

Tennessee's Behavioral Risk Factor Surveillance System

2007

November 2008

The Behavioral Risk Factor Surveillance System is a state-based computer-assisted telephone interviewing effort conducted in cooperation with the Centers for Disease Control and Prevention. Since 1984, surveys have been done every month, on adults from randomly selected households, throughout the state. Questions are constructed to determine the behaviors of individuals that will affect their risk of developing chronic diseases that may lead to premature mortality and morbidity. The data collected helps to identify high risk populations that can be targeted for intervention programs. The data can also be used to track changes over time of prevalence of risk factor behaviors and related diseases, and can assess the impact of health promotion and prevention intervention programs. In 2007, every state in the country, the District of Columbia, Puerto Rico, and The Virgin Islands were members of this surveillance system.

Tennessee currently conducts approximately 5,000 interviews annually. During 2007, approximately 49,000 unique telephone numbers and over 170,000 call attempts to those numbers were required to complete these interviews. *Tennessee's Behavioral Risk Factor Surveillance System 2007* examines the results of some of the survey questions, and the trends for specific risk factors for the period 1997-2007.

Summary

Highlights from the trend analysis of risk factors examined in this report showed that overall there has been little or only marginal improvement in the rates examined in Tennessee over the time period 1997-2007. In fact, for the risk factors overweight/obesity, diabetes, and hypertension, health conditions appear to be worsening. Prevalence and secular trend data were used to measure risk factors. Prevalence data is the percent of a population that is affected with a particular condition at a given time. Prevalence data is a measure of the survey for a given year. Secular trend data is data relating to a continuing period of time. Secular trend data is obtained through a statistical technique to remove random fluctuation and derive the long term trend of the characteristics within the population.

- The secular trend data for the prevalence of current **smoking** indicates that there was a very slight non-significant downward trend over the time period 1997-2007, and that the current prevalence rate of 24.3 percent is about twice that of the *Healthy People 2010 Objective* of 12.0 percent.
- The secular trend data for the prevalence of **no physical activity** indicates that there was a substantial statistically significant downward trend for the period of 1997-2007, a positive finding. However, the projected prevalence rate in 2010 will still be over 36.0 percent higher than the *Healthy People 2010 Objective* of 20.0 percent.
- Secular trend data for the prevalence of **overweight/obesity** showed a substantial statistically significant upward trend over the time period 1997-2007. The projected overweight/obesity prevalence rate of 70.8 in 2010 appears to be almost twice that of the *Healthy People 2010 Objective*.
- The secular trend data for the prevalence of **diabetes** showed a substantial statistically significant upward trend for the years 1997-2007. The projected diabetes prevalence rate of 13.2 for 2010 is expected to be five times that of the *Healthy People 2010 Objective* of 2.5 percent.
- Secular trend data for **hypertension awareness** showed a modest statistically significant upward trend; however, the proportion of persons who are aware of their hypertension is roughly twice the *Healthy People 2010 Objective* of the population who are hypertensive.
- Data for the percentage of respondents who reported that they daily consumed **five or more fruits and vegetables** indicates that initially this risk factor improved and then receded over the 1996-2007 time period; essentially, no overall change.
- The secular trend data for the prevalence of women aged 50 and over that had a **mammogram** within the last two years indicated there was a statistically significant upward trend in Tennessee for the percent of women having this procedure performed, a positive finding.
- Secular trend data for respondents reporting **fair or poor health** showed a slight, non-statistically significant upward trend over the time period 1997-2007, essentially little or no change for this risk factor.

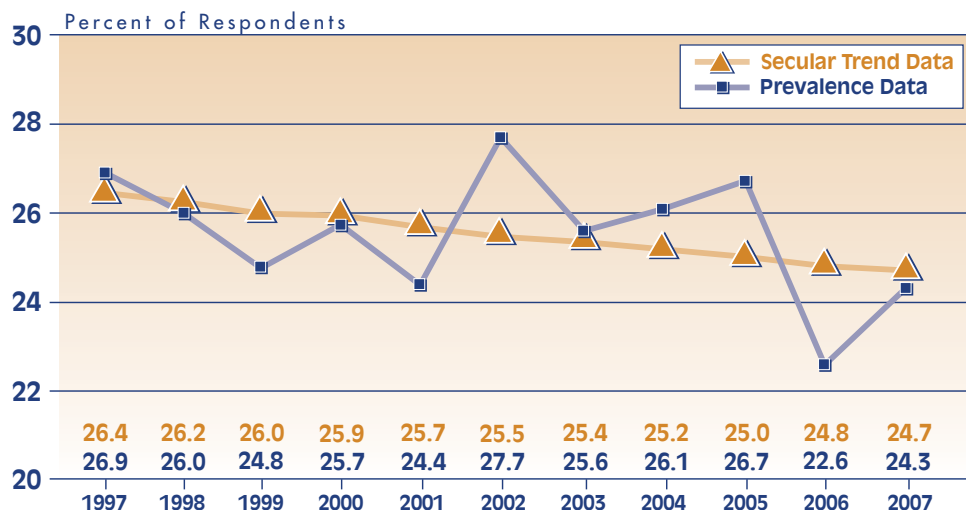
Tennessee's Behavioral Risk Factor Surveillance System 2007

Smoking

Tobacco use is the most preventable cause of premature mortality and morbidity in the United States and Tennessee. According to the survey, non-Hispanic white males overall reported the highest smoking prevalence rates for six of the last eleven years presented. Hispanic or nonwhite females consistently had the lowest smoking prevalence rates over this time period. Analysis of trend data showed that overall there was not a statistically significant downward trend for the population as a whole for the time period 1997-2007. While the earlier editions of this report had noted a statistically significant downward trend, data for the past five years no longer support this finding. Thus the noticeable progress in the reduction of percent current smoking, reported in previous editions of this report, has vanished with the inclusion of the last six years of data. Current smoking still remains a serious and unsolved health problem.

Tennessee's current smoking prevalence rate of 24.3 percent in 2007 is still well above the *Healthy People 2010 Objective* of 12.0 percent.

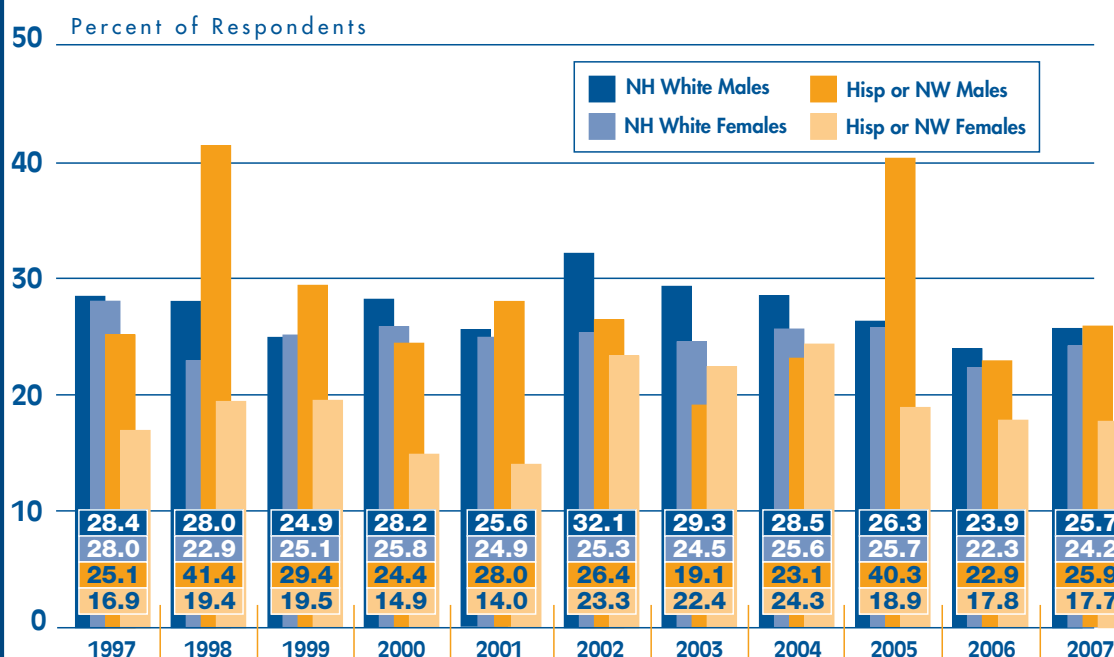
DATA FOR THE PREVALENCE AND SECULAR TREND OF CURRENT SMOKING FOR THE TOTAL POPULATION, TENNESSEE 1997-2007



In analyzing the trend data for the demographic sub-classifications of the population for this risk factor, it was likewise noted there was little or no noticeable change in smoking prevalence in each of the demographic subcategories analyzed. No category showed any statistically significant trend over this time period. High prevalence rates of 41.4 in 1998 and 40.3 in 2005, were noted for Hispanic or non-white males.

These data values were verified but appear to be inconsistent

PERCENT OF RESPONDENTS WHO REPORTED CURRENT SMOKING BY RACE AND GENDER, TENNESSEE 1997-2007



with similar data for the years covered in this study. The reason for these unusually high values remains unknown. Even ignoring these values, the prevalence rate for Hispanic or non-white males for the latter part of this time period remains as high as the beginning part of this period. There appears to be little or no progress in reducing the prevalence of smoking in the population overall. This risk factor remains a viable target area for future behavioral change programs or efforts.

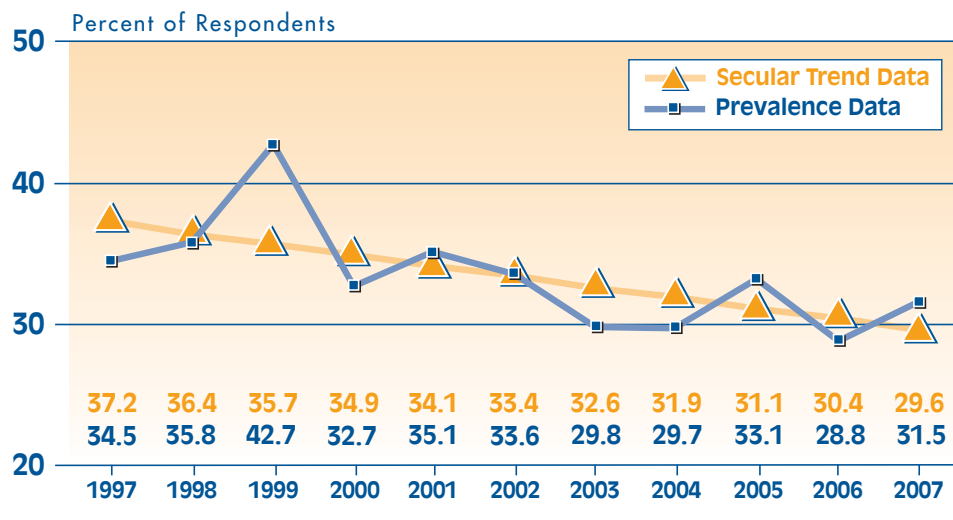
Tennessee's Behavioral Risk Factor Surveillance System 2007

Physical Activity

Physical activity and fitness are good health habits for promoting a healthy life and a preventive lifestyle. The percent of the population who reported no physical activity was surveyed from 1997 through 2007. Of the population surveyed during this time period, females of both race/ethnicity categories, in general, reported a higher percentage of physical inactivity than males. More detailed data not presented here indicated that physical activity decreased with age.

Analysis of trend data showed that overall there was a downward trend in the percent of respondents who reported no leisure time physical activity during the time period 1997-2007. This trend was statistically significant (slope= -0.76, p=0.0302). Analysis of trend data for each of the more detailed demographic categories of the population indicates similar results. All demographic categories show a downward trend. Only for Hispanic or nonwhite females (slope=-0.72, p=0.0217) was this downward trend statistically significant. While the strength of this association is not universally strong demographically, the direction of the trend appears to be very positive for this

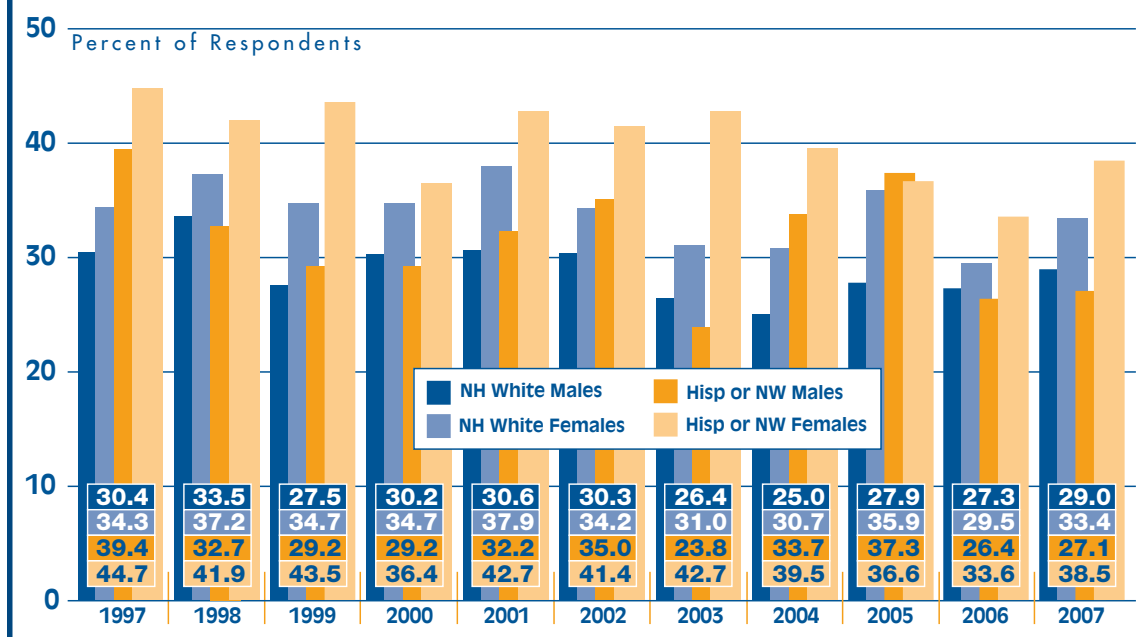
DATA FOR THE PREVALENCE AND SECULAR TREND OF NO PHYSICAL ACTIVITY FOR THE TOTAL POPULATION, TENNESSEE 1997-2007



behavioral risk factor. It is hoped that people are becoming aware of the benefits of physical activity and fitness.

The 2010 Healthy People Objective is to reduce the percent of adults who engage in no leisure time physical activity to 20.0 percent. In 2007, Tennessee's percentage for the population as a whole is 31.5, well above this objective. If the current trend continues, a percent rate of physical inactivity of 27.3 is predicted for 2010.

PERCENT OF RESPONDENTS WHO REPORTED NO PHYSICAL ACTIVITY, BY RACE AND GENDER, TENNESSEE 1997-2007



Tennessee's Behavioral Risk Factor Surveillance System 2007

Overweight/Obese

Being overweight/obese is a risk factor for heart disease, cancer, stroke, and diabetes. According to the Behavioral Risk Factor Surveillance System, the non-Hispanic white female population had lower overweight/obesity rates than those of the other demographic subgroups over the time period 1997-2007.

Overweight/obese is defined to include all respondents to weight and height questions that had a computed body mass index greater than or equal to 25.

Analysis of trend data showed that overall there was a statistically significant upward trend (slope=1.32, $p<0.0001$) for the population as a whole.

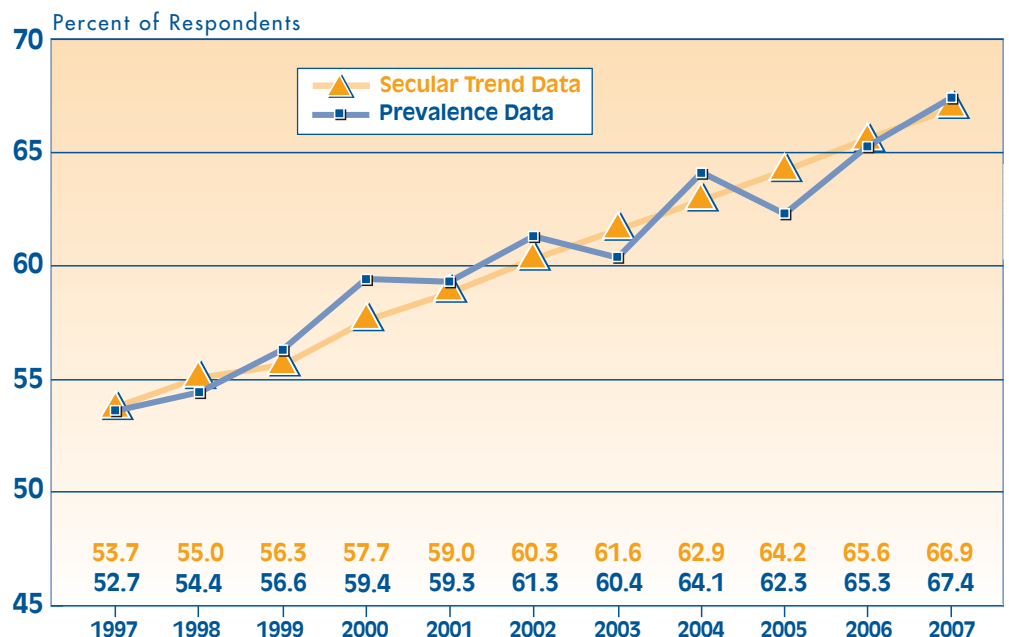
Analysis of trend data for the demographic categories of the population for this risk factor showed that there was a statistically significant upward trend in the prevalence of overweight/obesity for non-Hispanic white males (slope=1.30, $p<0.0001$), non-Hispanic white females

(slope=1.36, $p<0.0001$), and Hispanic or nonwhite females (slope=1.08, $p=0.0038$). Hispanic or nonwhite males showed an upward, but non-statistically significant trend. There is a very strong indication that the overweight/obesity prevalence

has increased over the time period 1997-2007, and this increase has occurred primarily in the non-Hispanic white population.

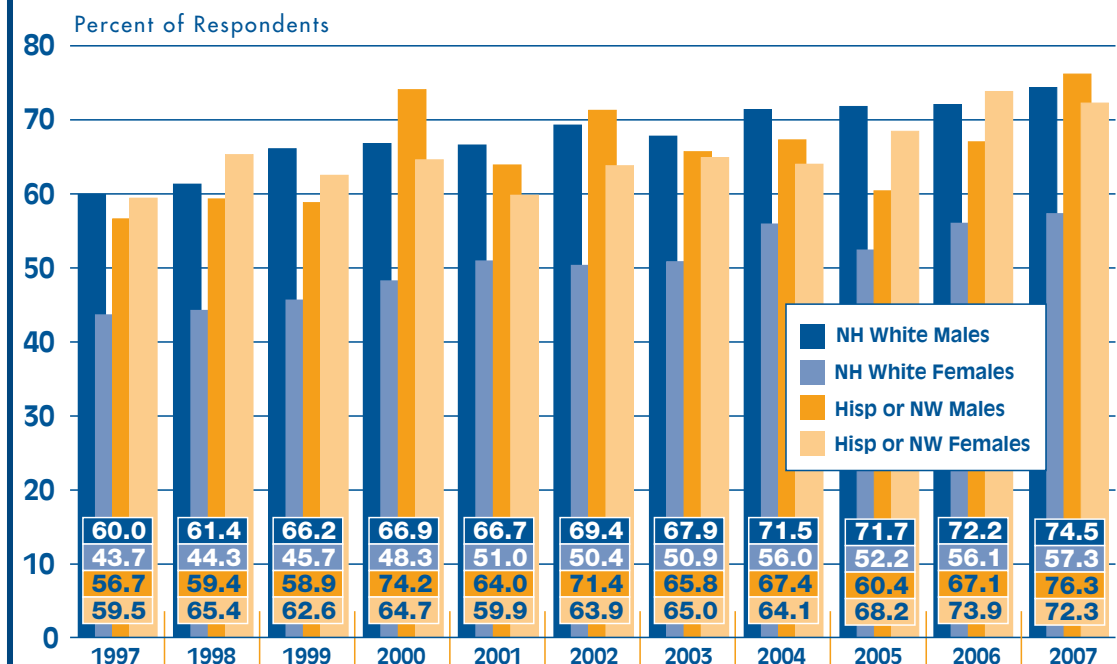
The prevalence of being overweight/obese for the total population was 67.4 percent in 2007. If the current trend continues an overweight/obesity rate of 70.8 percent is forecast for 2010. The behavioral risk factor of overweight/obesity is an increasing public health concern in Tennessee.

DATA FOR THE PREVALENCE AND SECULAR TREND OF THE TOTAL POPULATION WHO REPORTED OVERWEIGHT/OBESITY*, TENNESSEE 1997-2007



*Includes all respondents to weight and height questions that had a computed body mass index greater than or equal to 25.0.

PERCENT OF RESPONDENTS WHO REPORTED OVERWEIGHT/OBESITY* BY RACE AND GENDER, TENNESSEE 1997-2007

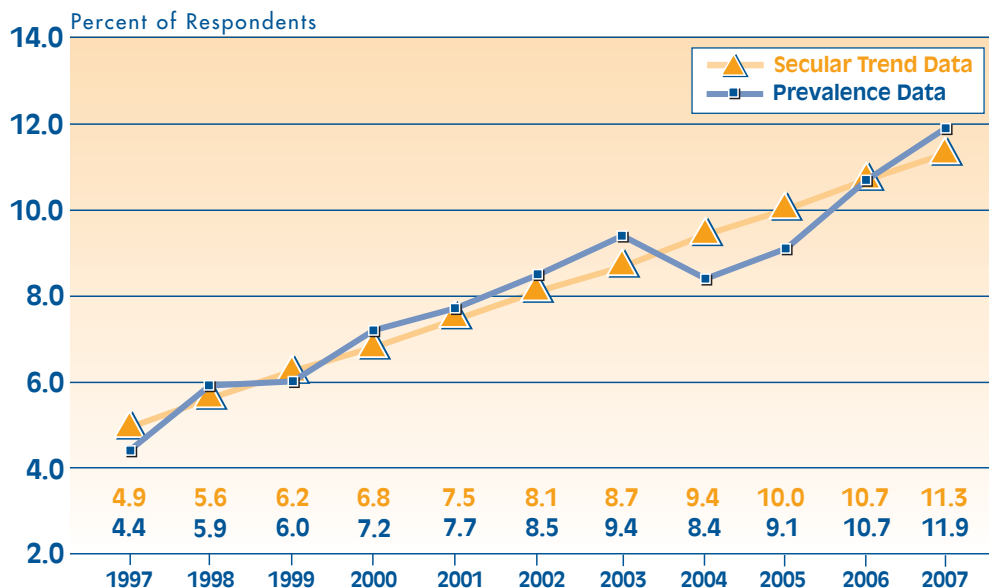


Tennessee's Behavioral Risk Factor Surveillance System 2007

Diabetes

Diabetes is a chronic metabolic disease. In 2007, it was the seventh leading cause of death in Tennessee and a contributing cause for various other deaths including cardiovascular disease. According to the survey, Hispanic or nonwhite females consistently reported the highest prevalence rates for most of the years during the 1997-2007 period. The other demographic categories appeared to fluctuate randomly in relation to one another. Analysis of trend data showed that overall there was a statistically significant upward trend (slope=0.64, $p<0.0001$) for the population as a whole. This is a strong indication that the prevalence of diabetes has been increasing over the period 1997-2007.

DATA FOR THE PREVALENCE AND SECULAR TREND OF THE TOTAL POPULATION WHO REPORTED DIABETES*, TENNESSEE 1997-2007

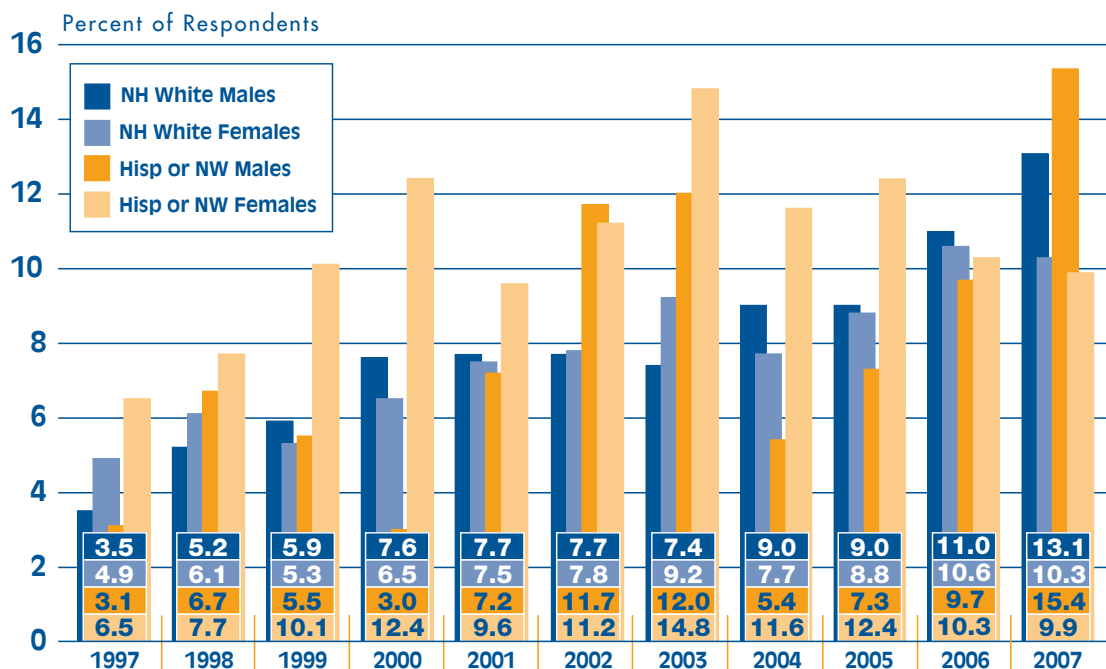


*Doctor diagnosed diabetes.

The current rate in Tennessee of 11.9 percent in 2007 is well above the Healthy People 2010 Objective for diabetes of 25 per 1,000 persons or 2.5 percent. In fact, Tennessee's rate is the highest of all of the states in the nation. This relationship only appears to be worsening. Should the current upward trend continue, a prevalence rate of 13.2 is forecast for 2010.

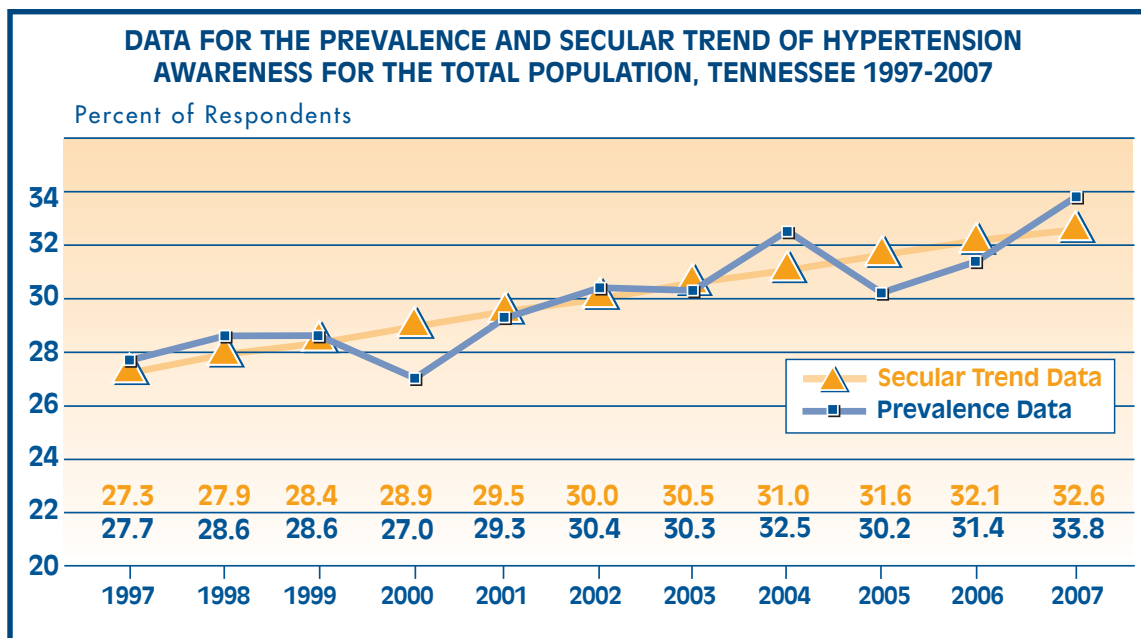
In analyzing the trend data for the demographic sub-classifications of the population for this risk factor, it was noted that diabetes prevalence for non-Hispanic white males (slope =0.75, $p<0.0001$), non-Hispanic white females (slope=0.54, $p<0.0001$), and Hispanic or nonwhite males (slope=0.80, $p=0.0202$), showed statistically significant upward trends. Hispanic or nonwhite females showed an upward non-statistical significance trend. The prevalence of diabetes is a behavioral risk factor which is currently on the increase and remains a public health concern.

PERCENT OF RESPONDENTS WHO REPORTED DIABETES*, BY RACE AND GENDER, TENNESSEE 1997-2007



*Doctor diagnosed diabetes.

Tennessee's Behavioral Risk Factor Surveillance System 2007

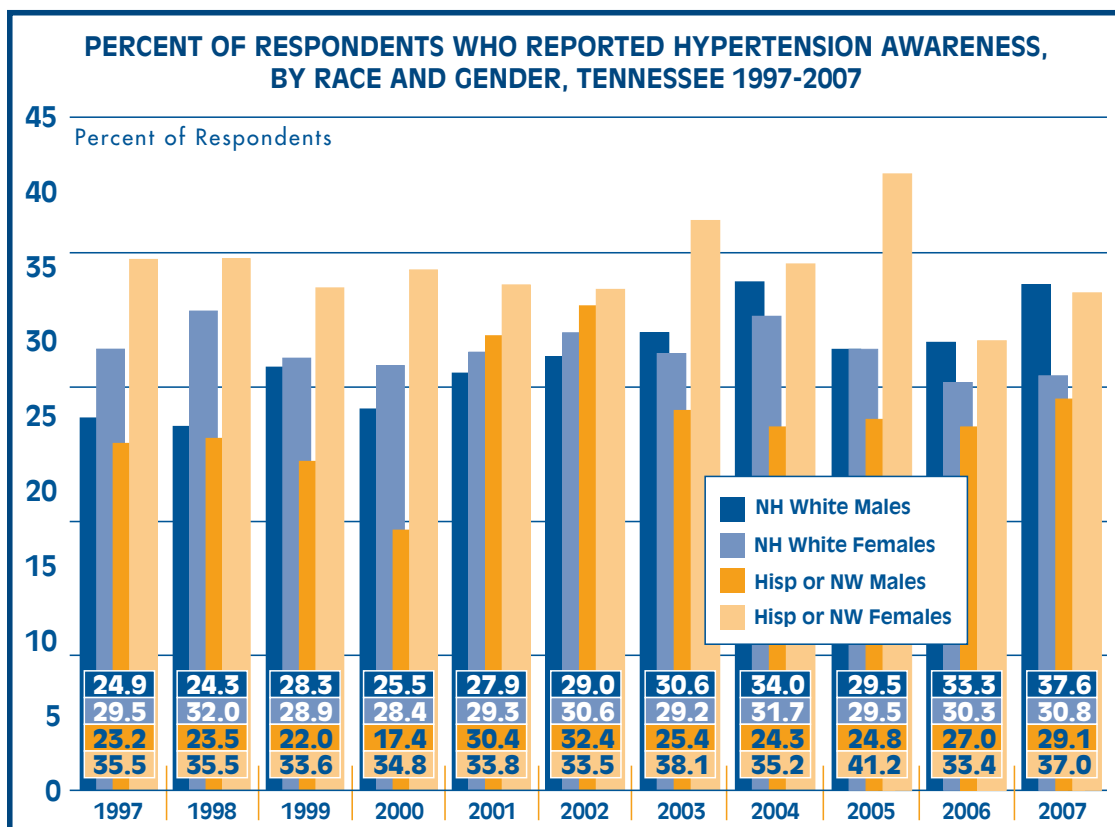


Hypertension

Uncontrolled hypertension is a well-known risk factor for cardiovascular, cerebrovascular, and end-stage renal diseases. According to the survey, Hispanic or nonwhite females had the highest percentage of hypertension awareness over the period 1997-2007. Analysis of trend data showed that there was, overall, a modest upward trend in the percent of the total population who were aware of their hypertension. This trend was statistically significant (slope=0.53, p=0.0006). White non-

Hispanic males also showed a statistically significant upward trend in hypertension awareness (slope=1.12, p=0.0002). The other demographic categories showed upward but non-statistically significant trends.

The proportion of the population aware of hypertension is still much greater than the Healthy People 2010 Objective of 14.0 percent of the proportion of the population who are likely to have this condition.

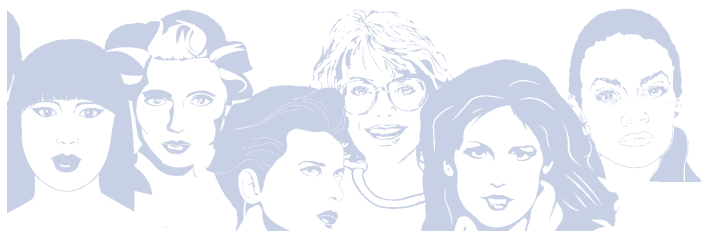
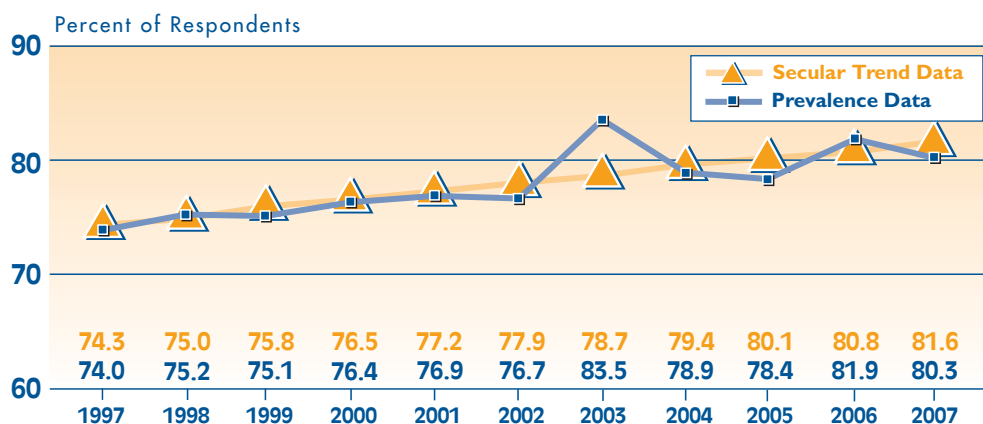


Tennessee's Behavioral Risk Factor Surveillance System 2007

Mammogram

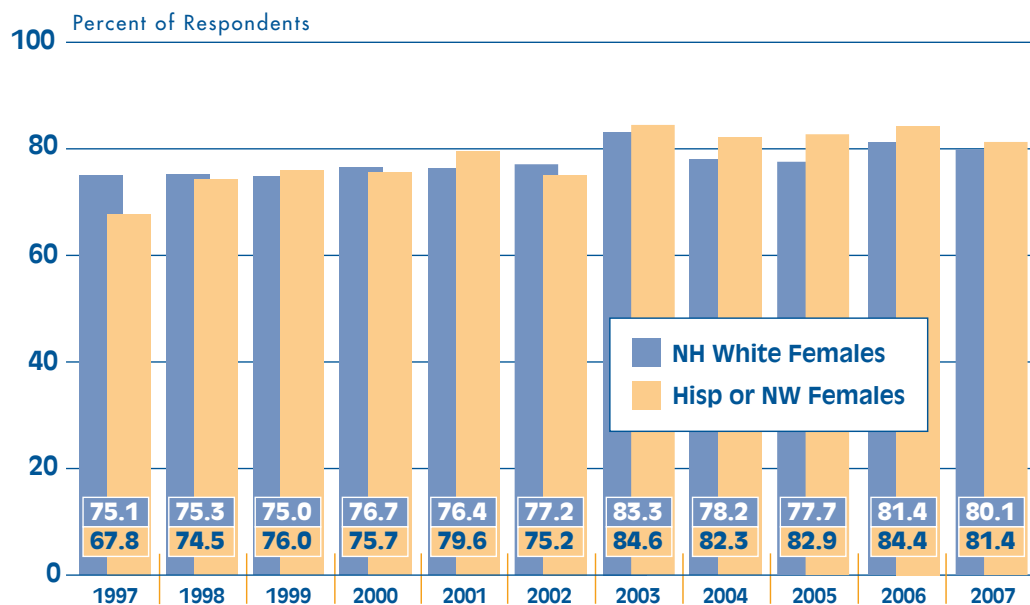
Having a mammogram is a very important and highly effective diagnostic screening procedure in the early detection and prevention of breast cancer, especially in women age 50 and over. Of the population surveyed over the time period 1997-2007, there was little difference between the two demographic racial/ethnicity groups in the percent of women 50 years of age and older who reported having had a mammogram within the previous two years. The fluctuation in percentage rates appeared to be fairly random between the two groups.

DATA FOR THE PREVALENCE AND SECULAR TREND OF THE TOTAL WOMEN RESPONDENTS AGED 50 AND OLDER WHO HAD A MAMMOGRAM WITHIN THE LAST TWO YEARS, TENNESSEE 1997-2007



Analysis of trend data showed that overall there was an upward statistically significant trend (slope=0.73, $p=0.0028$) in the percent of women, aged 50 and older, having a mammogram within the last two years. This was also true for the race/ethnicity category of Hispanic or nonwhite females (slope=1.33, $p=0.0010$). Non-Hispanic white females showed a slightly upward non-statistically significant trend for this behavioral risk factor.

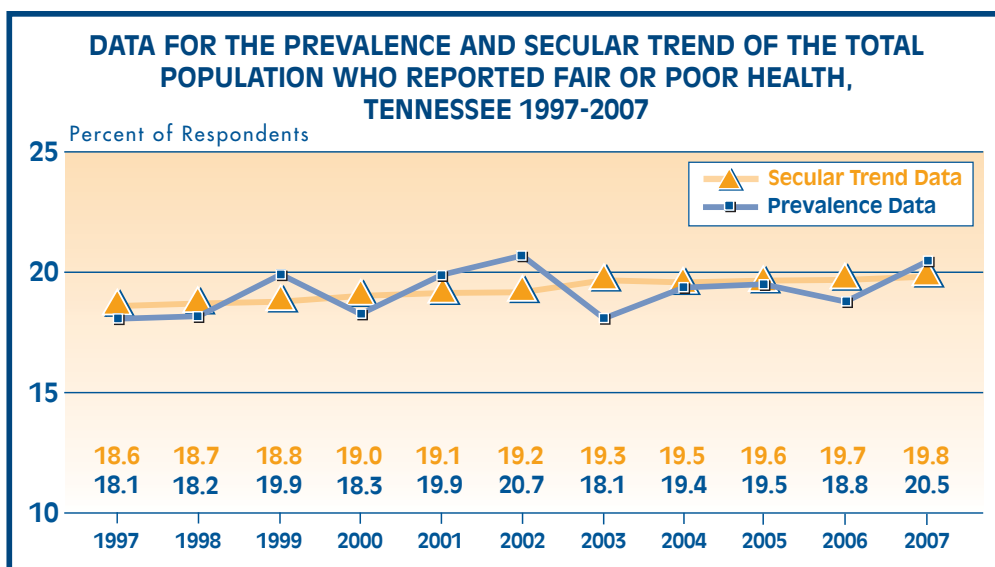
PERCENT OF WOMEN RESPONDENTS AGED 50 AND OLDER WHO HAD A MAMMOGRAM WITHIN LAST TWO YEARS, BY RACE, TENNESSEE 1997-2007



Tennessee's Behavioral Risk Factor Surveillance System 2007

Fair or Poor Health

The Behavioral Risk Factor Surveillance System interviews respondents regarding their self-reported health status. Information on those reporting fair or poor health was analyzed, and no discernable differences in the percentage of respondents who reported fair or poor health by demographic categories were noted. Analysis of trend data showed that overall there was a slight upward trend over the time period 1997-2007, however, this trend was not statistically significant. Analysis of trend data for each of the more detailed demographic categories of the population indicated the same result: a slightly upward non-statistically significant trend. Thus, there appears to be little if any change in the percent of respondents who reported fair or poor health over the period 1997-2007.

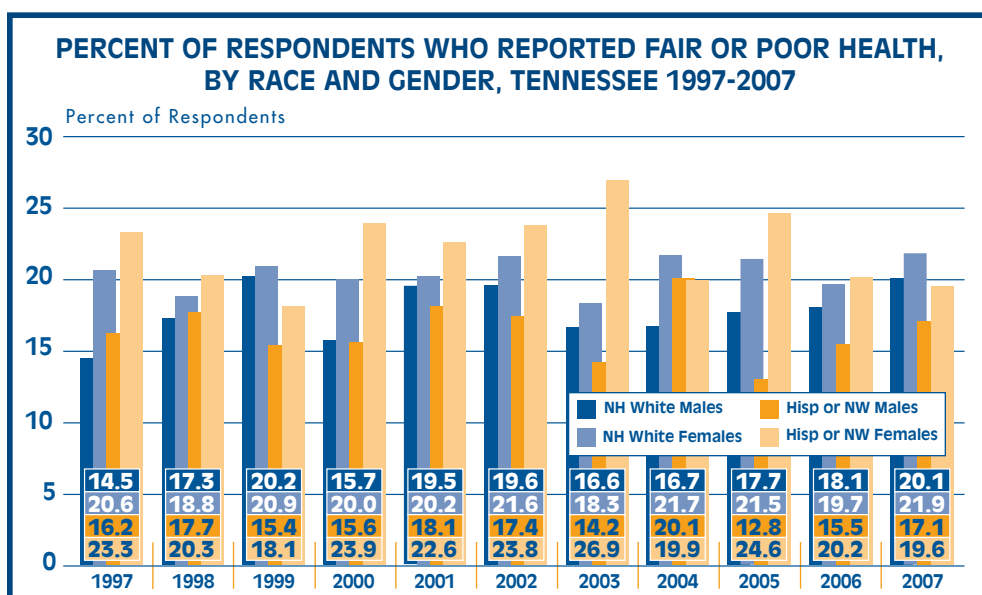


Good Nutrition

Good nutrition is an excellent health habit for promoting a healthy life and a preventive lifestyle. The percent of the population who reported they consumed five or more fruits and vegetables per day was surveyed generally every other year from 1996-2007 but was surveyed annually from 2000-2003. Therefore, data are only available for 1996, 1998, 2000-2003, 2005 and 2007. For the total population, the percent of respondents who reported that they consumed five or more fruits and vegetables per day was 26.4

In general, the survey showed that the non-Hispanic white females and Hispanic or nonwhite females appear to have had

the highest percent of the population reporting that they consumed five or more fruits and vegetables daily for most of the years presented during the time period 1996-2007. Due to the lack of complete data over this time period, no formal analysis discussion will be presented. In viewing the data however, it appears that the percentage of respondents who reported that they consumed five or more fruits and vegetables per day had been steadily increasing throughout the period 1996-2001, then began to fluctuate for the years 2002-2007. This observation applies not only to the population as a whole but to each demographic subcategory as well.



Technical Notes

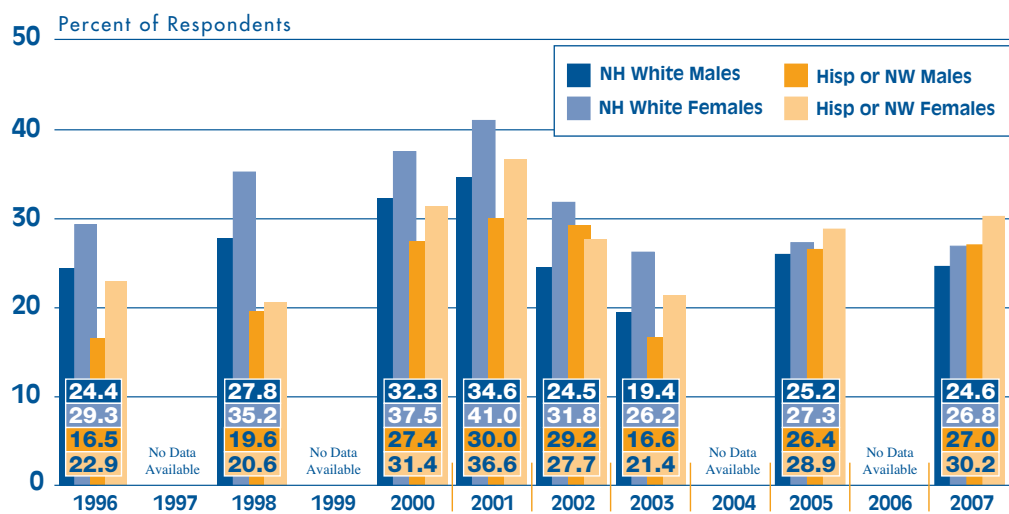
Beginning in 1999, the Centers for Disease Control and Prevention (CDC) redefined its demographic classification scheme to include the ethnicity factor of Hispanic or non-Hispanic origin in its data collection and presentations. Where before the data was analyzed and presented according to the broad categories of white male, white female, nonwhite male and nonwhite female, the categories now used are non-Hispanic white male, non-Hispanic white female, Hispanic or nonwhite male, and Hispanic or nonwhite female. The new classification scheme is basically a change in terminology and does not substantially differ from the previous classification breakdown used. Care should be exercised in the comparison between data from the 2001 and later editions of this report, which presents this new classification, and previous editions.

Also with this edition of the report, the methodology for the calculation of the risk factor for women aged 50 and over, who had a mammogram within the last two years, has been modified to be in agreement with similar methodology used by the CDC in determining this risk factor. Data in this year's report will differ slightly from similar data presented in past reports.

Please bear in mind that the percentage estimates presented in the report tables represent point estimates made from sample data. As such, they are associated with a certain degree of random variation which must be taken into consideration in viewing and interpreting the data. The comparison of the percentages of the various risk factors and their differences by demographic characteristics may or may not be of valid concern without taking into consideration the confidence intervals about the percentages and their differences and whether or not these differences were statistically significant. The 1998 edition of this report interpreted in detail many of these differences with respect to statistically significant differences ($\alpha=0.05$).

Beginning with the 2001 edition, analytical emphasis in this report began to focus on interpreting the time series analysis of the various selected behavioral risk indicators from 1994 through 2001. This analysis was done to note if any discernable change in the upward or downward movement of a respective risk factor had occurred over the time period, especially with

**PERCENT OF RESPONDENTS WHO REPORTED THEY CONSUMED FIVE OR MORE FRUITS AND VEGETABLES PER DAY BY RACE AND GENDER
TENNESSEE 1996, 1998, 2000-2003, 2005, AND 2007**



respect to any change being statistically significant. This edition is likewise following the methodology and protocol of its predecessor with additional years of data included in this analysis. The time period for the time series analysis is from 1997 through 2007. The inclusion of these additional years gives a time series of eleven years which should greatly enhance the credibility of any trend findings. The methodological approach applies a linear regression model to the time series data for each of the selected risk factors being reviewed and notes the direction of the slope coefficient so derived, particularly with respect to the strength of this relationship. A statistically significant trend relationship is defined when the slope coefficient is statistically significantly different from zero at the 95 percent ($\alpha=0.05$) confidence level.

To increase the span of healthy life is a challenge for health officials in Tennessee as well as the nation. Health promotion strategies can play an important role in influencing personal choices for good health habits and preventative lifestyles. Prevention intervention programs, designed to promote physical activity and fitness, good nutrition, along with educating the population to the health risks of diabetes, tobacco, and a sedentary lifestyle, are important tools toward increasing years of healthy life. The Behavioral Risk Factor Surveillance System can assist in identifying groups at risk in need of community-based programs that promote healthy lifestyles, and programs that provide education to reduce the risk of heart disease, stroke, cancer, and other diseases that could lead to premature mortality.

Tennessee's Behavioral Risk Factor Surveillance System 2007

Please visit the Tennessee Department of Health web site:
<http://health.state.tn.us>

More detailed state and regional data of the prevalence of major behavioral risk factors can be found by selecting Statistics and Information at the above web site and then selecting the Featured Topic BRFSS (Behavioral Risk Factor Surveillance System).

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