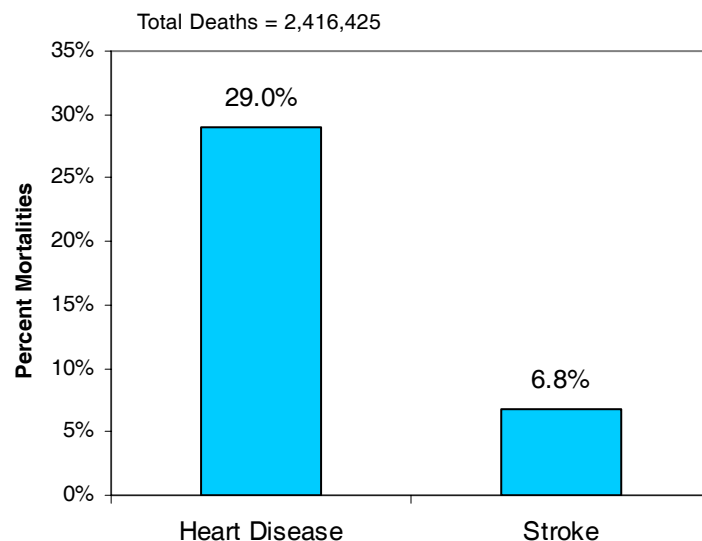


Hypertension Awareness in Knox County

According to the Centers for Disease Control and Prevention, high blood pressure increases the risk for heart disease and stroke, the first and third most common causes of death in the United States (Ayala et al., 2003; Arias et al., 2003; see Figure 1). The American Heart Association (2003) estimates that heart disease and stroke combined accounts for 38.5% of all deaths in the United States, or 1 out of 2.6 deaths.

Figure 1: Percent of 2001 Deaths Due to Heart Disease and Stroke in the United States:



Source: Aria et al., 2003

Hypertension Awareness & Risk Factors

Healthy People 2010, an extensive report by the Department of Health and Human Services that creates national health goals to be met by the year 2010, established an objective to reduce the number of adults with high blood pressure to 16% of the US population. Early detection and treatment of hypertension is considered a proven clinical practice to reduce the risk of cardiovascular or cerebrovascular disease (US Preventive Services Task Force, 1996; USDHHS, 1994). According to the American Heart Association, the severity of high blood pressure may be affected by: obesity, eating too much salt, drinking too much alcohol, lack of physical activity, race (African-Americans tend to have higher rates than whites), stress, heredity, and age (especially over the age of 35 years)

(AHA, 2004). According to the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), a 12-13 point reduction in blood pressure can reduce heart attacks by 21%, mortalities from cardiovascular disease by 25%, and strokes by 37%.

The “Silent Killer”

The American Heart Association (AHA) estimates that only 2/3 of the people with high blood pressure are diagnosed each year—a remaining 1/3 go undetected. The reader is urged to make note of this in any interpretation of the statistics on hypertension in this report.

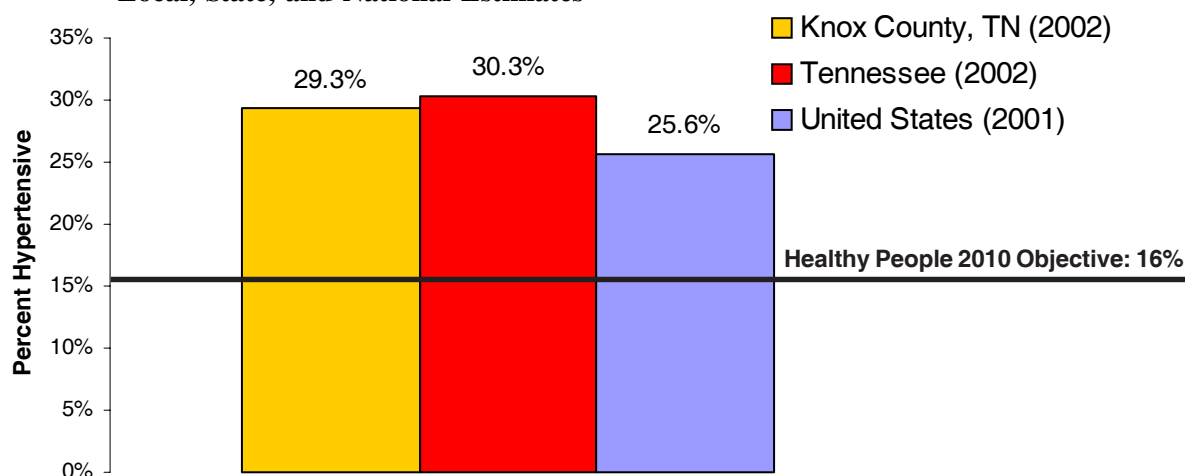
Purpose

The purpose of this report is to profile the prevalence of hypertension among Knox County adults. It is designed to assist health care providers and health education specialists to better target their prevention efforts toward segments of the population most at risk for hypertension and reduce the number of complications associated with the disease.

Prevalence of Hypertension in Knox County

Figure 2 below compares the number of adults in Knox County, Tennessee, and the United States that responded “yes” to the question, “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?” The data were drawn from the 2001-2002 national/state Behavioral Risk Factor Surveys and the 2002 Knox County Behavioral Risk Factor Survey ($n = 5,005$). The prevalence for hypertension awareness among Knox County adults was 29.3% (an estimated 86,879 adults). The prevalence of hypertension awareness among Knox County adults was similar to Tennessee’s prevalence (30.3%) in 2002, but higher than that of the United States in 2001 (25.6%)—the last available national estimate for this variable. The Knox County estimate (29.3%) exceeds the *Healthy People 2010* objective of no more than 16.0% of adults with high blood pressure.

Figure 2. Percent of Adults that Report Having Been Diagnosed with Hypertension: Local, State, and National Estimates



Sources: The 2002 Knox County Behavioral Risk Factor Survey and the Behavioral Risk Factor Survey

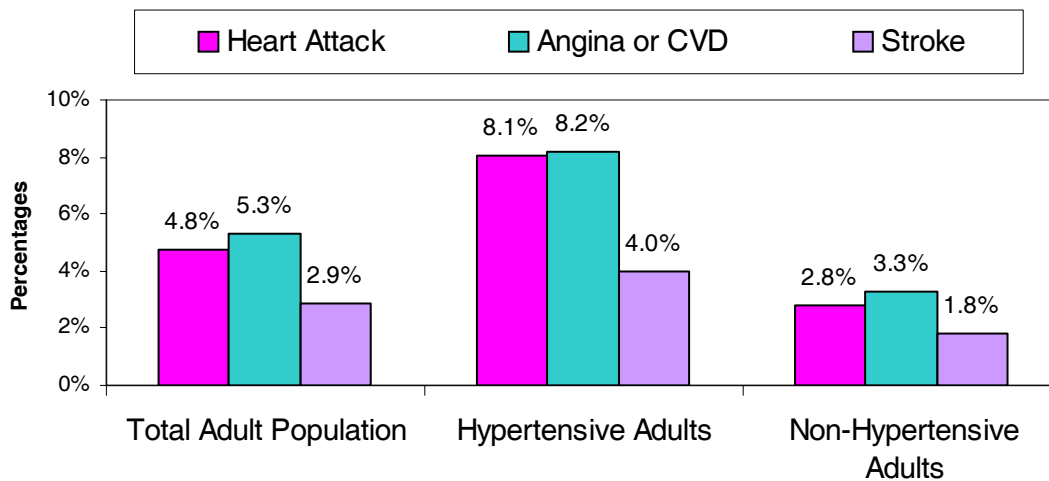
Knox County adults who responded they had been diagnosed with hypertension were also asked if they were currently on blood pressure medication. Approximately three out of four (74.6%) responded they were currently taking anti-hypertensive medication.

Hypertension and Disease in Knox County

According to the 2002 Knox County Behavioral Risk Factor Survey, 13.0% of Knox County adults (an estimated 39,157 adults) reported that a health care professional had diagnosed them with some form of vascular disease, including heart attack/myocardial infarction (4.8%), angina or cardiovascular disease (5.3%), or stroke (2.9%) (see Figure 3)

As seen in Figure 3, Knox County adults with hypertension are much more likely to report having cardiovascular or cerebrovascular disease compared to adults that have not been diagnosed with hypertension. In Knox County, approximately eight percent (8.1%) of adults with hypertension reported being diagnosed with a heart attack. In contrast, only 2.8% of adults without hypertension reported that they had suffered a heart attack. Eight percent (8.2%) of Knox County hypertensive adults reported having either angina or cardiovascular disease. In comparison, only 3.3% of non-hypertensive adults reported having a stroke. Finally, 4.0% of Knox County adults with diagnosed hypertension reported having a stroke, while only 1.8% non-hypertensive adults reported having a stroke. All of these findings were statistically significant.

Figure 3: Percent of Knox County Adults Reporting Heart Attacks, Angina/Cardiovascular Disease, or Stroke in 2002 By Diagnosis of Hypertension



Source: Knox County Behavior Risk Factor Survey

Findings from Table 1:

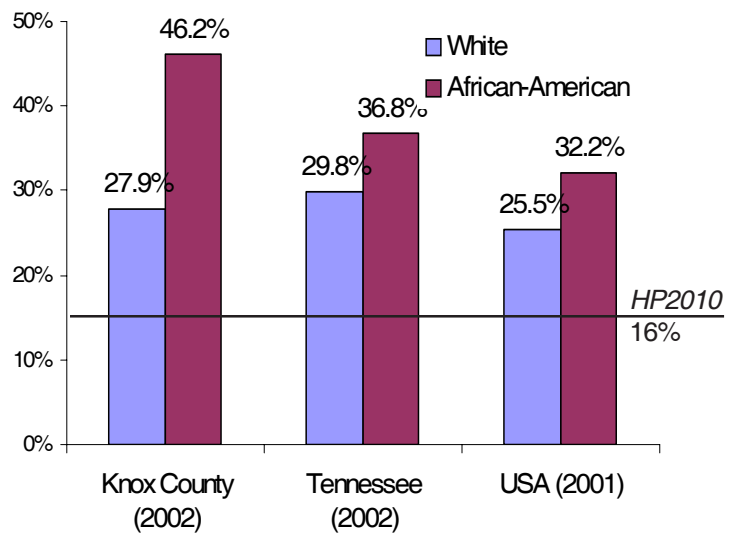
Table 1 (on the next page) displays the prevalence of Knox County adults with self-reported hypertension broken down by demographics, smoking status, weight, level of physical activity and health insurance status, according to the 2002 Knox County Behavioral Risk Factor Survey. As previously discussed, 29.3% of Knox County adults reported that they have been told by a health professional that they had hypertension. Almost one out of three men (29.8%) and one out of three women (28.7%) reported that they have been told they have high blood pressure in Knox County.

Data Trends

African-Americans had a much higher prevalence for hypertension than other races/ethnic groups

African-American adults in Knox County (46.2%; an estimated 11,400 adults) had a much higher prevalence of reported hypertension compared to white adults (27.9%) or other race/ethnicity adults (28.7%). In comparison, only 32.3% of African-American adults at the national-level and 36.8% of African-American adults in Tennessee reported being diagnosed with hypertension (Figure 4) in the national Behavior Risk Factor Survey.

Figure 4. An Ethnic Comparison of Adults with Hypertension: Knox County (2002), Tennessee (2002), and the United States (2001)



Sources: Behavioral Risk Factor Survey and the 2002 Knox County Behavioral Risk Factor Survey

Table 1. Demographic Profile of Knox County Adults Told By A Health Professional That They Had High Blood Pressure in 2002

	<u>%</u>	<u>Confidence Interval</u>
Total	29.3	(28.1-30.5)
<u>Gender</u>		
Males	29.8	(27.9-31.8)
Females	28.7	(27.3-30.0)
<u>Race</u>		
White	27.9	(26.7-29.0)
African-American	46.2	(41.5-50.9)
Other Race/Ethnicity	28.7	(23.5-33.8)
<u>Age</u>		
18-24 Years	8.3	(5.8-10.8)
25-34 Years	12.3	(10.0-14.6)
35-44 Years	20.9	(18.4-23.4)
45-54 Years	33.4	(30.6-36.2)
55-64 Years	48.5	(44.8-52.1)
65-74 Years	58.0	(53.7-62.3)
75-84 Years	55.1	(49.8-60.4)
85+ Years	54.4	(41.9-67.0)
<u>Household Income</u>		
<\$15K	39.4	(35.3-43.5)
\$15K-\$24,999	35.5	(32.2-38.6)
\$25K-\$34,999	32.4	(29.1-35.6)
\$35K-\$49,999	28.5	(25.6-31.4)
>=\$50K	22.8	(20.5-25.2)
<u>Education</u>		
Less than High School	35.8	(31.7-39.9)
High School	34.2	(31.9-36.5)
Some College	30.4	(28.1-32.7)
College Grad	22.9	(21.0-24.7)
<u>Employment Status</u>		
Employed	25.2	(23.3-27.0)
Unemployed	26.2	(19.2-33.2)
Homemaker	24.7	(21.2-28.1)
Student	24.4	(14.9-33.9)
Retired	46.5	(42.6-50.3)
Unable to Work	50.3	(43.8-56.9)
<u>Smoking Statussee</u>		
Nonsmoker	28.5	(26.9-30.1)
Ex-smoker	30.2	(27.6-32.7)
Regular Smoker	29.2	(26.5-31.8)
<u>Physical Activity*</u>		
Recommended	27.3	(25.0-29.6)
Insufficient	30.1	(28.0-32.2)
Inactive	35.4	(31.5-39.2)
<u>Weight*</u>		
Normal Weight	20.1	(18.5-21.7)
Overweight	30.9	(28.7-33.0)
Obese	42.9	(39.9-45.8)
<u>Health Insurance</u>		
No Insurance	29.4	(28.8-30.0)
Have Insurance	26.6	(18.8-34.4)
<u>Eat 5 Fruits & Vegetables A Day</u>		
Yes	31.2	(28.7-33.7)
No	29.4	(27.7-31.1)

* See table notes in methodology section.

Source: 2002 Knox County Behavioral Risk Factor Survey

Access to Care

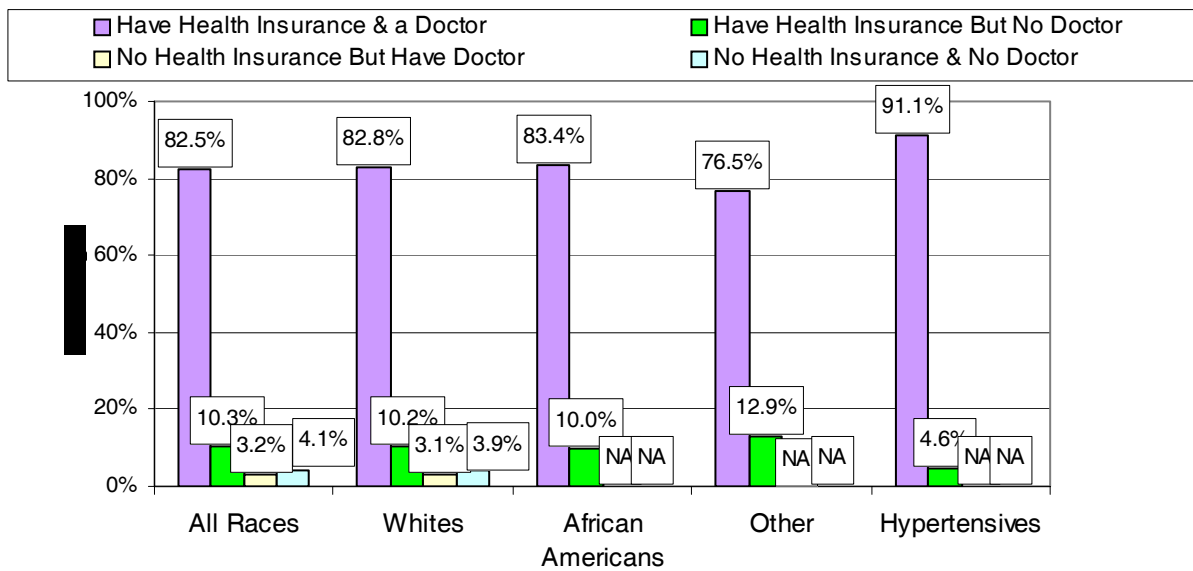
National studies recognize that African-Americans have approximately a 40% higher rate than whites for high blood pressure (*Healthy People 2010*). In 2003, the American Heart association estimated that 41.6% of African-American males and 44.7% of African-American females in the United States had high blood pressure (AHA, 2004). The American Heart Association reported that African-Americans develop hypertension earlier in life and are 1.5 times more likely to suffer a fatal heart attack and 1.8 times more likely to suffer a fatal stroke compared to whites (AHA, 2004).

The high prevalence for reported hypertension among Knox County African-American adults (46.2%) compared to white adults (28.7%) begs the question. “Is this disparity due to the fact that African-Americans have greater access to health care in Knox County, and are therefore more likely to be diagnosed?” To answer this complex question, two variables from the 2002 Behavior Risk Factor Survey were examined (1) whether or not the respondents (both hypertensive and non-hypertensive) have current health insurance, and (2) whether the respondents (both hypertensive and non-hypertensive) have a personal physician.

Analysis revealed no significant difference between the racial groups although it should be noted that the data amounts for African-Americans and the “other race/ethnicity” participants in the two ‘no health insurance’ categories were too small to be statistically reliable and therefore not reported (see Figure 5).

Approximately the same numbers of Knox County African-American adults (83.4%) and white adults (82.8%) report having both current medical insurance and a personal physician. Other race/ethnicity adults reported a lower rate (76.5%) for having both insurance and a personal physician although this result was not significantly different from the other races. Analysis of the results did not indicate a statistical difference between whites, African-Americans, and the “other race/ethnicity” category for having both health insurance and a personal doctor (the violet columns in Figure 5). More research is needed to determine if other variables involved in access to care may be the cause of this finding for African-American adults.

Figure 5: Current Medical Insurance by Having a Personal Physician Among Knox County Adults in 2002: Percentages



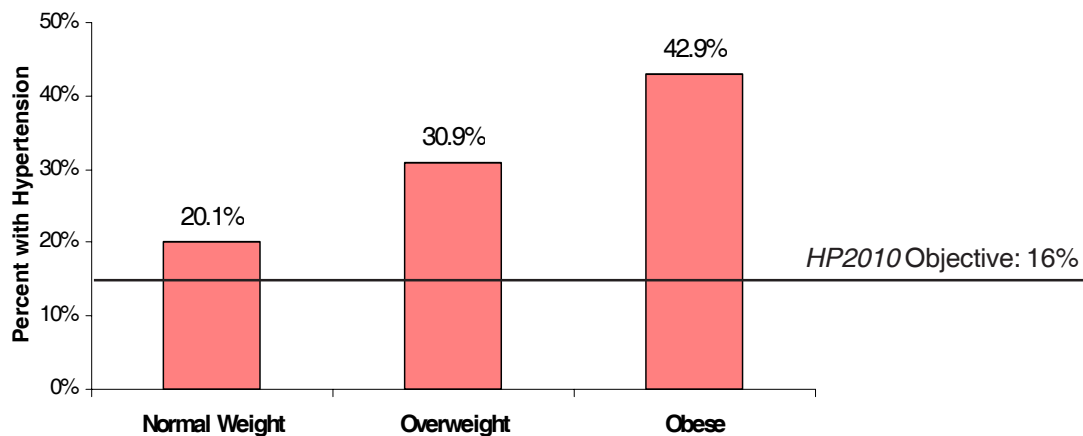
Source: 2002 Knox County Behavioral Risk Factor Survey

The portion of adults that reported having been diagnosed with hypertension were more likely to report having health insurance and a personal physician compared to the general population (Figure 5). The finding appears encouraging since hypertension requires careful monitoring to help reduce the chance for heart attack or stroke (*Healthy People 2010*).

The prevalence of hypertension increases with weight

According to Table 1, the prevalence of hypertension increased as weight increased (see also Figure 6). According to analysis, obese adults (42.9%) are approximately three-times more likely than normal weight adults (20.1%), and overweight adults (30.9%) are approximately twice as likely than normal weight adults, to report having been diagnosed with hypertension

Figure 6. Prevalence of Knox County Adults with Hypertension by Weight in 2002



Source: 2002 Knox County Behavioral Risk Factor Survey

The prevalence of hypertension increases with age

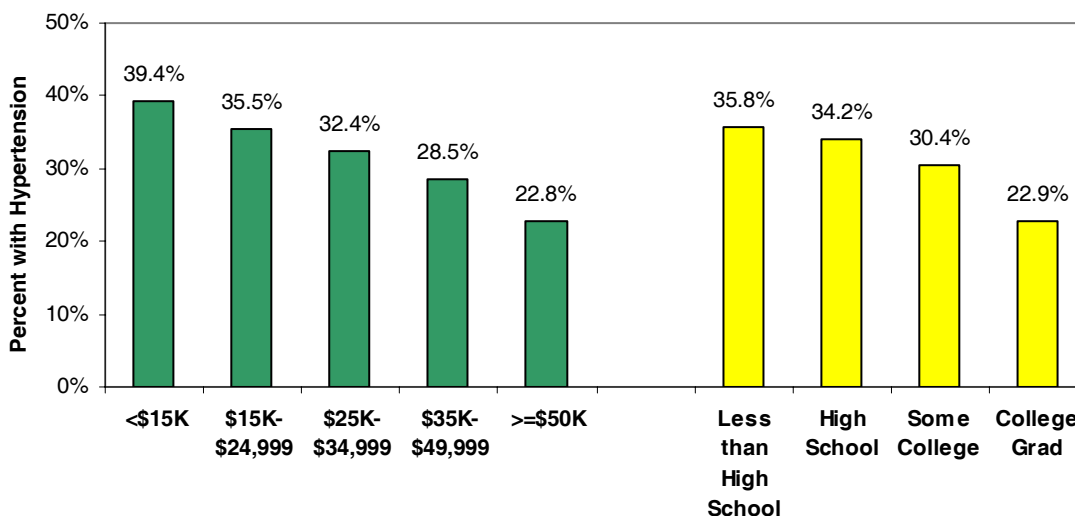
The prevalence of hypertension increased steadily between the ages of 18 and 74 among Knox County adults. According to analysis, those aged 65-74 years (58.0%) were approximately ten-times more likely to be diagnosed with hypertension compared to those in the 18-24 years of age group (8.3%).

The prevalence of hypertension increases as income and education levels decrease

According to analysis, those adults in households earning \$15,000 or less per year had a 50% increased risk for having been diagnosed with high blood pressure compared to those in the \$50,000+ age group (Figure 7).

The prevalence of diagnosed hypertension also tended to increase as education levels decreased (Figure 7). College graduates (22.9%) had a lower rate than all other groups. According to analysis, those with less than a high school education (35.8%) were approximately 50% more likely to report being diagnosed with high blood pressure compared to college graduates.

Figure 6. Prevalence of Knox County Adults with Hypertension by Annual Household Income and Educational Status in 2002



Source: 2002 Knox County Behavioral Risk Factor Survey

UNHEALTHY BEHAVIORS

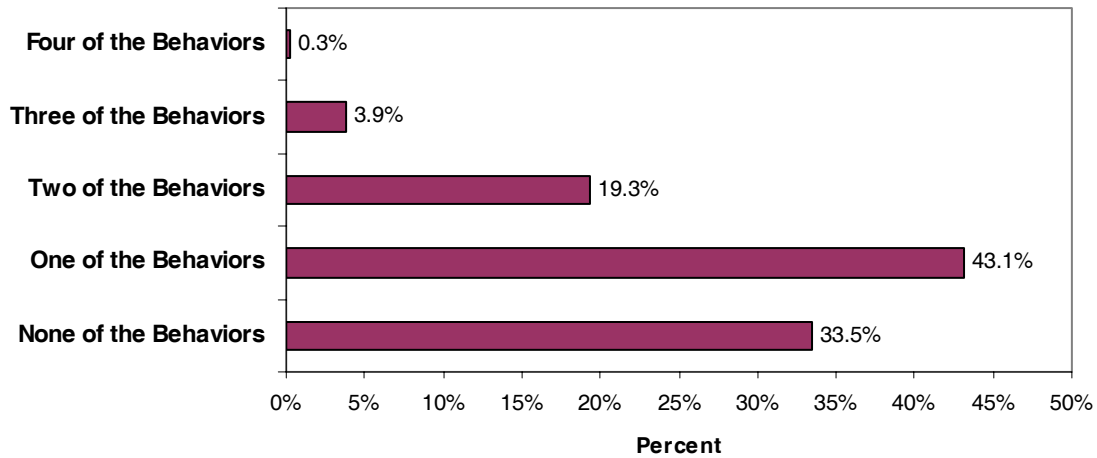
As previously mentioned, the AHA (and others) suggests that unhealthy behaviors and conditions such as smoking and obesity may contribute to the severity of hypertension. In an ideal world, adults diagnosed with hypertension would avoid all unhealthy behaviors known to increase the severity of their disease. The 2002 Knox County Behavioral Risk Factor Survey collected data on four possible risk behaviors/conditions associated with hypertension from the literature:

- (1) Currently obese as measured by BMI
- (2) Currently smoke or use tobacco
- (3) Do not exercise or participate in physical activities
- (4) Do not eat the recommended five servings of fruits and vegetables per day

In Knox County, one out of five (21.1%) hypertensive adults were obese, one out of four (25.4%) were current smokers, one out of six (16.8%) reported they do not exercise or participate in any physical activities, and one out of five (21.6%) reported they do not meet the recommendations for five servings of fruit and vegetables per day.

Figure 7 below adds the numbers of risk factors reported by hypertensive adults in Knox County. Exactly two-thirds of the adults (66.6% or approximately 132,121 adults) exhibited one or more of the above risk behaviors/conditions. Almost one out of four adults with hypertension (23.5%) reported two or more of the risk conditions/behaviors.

Figure 7: Risk Factor Clustering for Hypertension: Knox County Adults with Reported Hypertension in 2002



Source: 2002 Knox County Behavioral Risk Factor Survey

Community efforts to assist hypertensive adults to control weight, stop smoking, exercise, and eat five fruits and vegetables per day may bring about positive results to reduce the prevalence of hypertension and may impact the incidence of coronary heart disease and strokes. In addition to these behaviors, encouraging adults with hypertension to continue to take their prescribed blood pressure medicine is also suggested.

SUMMARY

- Approximately one out of eight Knox County adults has been diagnosed with some form of cardiovascular or cerebrovascular disease. Adults with hypertension are statistically more likely to report these diseases compared to non-hypertensive adults.
- In 2002, almost one out of three Knox County adults (29.3%) reported they have been diagnosed with hypertension. This exceeds the national estimate of 25.6% (in 2001) and is similar to the 2002 Tennessee prevalence (30.3%). The Knox County prevalence (29.3%) does not yet meet the *HP 2010* objective of no more than 16% of adults having hypertension.
- The prevalence of hypertension among African-American adults in Knox County (46.2%) is almost twice as high as the prevalence for white adults (27.9%) and exceeds national and state Behavioral Risk Factor Survey estimates for this ethnic group.
- The prevalence of hypertension among adults is highest among the following groups:
 - African-Americans
 - Obese
 - 55 years or older
 - Living in households with annual incomes of less than \$15,000
 - Less than a high school education
 - Retired and the unable to work
- Two out of three of adults with hypertension (66.6%) exhibit one or more risk factors for hypertension, including: (1) obesity, (2) smoking, (3) not exercising, or (4) not eating five recommended fruits and vegetables per day.

METHODOLOGY

This report presents data from the 2002 Knox County Behavioral Risk Factor Survey (BRFS), a population-based, telephone survey that collected health information from adults (18 or older) in Knox County ($n = 5,005$) from November 2001 to September 2002. Respondents were classified as having been diagnosed with hypertension if they answered, “yes” to the following question, “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?” Data points of less than 20 were not reported to ensure statistical accuracy. Risk analysis ratios were generated by logistic regression.

Table Notes:

1. Physical activity is based on the CDC recommendations for physical activity of moderate exercise for 30 minutes at least five or more days per week or vigorous exercise for 20 minutes at least three or more days per week. Those meeting the requirements were classified as “recommended,” those doing some physical activities in the past week but not meeting the guidelines were classified as “insufficient,” and those not participating in physical activities were classified as inactive.
2. Obesity and overweight were measured using Body Mass Index (BMI). In 1997, the World Health Organization established BMI as an international standard to study body weight. Dividing a person’s weight in pounds by her/his height in inches, then dividing that answer again by the height in inches and multiplying the result by 703 calculates BMI. A BMI of 24 or less is considered normal; overweight is 25-30; and obese is greater than 30.

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Questions?

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