



# **Behavioral Risk Factor Surveillance 1998**

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***Tarrant County  
Public Health Department***

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## Introduction

A large proportion of morbidity and mortality among adults in the United States is related to issues of lifestyle and personal behavior. Nine of the ten leading causes of premature death in the USA can be linked to one or more of six behaviors: cigarette smoking, alcohol misuse, lack of exercise, failure to wear seatbelts, overeating, and failure to adequately control hypertension. These factors work synergistically with one another and with hereditary and environmental factors to increase the risk of disease to the individual.

Despite the importance of these known health-related risk factors, it was only relatively recent that the public health sector developed a systematic means of collecting population-based prevalence data that is comparable between jurisdictions. **Prevalence** measures the **presence of all cases of a disease** or condition in a given population within a defined period. **Incidence** is a rate that measures the **occurrence of all new cases of a disease** or condition in a given population within a defined period. An important function of a public health agency is to assess the health status of the population. The value of such an assessment is enhanced when compared to some benchmark, such as other similar populations or national norms. In 1981, the Centers for Disease Control and Prevention (CDC) began to provide technical assistance to state health departments to enable them to use standard methodology to conduct telephone surveys. Data from these surveys would lead to baseline prevalence estimates for behavioral risk factors. These factors focus on specific behaviors and practices that place a person at increased risk for known diseases, or injury. The use of comparable survey methodology and questionnaire design began to permit state-to-state or state-to-national comparisons. This endeavor became the Behavioral Risk Factor Surveillance System (BRFSS). In 1987, Texas began participating in the BRFSS. During 1998, the Tarrant County Public Health Department conducted (for the first time) a countywide survey using the BRFSS.

The BRFSS is an ongoing telephone survey conducted with the purpose of collecting uniform data on behaviors and conditions that place adults at increased risk for developing chronic diseases and conditions, injuries and preventable infectious diseases. The Tarrant County BRFSS implemented by the Tarrant County Public Health Department was coordinated with the Dallas County Parkland Hospital District who simultaneously administered a BRFSS in Dallas County. This collaboration enabled a unique Metroplex-wide comparison, as well as comparison with state and national data.

Many of the data derived from the BRFSS are linked to objectives in the *Healthy People 2000* initiative. *Healthy People 2000* is a collection of national health promotion and disease prevention objectives developed by the U.S. Department of Health and Human Services with a diverse team of national experts. *Healthy People 2000* objectives are being used nationally as gold standards for assessing

trends in health-related conditions in different communities. BRFSS data have three main functions. They influence health program decisions, they increase the understanding of the relationship between health behavior and health status, and they support health policy positions.

### **Study Sample Selection**

Interviewing every person in a population is not logistically or economically feasible. Therefore, the BRFSS uses a scientifically selected telephone sample for interviewing so that the information obtained from the sample can be generalized to the total population. To accomplish this, the principle of probability sampling - a method of random sampling where each member of the population has a known, nonzero probability of being chosen was utilized. Several types of sampling designs will yield a probability sample; however for sampling efficiency, some form of cluster sampling is frequently used. Cluster sampling of households reduces the number of telephone numbers that must be called to complete the survey. Cluster sampling is easier and less expensive, but often results in increased variation in measurement. For the BRFSS the disproportionate stratified random sampling method, a type of cluster sampling, was used.

The disproportionate stratified random sampling method stratifies blocks of telephone numbers into groups that are “likely” or “unlikely” to contain residential numbers based on information from previous surveys or telephone listings. Individual telephone numbers in the likely stratum are then sampled at a higher rate than numbers in the unlikely stratum (usually at a 3:1 ratio). Then, individual respondents are randomly selected from all non-institutionalized adults, aged 18 and older, living in a household. They are interviewed in accordance with BRFSS protocol until the target number of interviews is completed. Respondent participation is voluntary and non-compensated. Personal identifiers such as name and address are not used, and other individual level data are pooled to provide information about the health practices of residents.

Before any chosen telephone number is discarded at each stage, calls are repeated for a maximum of 15 times (3 times on each of 5 calling occasions over weekends, weekdays and weeknights).

### **Components of BRFSS Questionnaire**

The BRFSS questionnaire consists of three parts: the core component, the optional modules and the State-added questions. The core component consists of questions asked by all researchers. The optional components are sets of questions that researchers may choose to include in their questionnaire. The State-added questions are developed or acquired and used by individual states. The components of the Tarrant County BRFSS were chosen in collaboration with

Parkland Hospital to allow for the compilation of comparative data between the two counties. The questionnaire consisted of all questions from the core component and questions from nine of the optional modules, but no State-added questions. Questions covered the following topics:

<b>Table 1: Modules Covered By the BRFSS and Number of Questions</b>			
<b>Topic: Core Section</b>	<b># of Question</b>	<b>Topic: Optional Modules</b>	<b># of Question</b>
Health Status	4	Diabetes	12
Health Care Access	7	Sexual Behavior	10
Diabetes	1	Health Care Coverage	6
Exercise	10	Health Care Utilization	9
Tobacco Use	8	Preventive Counseling Service	7
Fruits and Vegetables	6	Cholesterol Awareness	3
Weight Control	7	Hypertension Awareness	3
Demographics	15	Injury Control	5
Women's Health	11	Quality of Life	10
HIV/AIDS	11		
<b>Total</b>	<b>80</b>	<b>Total</b>	<b>65</b>

**Data Collection**

All interviews were conducted using a computer-assisted telephone interview (CATI) program. CATI programs use interactive computing systems for data collection. As questions are displayed, the interviewer reads them to the respondent and keys in the response. The CATI program automatically skips inappropriate questions and checks for the acceptability of responses (such as mammograms in males).

The quality of data collected is assured by several procedures. These include monitoring of interviewers through an unobtrusive telephone dial-in, conducting verification callback on a 5% random sample of all interviews, and assessing other quality assurance indicators, such as interviewer statistics, frequency distribution of disposition, response rate and percentage of interviews completed on the first day.

**Weighting Factors**

BRFSS adds weighting factors to each record to provide, unbiased, representative prevalence estimates. Weighting compensates for unequal

selection probabilities and non-response differences, i.e., overrepresentation or under-representation in the study sample. The BRFSS adjusts for several factors:

- Number of telephone lines per household
- Number of adults per household
- Number of interviews completed per cluster
- Post-stratification by population distribution

The first three factors address the problem of unequal selection probability, which could result in a biased sample - one that does not accurately represent the population. For example, a respondent in a four-adult household has only one quarter the chance of being selected for an interview as does a respondent in a one-adult household; a household with two telephone numbers has twice the chance of being selected as a household with one telephone number. Overrepresentation or under-representation of any single record is addressed through post-stratification. This method adjusts the distribution of the sample data so that it reflects the total population of the sampled area by computing the ratio of the age, race and sex distribution of the population divided by the sample. Weighting of the sample adjusts not only for variation in selection and sampling probability, but also for differing demographic characteristics so that projections can be made from the sample to the general population.

### **Uses of the BRFSS Data and Utilization of Telephone Surveys**

As mentioned earlier, BRFSS data are linked to *Healthy People 2000* objectives. These are gold standards used for assessing trends in health-related conditions. BRFSS data serves three main functions. They influence health program decisions, they increase the understanding of the relationship between health behavior and health status, and they support health policy positions. BRFSS results provide policy-makers with informed options for making decisions on public health policy. This information also assists planners in designing public health intervention strategies and evaluating their impact.

Telephone interviews are a proven methodology of collecting prevalence data in community-wide surveys. They are easy to administer and monitor. All calls can be made from one location and interviews are entered directly into a data file by using computer assisted methods. A supervisor can monitor interviews in progress more easily and in a shorter period of time than can be performed in face-to-face interviews, enhancing quality control efforts.

Telephone interviews are cost-effective and efficient. An experienced interviewer can handle multiple situations, i.e., busy lines, unanswered calls, refusals, etc., and still complete one or more interviews per hour; whereas face-to-face interviewers often travel many miles in a day without completing any interviews.

Telephone interviews are shorter than in-person interviews, and each telephone conducted interview for the Tarrant County BRFSS averaged 17 minutes.

Data is collected uniformly by trained interviewers. This ensures comparability of data from one point in time to another, over a period of time and comparability across selected populations and geographic areas.

There are limitations in the use of telephone interviews. Primarily, data from persons in households without telephones are not captured. The 1990 census indicated that over 95% of households in the USA and 94% of household in Tarrant County have telephones. One of the functions of weighting is to compensate for this potential bias. Other limitations include the inability to verify the actual responses provided by the interviewees. Further, some responses can vary according to seasonal influences such as for obesity and eating habits.

BRFSS data are also subject to errors common to all data collection systems, and records may be incomplete or contain inaccurate information. People may not remember essential information, a question may not mean the same thing to different respondents, and some individuals may not respond at all. It is not always possible to measure the magnitude of these errors and their impact on the results. The user must make his or her evaluation of the data. Overall, estimates generally have relatively small sampling errors; but estimates for certain population subgroups may be based on small numbers and have relatively large sampling errors. When the number is small and the probability of such an event is small, considerable caution must be observed in interpreting estimates and/or differences between groups and areas. Using trained interviewers helps minimize these types of error.

## General Overview of the Tarrant County BRFSS Results

### Demographic Distribution

A total of 877 randomly selected, non-institutionalized adults, aged 18 and older living in households within Tarrant County were interviewed (Table 2). Nearly three quarters (72.2%) of those interviewed were white Non-Hispanic persons. Hispanic and black persons comprised 12.2% and 11.6% of the sample respectively. Overall, the demographic profile of the sample was comparable to that of the 1990 Tarrant County population census, but with the following variations: Female to male ratio was nearly equal in 1990, whereas the study sample consisted of 60.3% females versus 39.7% males, the study group reported slightly higher education and income levels than that of the 1990 census, and there was an upward shift in age (25-55 years vs. 18-44 years in 1990) (Fig.1). The observed differences in education and income levels are possibly due to demographic changes over the decade and data from the study might mirror the actual current demographic pattern more closely than the 1990 data. Specifically, the Tarrant County surveyed population was represented by a quarter having completed high school or equivalent, 28.4% having some college, and a third (33.6%) with college degrees. Half (50.1%) made incomes greater than \$35,000, with 15.8% above \$75,000. Whereas, 7.3% of the population surveyed made below \$15,000. The Dallas-Fort Worth metroplex is continuing to experience phenomenal growth in industries, government enterprises, private business and population movement since the time of the last census (ie.1990). The lower unemployment rate found in this survey (3.2% vs. 4.2%) is also a further indication of continuing economic growth and prosperity in Tarrant County.

### Current General Health Status

The BRFSS results reveal that Tarrant County residents generally perceive their health to be good. Response to questions about general health status revealed that 86.2% reported good to excellent health (Fig.2). For the questions regarding “not good” health, 66.5% reported no days of physical health “not good”, 61.6% reported no days of mental health “not good” and 66.4% of respondents reported no days that their physical or mental health kept them from their usual activities in the past 30 days.

Report of fair or poor health status was generally associated with age. It was about 6 times higher in those aged 65 years and over (32.0%) than those aged 18-24 years (5.4%) (Fig.3). Average number of days that physical health was “not good” in the past 30 days among those aged 65 and over (6.5) was about two times that for younger age groups (2.8-3.3). However, the relationship was reversed for mental health. Younger respondents (aged 18-24 years) reported about twice the average number of days that mental health was “not good” (5.7)

or number of days feeling sad or “blue” in the past 30 days (5.3) than older respondents aged 55 years and older (Fig.7). The age group 55-64 years reported 2.5 average days mental health “not good” and 2.4 average days feeling sad or “blue” in the past 30 days, and those aged 65 and over reported 3.0 days for both. These reported differences are possibly due to the fact that teenagers and young adults in general are more agile and have fewer physical challenges, but greater psychosocial changes that affect their mental health than adults. Age group 18-24 follows the period of adolescent growth and emancipation.

Health status and days health was “not good” were also related to education, income and race. Fair or poor health status was reported almost seven times more frequently by respondents with less than a high school education (35.2%) than by respondents with a college degree (5.1%) (Fig.5). Respondents with a college degree reported less than half the number of days of poor mental health (2.1 days) than others (4.5-4.7 days) and fewer days of feeling sad or “blue” (1.2 days) than others (4.3-5.2 days). Fair or poor health status was reported by respondents earning less than \$20,000 6 to 7 times more often than those earning over \$50,000(Fig.6). Respondents making less than \$35,000 annually reported mental health “not good” (5-7.1 days) while respondents earning over \$35,000 report half as many days (2-3.2) of mental health “not good” (Fig.8). Reports of feeling sad or “blue” also followed the same pattern with an average of 7.3 days for those earning less than \$10,000 while those making over \$75,000 averaged 2.0 days. Among ethnic/racial groups, Hispanics (25.5%) had a higher percentage reporting poor and fair general health than blacks (15.7%) and whites (11%) (Fig.4). No ethnic/racial disparities were observed with mental health.

Overall, the proportion of respondents that seemed to have “chronic” health problems was consistently small. 5.3% of respondents reported 25-30 days of physical health “not good”, 5.8% reported mental health “not good” and 5.9% reported that their physical or mental health kept them from their usual activities in the past 30 days.

The proportion of respondents in Tarrant County reporting fair or poor health status (13.8%) was well below that reported by Dallas County (21.9%), and Texas (18.6%), but comparable to the United States median (13.2%) (Table 3). The difference noted may be due to the higher proportion of Hispanics living in Dallas County and other parts of Texas. Hispanics reported fair or poor health status more frequently than other racial/ethnic groups (Fig.4).

## Quality of Life

In comparison to the majority of Tarrant County residents reporting good to excellent health status, about 15% reported that their activities were limited

because of some impairment or health problems. Of those reporting limited activities, 32.1% had been limited for over 5 years. Common health problems causing limitation of activities include back or neck problems (24.1%), arthritis (14.1%) and fractures (9.5%). The majority of those who reported limited activities did not need help with personal care (90.5%) or routine needs (70.8%). Limitation of activities was related to age, income, race and employment. Limitation of activities was comparable among those aged 18-44 and thereafter increased with age and was highest among the age 65 and older respondents (24.7%) (Fig.9), income group below \$10,000 (33.3%), whites (16.7%) and the homemaker/student/retired group (20.3%).

In the past 30 days, 26.1% of respondents reported that pain prevented their usual activities with almost half of them being impaired for more than 5 days. Forty-five (45%) had experienced a sad or depressed day with about one third of them being sad or depressed for over 5 days. Over 60% had felt worried, tense or anxious in the past 30 days, and over 40% had experienced these feelings for over 5 days. More than 70% of the respondents reported days with insufficient rest or sleep. Overall, only 30.7% of respondents reported 26-30 "healthy" days in the preceding month and 10.6% reported no "healthy" days.

### **Health Insurance Coverage, Health Care Access and Utilization**

Over 85.6% of respondents reported having some form of health insurance. Of those with health coverage, 75.8% received it through their employer or their spouse's employer. Forty percent (40%) of respondents with health coverage had had it continuously for at least 5 years, while 11.1% had experienced some lapse in health coverage within the preceding 12 months. The most frequent reasons given for not having health insurance were inability to afford premiums, followed by job loss or change of employment and employer not offering insurance. Having health insurance coverage was associated with age, education, race, gender and income. U.S. citizens 65 years of age are eligible for Medicare. Thus, it was not surprising that 99% age 65 years and older reported coverage. Contrast this with 75% of those aged 18-24 years reporting health coverage (Fig.10). Forty percent (40%) of respondents without a high school degree reported no health coverage, while only 5.4% of those with a college degree lacked coverage. Among the racial/ethnic groups, the proportion of Hispanics without health insurance (38.7%) was almost four times that of whites (10.7%) or blacks (9.8%) (Fig.11). This racial discrepancy might be due to the fact that greater numbers of Hispanics are more recent immigrants to this area and they may not have a permanent job that will provide them with health insurance. A slightly higher ratio of women (16.3%) to men (11.6%) lacked health insurance coverage. Approximately 30% of respondents with an annual income below \$25,000 reported no health coverage compared to less than 10% of those with an annual income above \$35,000 (Fig.12). The actual gap in coverage is difficult to assess since many residents tend to not think of the county's extensive indigent health care system as health

coverage, nor does the survey tool address this point. In addition to this, a percentage of Medicaid eligible adults traditionally have not participated in the Title XIX program. The latter probably accounts for a small degree of under reporting of coverage for the lower-income group, though the former may introduce significant error. This becomes an important issue for Tarrant County because the question must then be sorted out as to either low-income persons without health care coverage need to be linked to existing programs for which they might be eligible or additional resources to provide coverage need to be secured.

Overall, only 12.2% of respondents indicated that cost deterred them from seeing a doctor when needed within the last 12 months. The proportion for females was two times that of males (14.9% vs. 8.1%). The influence of cost on obtaining health care was highest (18.5%) for the age group 18-24 (least insured), and lowest (1.0%) for those aged 65 and above (most insured through *Medicare*). Not surprisingly, those with lower annual income (<\$20,000) were much more likely to have been deterred from seeing a doctor because of cost than those with a higher income (\$35,000+). Finally, with respect to race/ethnicity, Hispanic (20.8%), other (17.1%), and black (16.7%) respondents were much more likely to not have seen a doctor in the last 12 months because of cost than White respondents (9.7%). Income level versus other demographic variables appears to be the determining factor in deterring the respondents from having seen a doctor in the last 12 months. Male respondents reported a higher income than females. There is more than a 10% difference in the proportion of males (66.4%) that report income greater than \$35,000 than females (54.6%). The proportion of whites (65.9%) that report income greater than \$35,000 is higher than that for blacks (40%) and Hispanics (34.7%). Middle age and older adults tend to report a higher income than young adults.

The majority of respondents (80.5%) rated satisfaction with their overall health care as excellent, very good or good. Overall, the percentage of respondents without health care coverage in Tarrant County (14.4%) was similar to that reported nationwide (13.0%), but substantially lower than the rate for Dallas County (29.2%) and Texas (23.6%). The observed differences in health care coverage between Tarrant County and the rest of Texas may be the existence of an extensive indigent health care system (Hospital District), and the outreach marketing of the managed Medicaid systems which was established in Tarrant County in 1997. However, the above percentage for Tarrant County may, in fact, be even lower than the national rate as many residents do not realize they are eligible for the county's health system.

### Prevalence of Smoking

Over 20% of the respondents reported being current daily smokers, whereas 43% of the study group had smoked at least 100 cigarettes in their lifetime. Current

smoking was related to age, education and income levels, but not to gender and race. **Over 27% of respondents age 18-24 years were current smokers** compared to 10.2% of respondents aged 65 years and over. Close to 30% of respondents with a high school education or less were current smokers, dropping to 10.5% for those with a college degree (Fig.13). A similar pattern was found across income levels with 44.1% of respondents with an income less than \$10,000 reporting they were current smokers compared to only 10.9% of those in the top income bracket (\$75,000+)(Fig.14). The percentage of smokers in Tarrant County was similar to that of Dallas County, of the State, and of the Nation.

Over 20% of daily smokers reported regularly consuming more than one pack of cigarettes per day. Close to 53% of current daily smokers had quit smoking for more than one day in the past 12 months. Of the respondents who have smoked at least 100 cigarettes in their lifetime but were not current smokers, over 90% had not had a cigarette for at least one year and 65% for at least 5 years.

Close to 39% of respondents had smoked cigars at some time in their life. However, nearly 60% had not smoked a cigar in the past 12 months and among those who had smoked cigars in the past month (12.7%), very few smoked cigars regularly.

## Body Weight, Physical Activity, Diet

### Body Weight

To assess a person's level of body fat, a measure called the body mass index (BMI) is frequently used. The BMI is a ratio of weight to height and is calculated by dividing a person's weight (in kilograms) by their height (in meters) squared. The Centers for Disease Control and Prevention (CDC) has defined being overweight for men as having a BMI greater than 27.8 and for women a BMI greater than 27.3.

Using the BMI criteria, the proportion of adults overweight in Tarrant County was related to age, employment and race but not to gender and income. Almost 19% of 18-24 year old respondents reported being overweight. The prevalence of being overweight increased with age, and over 40% of respondents older than 55 were overweight. The proportion overweight among those unable to work (60%) was close to two times those in other groups (21.4-35.5%). Blacks (50.5%) more frequently reported being overweight than Hispanics (36.9%) and whites (29.2%) (Fig.15). The proportion overweight among race/ethnicity groups was lowest among the "other" group, the majority of whom were East Asians and American Indian. Those earning incomes less than \$20,000 tended to represent a slightly higher proportion of respondents being overweight than those earning over \$50,000, but the difference was not statistically significant (Fig.16).

Questions about weight control revealed that 38% of respondents were trying to lose weight and 35.2% were trying to maintain their weight. Of the respondents who indicated that they were trying to lose weight or maintain their weight, 77.7% were eating fewer calories or less fat and 56.2% were exercising to lose or maintain weight. Only 15.3% of respondents had been advised by a health professional to lose, gain or maintain their weight.

Overall, the proportion of Tarrant County residents overweight was similar to Dallas, State of Texas and the United States (Table 3), but the proportion of blacks overweight in Tarrant County was at least 10% higher than their counterparts in Dallas County, the State of Texas and the United States.

### **Physical Inactivity**

When asked about physical activity, 27.5% of respondents said that they had not engaged in any type of leisure-time physical activity in the last 30 days. This level of physical inactivity falls far short of the Healthy People 2000 objective 1.5, which reads "Reduce to no more than 15 percent of people aged 6 and older who engage in no leisure-time activity."

Physical inactivity was related to gender, age, educational and income levels but not to race. Males were more physically active than females by 10 percentage points. Young adults (18-24 years) had the highest level of physical activity. Only 18.5% reported being physically inactive in the past 30 days. Contrast this to the oldest age group, respondents 65 and older, who reported the lowest level of physical activity. Up to 41.8% reported being physically inactive in the past 30 days (Fig.17). A little over 50% of the respondents with less than a high school education were the least active. Physical activity increased with advancing educational levels, the highest being among respondents with a college degree (only 17% physically inactive) (Fig.18). More than 40% of respondents with an annual income less than \$20,000 were physically inactive (Fig. 19). But, the level of activity increased in a near linear fashion as income increased, physical activity maximizing (less than 15% inactive) at the \$35,000 to \$50,000 income range and remaining under 20% as income further increased. Comparing physical activity behaviors among ethnic/racial groups did not achieve statistical significance.

Overall, 55.9% of the respondents participated in regular or sustained exercise defined as participating in a physical activity for at least 20 minutes three or more times per week. The proportion of respondents participating in regular or sustained exercise was comparable across all the demographic groups except education and race. Those with a college degree (60.2%) and whites (59.4%) participated in regular or sustained exercise more than other groups. With regard to age, the distribution was bell shaped with fewer old and young adults participating in regular or sustained exercise than middle aged adults. Walking was the most common type of physical activity, reported by over 50% of the respondents, followed by running (8.3%), gardening (5.5%), weight lifting (4.2%), and aerobics (3.6%).

Overall, the level of physical inactivity in Tarrant County was comparable to Texas and the United States, but slightly lower than Dallas County (Table 3).

## **Dietary Habits**

Tarrant County residents fall short of the CDC objective of eating at least 5 servings of fruit and vegetables per day. The average number of servings of fruit and vegetables consumed by Tarrant County residents was 3.43. Only 19.5% of the respondents reported consuming the recommended 5 servings per day. More females (22.3%) than males (15.2%) consumed the recommended daily servings of fruit and vegetables. The proportion that met the recommended daily servings of fruit and vegetables tended to increase with age and education. Among the income, racial and employment status groups, the lowest proportions were found among those earning \$10-15,000, Hispanics, and those unable to work.

Overall, the percentage of Tarrant County respondents consuming the recommended 5 or more daily servings of fruits and vegetables was slightly lower than Dallas County, the State of Texas, and the United States (Table 3).

## **General Safety Practice**

When asked how often seatbelts were used when riding in a motor vehicle, the majority of respondents (97.5%) reported sometimes using car seatbelts, and 81.5% indicated that they “always” used safety belts. Always using car safety belts was related to gender, but not to age, race, employment status, education or income levels. Females reported always using car seatbelts more frequently than males (76.1% vs. 85.1%). Prevalence of not using seatbelts in Tarrant County (18.5%) was comparable to that for Texas (18.7%) and Dallas County (17.7%), but lower than that for the United States (30.7%). The marked difference between Texas and the United States median may be due to a stricter enforcement of seatbelt regulations in Texas than in many other states.

Over 80% of respondents reported that the oldest child in their household “always” used car seat belts; 47% reported some use of bicycle helmets with about 25.8% “always” using them when riding a bicycle. Bicycle helmet use laws were enacted and have been enforced by cities. The data suggest the need to enact bicycle helmet ordinances where none currently exist and to strengthen enforcement in all localities.

Overall, 60.5% of the respondents reported that smoke detectors in their home had been tested within the past six months. The percentage of people testing their smoke detectors in the last 6 months was uniformly distributed across most demographic variables with the exception of black respondents (74.4%) who

reported a higher proportion testing their smoke detectors in the past 6 months than any other race/ethnic group (Fig.20).

## Prevalence of Diabetes

Of all respondents, 6.6% reported they had been diagnosed with diabetes. The prevalence of diabetes was related to age, but not to gender. There was also no consistent relationship with education, race, income and employment. Diabetes prevalence increased as age increased in an exponential fashion starting at 1.1% for those aged 18-24 years and culminating at 20.4% for those aged 65 years and older (Fig.21). The average age of diagnosis was 47.8 years with the majority being diagnosed after 40 years. Over 11% of respondents with less than a high school education and 5.6 to 6.5% of those with a high school education or beyond had been diagnosed with diabetes.

Of respondents with diabetes, only a third (34.5%) reported currently using insulin; and most of the respondents with diabetes fit the profile of having Type 2 diabetes.

Approximately 71% of respondents with diabetes had visited a health professional 1 to 5 times within the previous 12 months. About 45% checked their blood glucose 1-5 times a day and 22.4% between 1 to 5 times per week. Close to two thirds (65.5%) of the diagnosed diabetics were unfamiliar with glycosylated hemoglobin, which is an indirect measure of blood glucose control over a period of time. Of those who knew about glycosylated hemoglobin, 72.2% had checked it from 1 to 5 times in the last year. Over two thirds of the diagnosed diabetics had their feet checked at least once during the previous year. Half reported having had a good visual exam within the past year. Two-thirds of the diabetic group reported no problem recognizing people or objects across the street, and over 40% reported no problem reading. Nearly 80% said they could watch TV without any visual limitation.

Diabetes prevalence in Tarrant County was comparable to Dallas County (6.2%), but slightly higher than the average for Texas (5.5%) and the United States (5.4%). Tarrant County residents aged 65 years and over (20.4%) and Whites (6.2%) reported higher prevalence of diabetes than their counter parts in Dallas County (11.8%; 3.9% respectively), in Texas (13.3%; 4.7% respectively) and the US (12.5%; 4.8% respectively).

## Cardiovascular Health

### Prevalence of High Blood Pressure

Overall, 23.9% of respondents had been told their blood pressure (BP) was high, and 18.2% had been told their blood pressure was high more than once. High blood pressure was related to age, income and race, but less so for gender, educational level and employment. Less than 8% of respondents under the age of 35 had been told more than once that their blood pressure is high. This proportion increased to 18.5% for those aged 45-54 years, to 32.7% for those aged 55-64 years and to 50% for those aged 65 and over (Fig.22). The biological changes occurring in the blood vessels associated with aging may account for this linear relationship of high blood pressure, but may be related in part to stress. Income tended to have an inverse linear relationship with high blood pressure. More than a third of respondents with incomes below \$15,000 had high BP. The number decreased gradually to a fifth as income increased to over \$25,000 (Fig.23). Interestingly, while high blood pressure prevalence was nearly equivalent between black and white respondents (19.8% and 22.8% respectively), Hispanic and “other” racial groups had a substantially lower prevalence of high blood pressure (8.6% and 5.7% respectively) (Fig.24). Those with high school education and below (21-23.1%) had a slightly higher prevalence of high BP than their counterparts with a college degree (15.3-16%). Although, those unable to work and homemaker/student/retired group had a higher prevalence of elevated BP than those in other employment categories, small numbers in at least two of the four employment categories preclude meaningful comparison.

The prevalence of ever being told by a doctor or other health professional that blood pressure is high in Tarrant County was comparable to Dallas County, the State of Texas and the United States.

### **Cholesterol Screening**

Over 75% of all respondents had ever checked their cholesterol level and of these, 30.1% had been told their cholesterol was high. Cholesterol “screening” was associated with age, education, race and income. Actual high blood cholesterol “levels” correlated only with age. Of respondents aged 18-24 years, 41% had checked their cholesterol levels, and only 8.8% had been told they, in fact, had a high value. These proportions increased with age in a linear fashion, with 93.8% of respondents over 65 years of age being screened and half finding that they had high levels. Over 80% of respondents with some college or a college degree had checked their cholesterol, a significantly higher rate than for those with a high school degree (67.6%) or less than high school (56.9%) degree. However, finding high cholesterol levels did not show a consistent relationship with education. Cholesterol “screening” tended to increase with rising income, but high blood levels did not. Sixty-nine percent (69%) of respondents making less than \$10,000 a year “had ever checked their cholesterol.” This proportion increased with rising income to 89.2% for those with an annual income in excess of \$75,000. The proportion of respondents who had ever had cholesterol screening and had a high cholesterol level was higher among whites (80.3% and 31.2% respectively) and blacks (76.8% and 29.3% respectively) than Hispanics

(56.7% and 25.4% respectively) and other racial groups (60.0% and 23.8% respectively). It was also highest for those unable to work (94.1%) and lowest for those out of work (65.4%).

The overall prevalence of high blood cholesterol in Tarrant County (30.1%) was slightly lower than Dallas County (35.5%), but comparable to Texas (28.7%) and the United States (28.8%).

## Women's Health

### Pap Test

Overall, a very high proportion of women (94.8%) in Tarrant County reported having had a Pap test in the past. Over 91.1% of female respondents with a uterine cervix reported receiving a Pap test within the past three years, exceeding the Healthy People 2000 objective of 85% to be screened. The rate of Pap testing within the past three years was lower for respondents aged 65 and over (70.8%) and those unable to work (66.7%), though, this may not be a reliable finding due to small sample size. Report of Pap test within the past 3 years also tended to increase as levels of education increased. Routine checkup was the major reason for Pap smear. This data reflects a high level of awareness in the Tarrant County community of cervical cancer and of prevention and control strategies.

The percentage of Tarrant County residents who have ever had a Pap test is comparable to Dallas County, the State of Texas and the U.S. (Table 3).

### Clinical Breast Exam and Mammogram

Over eighty percent (88.2%) of all female respondents have ever received a clinical breast exam (CBE) and 59% have ever received a mammogram. While the majority of women (88.2%) who reported having mammography had it for routine screening, 12% had it in response to clinical problems or a history of breast cancer. Among female respondents, aged 40 and older, 80.9% reported ever having both a CBE and a mammogram; and 69.6% of women 50 and older had received both a CBE and mammogram within the past 2 years. Tarrant County exceeds the Healthy People 2000 objective for breast cancer screening. The objective states "increase to at least 80% of the proportion of women aged 40 and over who have ever received a clinical breast examination and to at least 60% of those aged 50 and older who have received both in the last 2 years."

Although Tarrant County has met the Healthy People 2000 screening objective for breast cancer, prevalence of CBE and mammogram were low among those aged 65 and over (51.6%), those with income below \$10,000 (58.3%) and those with high school or less education (50-60%). Prevalence tended to be low among

blacks and those unable to work, but is not a reliable finding due to the small number of responses. These high levels of breast cancer screening might be due in part to local community health education and cancer screening programs.

The proportion of Tarrant County women who reported receiving CBE was comparable to the U.S., but higher than that for Dallas County and Texas and that for mammogram was comparable with Dallas County, the State of Texas and the United States.

## **HIV and Sexually Transmitted Disease (STD) Behavior and Attitudes**

### **Perceived Risk of HIV and HIV Testing**

Respondents less than 65 years old were asked to rate their perceived risk of getting HIV, and 7.6% reported that they believed themselves to have a high or medium risk. Perception of high or medium HIV risk had an inverse relationship with education (Fig.25) and annual income (Fig.26). A greater proportion of those with less than high school education (13.6%) believed they were at a high or medium risk for HIV versus those with a college degree (3.8%). Twenty-eight percent of respondents earning less than \$10,000 perceived themselves to be at high or medium risk, and the proportion dropped as annual income rose, with only 3.8% of those earning \$50,000 or more reporting a high or medium risk (Fig.26). The proportion of medium to high risk among those aged 18-24 years (10.0%) was double that of those aged 55-64 years (5%). There were no significant differences among race, gender and employment groups.

Overall, 48% of respondents under 65 years old reported that they had been tested for HIV. The lowest proportion of respondents that had been tested were among those aged 55-64 years (27.7%). Respondents who reported high and medium risk for HIV were the most likely to have had HIV testing. The most frequent reason given for getting tested is self-knowledge; followed in descending order by pregnancy, blood donation, routine checkup, hospitalization and life insurance. The most frequently reported testing sites were private physician offices; followed by a hospital setting, the health department STD/HIV clinics, immigration centers, other public clinics and family planning facilities. Three quarters of respondents who had ever been tested for HIV said they received their test result, but only 33% of those who received their test result also received counseling for HIV.

The majority (91%) indicated that some form of HIV health education should take place in schools. About 70% noted it should begin in elementary school, 15% indicated it should begin in middle or high school and a few noted it should begin at kindergarten.

## Condom Use and Attitude Toward Teenage Condom Use

Respondents under age 50 were asked if a condom was used the last time they had intercourse, and those who reported using a condom were asked why the condom was used. Overall, 86% of the respondents reported that they believed proper use of condoms could prevent HIV infection; but less than a quarter reported using a condom during their last sexual encounter. Of the respondents reporting last having used a condom, only 7.7% reported that it was used to prevent sexually transmitted disease (STD) alone. Over a third (36.8%) claimed to use the condom to prevent pregnancy alone, but half (51.3%) of the respondents claimed to use the condom to prevent both STD's and pregnancy. Among unmarried respondents, only a quarter (25.9%) reported using a condom. The proportion who reported using condoms was comparable across education levels and employment status. Condom use comparison across race, gender and income showed no statistically significant differences.

All respondents under 65 years of age were asked if they would encourage condom use in a sexually active teenager. Overall, 88% responded that they would encourage condom use. The proportion of affirmative responses did not vary much with respect to sex, age, education level, annual income, race, or employment status.

## High Risk Behavior

Respondents less than 50 years of age were asked if any of the following applied to them in the past year: (1) had anal sex without a condom, (2) used intravenous drugs, (3) tested positive for HIV, or (4) tested positive for a sexually transmitted disease. Overall, only 5.5% responded that one of the above applied to them. Though an overall small sample, it was significant that the high risk HIV behavior (14.1%) was higher among the young adults aged 18-24 than among the older respondents aged 45-50 (1.4%) (Fig.27). Although, respondents who had incomes less than \$15,000 appeared to have higher HIV risk behavior than those with higher incomes, this sample size was not sufficient for statistical implication (Fig.28). A significantly greater proportion of unmarried (18.5%) than married respondents (5.7%) indicated participation in HIV risk behavior. There was no consistent relationship between participation in HIV risk behavior and education, race or employment.

A little over 10% of the sexually active group reported a change of behavior in the last 12 months because of their knowledge of HIV. These changes included a reduction in the number of sexual partners, entry into a monogamous sexual relationship and always using condom during sexual intercourse

Only 8% of respondents reported two or more partners in the last 12 months. The highest proportion (17.2%) was found among the 18-24 year old group, and (4.4-9.9%) frequency found among the 25 years and older group. One third in the lowest income group (< \$10,000) compared to 4.6-7.2% of the higher income groups (>\$35,000) reported two or more partners in the last 12 months. There were no consistent relationships with gender and education.

### **STD Prevalence**

To assess the overall prevalence of sexually transmitted diseases, respondents under 50 years of age were asked if they had been treated for a sexually transmitted disease within the past five years. Overall, only 2.7% of the respondents reported receiving treatment for a sexually transmitted disease in the past five years. About 21% received treatment at one of the Health Department's facilities.

## Summary Commentary

The Tarrant County Public Health Department in concert with Dallas County Parkland Hospital District conducted a metroplex-wide Behavioral Risk Factor Surveillance System (BRFSS) in 1998. The purpose of this study was to assess specific personal behaviors and practices of people that increase risk for disease, injury or chronic conditions. Data from such an undertaking can produce valuable information with respect to resource allocation and designing and implementing appropriate interventions aimed at risk reduction. The obvious benefits are realized in enhanced quality of life, increased years of productive life and health care cost savings. The BRFSS is a standardized tool developed by the Centers for Disease Control and Prevention that enables states to collect data with comparable results.

Measuring behavioral risk factors differs from a community health assessment in that it does not rely upon an individual's perception of their health status, but seeks to determine actual behaviors and practices that are known to place a person at increased risk of adverse health events. Likewise, there are lifestyle practices that can also reduce a person's risk for disease, and it is important to capture this data as well.

A total of 877 randomly selected adults over the age of 18 years and living in households in Tarrant County were interviewed (Table 2). The attributes of the population sample group were fairly representative of the demographic distribution revealed in the 1990 census of Tarrant County with the following exceptions. The study group had 10% more females, a slight upward age shift (25-55 years vs. 18-44 years in 1990), higher educational levels (8% more completing high school and 10% more completing college), and higher income levels (12% reduction in the <\$15,000 bracket and 6% increase in the >\$75,000 range). These differences may actually be more representative of the population demographics of today, given the growth and prosperity patterns of the county over the past decade.

The survey group was polled on a wide array of health issues utilizing 19 modules. Summary results of the survey and comparisons with data from Dallas County, the state of Texas and the United States may be found in Table 3. As would be expected age was a determinant in the prevalence of many of the risk factors. In general the proportion of the following health responses for Tarrant County residents increased with age: poor general health status, poor quality of life, diagnosis with diabetes, high blood pressure, cholesterol screening, physical inactivity, being overweight; and having had a Pap test, breast exam, and mammography. The proportion of the following health responses decreased with age: poor mental health, current smoking, no health insurance coverage, inadequate fruit and vegetable consumption, perception of HIV risk and engaging in HIV risk behavior. Ethnic and racial determinants were seen in the prevalence of health-related risk factor reporting. Blacks, Hispanics, East Asians, and

American Indians accounted for greater proportions of the risk factors studied. However, white Non-Hispanics reported nearly an equal proportion of high blood pressure as did Blacks. Overall, Hispanics had the lowest risk for high blood pressure and Asians were the least overweight. Gender influence was only notably seen with regard to the use of seat belts, with a greater proportion of women than men reporting “always using seatbelts.”

Tarrant County met the *Healthy People 2000* objective for the frequency of Pap test, Clinical Breast Examination and mammography, but fell short of the objective for diabetes prevalence, current cigarette smoking, physical inactivity, and fruit and vegetable consumption. These data suggest a need to intensify current health education and increase health promotion programs targeted to at least those objectives for which Tarrant County falls short of the *Healthy People 2000* objectives.

Overall, the prevalence of most behavioral risk factors in Tarrant County was comparable to that of Dallas County, the State of Texas and the United States except for health status and health insurance coverage. The proportion of Tarrant County residents who reported fair and poor health status and no health insurance was much lower than that of Dallas County and Texas, but comparable to the United States. The prevalence rates of current smoking and of adequate fruit and vegetable consumption were slightly lower in Tarrant County, while the rates of being overweight and of diabetes was slightly higher than for Dallas County, Texas and the United States. Among ethnic/racial groups, blacks in Tarrant County reported being overweight more than their counterparts in Dallas County, the State of Texas, and nationwide. And, with respect to age comparison, respondents aged 65 years and older reported a higher prevalence of diabetes than their counterparts in Dallas County, the State of Texas or nationwide.

Additional detailed analysis and statistical testing of each module of the behavioral risk factors will be done for each module to engender further understanding. These results will enable the Tarrant County Public Health Department and other community-based agencies to develop specific interventions targeted to the “at-risk-populations” within our community; and to form effective partnerships with Dallas and the State of Texas to embrace appropriate prevention programs for the metroplex.

**Table 2**  
**Demographic Distribution of Respondents**  
**Tarrant County Adults (18 and older)**

Demographic Variables	Survey Respondents		Tarrant County Population 18 and older, 1990 <sup>1</sup>
	N	%	
<b>Total</b>	877	100%	853,479
<b>Gender</b>			
Male	348	39.7%	48.6%
Female	529	60.3%	50.4%

<b>Age</b>			
18-24	92	10.5%	15%
25-34	202	23.0%	29%
35-44	219	25.0%	21.7%
45-54	162	18.5%	13.5%
55-64	104	11.9%	9.5%
65+	98	11.2%	11.4%
<b>Education</b>			
≤ High School	106	12.0%	20.1%
High School or GED	227	25.9%	24.8%
Tech/Some College	249	28.4%	31.1%
College Degree	295	33.6%	24%
<b>Annual Income</b>			
< \$10,000	34	3.9%	11.7%
\$10,000- <\$15,000	30	3.4%	7.9%
\$15,000- <\$20,000	63	7.2%	8.6%
\$20,000- <\$25,000	103	11.7%	8.9%
\$25,000- <\$35,000	127	14.5%	16.5%
\$35,000- <\$49,000	151	17.2%	19.1%
\$50,000- <\$75,000	150	17.1%	17.2%
\$75,000+	139	15.8%	9.9%
<b>Race/Ethnicity</b>			
White Non-Hispanic	633	72.2%	73.5%
Spanish/Hispanic	107	12.2%	13.2%
Black Non-Hispanic	102	11.6%	11.8%
Asian	18	2.1%	}
American Indian	13	1.5%	} 2.1%
Others	4	0.4%	}
<b>Employment</b>			
Employed	545	62.1%	} 69.2%
Self-employed	59	6.7%	}
Unemployed >1YR	7	0.8%	} 4.2%
Unemployed <1YR	21	2.4%	}
Homemaker	95	10.8%	} 26.6%
Student	27	3.1%	}
Retired	101	11.5%	}
Disabled	20	2.3%	}
<b>Marital Status</b>			
Married	477	54.4%	68%
Divorced	147	16.8%	11.8%
Widowed	52	5.9%	6.3%
Single	34	3.9%	NA
Never married	148	16.9%	27%
Unmarried Couple	18	2.1%	2.1%
<b># of Children less than 5 years in the Household</b>			
None	716	81.6%	}
One	118	13.5%	} NA
≥Two	43	4.9%	}

**Table 2 Continued**  
**Demographic Distribution of Respondents**  
**Tarrant County Adults (18 and older)**

<b># of Children aged 5-12 year in the Household</b>			
None	650	74.1%	}
One	140	16.0%	} NA
≥Two	86	9.7%	}
<b># of Children aged 13-17 years in the Household</b>			
None	732	83.5%	}
One	97	11.1%	} NA
≥Two	47	5.3%	}
<b># of Adults resident in the household</b>			

One	276	31.5%	}
Two	491	56.0%	} NA
Three	82	9.4%	}
Four	21	2.4%	
Five or More	7	0.8%	

NA - Not Available

**Table 3:  
Comparison of Selected Health Risk Factors in Tarrant County With  
Dallas County, Texas and the United States**

<b>Risk Factor</b>	<b>Tarrant County, 1998</b>	<b><sup>1</sup>Dallas County, 1998</b>	<b><sup>2</sup>Texas, 1998</b>	<b><sup>2</sup>United States, 1998</b>
<b>Fair or Poor Health Status Report</b> Would you say in general your health is excellent, very good, good, fair or poor?	13.8%	21.9%	18.6%	13.2%
<b>No Health Insurance Coverage</b> Do you have any health care coverage? "No"	14.4%	29.2%	23.6%	13.0%
<b>Current Smoker</b> Do you now smoke cigarettes everyday, some days, or not at all? = "everyday & some days"	20.6%	22.7%	21.9%	22.9%
<b>Overweight</b> Body Mass Index >27.8 for men and >27.3 for women	32.3%	31.9%	32.8%	31.1%
<b>Physical Inactivity</b> During the past month, did you participate in any physical activities or exercises such as running, calisthenics, golfing, gardening or walking for exercise? = "No"	27.5%	32.8%	27.9%	27.7%
<b>Consumption of Fruit and Vegetables</b> Consumption of $\geq$ 5 servings of fruit and vegetable per day	19.5%	21.3%	22.5%	23.8%
<b>Seat Belt Non-use</b> How often do you use seat belts when you drive or ride in a car? = "nearly always, sometimes, seldom and never"	18.5%	17.7%	18.7%	30.7%
<b>Diabetes Prevalence</b> Have you ever been told by a doctor that you have diabetes? = "Yes"	6.6%	6.2%	5.5%	5.4%
<b>Blood Cholesterol Screening</b> Have you ever had your blood checked for cholesterol? = "Yes"	74.3%	NA	71.0%	74.0%
<b>High Blood Pressure</b> Have you ever been told by a doctor or other health professional that you have a high blood pressure ? = "Yes"	23.9%	22.3%	23.1%	23.0%
<b>High Cholesterol</b> Have you ever been told by a doctor or other health professional that your blood cholesterol is high ? = "Yes"	30.1%	35.5%	28.7%	28.8%
<b>Papanicolaou Screening</b> Have you ever had a pap smear test? "Yes"	94.8%	95.1%	92.9%	94.5%
<b>Mammography Screening, Ever Had</b> Have you ever had a mammogram ? = "Yes"	59.5%	58.1	56.2%	59.2%
<b>Clinical Breast Exam</b> Have you ever had a clinical breast exam? ="Yes"	88.2%	81.7%	82.6%	88.8%

<sup>1</sup> Data obtained from Behavioral Health Risks of Dallas County Adults, 1998, Parkland Health and Hospital System, Dallas, TX.

<sup>2</sup> Data obtained from the 1998 BRFSS on the World Wide Web (www2.cdc.gov).