes you will get better on your own**

Response	Total Frequency	Percent
Yes	276	71.9%
No	108	28.1%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Household income \$75,000 or more	0.357	0.223	0.571

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: **Switched doctors or hospitals in order to save money**

Response	Total Frequency	Percent
Yes	27	7.0%
No	356	93.1%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Current smoker	2.961	1.292	6.788

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: **Minimized how often you use your health insurance in order to keep the overall cost of premiums for everyone in your group from rising**

Response	Total Frequency	Percent
Yes	120	34.5%
No	228	65.5%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
No significant effects			

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: Switched health insurance to a plan with higher deductibles and copayments in order to save money

Response	Total Frequency	Percent
Yes	150	42.5%
No	203	57.5%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Resident of a rural county	1.772	1.027	3.058
Is your organization size less than 20 employees?	2.212	1.427	3.428

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: Switched health insurance to a plan with fewer participating doctors and hospitals to save money

Response	Total Frequency	Percent
Yes	38	10.9%
No	310	89.1%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Resident of a rural county	3.658	1.093	12.239

Table 14. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: Switched health insurance to a plan with fewer benefits to save money

Response	Total Frequency	Percent
Yes	84	21.3%
No	265	78.7%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Is your organization size btw 20 to 49 employees?	0.378	0.144	0.994

Table 15. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: Choose a policy with a higher deductible

Response	Total Frequency	Percent
Yes	274	68.2%
No	128	31.8%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Are you self-employed?	2.085	1.251	3.474

Table 15. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: Choose a policy with higher co-pays for doctor visits and prescription drugs

Response	Total Frequency	Percent
Yes	257	66.4%
No	139	33.6%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Are you self-employed?	1.923	1.167	3.167
Household income less than \$35,000	0.473	0.292	0.767

Table 15. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: Reduce the number of doctor's visits made by members of your household

Response	Total Frequency	Percent
Yes	194	46.7%
No	221	53.3%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	0.599	0.399	0.901
Household income \$75,000 or more	0.622	0.396	0.976
Is your organization size between 50 and 250 employees?	1.983	1.205	3.265

Table 15. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: *Make more use of clinics staffed by nurses and physician’s assistants rather than doctors*

Response	Total Frequency	Percent
Yes	310	74.3%
No	107	25.7%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Is your organization size 250 employees or more?	0.530	0.319	0.879
Body Mass Index	1.041	1.001	1.084

Table 15. Different people do different things to cut back on health care expenses. Please tell me if you have done the following: *Choose a policy with fewer participating doctors and hospitals*

Response	Total Frequency	Percent
Yes	156	39.1%
No	243	60.9%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
No significant effects			

Figure 7. In the past 12 months, have you had either the flu shot injection or the nasal mist?

Response	Total Frequency	Percent
Yes	556	52.0%
No	513	48.0%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	0.482	0.371	0.626
Age (years)	1.025	1.013	1.037
Are you self-employed?	0.631	0.424	0.938
Household income less than \$35,000	0.639	0.451	0.904
Is your organization size less than 20 employees?	0.592	0.429	0.817
Body Mass Index	1.023	1.001	1.045

Figure 8. Do you always wear seatbelts when you ride in a car?

Response	Total Frequency	Percent
No	187	17.5%
Yes	882	82.5%

Probability modeled is 'No'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	1.977	1.419	2.756
Are you self-employed?	2.559	1.788	3.664
Resident of a rural county	1.633	1.080	2.470
Have never smoked	1.783	1.249	2.546
Body Mass Index	1.038	1.011	1.066

Table 16. During the past 30 days, have you had at least one drink of any alcoholic beverage such as beer, wine, or liquor?

Response	Total Frequency	Percent
Yes	732	68.5%
No	337	31.5%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Male gender	1.375	1.033	1.828
Age (years)	0.961	0.949	0.974
Have never smoked	0.683	0.513	0.909
Household income less than \$35,000	0.679	0.469	0.983
Household income \$75,000 or more	2.283	1.667	3.125
Body Mass Index	0.966	0.944	0.988

Table 17. Do you typically exercise 20 minutes per day at least 3 days a week?

Response	Total Frequency	Percent
Yes	531	50.6%
No	518	49.4%

Probability modeled is 'Yes'.

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Do you have a college degree?	1.472	1.145	1.892
Body Mass Index	0.955	0.935	0.976