

Tennessee's Behavioral Risk Factor Surveillance System

2009

November 2010

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 2009, 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 5,600 interviews annually. During 2009, approximately 72,000 unique telephone numbers and over 210,000 call attempts to those numbers were required to complete these interviews. *Tennessee's Behavioral Risk Factor Surveillance System 2009* examines the results of some of the survey questions, and the trends for specific risk factors for the period 1999-2009.

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 data examined in Tennessee over the time period 1999-2009. 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 current linear trend of the characteristics within the population.

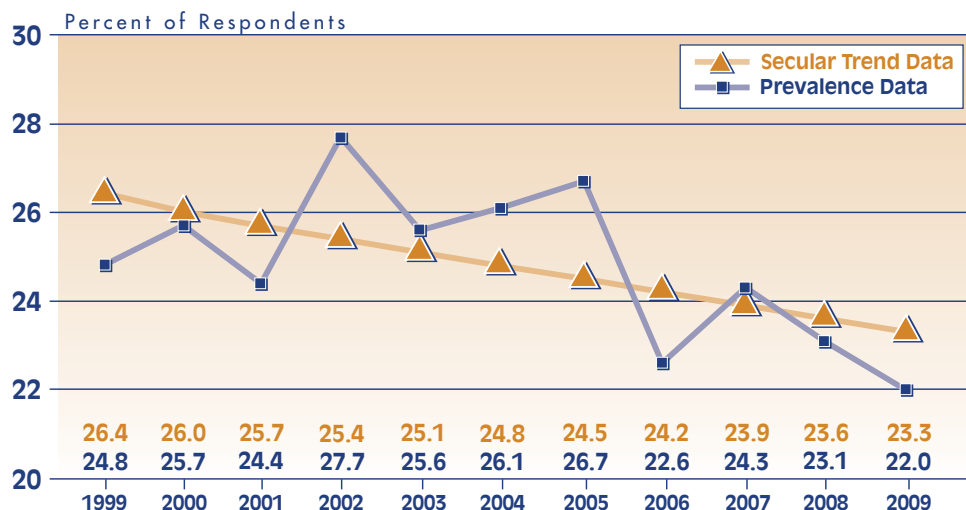
- The secular trend data for the prevalence of current **smoking** indicates that there was a slight non-statistically significant downward trend over the time period 1999-2009, and that the current smoking prevalence of 22.0 percent is almost twice that of the *Healthy People 2010 Objective* of 12.0 percent.
- The secular trend data for the prevalence of **no physical activity** indicates that there was a statistically significant downward trend for the period of 1999-2009, a positive finding. However, the 2009 prevalence rate of 31.0 percent was much higher than the *Healthy People 2010 Objective* of 20.0 percent.
- Secular trend data for the prevalence of **overweight/obesity** showed a statistically significant upward trend over the time period 1999-2009. The 2009 overweight/obesity prevalence rate of 69.0 percent was the highest for the eleven-year period.
- The secular trend data for the prevalence of **diabetes** showed a substantial statistically significant upward trend for the years 1999-2009. The 2009 diabetes prevalence rate of 10.3 percent was much greater than the *Healthy People 2010 Objective* of 2.5 percent.
- Secular trend data for **hypertension awareness** showed a modest statistically significant upward trend. The 2009 prevalence of persons who are aware of their hypertension is over twice the *Healthy People 2010 Objective* of the percent 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 this risk factor fluctuated over the 2000-2009 time period; with very little 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 non-statistically significant upward trend in Tennessee for the percent of women having this procedure performed, which is not a negative finding.
- Secular trend data for respondents reporting **fair or poor health** showed a slight, non-statistically significant upward trend over the time period 1999-2009, essentially little or no change for this risk factor.

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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 data for five of the eleven years presented. Hispanic or nonwhite females had the lowest smoking prevalence rates for nine years of the 1999-2009 time period. While earlier editions of this report had noted a statistically significant downward trend, subsequent data, while still showing a slight downward trend, does not now support this trend as being statistically significant. Current smoking still remains a serious and unsolved health problem.

DATA FOR THE PREVALENCE AND SECULAR TREND OF CURRENT SMOKING FOR THE TOTAL POPULATION, TENNESSEE 1999-2009



Tennessee's current smoking prevalence rate of 22.0 percent in 2009 is still well above the *Healthy People 2010 Objective* of 12.0 percent.

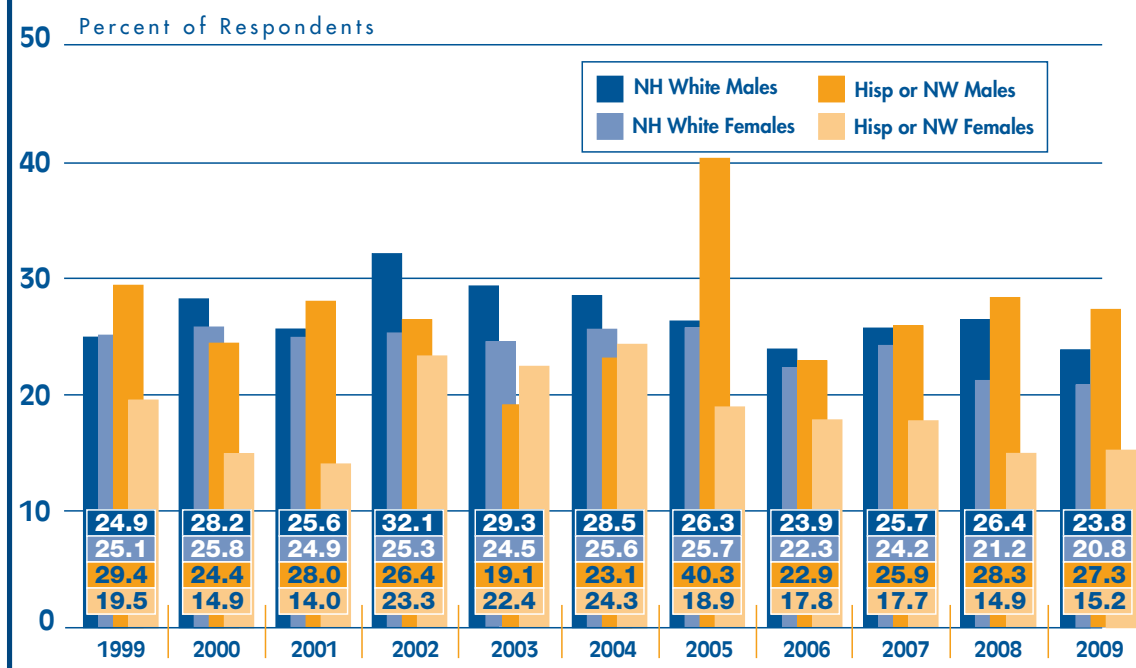
In analyzing the trend data for the demographic sub-classifications of the population for this risk factor, it was noted that there was a statistically significant downward trend for non-Hispanic white females (slope=-0.43, p=0.0055). Data for non-Hispanic white males and Hispanic or non-white females

showed slight non-statistically significant downward trends. However, Hispanic or non-white males showed a slight non-statistically significant upward trend. This was due in part to a high prevalence rate of 40.3 percent reported for this demographic group in 2005.

This data value was verified but appears to be inconsistent with similar data for the years covered in this study. The reason for

this unusually high value remains unknown. Even ignoring this value, the smoking prevalence rates 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 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.

PERCENT OF RESPONDENTS WHO REPORTED CURRENT SMOKING BY RACE AND GENDER, TENNESSEE 1999-2009



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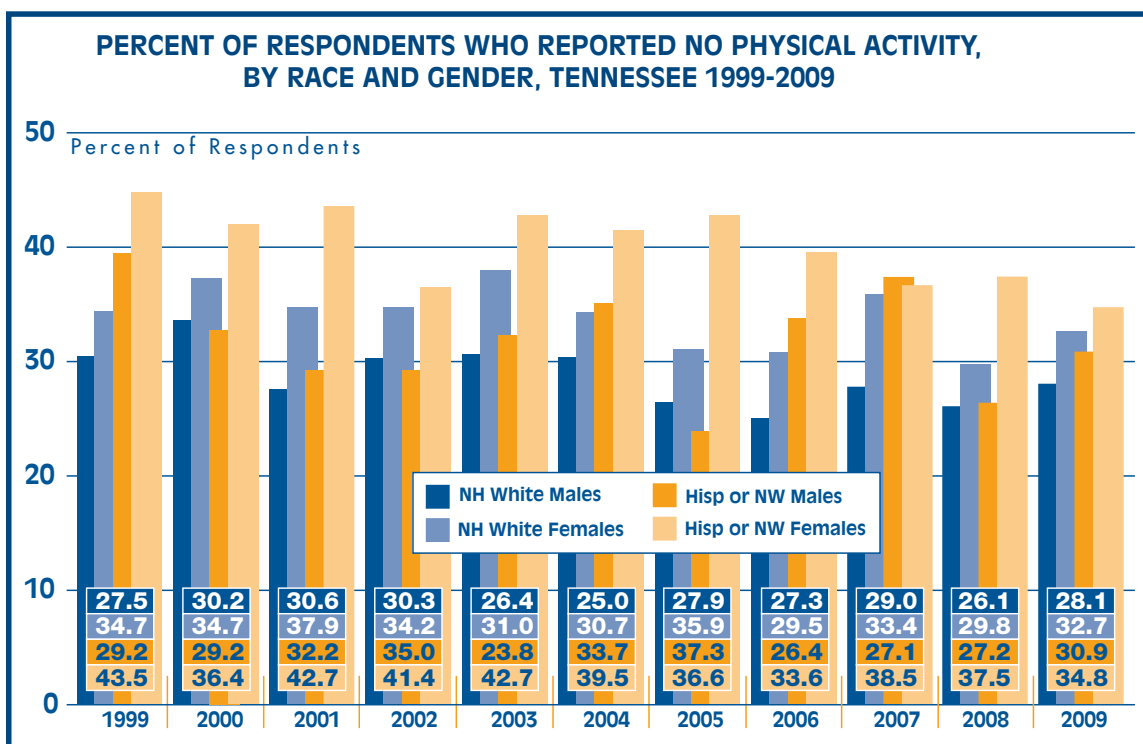
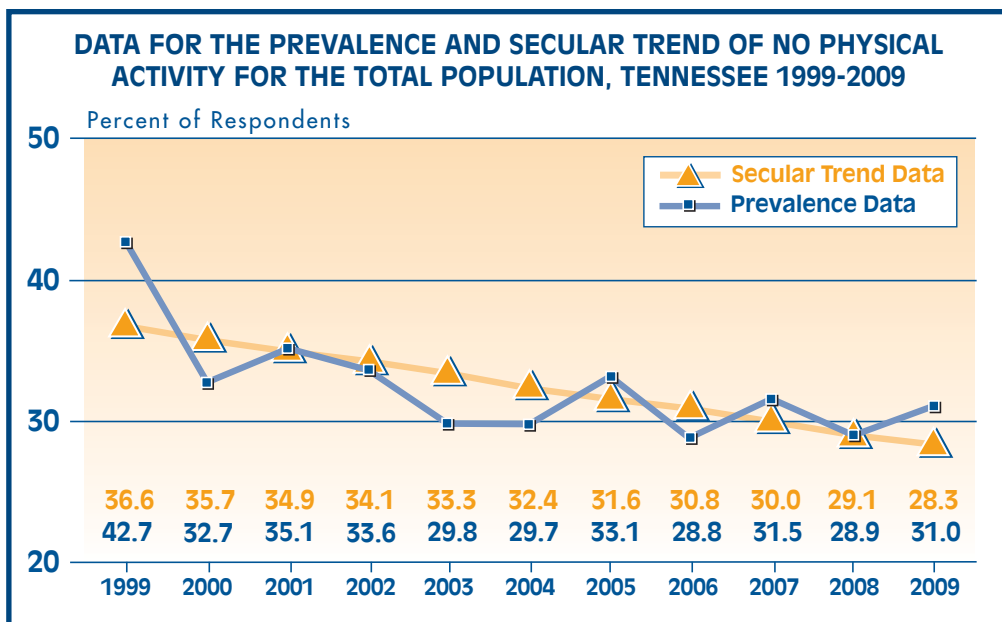
Physical Activity

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 1999 through 2009. 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 1999-2009. This trend was statistically significant (slope=-0.83, $p=0.0188$). 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=-0.67, $p=0.0297$) 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 behavioral risk factor. It is hoped that people are becoming aware of the benefits of physical activity and fitness.

The *Healthy People 2010 Objective* is to reduce the percent of adults who engage in no leisure time physical activity to 20.0 percent. In 2009, Tennessee's percentage for the population as a whole is 28.9, well above this objective.



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Overweight/Obese

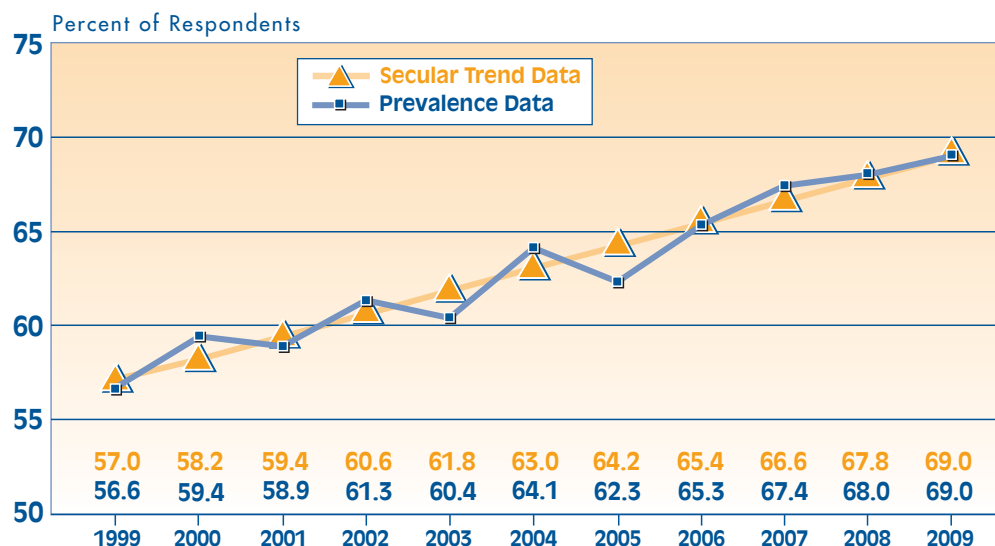
Being overweight/obese is a risk factor for heart disease, cancer, stroke, and diabetes. According to the Behavioral Risk Factor Surveillance System, the non-Hispanic white female population had lower overweight/obesity percentages than those of the other demographic subgroups over the time period 1999-2009. 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=1.20, $p<.0001$) 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=0.83, $p<.0001$), non-Hispanic white females (slope=1.41, $p<.0001$), and Hispanic or nonwhite females

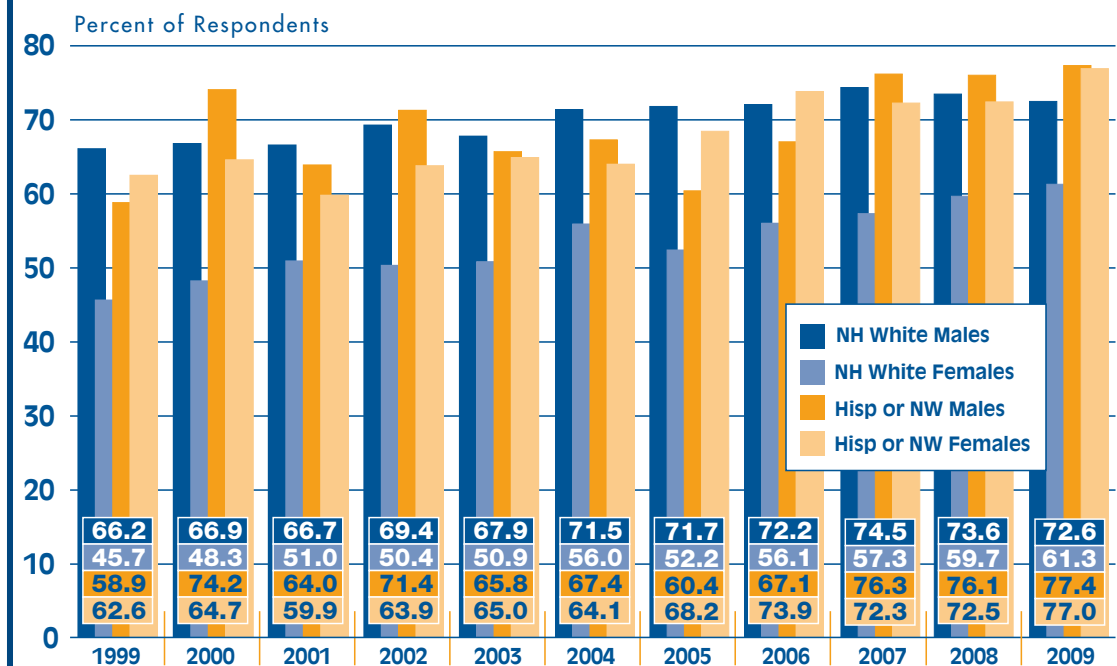
(slope=1.49, $p=0.0002$). Hispanic or nonwhite males showed an upward, but non-statistically significant trend. There is a very strong indication that the overweight/obesity prevalence has definitely increased over the time period 1999-2009, and this increase has occurred primarily in the non-Hispanic white population.

DATA FOR THE PREVALENCE AND SECULAR TREND OF THE TOTAL POPULATION WHO REPORTED OVERWEIGHT/OBESITY*, TENNESSEE 1999-2009



*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 1999-2009



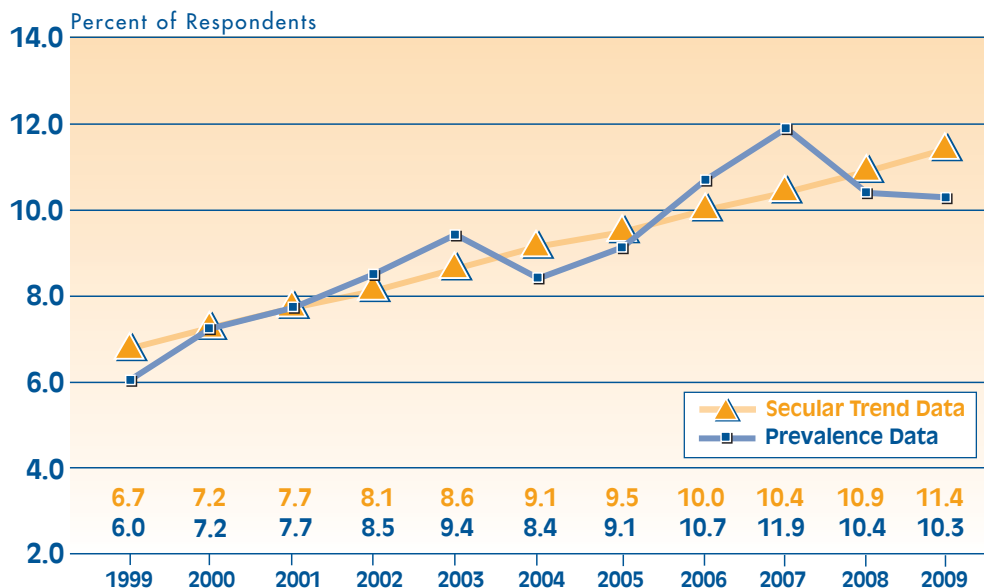
The prevalence of being overweight/obese for the total population was 69.0 percent in 2009. The behavioral risk factor of overweight/obesity is an increasing public health concern in Tennessee.

Tennessee's Behavioral Risk Factor Surveillance System 2009

Diabetes

Diabetes is a chronic metabolic disease. In 2009, 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 data for most of the years during the 1999-2009 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=0.46, p=0.0002) for the population as a whole. This is a strong indication that the prevalence of diabetes has been increasing over the period 1999-2009.

DATA FOR THE PREVALENCE AND SECULAR TREND OF THE TOTAL POPULATION WHO REPORTED DIABETES*, TENNESSEE 1999-2009

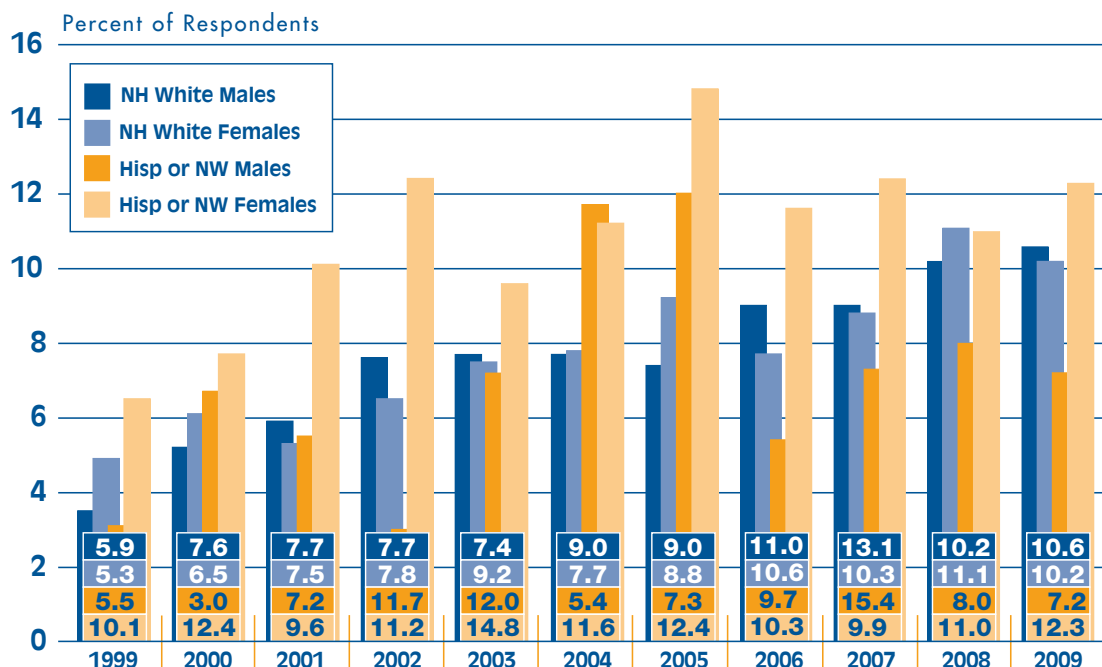


*Doctor diagnosed diabetes.

The current diabetes prevalence in Tennessee of 10.3 percent in 2009 is well above the *Healthy People 2010* Objective for diabetes of 25 per 1,000 persons or 2.5 percent. While the overall trend has been increasing for the 1999-2009 time period, recent data for 2008 and 2009 shows a more positive downward shift in this trend.

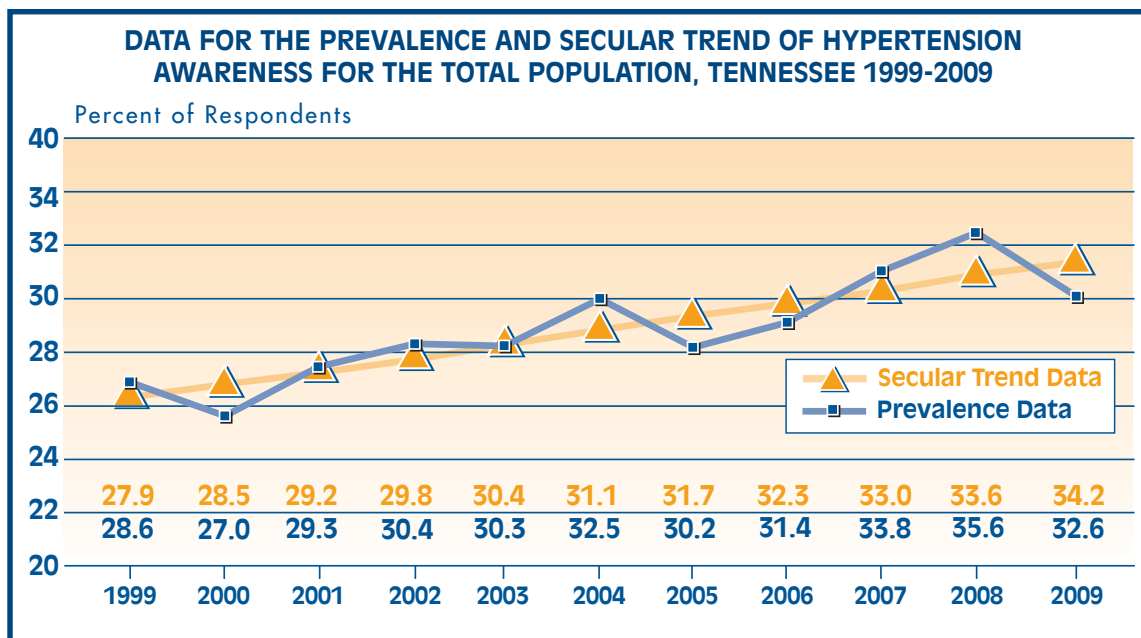
In analyzing the trend data for the demographic sub-classifications of the population for this risk factor, it was noted that diabetes prevalence for non-Hispanic white males (slope =0.53, p=0.0008), and non-Hispanic white females (slope=0.51, p=<0.0001) showed statistically significant upward trends. Both Hispanic or nonwhite males and females showed upward non-statistical significance trends. The prevalence of diabetes is a behavioral risk factor which is currently remains a public health concern.

PERCENT OF RESPONDENTS WHO REPORTED DIABETES*, BY RACE AND GENDER, TENNESSEE 1999-2009



*Doctor diagnosed diabetes.

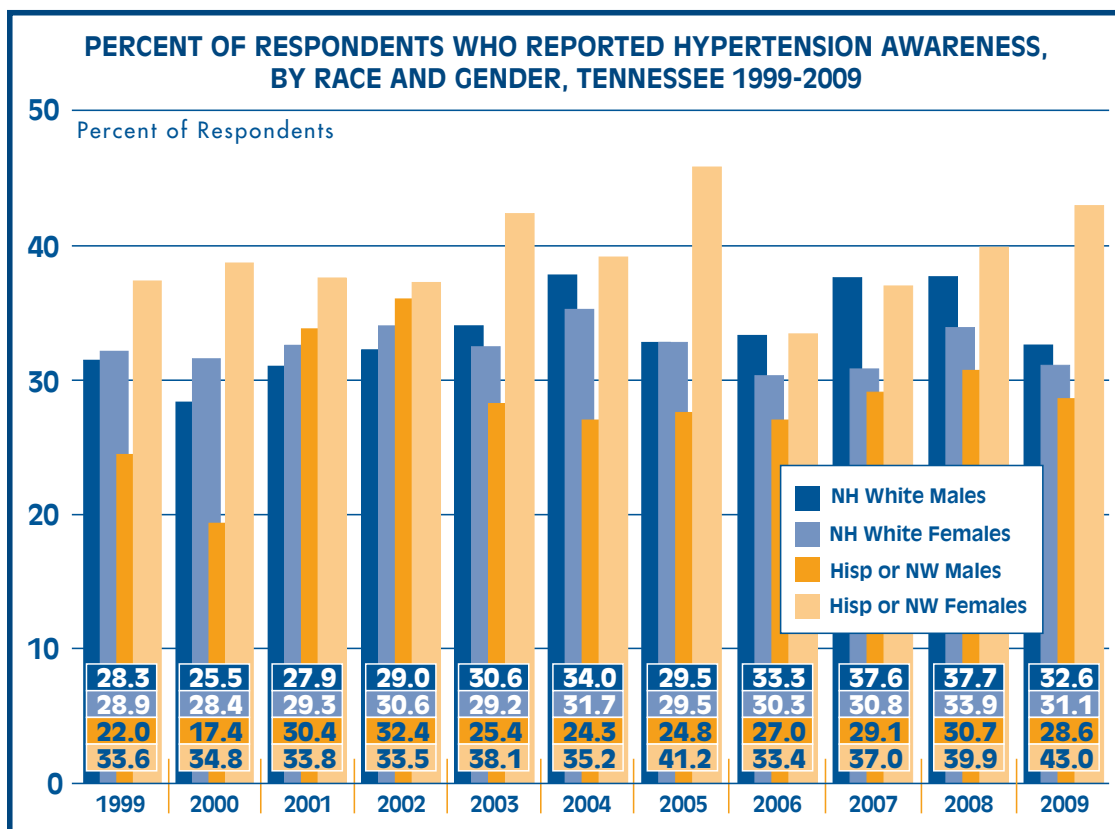
Tennessee's Behavioral Risk Factor Surveillance System 2009



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 respondents over the period 1999-2009. 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=0.63, $p=0.0007$). White non-Hispanic males also showed a statistically significant upward trend in hypertension awareness (slope=0.97, $p=0.0023$) as did white non-Hispanic females (slope=0.34, $p=0.0126$); and Hispanic or nonwhite females (slope=0.73, $p=0.0157$). Hispanic or nonwhite males showed an upward non-statistically significant trend.



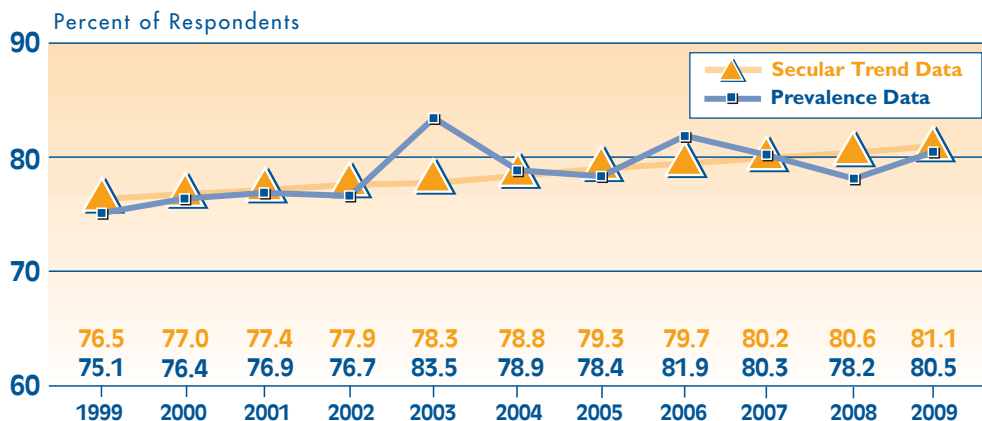
The proportion of the population aware of hypertension is still much greater than the *Healthy People 2010 Objective* of 14.0 percent of the population who should have this condition.

Tennessee's Behavioral Risk Factor Surveillance System 2009

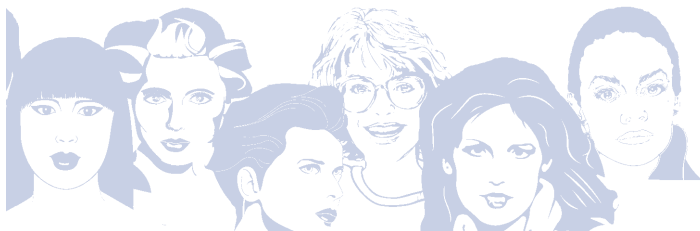
Mammogram

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 1999-2009, 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.

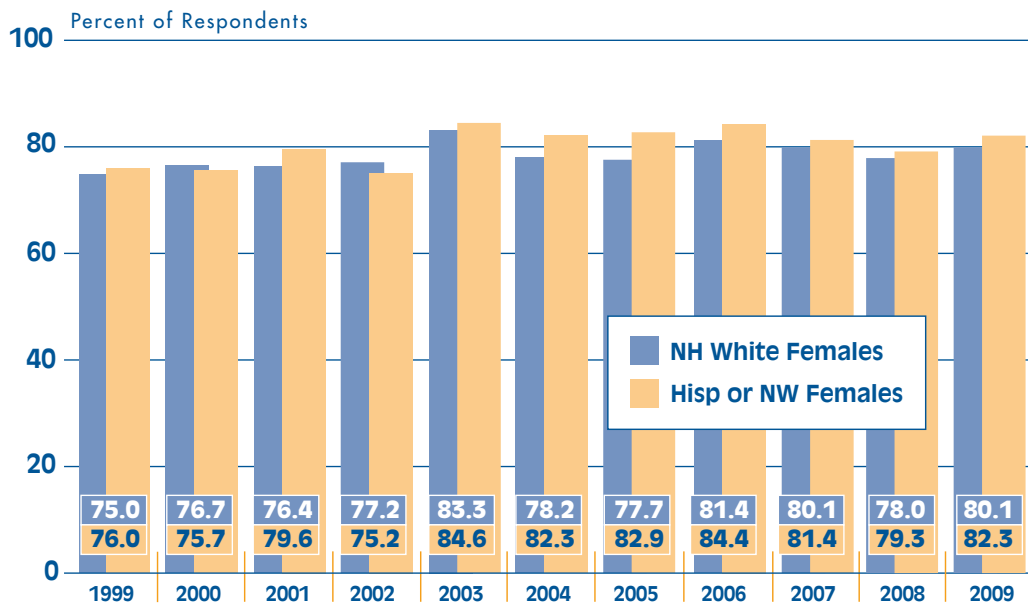
DATA FOR THE PREVALENCE AND SECULAR TREND OF THE TOTAL WOMEN RESPONDENTS AGED 50 AND OLDER WHO HAD A MAMMOGRAM WITHIN THE LAST TWO YEARS, TENNESSEE 1999-2009



Analysis of trend data showed that overall there was an upward non-statistically significant trend in the percent of women, aged 50 and older, having a mammogram within the last two years. This was also true for both non-Hispanic white and Hispanic or nonwhite females. While the upward trend in the percent of these women age 50 and over has lessened somewhat over the past two years, the overall percent of women in this age category who have had a mammogram within the past two years is now over 80 percent.



PERCENT OF WOMEN RESPONDENTS AGED 50 AND OLDER WHO HAD A MAMMOGRAM WITHIN LAST TWO YEARS, BY RACE, TENNESSEE 1999-2009



Tennessee's Behavioral Risk Factor Surveillance System 2009

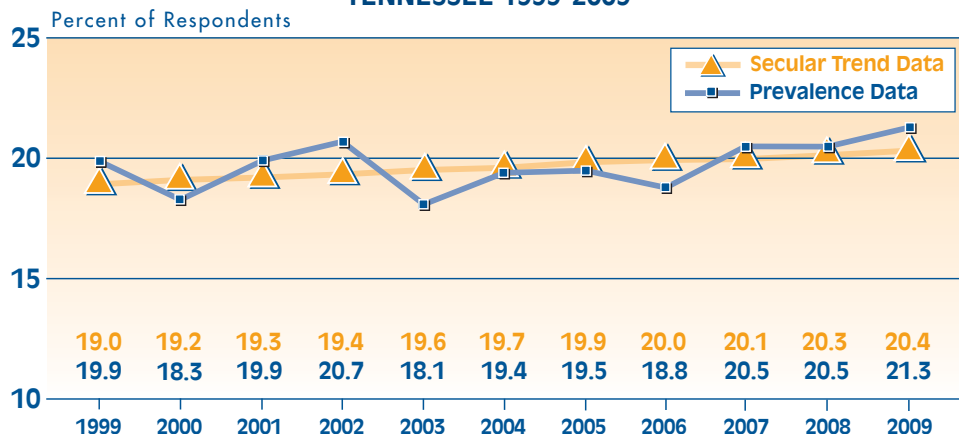
Fair or Poor Health

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 1999-2009, however this trend was not statistically significant. Analysis of trend data for each of the more detailed demographic categories of the population indicated a slightly upward non-statistically significant trend for the non-Hispanic white subgroups and a slight non-statistically significant downward trend for the Hispanic or non-white groups. Thus, there appears to be little if any change in the percent of respondents who reported fair or poor health over the period 1999-2009.

Good Nutrition

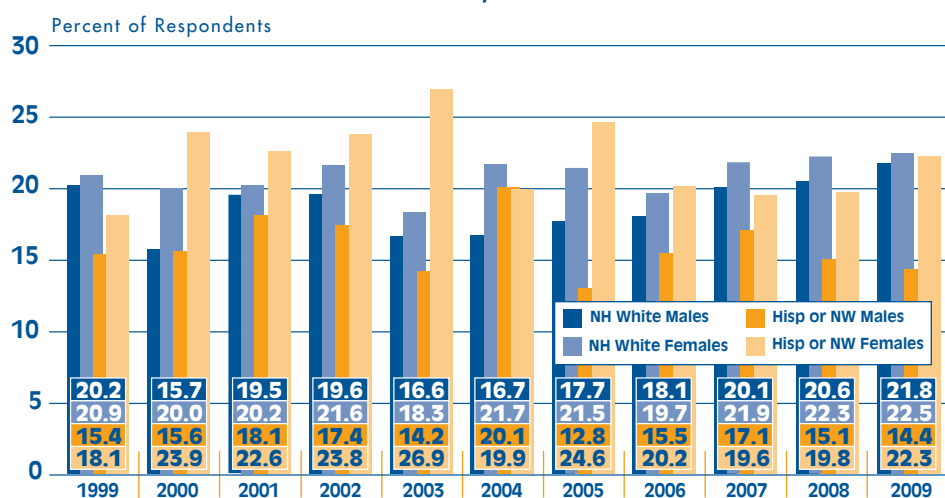
Good nutrition is an excellent health habit for promoting a healthy life and a preventive lifestyle. The percent of the population who reported they consumed five or more fruits and vegetables per day was surveyed annually from 2000-2003 then every other year from 2005 through 2009. Therefore, data are only available for 2000-2003, 2005, 2007, and 2009. For the total population, the percent of respondents who reported that they consumed five or more fruits and vegetables per day was 23.3 in 2009.

DATA FOR THE PREVALENCE AND SECULAR TREND OF THE TOTAL POPULATION WHO REPORTED FAIR OR POOR HEALTH, TENNESSEE 1999-2009



In general, the survey showed that the non-Hispanic white 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 2000-2009. 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 has been fluctuating randomly over the 2000-2009 time period. This observation applies not only to the population as a whole but to each demographic subcategory as well.

PERCENT OF RESPONDENTS WHO REPORTED FAIR OR POOR HEALTH, BY RACE AND GENDER, TENNESSEE 1999-2009



Technical Notes

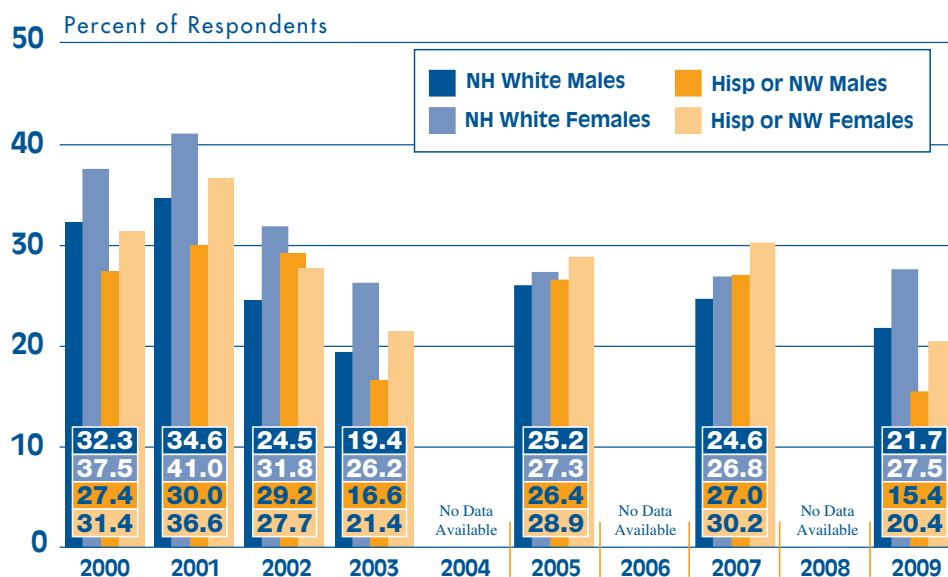
Beginning in 1999, the Centers for Disease Control and Prevention (CDC) redefined its demographic classification scheme to include the ethnicity factor of Hispanic or non-Hispanic origin in its data collection and presentations. Where before the data were analyzed and presented according to the broad 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 beginning with the 2007 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 the 2007 and 2009 editions will differ slightly from similar data presented in earlier 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.

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 respect to any change being statistically significant. This edition

**PERCENT OF RESPONDENTS WHO REPORTED THEY CONSUMED FIVE OR MORE FRUITS AND VEGETABLES PER DAY BY RACE AND GENDER
TENNESSEE 2000-2003, 2005, 2007 AND 2009**



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 1999 through 2009. The inclusion of this current time period gives a time series of eleven years which should be sufficient for 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 those individuals 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 2009

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

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

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