

SPOTLIGHT: IMPACT OF UNHEALTHY BEHAVIORS



About the United Health Foundation's *America's Health Rankings®* and *Spotlight: Impact of Unhealthy Behaviors*

As part of a new and expanded reporting series for 2016, *America's Health Rankings® Spotlight: Impact of Unhealthy Behaviors* marks the second of four spotlights to be released this year focused on important markers of our nation's health, including prevention, substance abuse, and mental health. Spotlights are intended to shine a light on the role that these issues and their associated factors play in our nation's health. The spotlights complement the *America's Health Rankings® Annual Report* and the *America's Health Rankings® Senior Report*, as well as new population reports examining the health of women and children and the health of those who have served our country. For more information, visit www.americashealthrankings.org.

United Health Foundation encourages the distribution of information in this publication for non-commercial and charitable, educational, or scientific purposes. Please acknowledge the 2016 America's Health Rankings® Spotlight: Impact of Unhealthy Behaviors as the source and provide the following notice: ©2016 United Health Foundation.

All rights reserved. Please acknowledge the original source of specific data as cited.

TABLE OF CONTENTS

Introduction.....4

Key Findings.....6

National Insights

 Prevalence of Unhealthy Behaviors.....7

 Prevalence of Multiple Unhealthy Behaviors.....8

 Prevalence of Zero Unhealthy Behaviors.....12

 Odds of Reporting Fair or Poor Health Status.....16

State Insights

 Multiple Unhealthy Behaviors:Education-Based Differences.....17

Conclusions.....20

Appendix 1.....21

Appendix 2.....22

Appendix 3.....27

Appendix 4.....28

INTRODUCTION

With an aging American population, a significant amount of research has focused on people with one or more chronic medical conditions and the individual unhealthy behaviors, such as physical inactivity or smoking, that lead to chronic conditions. Unhealthy behaviors and related chronic diseases are among the costliest health conditions in the United States. Approximately 71% of total health care spending is associated with care for Americans with multiple chronic medical conditions.ⁱ Among Medicare fee-for-service beneficiaries, people with multiple chronic conditions account for 93% of total Medicare spending.ⁱⁱ Unhealthy behaviors associated with chronic diseases also cost the United States billions of dollars in medical expenses and lost productivity.^{iii, iv, v} For example, nearly \$170 billion in direct medical expenses and \$156 billion in lost productivity are attributed to smoking annually in the United States.^{vi, vii}

Less research has focused on the impact of multiple unhealthy behaviors on a person's health status. Traditionally, population risk behaviors are reported at the individual level. However, just like diseases, the combination of multiple unhealthy behaviors, even though they are often highly correlated, presents a different challenge for improving public health compared with examining the same behaviors in isolation. Understanding the distribution of multiple unhealthy behaviors within a population and risks to health status from these behaviors can help focus efforts of public health officials, policy makers, clinicians, and communities on the most affected populations.

UNHEALTHY BEHAVIORS



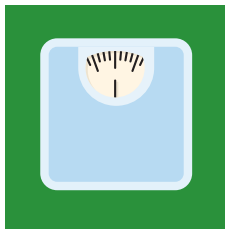
Currently a smoker.



Less than seven hours of sleep per night.



For women, four or more alcoholic drinks in one sitting or an average of greater than one drink per day; for men, five or more alcoholic drinks in one sitting or an average of greater than two drinks per day.



Body mass index ≥ 30 .



No physical activity outside of work.

This *Spotlight: Impact of Unhealthy Behaviors* examines the prevalence of unhealthy behaviors among noninstitutionalized adults in the United States, and the association of these risk factors with self-reported health status¹, a validated health status measure in general and disabled populations.^{viii} The following five unhealthy behaviors from the 2011 to 2014 Behavioral Risk Factor Surveillance System were selected for analysis because of their strong association with heart and other chronic diseases:^{ix} smoking², physical inactivity³, excessive drinking⁴, obesity⁵, and insufficient sleep.⁶ Smoking cigarettes, being physically inactive, excessive drinking, and being overweight or obese, have all been individually linked to premature morbidity and mortality.^x For the full methodology, see Appendix 1.

1. Five levels: excellent, very good, good, fair, or poor.

2. Currently a smoker.

3. No physical activity outside of work.

4. For women, four or more alcoholic drinks in one sitting or an average of greater than one drink per day; for men, five or more alcoholic drinks in one sitting or an average of greater than two drinks per day.

5. Body mass index ≥ 30 .

6. Less than seven hours of sleep per night.

KEY FINDINGS



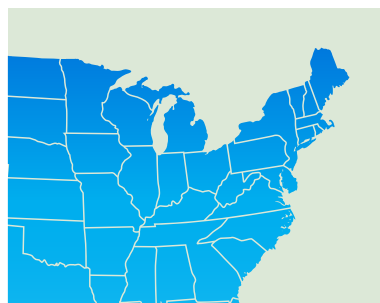
The prevalence of unhealthy behaviors varies widely among US adults. Seventy-two percent report having at least one unhealthy behavior, while more than 25 million (12.0%) report having multiple (three or more) unhealthy behaviors.



The odds of reporting fair or poor health status increase with the addition of each unhealthy behavior studied. Adults with multiple unhealthy behaviors are 6.1 times more likely to report fair or poor health than those reporting zero unhealthy behaviors.



Adults aged 25 and older making less than \$25,000/year are more likely to report having multiple unhealthy behaviors than those at higher income levels. Similarly, adults who have not graduated from high school are more likely to have multiple unhealthy behaviors than those with higher education levels, and the gap is widest when compared to college graduates.



The percent of college graduates aged 25 and older reporting multiple unhealthy behaviors is relatively consistent across states. However, the prevalence of multiple unhealthy behaviors among adults who have not graduated from high school varies widely by geography.

NATIONAL INSIGHTS

PREVALENCE OF UNHEALTHY BEHAVIORS

An estimated 58 million US adults, or 28.1%, report having none of the five unhealthy behaviors analyzed (Table 1). Approximately 36.0% report one unhealthy behavior and 23.9% report two unhealthy behaviors, while 12.0% report having multiple unhealthy behaviors (MUBs), defined as any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep. (Figure 1). Among the five individual behaviors analyzed, insufficient sleep is the most common (see Appendix 2).

TABLE 1
Percentage and Estimated Population of Zero through Five Unhealthy Behaviors Among US Adults (BRFSS 2014)

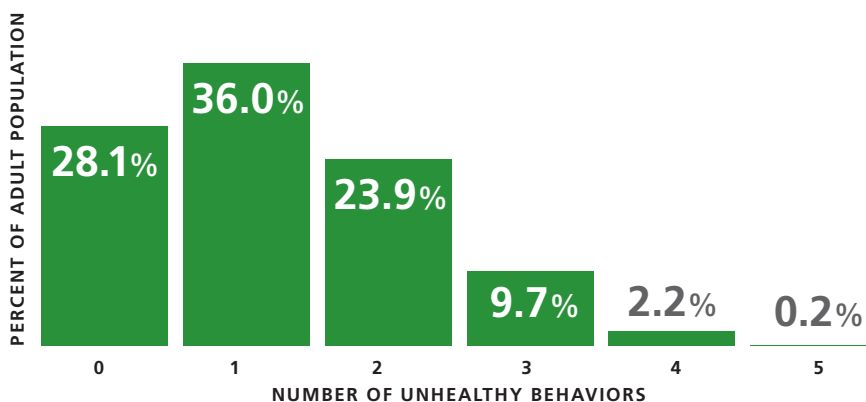
UNHEALTHY BEHAVIORS*	VALUE (%)	95% CI	POPULATION COUNT**
0	28.1	27.9–28.4	58,523,552
1	36.0	35.7–36.3	74,809,095
2	23.9	23.6–24.1	49,618,587
3	9.7	9.5–9.8	20,080,316
4	2.2	2.1–2.3	4,527,266
5	0.20	0.16–0.23	405,162
MUBs (3+)	12.0	11.8–12.2	25,012,800

*Unhealthy behaviors: Smoking, obesity, physical inactivity, excessive drinking, and insufficient sleep. Multiple unhealthy behaviors (MUBs) is any combination of three or more of the five unhealthy behaviors.

**Estimated number of adults

Nationally, 72.0% of adults report having one or more unhealthy behaviors.

FIGURE 1
Prevalence of Zero through Five Unhealthy Behaviors* Among US Adults (BRFSS 2014)



*Unhealthy behaviors: Smoking, obesity, physical inactivity, excessive drinking, and insufficient sleep.

PREVALENCE OF MULTIPLE UNHEALTHY BEHAVIORS

Analysis of the estimated 25 million US adults, or 12.0%, with MUBs, found that states with the highest and lowest proportions of adults with MUBs are clustered in certain regions of the United States (Figure 2). States with the highest proportion of adults with MUBs are clustered in the East North Central (ie, Indiana, Michigan, Ohio) and East South Central (ie, Alabama, Kentucky, Mississippi, Tennessee) Census Divisions. In addition to Minnesota, states with the lowest proportion of adults with MUBs are clustered in the Pacific (ie, California, Oregon, Washington), Mountain (ie, Idaho, Utah, Colorado), and New England (ie, Connecticut, Massachusetts, Vermont) Census Divisions.

Adults with a higher prevalence of MUBs compared with the national rate (12%) include

- those with less than a high school diploma (21.5%)
- high school graduates (16.1%),
- those with some college (12.5%)
- non-Hispanic blacks (16.5%)
- Hispanics (13.0%)
- males (13.0%)
- those with an income below \$25,000 (19.6%)
- those with an income of \$25,000 to \$49,999 (13.5%)
- those aged 18-44 (12.9%)
- those aged 45-64 (14.0%) (Figures 2-6).

On a national level, the prevalence of MUBs differed greatly by education level and income level (Table 2).

FIGURE 2

Proportion of Adults with Multiple Unhealthy Behaviors*, United States (BRFSS 2014)

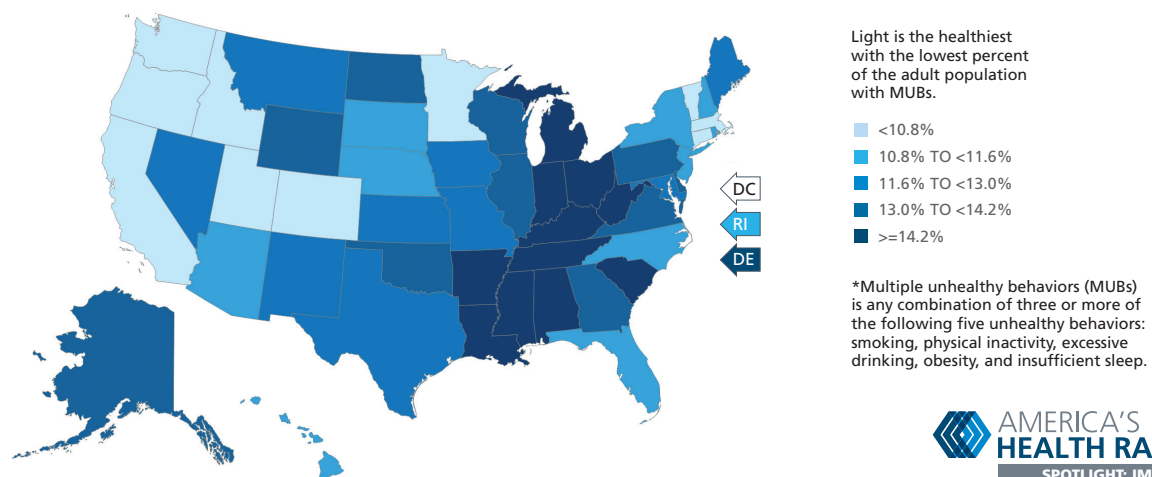
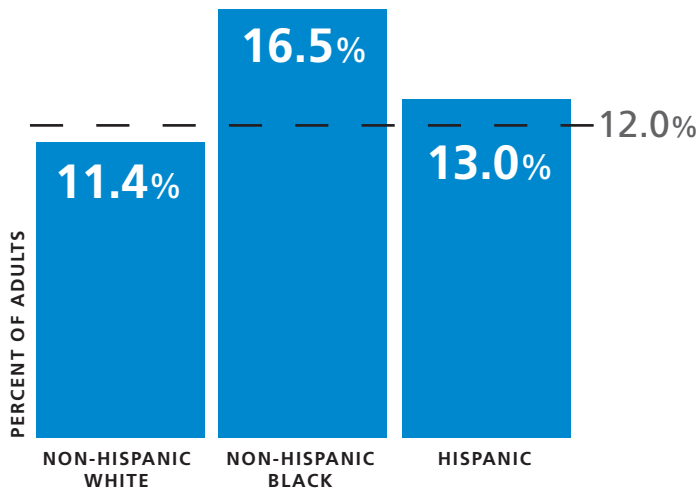
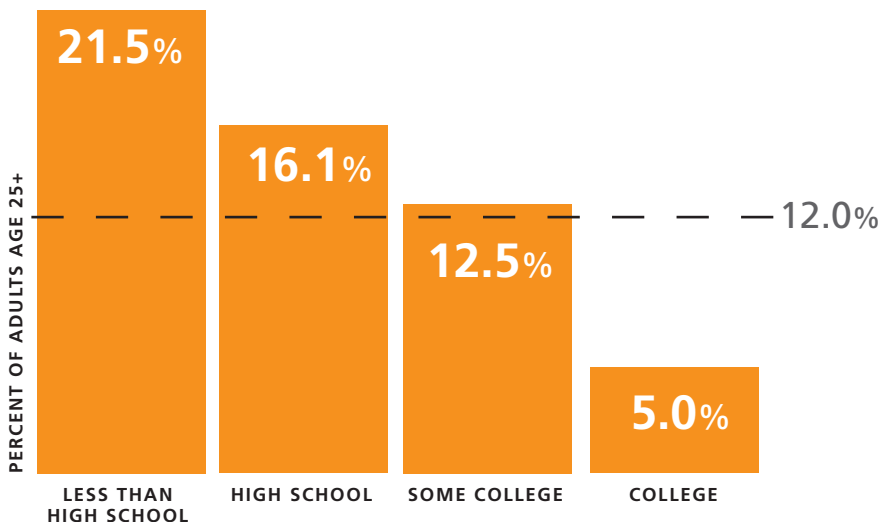


FIGURE 3

Percentage of Adults with Multiple Unhealthy Behaviors* by Race/Ethnicity, United States (BRFSS 2014)

*Multiple unhealthy behaviors is any combination of three or more of the five following unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

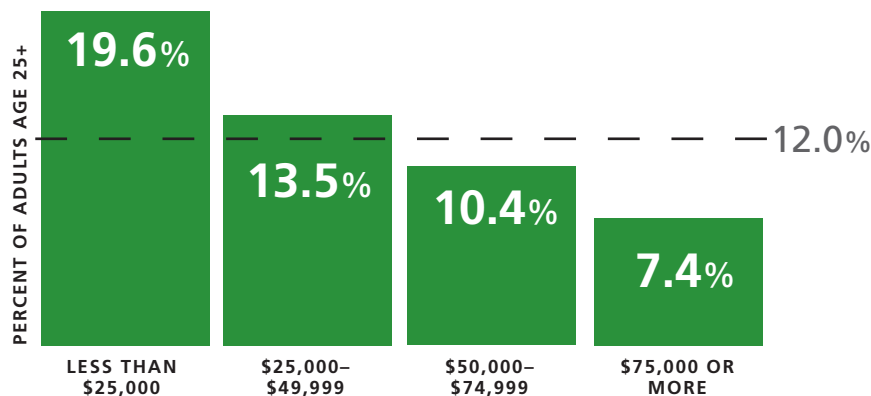
FIGURE 4

Percentage of Adults Aged 25 and Older with Multiple Unhealthy Behaviors* by Education Level, United States (BRFSS 2014)

*Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

FIGURE 5

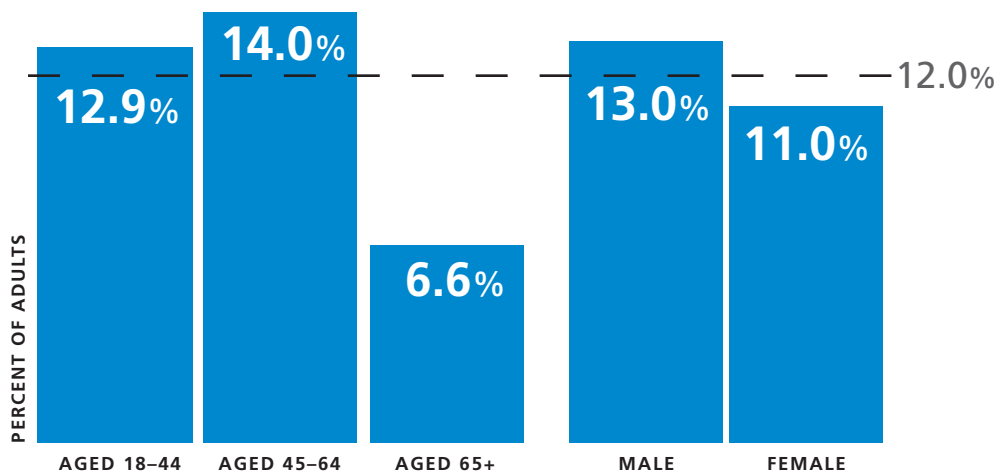
Percentage of Adults Aged 25 and Older with Multiple Unhealthy Behaviors* by Household Income, United States (BRFSS 2014)



*Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

FIGURE 6

Percentage of Adults with Multiple Unhealthy Behaviors* by Age and Gender, United States (BRFSS 2014)



*Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

TABLE 2**Value and Estimated Population Count of US Adults with Multiple Unhealthy Behaviors* by Subpopulation****

GROUP	VALUE (%)	95% CI	POPULATION COUNT***
Overall	12.0	11.8-12.2	25,012,800
Non-Hispanic White	11.4	11.2-11.6	15,783,900
Non-Hispanic Black	16.5	15.7-17.2	3,914,600
Hispanic	13.0	12.3-13.7	3,606,000
< High School	21.5	20.6-22.4	5,233,500
High School	16.1	15.7-16.5	7,927,300
Some College	12.5	12.1-12.9	6,837,100
College	5.0	4.8-5.2	2,642,700
< \$25,000	19.6	19.1-20.2	8,804,600
\$25,000 to \$49,999	13.5	13.0-14.0	5,394,000
\$50,000 to \$74,999	10.4	9.9-10.9	2,657,000
>= \$75,000	7.4	7.0-7.7	3,852,400
Aged 18-44	12.9	12.5-13.2	12,262,500
Aged 45-64	14.0	13.6-14.3	10,068,700
Aged 65+	6.6	6.3-6.9	2,681,600
Male	13.0	12.7-13.4	13,550,900
Female	11.0	10.8-11.3	11,461,800

*Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

**Education and income subpopulation data is limited to adults aged 25 and older.

*** Estimated number of US adults.

Of an estimated 58.5 million US adults, or 28.1%, with zero unhealthy behaviors, the map shows a similar clustering of states as was found in the MUB analysis (Figure 7). States with the lowest proportion of adults with zero unhealthy behaviors are clustered in the East North Central and East South Central Census Divisions, while states with the highest proportion of adults with zero unhealthy behaviors are clustered in the Pacific, Mountain, and New England Census Divisions, as well as Minnesota.

FIGURE 7
Percentage of Adults with Zero Unhealthy Behaviors*, United States (BRFSS 2014)

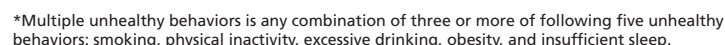
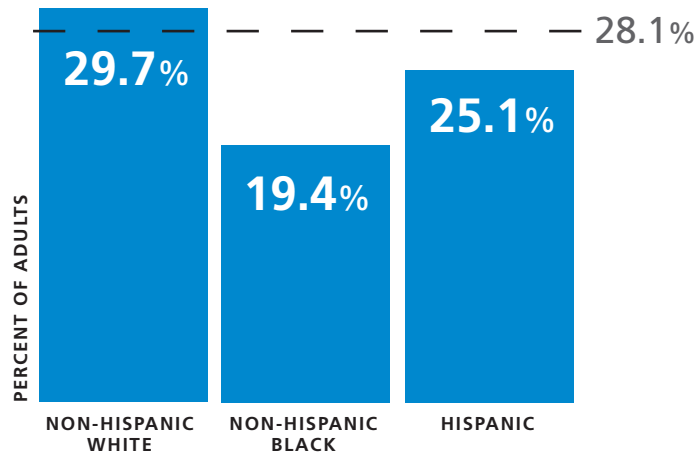
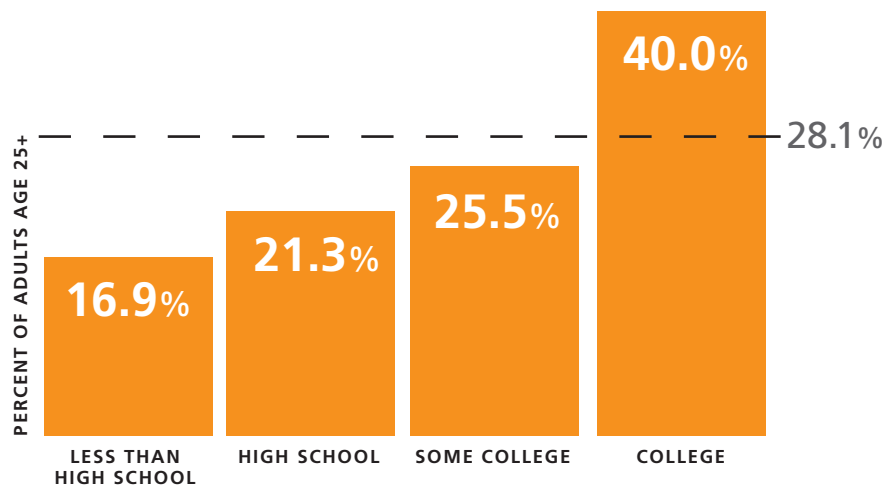


FIGURE 8

Percentage of Adults with Zero Unhealthy Behaviors* by Race/Ethnicity, United States (BRFSS 2014)

*Multiple unhealthy behaviors is any combination of three or more of following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

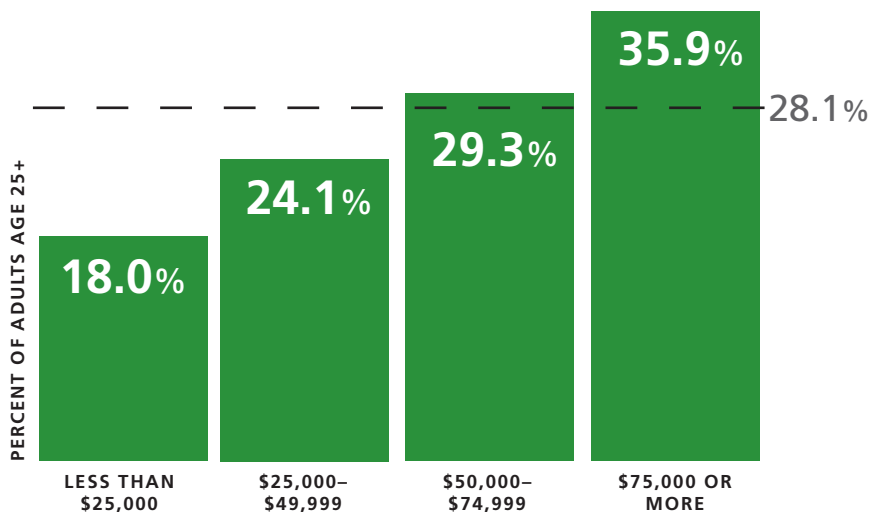
FIGURE 9

Percentage of Adults Aged 25 and Older with Zero Unhealthy Behaviors* by Education Level, United States (BRFSS 2014)

*Multiple unhealthy behaviors is any combination of three or more of following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

FIGURE 10

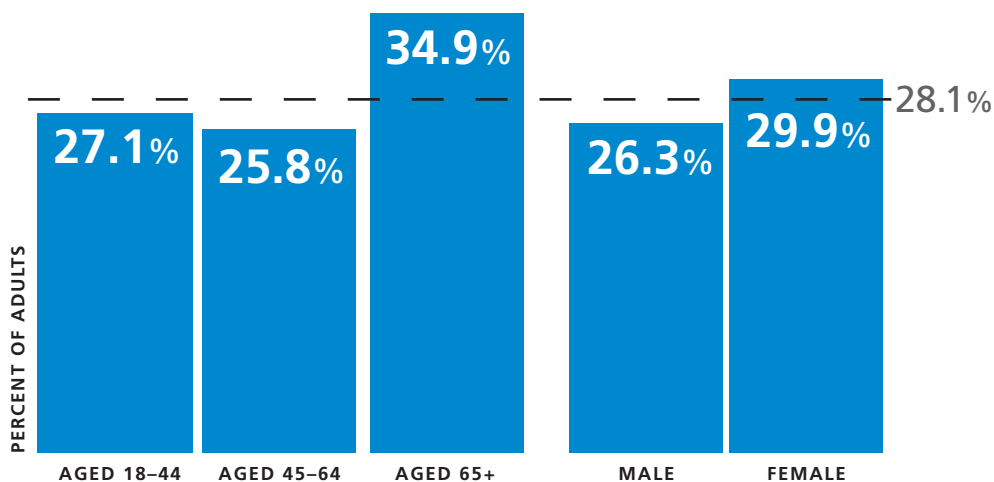
Percentage of Adults Aged 25 and Older with Zero Unhealthy Behaviors* by Income (BRFSS 2014)



*Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

FIGURE 11

Percentage of Adults with Zero Unhealthy Behaviors* by Age and Gender, United States (BRFSS 2014)



*Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

TABLE 3**Value and Estimated Population Count of Adults with Zero Unhealthy Behaviors* by Subpopulation****

GROUP	VALUE (%)	95% CI	POPULATION COUNT***
Overall	28.1	27.9-28.4	58,523,600
Non-Hispanic White	29.7	29.4-30.0	41,064,200
Non-Hispanic Black	19.4	18.5-20.2	4,600,200
Hispanic	25.1	24.1-26.1	6,962,000
< High School	16.9	16.0-17.8	4,111,400
High School	21.3	20.8-21.8	10,481,300
Some College	25.5	25.0-26.1	13,953,600
College	40.0	39.5-40.4	21,028,700
< \$25,000	18.0	17.4-18.5	8,062,600
\$25,000 to \$49,999	24.1	23.5-24.6	9,618,900
\$50,000 to \$74,999	29.3	28.6-30.1	7,476,700
>= \$75,000	35.9	35.3-36.4	18,799,200
Aged 18-44	27.1	26.6-27.5	25,785,700
Aged 45-64	25.8	25.4-26.2	18,584,200
Aged 65+	34.9	34.4-35.4	14,153,700
Male	26.3	25.9-26.7	27,378,400
Female	29.9	29.5-30.3	31,145,200

*Zero of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

**Education and income subpopulation data is limited to adults aged 25 and older.

***Estimated number of US adults.

The prevalence of the individual unhealthy behaviors explored in this report have all been declining over the past two to four years except for obesity, which has seen a 1.8% increase (27.8% in 2012 to 29.6% in 2015). For more information on individual unhealthy behaviors and the distribution of each behavior in the United States, see Appendix 2.

NATIONAL INSIGHTS

ODDS OF REPORTING FAIR OR POOR HEALTH STATUS

The odds of reporting fair or poor health status increase significantly with the addition of unhealthy behaviors (Table 4). Adults with one unhealthy behavior are two times more likely to report fair or poor health status compared with adults exhibiting no unhealthy behaviors, while adults with all five unhealthy behaviors are 8.7 times more likely to report fair or poor health status compared with adults with none of the unhealthy behaviors analyzed.

Adults with MUBs* are 6.1 times more likely to report fair or poor health status at the national level compared with adults with zero of the included unhealthy behaviors (Table 4).

TABLE 4
Odds Ratios for Fair or Poor Health Status by Number of Unhealthy Behaviors

UNHEALTHY BEHAVIORS*	OR**	95% CI	p-VALUE
0	1.0	—	—
1	2.0	1.9-2.1	<0.001
2	3.6	3.4-3.8	<0.001
3	5.7	5.4-6.1	<0.001
4	7.8	7.0-8.6	<0.001
5	8.7	6.2-12.1	<0.001
MUBs (3+)	6.1	5.8-6.5	<0.001

*Unhealthy behaviors: Smoking, obesity, physical inactivity, excessive drinking, and insufficient sleep. Multiple unhealthy behaviors (MUBs) is any combination of three or more of the five unhealthy behaviors.
**Unadjusted odds ratio.

Adults with multiple unhealthy behaviors are 6.1 times more likely to report fair or poor health status than those with zero unhealthy behaviors.

The association between each of the unhealthy behaviors and self-reported fair or poor health status was evaluated in a multivariable logistic regression model. All five unhealthy behaviors were significantly associated with self-reported fair or poor health status. For instance, the odds of self-reporting fair or poor health status among smokers was 1.8 (controlling for other unhealthy behaviors). See Appendix 2 for individual behavior odds ratios and additional discussion and Appendix 3 for related research on unhealthy behaviors and poor health status.

STATE INSIGHTS

MULTIPLE UNHEALTHY BEHAVIORS: EDUCATION-BASED DIFFERENCES

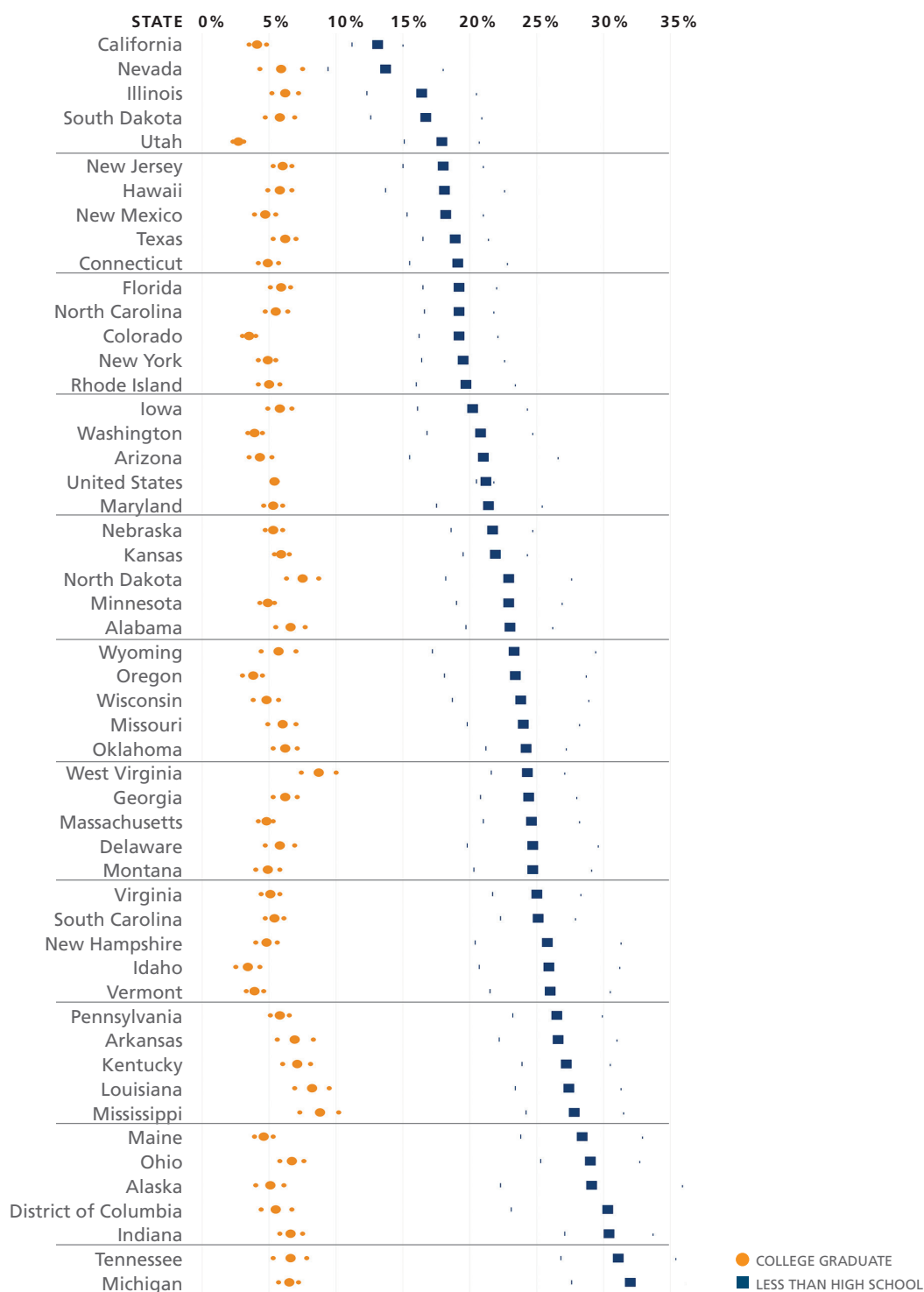
Nationally, the prevalence of MUBs in adults aged 25 and older varied widely by education level; adults with less than a high school diploma were more likely to exhibit MUBs than college graduates. To explore this at a state level, the 2013 and the 2014 BRFSS datasets were combined and stratified by state and education level.

Figure 12 shows how the range between states in the prevalence of MUBs among college graduates (6.1%) is narrower compared with the range between states in the prevalence of MUBs among those with less than a high school diploma (18.9%). Among college graduates, the prevalence of MUBs varied from a low of 2.7% (95% CI: 2.3%-3.1%) in Utah to a high of 8.8% (95% CI: 7.3%- 10.2%) in Mississippi. Among those with less than a high school diploma, the prevalence of MUBs ranged from a low of 13.1% (95% CI: 11.2%- 15.0%) in California to a high of 32.0% (95% CI: 27.6%- 36.3%) in Michigan.

The difference in the prevalence of multiple unhealthy behaviors among college graduates and adults with less than a high school diploma varies widely across states.

FIGURE 12

Prevalence of Multiple Unhealthy Behaviors* in Adults Aged 25 and Older by State and Education Level (BRFSS 2013-2014)

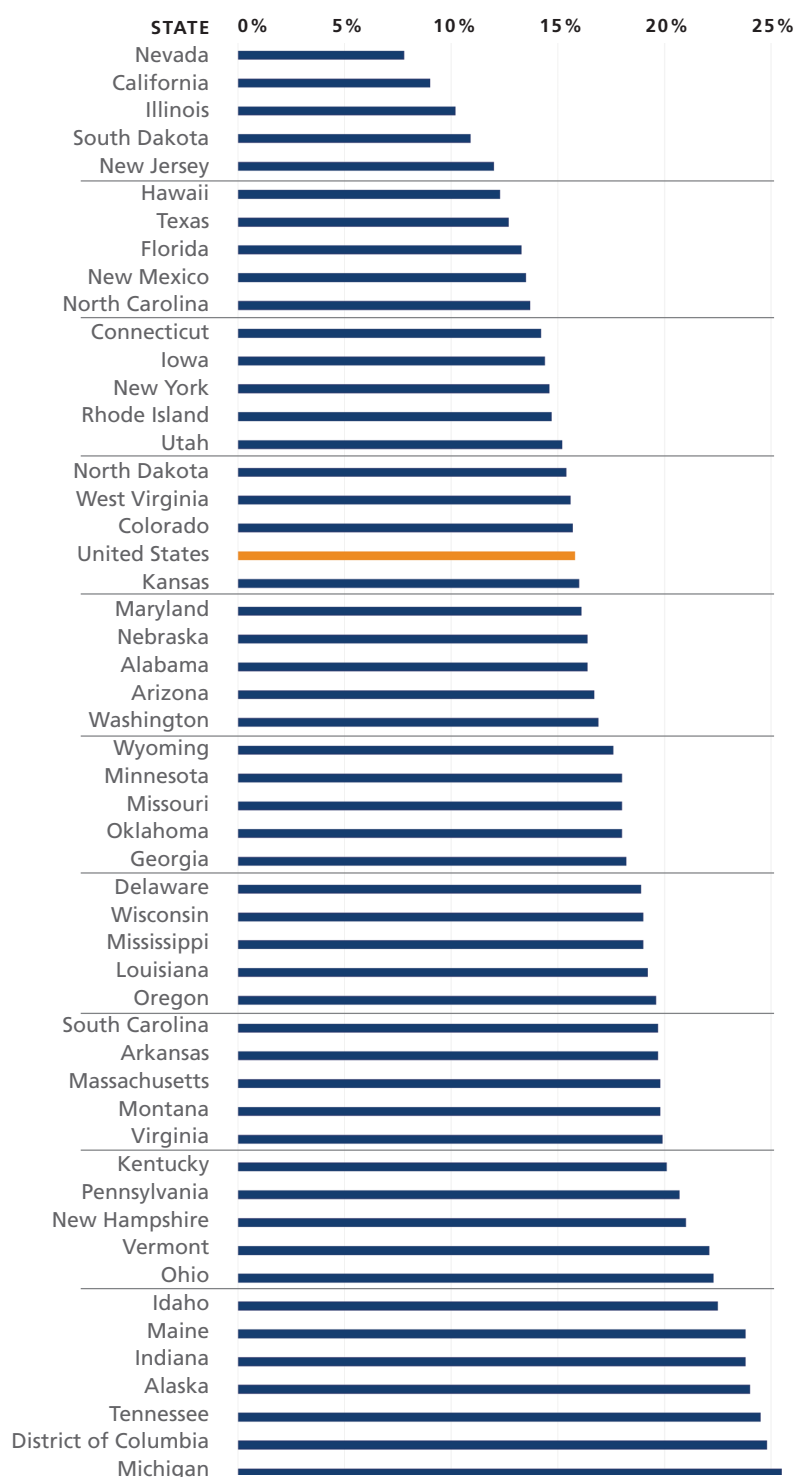


*Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

Another way of looking at this difference in prevalence of MUBs is the gap between rates for college graduates and adults with less than a high school diploma (Figure 13). In California and Nevada, this gap is less than 10 percentage points, while in Alaska, Tennessee, and Michigan, it exceeds 20 percentage points. This is a two-fold difference between states with the lowest and states with the highest gap. Nationally, the gap is 15.8 percentage points, which is the difference in the prevalence for those with less than a high school diploma (21.2%) and college graduates (5.4%).

Please refer to Appendix 4 for all values and simple differences by education level.

FIGURE 13
Difference in Prevalence of Multiple Unhealthy Behaviors Between Adults with Less Than a High School Diploma and College Graduates by State (BRFSS 2013-2014)**



*Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.
 **Data limited to adults aged 25 and older.

CONCLUSIONS

The increasing odds of reporting fair or poor health status with each additional unhealthy behavior practiced serves as a call to action to reduce the prevalence of multiple unhealthy behaviors among adults and to help Americans get back on track to better health.

Focusing interventions on individuals practicing multiple unhealthy behaviors, who are at highest risk for fair or poor health status, likely will be key to improving the health status of the population. These individuals are 6.1 times more likely to report fair or poor health, and are disproportionately low income and low education—which suggests a need for holistic solutions tailored to these populations.

Interventions to curb unhealthy behaviors will also have an impact on health care costs. Health care costs are unevenly distributed in the United States. Research on health care costs and utilization shows that a small percentage of patients account for the majority of health care costs.^{xi} Understanding this, some states and health care providers are implementing programs that provide this patient population with expanded access to primary care and clinical preventive services that help individuals take action to improve their health.^{xii, xiii}

APPENDIX 1

The Behavioral Risk Factor Surveillance System (BRFSS) is the largest and longest running state-based data collection tool in the United States. The telephone-administered surveys collect data on health-related risk behaviors, chronic health conditions, and use of preventive services in all 50 states, the District of Columbia, Guam, and Puerto Rico.^{xiv} The validity and reliability of estimates produced by BRFSS data has been repeatedly confirmed through comparisons to other national household surveys.^{xv}

Using BRFSS data for the five chosen unhealthy behaviors: smoking, obesity, physical inactivity, excessive drinking, and insufficient sleep, dichotomous variables were created representing the presence or absence of each behavior. A composite variable was then created to model the combination of the five unhealthy behaviors. The composite variable was defined as the total number of unhealthy behaviors, ranging from zero to five. The proportions of zero to five unhealthy behaviors were examined at the national level. At the state and subpopulations levels, the multiple unhealthy behaviors (MUBs) variable was collapsed into two categories, having three or more unhealthy behaviors or having less than three unhealthy behaviors, to allow for adequate sample size in the reporting of proportions by state and subpopulation.

The association between the number of unhealthy behaviors as an indicator variable and self-reported fair or poor health status was examined using logistic regression. The outcome variable, general health status, was dichotomized into 1="low" (fair or poor health status) and 0="high" (good, very good or excellent health status). The results are reported as prevalence odds ratios, which has been shown to overestimate the strength of the association.^{xvi} For this reason, confidence intervals are included with estimates of association and sample sizes to improve the accuracy of interpretation.

The following covariates were included in the regression analysis to evaluate their effect on the association between MUBs and self-reported fair or poor health status: sex, age, race/ethnicity, education level, and income. All responses coded as "don't know," "not sure," "refused," or "missing" were excluded for all variables.

APPENDIX 2

Nationally, the most common unhealthy behavior among the five analyzed was insufficient sleep while physical inactivity had the strongest association with self-reported fair or poor health status (adjusted OR=2.9). Notably, excessive drinking had an inverse association with self-reported fair or poor health status, in both the univariable and multivariable model. This association varied across race/ethnicity, education level, and was confounded by age. Excessive drinking remained in the overall model of the five unhealthy behaviors due to the association being positive for certain race/ethnicity subpopulations (non-Hispanic blacks, OR=1.6; Hispanics, OR=1.9; American Indians, OR=1.8; and Hawaiian or Pacific Islander, OR=1.3; all compared to non-Hispanic whites).

The association between increasing number of unhealthy behaviors and fair or poor health status varied across levels of sex, race/ethnicity, education level, and income. All interaction terms were statistically significant at $p < 0.001$. The association between MUBs and fair or poor health status differed across age group, sex, race/ethnicity, education level, and income and all interaction terms were statistically significant ($p < 0.001$).

SMOKING

Public Health Impact

Smoking has a well-documented unhealthy impact on overall health. It is the leading cause of preventable death in the United States; approximately 14 million major medical conditions among adults are attributed to smoking.^{xvii} Annually, more than 480,000 people die from cigarette smoking with nearly 42,000 deaths caused by exposure to secondhand smoke.^{xvii} Another 10.9 million adults suffer from a serious smoking-related illness.^{xvii} Smoking damages nearly every body organ and causes respiratory disease, heart disease, stroke, cancer, preterm birth, low birthweight, and premature death.^{vi, xviii} Smokers lose an average of 10 years of life because of their smoking.^{xix} Furthermore, smoking harms not only smokers, but also affects non-smokers by causing respiratory infections in children and heart disease and lung cancer in adults.^{xx}

Smoking prevalence among adults in the United States has consistently decreased since 2012 from 21.2% to 18.1% in 2015. See the *America's Health Rankings*® website for more information on smoking: <http://www.americashealthrankings.org/ALL/Smoking>.

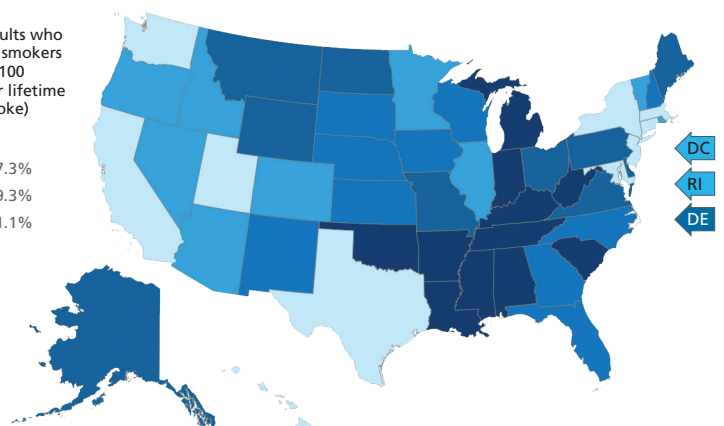
Odds Ratio—Fair or Poor Health Status

The odds of self-reporting fair or poor health status among smokers was 1.9 compared to non-smokers (adjusted OR=1.8, controlling for other unhealthy behaviors in the model).

Smoking Prevalence by State (BRFSS 2014)

Percentage of adults who are self-reported smokers (smoked at least 100 cigarettes in their lifetime and currently smoke)

- <15.7%
- 15.7% TO <17.3%
- 17.3% TO <19.3%
- 19.3% TO <21.1%
- ≥21.1%



EXCESSIVE DRINKING

Public Health Impact

Excessive drinking is a leading cause of premature death in the United States, accounting for one in 10 deaths among working adults.^{xxi} From 2006 to 2010 there was an annual average of 87,798 alcohol-attributable deaths and 2.5 million years of potential life lost due to excessive alcohol use.^{xxi} In that same time span, an average of 12,460 motor vehicle traffic crashes were attributed to excessive drinking.^{xxii} Excessive alcohol use includes binge drinking and heavy drinking;^{xxiii} it can lead to fetal damage, liver diseases, high blood pressure, cardiovascular diseases, and other major health problems.^{xxv}

Excessive drinking prevalence among adults in the United States decreased from 18.2% to 17.6% over 2014-2015. See the *America's Health Rankings*[®] website for more information on excessive drinking: <http://www.americashealthrankings.org/ALL/ExcessDrink>.

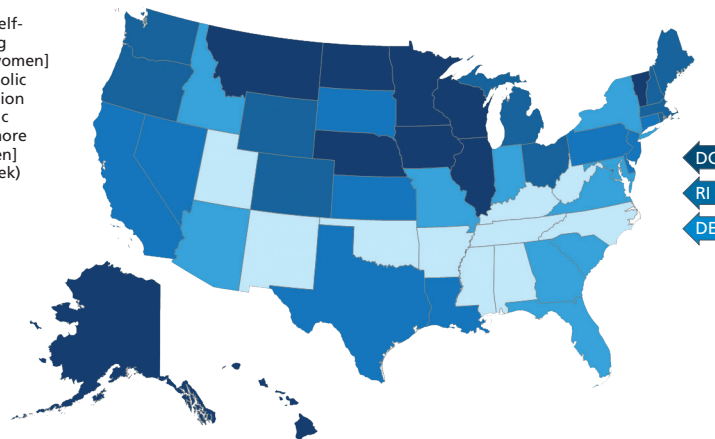
Odds Ratio—Fair or Poor Health Status

The odds of self-reporting fair or poor health status is less in those who self-report as excessive drinkers compared to those who do not (unadjusted OR=0.59; adjusted OR=0.58, controlling for other unhealthy behaviors in the model). This finding is intriguing and could be due to a variety of factors, not limited to: the perceived beneficial effect of social drinking, the type of alcohol consumed, and the gradual detrimental effect of excessive alcohol use on health compared to the more immediate effect of smoking, obesity, physical inactivity and insufficient sleep on one's perceived health status.

Excessive Drinking Prevalence by State (BRFSS 2014)

Percentage of adults who self-report either binge drinking (consuming more than 4 [women] or more than 5 [men] alcoholic beverages on a single occasion in the last month) or chronic drinking (consuming 8 or more [women] or 15 or more [men] alcoholic beverages per week)

- <15.5%
- 15.5% TO <17.1%
- 17.1% TO <18.5%
- 18.5% TO <20.6%
- ≥20.6%



OBESITY

Public Health Impact

One of the greatest health threats to the United States is obesity. It contributes to heart disease, type 2 diabetes, stroke, certain cancers, hypertension, liver disease, kidney disease, Alzheimer's disease, dementia, respiratory conditions, osteoarthritis, and poor general health.^{xxvi} One-third of US adults are obese^{xxvii}, and obesity is a leading factor in preventable diseases causing an estimated 200,000 deaths per year.^{xxviii} Children and teens who are obese are more likely to be obese as adults and are at increased risk for developing heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis.^{xxix}

The prevalence of obesity is greater than the prevalence of smoking, and obesity is similar to smoking and excessive alcohol consumption in terms of contributing to chronic conditions and overall poor physical health.^{xxx} Since the 1980s energy intake has climbed and energy expenditure has declined, leading to a growing energy imbalance that closely mirrors the obesity rates.^{xxxi} There is increasing evidence illustrating the importance of environment in the obesity epidemic and the need for changes in social and physical environments in order to better facilitate lifestyle changes.^{xxxii}

The prevalence of obesity among adults in the United States has increased over the past four years to reach 29.6% in 2015, with a momentary dip in 2013 to 27.6%. See the *America's Health Rankings*® website for more information on obesity: <http://www.americashealthrankings.org/ALL/Obesity>.

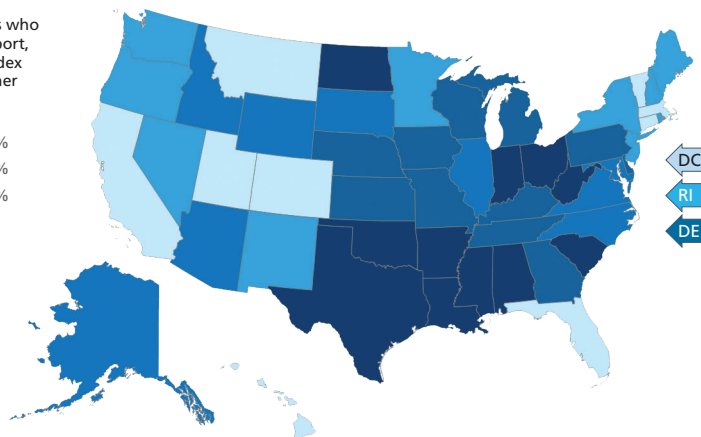
Odds Ratio—Fair or Poor Health Status

The odds of self-reporting fair or poor health status among the obese population was 2.2 compared to the non-obese population (adjusted OR=2.0, controlling for other unhealthy behaviors in the model).

Obesity Prevalence by State (BRFSS 2014)

Percentage of adults who are obese by self-report, with a body mass index (BMI) of 30.0 or higher

- <26.9%
- 26.9% TO <28.5%
- 28.5% TO <30.2%
- 30.2% TO <31.9%
- ≥31.9%



PHYSICAL INACTIVITY

Public Health Impact

Physical inactivity increases the risk of developing cardiovascular disease, type 2 diabetes, hypertension, obesity, certain cancers, depression, and premature death.

^{xxxiii–xxxiv} Only 21.0% of adults meet 2008 physical activity guidelines.^{xxxv} Non-Hispanic white adults report more aerobic and muscle strengthening physical activity than non-Hispanic black and Hispanic adults.^{xxxv} Increasing physical activity, especially from a baseline absence of activity, prevents numerous chronic diseases and aids in their management.^{xxxvi} It is estimated that physical inactivity is responsible for almost one in 10 deaths annually.^{xxxviii} Physical inactivity is associated with many social and environmental factors including low educational attainment, socioeconomic status, violent crime, and poverty.^{xi} Socioeconomic status and education moderate the relationship between race and physical inactivity;^{xxxviii} adults with higher education or those with higher incomes are more likely to be physically active than those with low education or low income.^{xxix}

Since 2012, there has been a decrease on average in the prevalence of physical inactivity or a sedentary lifestyle among adults in the United States (26.2% in 2012 to 22.6% in 2015). See the *America's Health Rankings*® website for more information on physical activity: <http://www.americashealthrankings.org/ALL/Sedentary>.

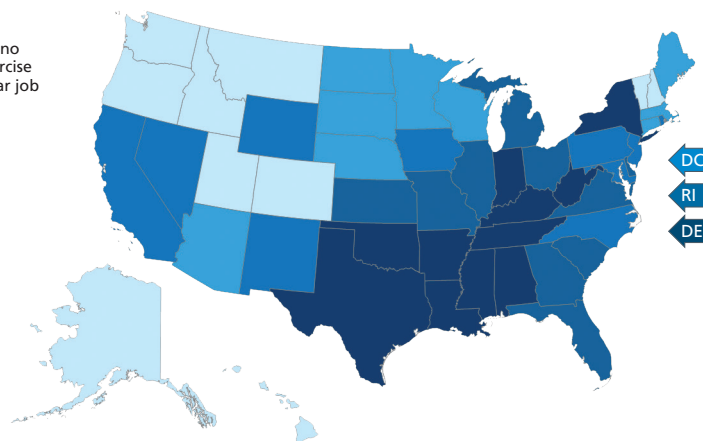
Odds Ratio—Fair or Poor Health Status

The odds of self-reporting fair or poor health status among the physically inactive population compared to the physically active outside of work population was 3.3 (adjusted OR=2.9, controlling for other unhealthy behaviors in the model).

Physical Inactivity Prevalence by State (BRFSS 2014)

Percentage of adults who self-report doing no physical activity or exercise other than their regular job in the last 30 days

- <19.7%
- 19.7% TO <21.4%
- 21.4% TO 23.5%
- 23.5% TO <25.9%
- >=25.9%



INSUFFICIENT SLEEP

Public Health Impact

Insufficient sleep has become a public health epidemic over the last two decades.^{xxxix} An estimated 70 million US adults suffer from chronic sleep and wakefulness disorders.^{xl} Sleep is an important determinant of overall health and well-being. Adequate sleep is necessary for optimal sugar metabolism and functioning of the immune system. CDC's surveillance of sleep behavior has expanded to include data on outcomes associated with sleep insufficiency such as motor vehicle crashes and occupational errors.^{xxxix} An estimated 1,500 fatal car accidents and 40,000 non-fatal injuries annually are the result of drowsy drivers.^{xxxix} Adults who average fewer than seven hours of sleep nightly are more likely to have chronic illnesses including obesity, diabetes, cancer, hypertension, and depression; they are also more likely to have a reduced quality of life and productivity.^{xli}

Insufficient sleep prevalence among adults in the United States decreased slightly from 35.3% to 34.2% over 2014-2015. See the *America's Health Rankings*[®] website for more information on insufficient sleep: <http://www.americashealthrankings.org/ALL/sleep>.

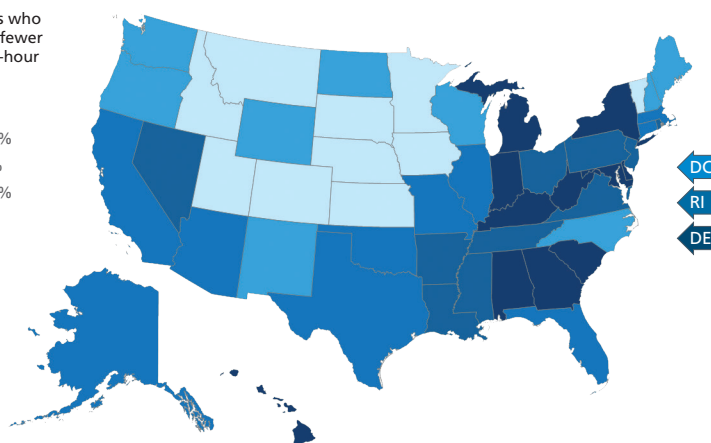
Odds Ratio—Fair or Poor Health Status

The odds of self-reporting fair or poor health status among the population with insufficient sleep compared to the population with 7 or more hours of sleep was 1.9 (adjusted OR=1.7, controlling for other unhealthy behaviors in the model).

Insufficient Sleep Prevalence by State (BRFSS 2014)

Percentage of adults who self-report sleeping fewer than 7 hours in a 24-hour period, on average

- <19.7%
- 19.7% TO <21.4%
- 21.4% TO 23.5%
- 23.5% TO <25.9%
- ≥25.9%



APPENDIX 3

The prevalence of multiple unhealthy behaviors, or risk factors, has been linked to increased risk of chronic disease morbidity and mortality.^{xlii, xliii, xliv, xlv}

Related Research on Individual and Multiple Unhealthy Behaviors

Other studies have analyzed the independent association of unhealthy behaviors and low health status, statistically controlling for the other unhealthy behaviors.^{xlii, xlv} An analysis of National Health Interview Survey data from 2001 found the prevalence of three or more risk factors in adults to be 17% (current smoker, obese/overweight, physically inactive, excessive drinker).^{xlii} Nationally representative studies have found a lower prevalence of multiple unhealthy health behaviors among women, the older population and those with higher education levels.^{xlii}

Related Research on Multiple Unhealthy Behaviors and Fair or Poor Health Status

Using 2001 and 2002 BRFSS data, Strine et al showed that current smokers were more likely to report fair or poor health (OR=1.7) and to report 14 or more poor mental health days (OR=2.3), after adjusting for age, gender, race/ethnicity, education, employment status, and marital status.^{xlvi} An analysis of 2011 Georgia BRFSS data showed a 2.8 times greater odds of fair/poor self-perceived health among those reporting engaging in more than one health risk behavior (smoking, physical inactivity and binge drinking).^{xlvii} Studies within specific populations of risk behaviors and self-rated health found that excessive drinking either had no significant effect or (a protective effect) on self-rated health.^{xlviii, xlix}

APPENDIX 4

Table 6 displays the percentage of adults aged 25 and older with MUBs for those with less than a high school diploma, college degree, and the difference, or gap, between the two education levels.

TABLE 6
Prevalence of Multiple Unhealthy Behaviors* in Adults Aged 25 and Older by Education Level and State (BRFSS 2013-2014)

STATE	LESS THAN HIGH SCHOOL (%)	COLLEGE GRADUATE (%)	DIFFERENCE (%)
Alabama	23.0	6.6	16.4
Alaska	29.1	5.1	24.0
Arizona	21.0	4.3	16.7
Arkansas	26.6	6.9	19.7
California	13.1	4.1	9.0
Colorado	19.2	3.5	15.7
Connecticut	19.1	4.9	14.2
Delaware	24.7	5.8	18.9
District of Columbia	30.3	5.5	24.8
Florida	19.2	5.9	13.3
Georgia	24.4	6.2	18.2
Hawaii	18.1	5.8	12.3
Idaho	25.9	3.4	22.5
Illinois	16.4	6.2	10.2
Indiana	30.4	6.6	23.8
Iowa	20.2	5.8	14.4
Kansas	21.9	5.9	16.0
Kentucky	27.2	7.1	20.1
Louisiana	27.4	8.2	19.2
Maine	28.4	4.6	23.8
Maryland	21.4	5.3	16.1
Massachusetts	24.6	4.8	19.8
Michigan	32.0	6.5	25.5
Minnesota	22.9	4.9	18.0
Mississippi	27.8	8.8	19.0
Missouri	24.0	6.0	18.0
Montana	24.7	4.9	19.8
Nebraska	21.7	5.3	16.4
Nevada	13.7	5.9	7.8
New Hampshire	25.8	4.8	21.0
New Jersey	18.0	6.0	12.0
New Mexico	18.2	4.7	13.5
New York	19.5	4.9	14.6
North Carolina	19.2	5.5	13.7
North Dakota	22.9	7.5	15.4
Ohio	29.0	6.7	22.3
Oklahoma	24.2	6.2	18.0
Oregon	23.4	3.8	19.6
Pennsylvania	26.5	5.8	20.7
Rhode Island	19.7	5.0	14.7
South Carolina	25.1	5.4	19.7
South Dakota	16.7	5.8	10.9
Tennessee	31.1	6.6	24.5
Texas	18.9	6.2	12.7
Utah	17.9	2.7	15.2
Vermont	26.0	3.9	22.1
Virginia	25.0	5.1	19.9
Washington	20.8	3.9	16.9
West Virginia	24.3	8.7	15.6
Wisconsin	23.8	4.8	19.0
Wyoming	23.3	5.7	17.6
United States	21.2	5.4	15.8

* Multiple unhealthy behaviors is any combination of three or more of the following five unhealthy behaviors: smoking, physical inactivity, excessive drinking, obesity, and insufficient sleep.

- i Gerteis J, Izrael D, Deitz D, LeRoy L, Ricciardi R, Miller T, et al. Multiple Chronic Conditions Chartbook. AHRQ Publications No. Q14-0038. Rockville, MD: Agency for Healthcare Research and Quality. April 2014. <http://www.ahrq.gov/sites/default/files/wysiwyg/professionals/prevention-chronic-care/decision/mcc/mccchartbook.pdf>. Accessed March 7, 2016.
- ii Centers for Medicare and Medicaid Services. Chronic Conditions among Medicare Beneficiaries, Chartbook, 2012 Edition. Baltimore, MD. 2012. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/Downloads/2012Chartbook.pdf>. Accessed March 7, 2016.
- iii Sacks JJ, Gonzales KR, Bouchery EE, Tomedi LE, Brewer RD. 2010 National and State Costs of Excessive Alcohol Consumption. *Am J Prev Med*. 2015;49(5):e73-79.
- iv Cawley J, Meyerhoefer C. The medical care cost of obesity: An instrumental variables approach. *J Health Econ*. 2012;31(1):219-230.
- v Carlson SA, Fulton JE, Pratt M, Yang Z, Adams EK. Inadequate physical activity and health care expenditures in the United States. *Prog Cardiovasc Dis*. 2015;57(4):315-323.
- vi Xu X, Bishop EE, Kennedy SM, Simpson SA, Pechacek TF. Annual healthcare spending attributable to cigarette smoking: an update. *Am J Prev Med*. 2015;48(3):326-333.
- vii US Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- viii Li C, Ford ES, Mokdad AH, Balluz LS, Brown DW, Giles WH. Clustering of Cardiovascular Disease Risk Factors and Health-Related Quality of Life among US Adults. *Value Health*. 2008;11(4):689-699.
- ix Liu Y, Croft JB, Wheaton AG, Perry GS, Chapman DP, Strine TW et al. Association between perceived insufficient sleep, frequent mental distress, obesity and chronic diseases among US adults, 2009 behavioral risk factor surveillance system. *BMC Public Health*. 2013;13:84. <http://bmcpubhealth.biomedcentral.com/articles/10.1186/1471-2458-13-84>. Accessed February 17, 2016.
- x Lantz PM, House JS, Lepkowski JM, Williams DR, Mero RP, Chen J. Socioeconomic factors, health behaviors, and mortality: Results from a nationally representative prospective study of US adults. *JAMA*. 1998;279(21):1703-1708.
- xi Health Care Costs: A Primer. Key information on health care costs and their impact. The Henry J. Kaiser Family Foundation. May 2012. <https://kaiserfamilyfoundation.files.wordpress.com/2013/01/7670-03.pdf>. Accessed March 11, 2016.
- xii Wang, N. A Bridge to Health – And Away from ER Overuse. Kaiser Health News. <http://khn.org/news/a-bridge-to-health-and-away-from-er-overuse/>. Accessed March 7, 2016.
- xiii Foden-Vencil K. How Oregon Is Getting ‘Frequent Flyers’ Out of Hospital ERs. Kaiser Health News. <http://khn.org/news/emergency-room-frequent-flyers/>. Accessed March 11, 2016.
- xiv Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System. <http://www.cdc.gov/brfss/>. Updated February 1, 2016. Accessed February 26, 2016.
- xv Pierannunzi C, Sean Hu S, Balluz L. A systematic review of publications assessing reliability and validity of the Behavioral Risk Factor Surveillance System (BRFSS), 2004-2011. *BMC Medical Research Methodology*. 2013;13:49. <http://bmcmmedresmethodol.biomedcentral.com/articles/10.1186/1471-2288-13-49>. Accessed March 24, 2016.
- xvi Thompson ML, Myers JE, Kriebel D. Prevalence odds ratio or prevalence ratio in the analysis of cross sectional data: what is to be done? *Occup Environ Med*. 1998;55(4):272-277.
- xvii Rostron BL, Chang CM, Pechacek TF. Estimation of cigarette smoking-attributable morbidity in the United States. *JAMA Intern Med*. October 13, 2014; doi:10.1001/jamainternmed.2014.5219.
- xviii US Department of Health and Human Services. How Tobacco Smoke Causes Disease: What It Means to You. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2010. Accessed March 24, 2016.
- xix Jha P, Ramasundarahettige C, Landsman V, Rostron B, Thun M, Anderson RN, et al. 21st-century hazards of smoking and benefits of cessation in the United States. *N Engl J Med*. 2013;368(4):341-50. <http://www.ncbi.nlm.nih.gov/pubmed/23343063>. Accessed August 11, 2014.
- xx Centers for Disease Control and Prevention, Health Effects of Secondhand Smoke. Updated March 5, 2014. Accessed March 24, 2016.
- xxi Stahre M, Roeber J, Kanny D, Brewer RD, Zhang X. Contribution of excessive alcohol consumption to deaths and years of potential life lost in the United States. *Prev Chronic Dis*. 2014;11:130293.
- xxii Centers for Disease Control and Prevention. Alcohol and public health: alcohol-related disease impact (ARDI) application. 2013. <http://www.cdc.gov/alcohol/onlineetools.htm>. Updated November 12, 2015. Accessed July 8, 2015.

- xxiii Centers for Disease Control and Prevention. Fact sheets—moderate drinking: alcohol and public health. <http://www.cdc.gov/alcohol/fact-sheets/moderate-drinking.htm>. Updated March 3, 2015. Accessed July 8, 2015.
- xxv Centers for Disease Control and Prevention. Alcohol and public health. <http://www.cdc.gov/alcohol/faqs.htm#excessivealcohol>. Updated November 16, 2015. Accessed March 16, 2016.
- xxvi Centers for Disease Control and Prevention. Overweight and obesity. <http://www.cdc.gov/obesity>. Updated August 6, 2013. Accessed August 21, 2013.
- xxvii Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of Childhood and Adult Obesity in the United States, 2011-2012. *JAMA*. 2014;311(8):806-814.
- xxviii Danaei G. The preventable causes of death in the United States: comparative risk assessment of dietary, lifestyle, and metabolic risk factors. *PLoS Medicine*. 2009;6(4).
- xxix Centers for Disease Control and Prevention. Childhood obesity facts. <http://www.cdc.gov/healthyyouth/obesity/facts.htm>. Updated April 24, 2015. Accessed July 16, 2015.
- xxx Sturm R. Does obesity contribute as much to morbidity as poverty or smoking? *Public Health*. 2001;115(3):229.
- xxxi Finkelstein EA. Economic causes and consequences of obesity. *Annu Rev Public Health*. 2005;26(1):239.
- xxxii Papas MA. The built environment and obesity. *Epidemiol Rev*. 2007;29(1):129.
- xxxiii Hu FB. Sedentary lifestyle and risk of obesity and type 2 diabetes. *Lipids*. 2003;38(2):103.
- xxxiv King AC. Environmental and policy approaches to cardiovascular disease prevention through physical activity: issues and opportunities. *Health Education Behavior*. 1995;22(4):499.
- xxxv Centers for Disease Control and Prevention. Facts about physical activity. <http://www.cdc.gov/physicalactivity/data/facts.htm>. Updated May 23, 2014. Accessed July 24, 2015.
- xxxvi Weiler R, Stamatakis E, Blair S. Should health policy focus on physical activity rather than obesity? Yes. *BMJ*. 2010;340(7757):1170-1171.
- xxxvii King AC. Personal and environmental factors associated with physical inactivity among different racial-ethnic groups of US middle-aged and older-aged women. *Health Psychology*. 2000;19(4):354.
- xxxviii Marshall S, Jones D, Ainsworth B, Reis J, Levy S, Macera C. Race/ethnicity, social class, and leisure time physical inactivity. *Med Sci Sports Exerc*. 2007;39(1):44-51.
- xxxix Centers for Disease Control and Prevention. Insufficient sleep is a public health epidemic. <http://www.cdc.gov/features/dssleep/>. Updated January 13, 2014. Accessed July 22, 2015.
- xl The National Center on Sleep Disorders Research (NCSDR). National Heart, Lung, and Blood Institute. <http://www.nhlbi.nih.gov/about/org/ncsdr/>. Accessed July 23, 2015.
- xli Institute of Medicine. *Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem*. Washington, DC: The National Academies Press; 2006.
- xlvi Fine L, Philogene G, Gramling R, Coups EJ, Sinha S. Prevalence of Multiple Chronic Disease Risk Factors. *Am J Prev Med*. 2004;27(25):18-24.
- xlvi Carlsson AC, Wandell PE, Gigante B, Leander K, Hellenius M-L, de Faire U. Seven modifiable lifestyle factors predict reduced risk for ischemic cardiovascular disease and all-cause mortality regardless of body mass index: A cohort study. *Int J Cardiol*. 2013;168:946-952.
- xliv Spring B, Moller AC, Coons MJ. Multiple health behaviors: overview and implications. *J Public Health*. 2012;34(1):i3-i10.
- xlvi Yusuf HR, Giles WH, Croft JB, Anda RF, Casper ML. Impact of Multiple Risk Factor Profiles on Determining Cardiovascular Disease Risk. *Prev Med*. 1998;27:1-9.
- xlvi Strine TW, Okoro CA, Chapman DP, Balluz LS, Ford ES, Ajani UA, et al. Health-Related Quality of Life and Health Risk Behaviors Among Smokers. *Am J Prev Med*. 2005;28(2):182-7.
- xlvi Annor F, Bayakly R, Vajani M. Self-perceived health: Relationship with chronic disease and health risk behaviors among adult Georgians. Paper Presented at: 141st APHA Annual Meeting and Exposition 2013; November 4, 2013; Boston, MA.
- xlvi Selivanova A, Cramm JM. The relationship between healthy behaviors and health outcomes among older adults in Russia. *BMC Public Health*. 2014;14:1183.
- xlvi Jiang Y, Hesser JE. Associations between health-related quality of life and demographics and health risks. Results from Rhode Island's 2002 behavioral risk factor survey. *Health and Quality of Life Outcomes*. 2006;4:14. Accessed March 7, 2016.



Guided by a passion to help people live healthier lives, United Health Foundation provides helpful information to support decisions that lead to better health outcomes and healthier communities. The Foundation also supports activities that expand access to quality health care services for those in challenging circumstances and partners with others to improve the well-being of communities.

United Health Foundation
9900 Bren Road East
Minnetonka, MN 55343

www.unitedhealthfoundation.org

The *America's Health Rankings® Spotlight: Impact of Unhealthy Behaviors* is available in its entirety at www.americashealthrankings.org. Visit the website to find additional resources and to download an electronic version of the report.

APRIL 2016