The Burden of Chronic Disease in Fresno

Final Report

May 31, 2006
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Prepared for America’s Pharmaceutical Companies
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1.0 Executive Summary

Chronic diseases – long-lasting illnesses, such as asthma, cancer, diabetes, cardiovascular disease, and depression – impose a great burden on the Fresno community. Together they comprise Fresno’s number one health threat and the single greatest cause of death and disability. Yet, many chronic diseases are preventable through changes in behavior.

This report, *The Burden of Chronic Disease in Fresno*, outlines the impact of chronic diseases in Fresno and how unhealthy behaviors are contributing to the crisis.¹

Here are some of the highlights from the report:

**Chronic diseases directly affect one of three Fresno County residents.**

Chronic illnesses affect a significant portion of people living in Fresno County.

- Approximately 301,000 people – or about one of three Fresnans (35%) – have been diagnosed with at least one chronic disease.
- Cardiovascular diseases (CVD) are among the most prevalent chronic diseases in Fresno: More than one-quarter (27%) of Fresnans – or 160,000 people – have a diagnosed cardiovascular disease or condition.
- Asthma is the next most commonly diagnosed chronic condition, with about 15% – or 126,000 residents – affected.
- Cancer affects 8% of Fresnans – or 47,000 people.
- About 7% of Fresnans – or 44,000 residents – have been diagnosed with diabetes.

**Chronic diseases affect many more Fresno area residents indirectly.**

The number of people burdened by chronic disease extends beyond those who actually have a diagnosed disease or condition themselves. In reality, entire families are affected when one member has a chronic disease.

- In the Fresno area, four out of five families (79%) have at least one family member with a chronic disease.

The total prevalence of chronic illness is likely much more than 301,000 people because many people with chronic diseases are unaware they have them.

The true prevalence of chronic disease in the Fresno area is difficult to estimate because it includes not only people who have been diagnosed with a disease (i.e., 301,000 people) but also those people who are undiagnosed or are unaware they have a chronic disease.

¹ *The Burden of Chronic Disease in Fresno* was prepared for America’s Pharmaceutical Companies. For a copy of the full report, visit www.HealthyFresno.org.
A U.S. government survey, which looks at national data, estimates that nearly one-third (31%) of people with diabetes do not know they have it.

If the rate of undiagnosed diabetes in Fresno is similar to the rest of the U.S., as many as 9,800 people in the Fresno area may be living with undiagnosed diabetes.

Each of the five chronic conditions examined in this report are believed by experts to be under-diagnosed and under-treated, according to multiple health studies and health experts.

**Fresno has higher rates of asthma and cancer than the rest of the U.S.**

Rates of diagnosed diabetes are about the same as elsewhere in the U.S., while rates of CVD and mental health problems are lower. It should be noted, however, that undiagnosed conditions may be present, and originate from lack of access to health providers who can diagnose conditions and low health literacy. Additionally, mental illnesses are often under-diagnosed by health providers.

**Chronic diseases kill about 3,500 people per year in Fresno.**

Chronic diseases pose a greater threat to the lives of Fresnans than any other health problem or safety issue.

- Of all chronic diseases, cardiovascular diseases (CVD) cause the most deaths: Every year about 2,200 Fresnans die from heart attacks or strokes.
- Cancer is the second leading cause of death in Fresno, killing about 1,100 per year.
- Diabetes kills more than 190 Fresnans every year.

**Chronic diseases affect the quality of life of many more.**

Chronic diseases have a great impact on a person’s ability to lead a normal life and perform in work or school. For example:

- Asthma is the number one cause of missed school days among children in the U.S.
- Diabetes is the leading cause of non-injury blindness and is responsible for 150 amputations per day in the U.S.
- The burden of living with CVD is so great that close to half of patients are willing to sacrifice years of life to obtain a higher quality of life.
- Major depression is the leading cause of disability among adults in developed nations; it is a leading cause of absenteeism and diminished productivity in the workplace.

**Chronic diseases cost the Fresno community $2 billion dollars every year.**

Chronic diseases place an enormous burden on patients and their families, both emotionally and economically. But the impact of chronic diseases does not stop.
there; it reaches the wider community and economy in many ways, primarily the health care and employment systems.

Chronic disease imposes a steep cost on the Fresno community:

- Every year, approximately $2 billion dollars is spent on chronic disease.
- These costs include direct expenditures, such as the amount of money spent on health care bills associated with chronic diseases.
- They also include indirect costs, such as the amount of lost productivity and economic activity associated with loss of life and disability related to chronic disease.

If Fresnans improved their health behaviors, they could reduce the burden of chronic disease in their community.

Right now, too many Fresnans are not taking advantage of all the ways they can protect and promote their health. Fresno County residents self report many poor health behaviors that put them at risk for chronic disease:

- Almost one-fifth (17%) of the population smokes;
- About three in ten (31%) get no exercise;
- More than one out of three (37%) is obese; and
- Many Fresnans also fail to get adequate preventive health care.

Though the burden of chronic disease in Fresno is high, there is hope – and opportunity.

If more people practiced healthy behaviors and increased their awareness of chronic disease symptoms and treatment, the burden of disease could be significantly lowered.

- In Fresno County, if all residents practiced healthy behaviors, more than 188,000 people currently suffering from chronic disease could be living healthier lives.
- About 2,800 deaths could be prevented every year.
2.0 Introduction

Chronic diseases – long-lasting illnesses, such as asthma, cancer, diabetes, heart disease and depression – are the leading causes of death and disability in the United States. Chronic diseases affect the quality of life of 90 million Americans and are responsible for seven out of every ten deaths in the U.S. – killing more than 1.7 million Americans every year.24

Chronic illnesses place an enormous burden on patients and their families, both emotionally and economically. They influence a person’s ability to lead a “normal” lifestyle, and are associated with lower quality of life, and reduced civic participation and educational attainment, among other things. But the impact of chronic diseases does not stop there; it reaches the wider community and economy in many ways, primarily through the health care and employment systems. Chronic diseases are one of the main drivers behind the use of health care services in the U.S. As the Centers for Disease Control (CDC) has warned, “The United States cannot effectively address escalating health care costs without addressing the problem of chronic diseases.” Of every dollar the nation spends on health care, more than 75 cents is spent on medical care for people with chronic illness. Chronic diseases are also the number one cause of lost productivity in the workplace and missed workdays. In the U.S., the direct and indirect costs of chronic disease are estimated to total more than $800 billion each year.b

In the Fresno, California area – the community evaluated in this report – the burden of chronic disease is especially profound. These conditions are widely prevalent and extremely costly. Although current health status in Fresno is poor, especially for those with chronic conditions, much can be done – both at the individual and community level – to reduce the burden of chronic disease. Health behaviors and low health literacy, two of the major contributors to these illnesses, are factors that can be modified. But change will not occur unless residents have the resources and support to make the right decisions for their health, and unless community institutions, such as local government and businesses, schools and employers, step forward to support residents as they strive to lead healthier lives. With the right information, resources, and support, residents in Fresno can start to make better decisions for their health, reduce the burden of chronic disease in their community, and dramatically improve their overall health and well-being.

b Please see Appendix for information regarding cost and prevalence estimates, and data sources.
3.0 Chronic Disease in Fresno, CA

3.1 Key Findings on Prevalence and the Burden of Chronic Disease

Approximately 301,000 individuals living in Fresno County, or about one out of every three residents (34.7%), have been diagnosed with at least one major chronic disease. But it isn’t only people with the disease who are affected. Chronic diseases affect the lives of the approximately four out of five families (78.5%) in the Fresno area who have at least one family member suffering from a chronic disease. 

Cardiovascular diseases (such as heart disease and stroke), diabetes, and cancer, are among the most prevalent, costly, and preventable of all health problems, according to the CDC. Asthma and mental health problems such as depression, also pose major problems to many Americans, but can often be managed with appropriate treatment. Among these five major chronic diseases, which are the focus of the discussion in this report, cardiovascular disease (CVD) is, by far, the most prevalent diagnosed chronic condition in Fresno. Almost one-third of adults (27%) – or about 160,000 people – experience some form of the disease (see Figure 3-1). Asthma is the next most common diagnosed condition, with about 15% – or 126,000 residents (including children) being affected. Cancer and diabetes were the next most prevalent with 8% and 7.5% of adults diagnosed respectively. Mental illness was the least diagnosed of the conditions studied, with approximately 31,000 people seeing a mental health professional.

Figure 3-1: Prevalence of Chronic Disease in Fresno County

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^c Based on national estimates, scaled by local data. Please see appendix for methods.
^d Cardiovascular disease includes heart disease, hypertension and stroke unless otherwise noted.
The total prevalence of chronic disease in Fresno is likely to be much higher than this because many people with chronic diseases are unaware they have them. Total prevalence of chronic disease is difficult to estimate because it includes not only people who have been diagnosed with the condition (the numbers referenced above), but also undiagnosed people (those who have a chronic disease but do not know they have it).

It is very difficult to know how many residents have conditions or diseases but have not been diagnosed. A U.S. government survey, which looks at national data, estimates that nearly one third (31%) of people with diabetes do not know they have it. If the rate of undiagnosed diabetes in Fresno is similar to the rest of the U.S., as many as 9,800 people in the Fresno area may be living with undiagnosed diabetes. The chronic conditions examined in this report are believed by experts to be under-diagnosed and under-treated, according to multiple health studies.

Two primary reasons account for undiagnosed chronic disease – lack of access to a health care provider who would make the diagnosis, and poor health literacy that hinders the decision to seek health care for disease symptoms or to get screened to detect disease at an appropriately early stage. It is quite plausible that both factors are present in Fresno. Nearly one in five (18.4%) of Fresno-area adults do not have health care coverage, and may have very limited access to care. Prevalence numbers in this report, therefore, can be considered lower bounds.

Chronic diseases kill about 3,500 people per year in Fresno, and CVD is the most deadly. In 2005, 2,202 residents of Fresno County died of heart disease or stroke, the leading causes of death for CVD (See Figure 3-2). Cancer, the second-leading killer with 1,096 deaths, and CVD accounted for more than two-thirds of the deaths from chronic disease. Diabetes accounted for 194 known deaths, although deaths from diabetes are frequently attributed to cardiovascular disease. Although asthma does not carry a great risk of death, it imposes a substantial burden on the quality of life.

**Figure 3-2: Deaths from Chronic Disease in Fresno County**

Chronic diseases limit the ability of Fresnans to lead normal lives, be productive in the school and workplace, and engage in the community. In Fresno County, 3.8% of
children have a health condition that limits their activities and 7.4% of adults have a physical or mental health problem that impairs their ability to work.\textsuperscript{75}

Fresno could reap substantial benefits from reducing the incidence of chronic disease, chronic disease disabilities, and deaths. The benefits to Fresno residents in terms of their health and quality of life would be enormous; the wider community would benefit, as well. Using national data to estimate disease cost, Fresno incurs approximately $2 billion in direct and indirect costs due to chronic disease (see Figure 3-3).\textsuperscript{6} Reducing the burden of chronic disease would free resources that can better serve the health and other needs of the Fresno community. While changing behaviors and improving health literacy is not free, the Centers for Disease Control has outlined the cost-effectiveness of a range of different prevention efforts including smoking cessation and arthritis self-help programs, providing Pap smears for low-income women and greater use of mammograms among older women, among others, which yield savings in terms of improved longevity and quality of life, as well as reduced health expenditures.

\textbf{Figure 3-3: Total Cost of Chronic Disease in Fresno County}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fresno_chronic_disease_cost.png}
\caption{Total Cost of Chronic Disease Burden in Fresno Co., CA (in Millions)}
\end{figure}

\textbf{3.2 Prevalence in Fresno Compared to the U.S.}

National sources indicate that CVD is both the most prevalent chronic disease and the leading cause of death in the country. CVD affects about 71 million Americans and kills about 240,000 per year.\textsuperscript{9} Cancer, diabetes, and depression each affect about 20 million Americans and asthma about 11 million (see Figure 3-4). Cancer remains the second leading cause of death, killing about 200,000 Americans every year; diabetes, depression and asthma have lower rates of mortality, killing about 186,000, 30,000 and 4,000 people respectively each year.\textsuperscript{7,78} Diabetes is growing more prevalent over time; the percentage of people with diagnosed diabetes is expected to more than double by the year 2050.\textsuperscript{18}

\textsuperscript{e} Please see the appendix for information on the methods used to estimate Fresno area costs and prevalence.
In Fresno, diagnosed asthma is considerably higher than the rest of the U.S. Rates of cancer and diabetes are also slightly higher in Fresno than in the U.S. Rates of CVD and diagnosed mental illness are lower in Fresno than in the U.S. (see Figure 3-5).

The differences in disease prevalence in Fresno and the U.S. could be explained in many ways. National data may use different survey questions compared to local data or rely on self-reported rates of disease as compared to physician diagnosis.

Undiagnosed disease is certainly present in Fresno, CA, and this compounds the differences in diagnosed disease prevalence. Fresnans without access to care will most certainly have a lower chance of diagnosis for chronic, often initially asymptomatic, conditions.

Similarly, a variety of factors lead to under-diagnosis of mental illnesses, including lack of access to care and the negative stigma associated with some mental illnesses.
When mental illness occurs in conjunction with physical illness, it is often overshadowed and untreated. It is likely that many people in Fresno are living with mental illness who have never been diagnosed by a health professional.

Numerous health services research studies have shown that certain characteristics, such as being a member of a traditionally underserved racial or ethnic minority group, are associated with greater levels of heart disease, diabetes, and asthma. These relative differences in disease burden are called health disparities. Fresno is a largely Hispanic community. Nationally, 12.5% of the population is Hispanic, in Fresno that number is 39.9%, more than triple. Fresno also has a larger Asian population – 11.2% versus 3.6% nationally (See Figure 3-6).78

Health disparities concern not only racial groups. Poverty status and disability are associated with greater rates of CVD, and they are two characteristics more common in Fresno than in the rest of the country. Compared to the rest of the U.S., many more people in Fresno County live below the poverty line (22.9% versus 12% nationally), and are disabled (21% versus 19% nationally) (see Figure 3-6).78 Poverty and disability are both linked to higher disease prevalence.

Figure 3-6: Census Information on Fresno City, Fresno County, CA and the U.S.78

<table>
<thead>
<tr>
<th></th>
<th>Fresno City</th>
<th>Fresno County</th>
<th>California</th>
<th>United States</th>
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</thead>
<tbody>
<tr>
<td>% White</td>
<td>50.2%</td>
<td>54.3%</td>
<td>59.5%</td>
<td>75.1%</td>
</tr>
<tr>
<td>% Black</td>
<td>8.4%</td>
<td>5.3%</td>
<td>6.7%</td>
<td>12.3%</td>
</tr>
<tr>
<td>% Asian</td>
<td>11.2%</td>
<td>8.1%</td>
<td>10.9%</td>
<td>3.6%</td>
</tr>
<tr>
<td>% Hispanic</td>
<td>39.9%</td>
<td>44.0%</td>
<td>32.4%</td>
<td>12.5%</td>
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<td>Median Household Income (1999)</td>
<td>$32,236</td>
<td>$34,725</td>
<td>$47,493</td>
<td>$41,994</td>
</tr>
<tr>
<td>% Below Poverty Line</td>
<td>26.2%</td>
<td>22.9%</td>
<td>14.2%</td>
<td>12.4%</td>
</tr>
<tr>
<td>% Over Age 16 Employed (2004)</td>
<td>67.2%</td>
<td>66.1%</td>
<td>65.2%</td>
<td>65.9%</td>
</tr>
<tr>
<td>% Disabled</td>
<td>24.9%</td>
<td>21.3%</td>
<td>20%</td>
<td>19.2%</td>
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3.3 Prevalence by Disease

3.3.1 Cardiovascular Disease

Heart disease is both the most prevalent chronic disease and the leading cause of death in the U.S.9 Among Americans age 35 and older, heart disease killed 509 people per 100,000.28 Although the death rate has been declining, nationally, evidence suggests that in recent years this trend is tapering off. Increasing rates of poor health behaviors like obesity and smoking have been labeled as the causes of early heart disease death.49

An estimated 27% of adults in Fresno County have diagnosed CVD.25 CVD is the number one killer of Fresno residents, and was the cause of 2,202 deaths in 2005 (CA VSQS, 2006). Compared to the rest of California, Fresno has a higher rate of heart
disease, a type of CVD: 7.4% of Fresnans have heart disease compared to 6.9% of Californians. Prevalence of CVD, including heart attacks, varies by socioeconomic and demographic factors (see Figures 3-7 and 3-8).

- Overall, males are more likely than females to experience a heart attack, with white males most likely to experience a heart attack.
- Risk of heart attacks is 65% higher in African-American females than in white females.

Figure 3-7: National Prevalence of Heart Attack Among Americans Over Age 20 by Select Characteristics

![Prevalence of Heart Attacks Among Americans Age 20+](image)

Figure 3-8: Prevalence of High Blood Pressure in Fresno County and CA by Race/Ethnicity

![Prevalence of Hypertension by Race in Fresno and CA](image)

*Results for Blacks, Asians and Mixed Races in Fresno County are statistically unstable.

Heart attack and stroke, the leading causes of death for patients with cardiovascular disease, can be largely predicted by health behaviors like smoking and exercise.
These health behaviors are similarly related to low income, low education, and disability. More than one in four people in Fresno live below the poverty line, suggesting that CVD risk factors may be highly prevalent in this region.

### 3.3.2 Cancer

Cancer is the second leading cause of death in America. Contrary to popular belief, cancer does not only affect older people: It is the second most common cause of death in children, and half of the new cases of cancer occur in people under age 65.

In Fresno County, about 8.2% of the adult population, or 47,000 residents, have ever been diagnosed with a malignancy. In 2005, 1,096 Fresno County residents died from cancer.

Cancer ranked just behind heart disease as the most common cause of death, and the second most common cause of death in children. The age-adjusted death rate per 100,000 in Fresno is 170.

Cancers occur at different rates in different racial and ethnic populations, with African-Americans bearing the greatest burden. African-Americans are 34% more likely to die of cancer than whites and more than two times as likely to die of cancer than Asian or Pacific Islanders, American Indians, and Hispanics (see Figure 3-9).

Five-year relative survival is also lower among African-Americans than among whites at each stage of diagnosis for nearly every cancer site.

African-American women:
- Are more likely to die of breast and colon cancers than are women of any other racial and ethnic group; and
- Have a lower incidence rate but nearly 20% higher death rate than whites for all cancer sites combined.

Similarly, African-American men:
- Have the highest death rates of colon and rectum, lung, and prostate cancers; and
- Have lung cancer death rates that are approximately 40% higher than white males; and
- Have a 24% higher incidence rate and 40% higher death rate than whites for all cancer sites combined.
This disparity is most likely not entirely genetic. When African-Americans receive similar cancer treatment and medical care as white Americans, they tend to have similar outcomes, suggesting that barriers to timely and quality health care likely explain higher death rates among African-Americans. In four major sites (prostate, female breast, lung and bronchus, and colon and rectum), minority populations are more likely to be diagnosed at a later stage of their disease compared to non-Hispanic whites, leading to poorer treatment outcomes. Cancer screenings, which provide early detection opportunities for colon, prostate, cervical, and breast cancers, are largely underused in Fresno (see Figure 3-10). Breast and cervical cancer screening are more common; however, a considerable number of residents do not get screened for these highly prevalent cancers. Research has demonstrated that early cancer detection leads to rapid treatment that dramatically reduces fatality.

Figure 3-10: Self-Reported Prevalence of Fresno Residents Who Do Not Use Cancer Screens

<table>
<thead>
<tr>
<th></th>
<th>Failure to Use Cancer Screening in Fresno Co.</th>
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<tbody>
<tr>
<td>Age 40+, Never Had Colon Cancer Screen</td>
<td>45.0%</td>
</tr>
<tr>
<td>Male, Age 40+, No PSA Test</td>
<td>64.9%</td>
</tr>
<tr>
<td>Female, Age 18+, No Pap Test</td>
<td>7.0%</td>
</tr>
<tr>
<td>Female, Age 30+, No Mammogram</td>
<td>24.2%</td>
</tr>
</tbody>
</table>
3.3.3 Diabetes

More than 20 million Americans have diabetes. In the past 15 years, the number of people with diabetes has increased by more than 50%. The increases have been greatest among children. Most of the increase has come in the form of type 2 diabetes, with rates among children and teenagers increasing rapidly. One in three children born in the U.S. in the 2000 will develop diabetes over the course of their lifetime, according to the American Diabetes Association. Children of this generation could have a lower life expectancy than their parents, an unprecedented event.

Diabetes affects 7.5% of residents of Fresno County, or about 44,000 people. An additional 1.4% of people in Fresno have been diagnosed as pre-diabetic and 3% are estimated to have undiagnosed diabetes.

In 2005, diabetes claimed the lives of 194 Fresno County residents. Sixty-five percent of people with diabetes will die of either heart disease or stroke. Diabetes ranks as the sixth most common cause of death in Fresno.

Diabetes disproportionately affects certain groups in the population (see Figure 3-11). The relative number of people with diabetes in African-American, Hispanic, and American Indian communities is one to five times greater than in white communities.

Figure 3-11: National Prevalence of Diabetes by Select Characteristics

3.3.4 Asthma

Almost 15 million Americans, adults and children, have asthma. Asthma is the most common chronic condition among children. Asthma prevalence rates are lower among the elderly than for young adults because many children with asthma recover from most of the symptoms by adulthood. Asthma also disproportionately affects certain populations. Asthma is more common among African-Americans and whites than among Hispanics and Asians. Hispanics generally report the highest average number of physically unhealthy days, days with activity limitations, and physically or mentally unhealthy days due to asthma. African-Americans and Hispanics are two
African-Americans and Hispanics are two to six times more likely to die from asthma than are whites. The rates of asthma are higher for women (6.7%) than men (5.2%), and higher for African-Americans (6.7%) than whites (5.6%) (See Figure 3-12). Among adults, women of all races have higher rates of illness and death from asthma than men.

Asthma rates in Fresno, CA are among the highest in the United States. About one in six (15%) of Fresno County residents, or 126,000 adults and children report having an asthma diagnosis in their lives. About one in five (20.2%) of children with asthma in Fresno visited an emergency room or urgent care due to asthma in 2002. In 2005, asthma claimed nine lives in Fresno County.

Mental illness is estimated to directly affect 9.5% of the U.S. population, while numbers of diagnosed residents in Fresno County are closer to 6.6%, or 37,800. Lifetime rates of depression are nearly 30% for the national population, though only 18% will receive an actual diagnosis.

Underreported and undiagnosed mental illnesses in Fresno are highly likely. Depression is highest among the elderly and patients with chronic disease. Women who are poor, have little formal education, and are on welfare or are unemployed are more likely to experience depression than women in the general population. People with lower annual salaries have a higher prevalence of depression. With the high rates of poverty and chronic disease in Fresno, it is likely that depression is quite common.

Depression is increasing in prevalence and impact: By 2020, depression will be second only to heart disease as the world’s greatest disease burden. When not treated properly, the effects of depression can be extremely serious and even life threatening. The vast majority (90%) of suicides occur among people with a diagnosable mental illness.
3.4 Chronic Disease Burden by Disease

Chronic diseases impose a severe burden on patients and their families, as well as the wider community. This section discusses the social and economic burden of chronic illness by disease and presents estimates of the effects of these diseases on the Fresno community in terms of both direct and indirect costs.

Using national data adjusted for local wages, Fresno has approximately $2 billion in direct and indirect costs annually due to chronic disease prevalence. Reducing the burden of chronic disease through prevention has the potential to free substantial resources that could better the community, especially its health-related quality of life.

3.4.1 Cardiovascular Disease

People with CVD experience significant problems with performing everyday activities. Heart failure causes more severe impairment of physical functioning – role limitation because of physical problems and lack of energy – than chronic lung disease or arthritis. Those with more severe heart failure have more severe limitation of social functioning and suffer impaired mental health compared to those with mild heart failure.

In fact, the burden of heart failure is so great that close to half of patients are willing to sacrifice years of life to obtain a higher quality of life. Patients with CVD rank as low as patients on kidney dialysis on all quality of life measures – far below the healthy population in self-reported general health. CVD patients, especially those with advanced cases, experience high rates of depression. Declines in physical well-being may have significant social, emotional, and economic repercussions; these declines correlate with job loss, high healthcare utilization, and increased mortality.

According to national data, coronary heart disease costs $142.1 billion in direct medical costs and lost productivity from disability and early death. When stroke and other cardiovascular diseases are included, the total cost reaches $403.1 billion.

Using national cost estimates, CVD costs Fresno County an estimated $994 million per year. This number is likely an underestimate of the true burden of heart disease, given undiagnosed heart attacks and increasing prevalence of CVD risk factors of high blood pressure and obesity.

3.4.2 Diabetes

While diabetes is not as fatal as heart disease or cancer, the burden of complications it imposes is severe. Diabetes, both type 1 and type 2, can cause heart disease, stroke, pregnancy complications, and deaths related to flu and pneumonia. If uncontrolled, complications from diabetes can lead to amputations, renal failure, and blindness.

Diabetes is a highly expensive chronic disease, accounting for a major portion of national health care expenditures. Although inpatient care is the most expensive service used by diabetics, many different types of health services are required to appropriately treat the disease (see Figure 3-13).
Diabetes is a major cause of functional disability. It is the leading cause of non-injury blindness and is responsible for 150 amputations per day in the U.S. Diabetes is associated with functional dependence, increased use of health services, increased health care costs, and increased risk of death. The physical disability caused by diabetes can lead to future declines in health status, a greater likelihood of institutionalization and health service use, and serious reductions in quality of life.

While the physical repercussions are daunting, diabetes also takes a significant emotional toll. Nearly one-fourth (23.6%) of people with diabetes have a depressive syndrome, compared with 17.1% of the non-diabetes population. Compared with adolescents without diabetes or with other chronic conditions, adolescents with diabetes have a threefold increased risk of psychiatric disorders, with rates as high as 33%. Depression among people with diabetes causes a high economic burden to society in terms of both direct and indirect costs.
Diabetes can create many problems for workers. 25% of people with diabetes experience significant work disability. Studies show that disability claims and missed workdays are much higher for employees with diabetes than for those without. Diabetes is estimated to cause a one-third reduction in earnings because of reduced workforce participation, with annual costs ranging from $3,700 to $8,700 in 2002. The incremental cost to employers from medical and productivity losses for beneficiaries with diabetes was $4,410 more than people without diabetes.

Diabetes impacts a child’s health and overall well-being. Children with early-onset diabetes sometimes perform lower on intelligence measures than healthy children and children with other chronic diseases. Children with poorly managed diabetes perform even worse in school. A 2002 study found that children with diabetes had a mean absence rate of 7.3 days per year, compared to a rate of 5.3 days for their siblings. This increase in absences may be the cause of lower school performance. Eighteen percent of parents with diabetic children believed diabetes caused learning problems; 18% believed diabetes caused behavior problems; and 32% believed diabetes caused mood problems.

Parents, family members, and teachers each bear a significant burden due to diabetic children. Because diabetes, especially type 1, depends on daily attention and consistent monitoring and care to maintain a healthy status, parents can experience considerable stress worrying about whether they are providing appropriate care for their child. Schools and daycare settings must also provide appropriate attention and supplies for children with diabetes. When a child with diabetes has other health problems (e.g., asthma, eating disorders), poor school attendance, learning disabilities, and/or emotional and behavioral disorders, it is highly likely that management of the child’s diabetes will be that much more difficult.

Altogether, diabetes exacts an enormous penalty on a community. The national total cost of diabetes is estimated at $132 billion. Direct care costs for health services are considerable – one dollar out of every five dollars spent on healthcare is spent on diabetes. Applying national diabetes cost estimates suggests that the cost of diabetes in Fresno County is about $307 million.
3.4.3 Asthma

Although asthma kills few people, it is still a very frightening disease that imposes a substantial burden on patients, their families and friends.

Asthma is responsible for about 500,000 hospitalizations and 134 million days of restricted activity a year. In 1996, asthma was the tenth most common principal diagnosis in emergency department (ED) visits.

Asthma attacks can be very scary and can leave an emotional scar on people with asthma. The disease is highly correlated with depressive disorders: Up to 56% of patients with severe asthma experience anxiety and 19% have depression. A decreased sense of personal control over health leading to decreased confidence and a diminished desire to manage their treatment is associated with a lower quality of life among people with asthma. The age-adjusted likelihood for adults who have asthma to exhibit such behaviors as smoking, being obese, and being physical inactive is greater among adult with asthma who suffer frequent mental distress than among adults with asthma who do not. Adults with asthma experience, on average, 10 days each month of impaired physical or mental health – almost double that of those who have never have had asthma.

Asthma can be a debilitating condition for children. Asthma is one of the most common causes of pediatric hospitalization. Children with asthma are more likely to have learning disabilities due to difficulties in concentration, fatigue, and absenteeism. In fact, asthma is the number one cause of missed school days – with 10.1 missed school days per year, on average, for children with asthma.

Parents of children with asthma also experience a significant burden. Parents must be ever attentive to their child’s situations at school, play, work, and home. Parents report that they are constantly “on guard” concerning the health of the child with asthma. Most describe their experience with asthma as exhausting, stressful, anxiety provoking, and frightening. Anxieties about the need to be available to support and care for their child’s asthma condition serve to limit employment opportunities for parents. Parents and children struggle with medical and insurance professionals to obtain needed care and treatment; with schools to assure access to health personnel knowledgeable about asthma; with employers to obtain job flexibility; and with the community to find support for clean air and a safe, smoke-free environment.

Adults with asthma suffer in their professional careers. Asthma-related work disability, including job duty changes, is estimated to be significant – with 23% to 40% of people experiencing at least one adverse work event related to asthma over a five year period. Seven percent of adults with asthma ceased working because of the severity of their conditions. Employer costs for asthma are estimated at approximately 2.5 times those for people who do not have asthma ($5,385 vs. $2,121, respectively per year).

Nationally, asthma costs $16 billion in direct medical costs and lost productivity. For Fresno County, this translates into an estimated cost burden of $203 million annually.
3.4.4 Cancer

Cancer is a physically and emotionally devastating disease that exacts a high cost on patients, their families, and the community. The effects of cancer can be long-lasting, extending beyond the time a person is physically ill with the disease.

Patients themselves experience substantial physical effects from the disease and treatment, and these effects can last for years. Fatigue has been identified as the most disabling symptom experienced by cancer patients during treatment: 70% to 100% of cancer patients were affected by fatigue in 2004. A substantial number of long-term breast cancer survivors experience chronic pain that interferes with physical functioning, mood, work, relationships, sleep, and the enjoyment of life.

From the moment of diagnosis, the lives of children with cancer are irrevocably changed. For many, hospitalizations and medical procedures replace slumber parties, camping trips, and other childhood adventures. Children with cancer have been found to be at risk for school adjustment difficulties for a number of reasons, including increased absenteeism. Only 30% of children with cancer report that their teachers were sensitive to their individual needs, monitored their progress, and were responsible for their positive progress in school.

Among parents of children with cancer, certain types of anxiety appear to persist for decades after the initial diagnosis. Forty-five percent of parents feel fairly or very afraid, worried, and/or brooding about unpleasant things; 46% of parents report they suffered from difficulty in sleeping, early waking, and/or during sleep, re-experiencing situations associated with the child’s illness; 26% to 37% of parents report experiencing loss of control problems; and 70% of the parents expressed intermediate or high levels of anxiety (see Figure 3-15).

Figure 3-15: Feelings of Parents Whose Children Have or Had Cancer

![Bar chart showing feelings of parents whose children have had cancer.]

Cancer puts a significant burden on caregivers. The distress resulting from assuming the role of caregiver can be manifested as anxiety, depression, helplessness, burden, and fear, and it is often related to providing direct care, performing complex medical procedures, coping with disruptions in daily routine, and negotiating the need to provide emotional support to the patient and to other family members. Depression is a common side effect of assuming caregiver responsibilities for cancer patients.
More than 30% of caregivers feel anxiety, sadness, and frustration while providing care, and 60% of caregivers under the age of 65 suffer from depression.\textsuperscript{44, 58} Five percent of caregivers quit their job or decline advancement, and a large percentage of caregivers lose work hours or use special leave or holidays to fulfill their care giving responsibilities.\textsuperscript{47} The total cost of family care giving time ranges from an average of $2,435 to $3,772 over a 3-month period.\textsuperscript{48}

Employment among cancer patients and survivors can be highly challenging. Annual employer healthcare costs were $16,246 for cancer patients versus $3,264 for others in a 2000 study.\textsuperscript{11}

Nationally, the cost of cancer is $189 billion per year. Per capita it is the most costly chronic condition.\textsuperscript{26} Given the prevalence of cancer and the national per capita cost of cancer, cancer is estimated to cost Fresno County approximately $496 million per year.

### 3.4.5 Mental Illness

The World Health Organization found major depression to be the leading cause of disability among adults in developed nations.\textsuperscript{29} With increased severity, people with depression experience a decline in their quality of life and physical and mental functioning as well as increased disability. Evidence suggests that depression is under-diagnosed and under-treated, both because of the health system placing priority on physical health problems and because people with mental illnesses may themselves be reluctant to seek out help for a number of reasons.

Mental illnesses often do not receive the same attention in the healthcare system as other chronic diseases. People may avoid seeking treatment for a variety of reasons—the unaffordable cost of treatment, fear of the stigma of mental disease, or simply not even recognizing they need mental health treatment as the effects of some mental illnesses often manifest themselves as physical symptoms. Depression that is co-morbid with other physical illnesses is often unnoticed while doctors focus on the more tangible disease.

People may avoid seeking treatment for depression for a variety of reasons. These include the unaffordable cost of treatment, fear of the stigma of mental disease, or simply not even recognizing they need mental health treatment because the effects of some mental illnesses often manifest themselves as physical symptoms. Only 25% of people with a mental disorder obtain professional help for their illness. In comparison, 60% to 80% of people with heart disease seek and receive care.\textsuperscript{29} Forty percent of all people who have a severe mental illness do not seek treatment from either general medical or specialty mental health providers.\textsuperscript{29} Of those aged 18 years and older who get help, about 15% receive it from mental health specialists.\textsuperscript{29} Of young people aged 9 to 17 years who have a mental disorder, 27% receive professional treatment. An additional 20% of children and adolescents with mental disorders use mental health services only in their schools.\textsuperscript{29} Although only a minority seek professional help to relieve a mood disorder, people with depression are significantly more likely than others to visit a physician for some other reason.\textsuperscript{29}

Depression is a leading cause of absenteeism and diminished productivity in the workplace.\textsuperscript{29} Individuals who filed at least one claim for depressive illness took a
mean of 9.9 annual sick days. Workers with depression reported significantly more total health-related lost productivity time than those without depression – 5.6 hours per week versus 1.5 hours per week.

Major depression is costly to patients and employers. It is estimated to cost $6,000 in health-related and work-related costs per depressed worker, and employers bear $4,200 of this amount. Patients submitting claims for depressive illness incurred a mean annual total of $5,415 in health and disability payments. Employees with depressive illness incur on average $4,373 in annual healthcare costs, significantly higher than the annual costs of $949 for employees without any other conditions. The average mental health cost per enrollee associated with depression is $1,341.

The national cost of mental illness in direct and indirect costs is $83 billion for diagnosed patients per year. Applying national cost estimates to the diagnosed population in Fresno County yields a cost burden for depression of more than $150 million. Rates of mental illness likely exceed rates of depression alone, suggesting that the true cost of mental illness is significantly higher.
4.0 Looking to the Future: Changing Behaviors to Improve Health

Though the burden of chronic disease in Fresno is high, there is hope—and opportunity. If more people practiced healthy behaviors and increased their awareness of chronic disease symptoms and treatment, the burden of disease could be lowered.

For example, research shows that:

- Improving one’s diet and getting more exercise can also help to reduce likelihood a person will develop CVD or diabetes;
- About one-third of all cancer deaths are related to dietary factors and lack of physical activity in adulthood; and\(^5\)
- More than one million skin cancers diagnosed in 2003 could have been prevented by protection from the sun’s rays.\(^5\)

In fact, an estimated 70% to 90% of all chronic disease deaths can be prevented through behavior and lifestyle changes, according to a January 2006 article published in Preventing Chronic Disease (a CDC publication) reviewing the research in this area.\(^4\) Applying these estimates to Fresno County, approximately 2,800 deaths of the 3,500 deaths from chronic disease occurring every year could be prevented if residents practiced healthy behaviors. In addition, the more than 188,000 people currently suffering from chronic disease in Fresno could potentially be living healthier lives.\(^4\)

Unfortunately, right now, too many Fresno residents have poor health behaviors that put them at risk for chronic disease (see Figure 4-1).

For example:

- Almost one-fifth (17%) of the population smokes;
- About three in ten (31%) get no exercise;
- More than one out of every three (37%) adults is obese; and
- Many Fresnans are not getting adequate preventive health care.
4.1 Obesity

Obesity is a major epidemic in the U.S. From 1960 to 2002, the number of obese adults (between the ages of 20 and 74) has jumped from 13.4% to 30.9%.\(^{41}\)

This spells trouble for the patients’ health and the U.S. health care system. Obesity and inactivity are strongly linked to many chronic diseases, including heart disease, type 2 diabetes, depression, and cancer.\(^{10}\) And not only can obesity lead to chronic disease, it can also worsen the burden of existing chronic disease.\(^{10}\) This places an economic strain on the health care system. Health care costs are about 10% and 36% greater for overweight or obese people than for healthy weight individuals.\(^{10}\) Already, almost 10 cents out of every dollar of all health care expenditures in the U.S. is attributable to overweight and obesity.\(^{10}\)
Obesity is more prevalent among certain populations, including groups that are highly represented in Fresno. Broken out by racial groups, 30.5% of Latinos in Fresno are obese compared to 23.8% of whites.75

If Fresno residents reduced their obesity rate, they would most likely lower the levels of chronic disease in their community. Weight loss, provided it is maintained, is associated with a 30% to 46% reduction in diabetes among high-risk populations and significant improvements in depression rates.37, 63, 69

While weight loss is something that requires individuals to change, a growing body of literature has shown that the environment in which one lives and the amount of support for healthy living within a community can impact the likelihood that a person will achieve success with weight loss. This fact is important to keep in mind in any community-based campaign to decrease obesity; an effective campaign will aim to lower community barriers to success in weight loss.

4.2 Exercise

Only one in four adults in the United States gets the recommended amount of weekly exercise. One in four adults are also completely sedentary.10 Those who are inactive have, on average, 24% higher health care costs than those who exercise regularly.10

In Fresno, 30.9% of adults report getting no exercise, compared to 23% of Americans.22

Inactivity is one of the leading causes of death and disease in the U.S. Inactivity is believed to account for 22% of all heart disease, 22% of colon cancer, 12% of diabetes and hypertension, and 5% of breast cancer.85

Increasing levels of physical activity can reduce the risk and the burden of these chronic diseases. Those who are active have reduced risk of heart disease, stroke, type 2 diabetes, colon cancers, breast cancers, lung cancers, and depression.34, 85 Exercise reduces the risk for heart disease by decrease resting heart rate, and it reduces the risk of type 2 diabetes by improving body glucose tolerance and increasing insulin sensitivity.4 Exercise also lowers the risk of diabetes, another factor in many chronic diseases. Adopting an active lifestyle could prevent one-third of all new cases of obesity and 43% of all new cases of diabetes.80

African-Americans especially benefit from increases in exercise. Risk for type 2 diabetes is 50% lower among African Americans who are at all physically active and two-thirds lower among those who are at least moderately active.80

4.3 Smoking

Smoking is a large factor in many types of chronic disease. It causes and exacerbates multiple types of cancers, heart disease, stroke, and asthma.84 Smoking causes more than 400,000 deaths each year and costs more than $50 billion dollars in direct medical expenditures alone.84 Each year, more people die from smoking than do from AIDS, alcohol, illegal drugs, motor vehicle accidents, homicide, and suicide combined.33
17% of Fresno area residents currently smoke.\textsuperscript{75}

If Fresno residents committed to quitting smoking, they would likely see dramatic reductions in the burden of chronic disease in their community. With fewer smokers, the burden of lung diseases, such as lung cancer, asthma, and chronic obstructive pulmonary disease, would likely be lower. In patients already suffering from heart disease, smoking cessation can reduce the risk of another heart attack by half and may be more effective in reducing heart disease mortality than any other medical treatment.\textsuperscript{35}

### 4.4 Use of Preventive Health Care

One of the most important steps that a person could take to prevent and detect chronic disease is to get appropriate preventive medical care. Preventive care guidelines, established by groups like the Agency for Health care Research and Quality and the U.S. Preventive Services Task Force, suggest which patients should get what preventive tests or screenings based on their age, gender, and other risk factors.

In Fresno, it appears that many residents are not getting adequate preventive care. Cancer screenings, which provide early detection opportunities for colon, prostate, cervical, and breast cancers, are largely underused in Fresno County (see Figure 4-3). The prostate-specific antigen (PSA) test to screen for prostate cancer is not used by 65% of those eligible in Fresno. Colon cancer screens like the fecal occult blood (FOB) test and colonoscopies are unused by 45%. Among women eligible for mammograms, 24% in Fresno have not been screened.\textsuperscript{75} Research has demonstrated that early cancer detection leads to rapid treatment that dramatically reduces fatality.\textsuperscript{26}

**Figure 4-3: Self-Reported Prevalence of Fresno Residents Who Do Not Use Cancer Screens\textsuperscript{75}**

A number of factors, such as high rates of uninsurance and underinsurance, difficulty accessing primary care for rural residents, and provider organization skills in addressing racial and ethnic and cultural factors in use services, may provide an explanation.
Helping residents establish a strong relationship with a regular source of healthcare has the potential to help them get the preventive care they need. When a patient sees a doctor regularly for healthcare, their doctor is more likely to know the medical history and important details about the patients’ health – including health behaviors and whether the patient should be screened for a disease based on known risk factors. Barriers to developing such relationships are numerous and range from lack of insurance, to a paucity of primary care physicians and problems finding a trusted physician, to a lack of understanding of the importance of having a primary care physician.
5.0 Conclusions

Chronic diseases impose a great burden on the Fresno community. They are a serious health threat and together are responsible for more death and disability in the community than any other factor. Yet, many chronic diseases are preventable through changes in behavior and improvements in early detection.

The ability of Fresno residents to make these lifestyle changes depends on access to health care, an understanding of chronic diseases, health behaviors and risk factors, and how to prevent disease (health literacy), proper motivation, and appropriate community and medical support. Any effort to reduce chronic disease in the Fresno community must consider the barriers to good health behaviors and aim to reduce these barriers. Initiatives must engage all segments of the community, including community and business leaders, and community institutions, such as employers, schools and churches, and, of course, residents themselves.

By improving access to health care, and residents’ knowledge of disease prevention and support for improvements in health behaviors, Fresno can divert a portion of the approximately $2 billion it spends annually on chronic disease and begin to invest in its future, instead of paying the price of poor health.
6.0 References


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7.0 Appendix: Data Sources and Methodology

7.1 Behavioral Risk Factor Surveillance System

The BRFSS is a state-based system of health surveys that generate information about health risk behaviors, clinical preventive practices, and health care access and use primarily related to chronic diseases and injury. Some questions vary by state and year, so the most complete data set relies on information from 2000-2004. www.cdc.gov/brfss

Prevalence information is based on the following questions from the BRFSS 2004 CA and national datasets:

- Heart disease: “Are you currently taking medicine for your high blood pressure? Have you ever had your blood cholesterol checked? About how long has it been since you last had your blood cholesterol checked?” for the adult population.

- Cancer: “Have you ever had a mammogram? How long has it been since you had your last mammogram? Have you ever had a clinical breast exam? How long has it been since your last breast exam? Have you ever had a Pap test? How long has it been since you had your last Pap test? Have you ever had a PSA test? How long has it been since you had your last PSA test? Have you ever had a digital rectal exam? Sigmoidoscopy and colonoscopy are exams in which a tube is inserted in the rectum to view the colon for signs of cancer or other health problems. Have you ever had either of these exams? How long has it been since you had your last sigmoidoscopy or colonoscopy?” for the adult population, based on the age at which regular screenings are recommended.

- Diabetes: “Are you now taking insulin? Are you now taking diabetes pills? About how often do you check your blood for glucose or sugar? About how often do you check your feet for any sores or irritations? About how many times in the past 12 months have you seen a doctor, nurse, or other health professional for your diabetes? About how many times in the past 12 months has a doctor, nurse, or other health professional checked you for "A one C"? About how many times in the past 12 months has a health professional checked your feet for any sores or irritations?” for the adult population self-reporting diabetes.

- Asthma: “During the past 12 months, how many times did you see a doctor, nurse or other health professional for urgent treatment of worsening asthma symptoms? During the past 12 months, how many times did you see a doctor, nurse, or other health professional for a routine checkup for your asthma? During the past 30 days, how many days did you take a prescription asthma medication to PREVENT an asthma attack from occurring? During the past 30 days, how often did you use a prescription asthma inhaler DURING AN ASTHMA ATTACK to stop it?” for the adult population self-reporting asthma.
7.2 California Center for Health Statistics Vital Statistics Query System

This query system allows the user to search for cause of death events. It identifies the year of the event (1994-2001), allows the choice of an individual county or the entire state and can sort by age, race/ethnicity, gender.
http://www.applications.dhs.ca.gov/vsq/

7.3 California Department of Health Services

A 2002 report from the Department of Health and Human Services, highlights risk factors, hospitalization surveillance data by county, clinical treatment and disease management, and mortality surveillance data by county (see Kamigaki, 2002). Also within the DHS is the Center for Health Statistics, Office of Health Information and Research. This office contains information on Fresno County death rates and a 2005 Health Status Profile.

7.4 California Health Interview Survey (CHIS)

CHIS is a telephone survey of adults, adolescents, and children from all parts of the State of California. The survey is conducted every two years. The most recent data set is for 2003, although some questions were not asked in this year. Health data is searchable by geographic area, health topic and population (age, race, gender, poverty level). The sample size for Fresno County in the 2003 data was 630 adults (age 18 and older), 66 adolescents (age 13-17), and 177 children (0-12 years old).
www.chis.ucla.edu

Prevalence information is based on the following questions from the CHIS 2003 dataset unless otherwise specified:

- Heart disease: “Has a doctor ever told you that you have high blood pressure? Are you now taking any medications to control your high blood pressure? Has a doctor ever told you that you have any kind of heart disease? Has a doctor ever told you that you have heart failure or congestive heart failure? Has a doctor ever told you that you had a stroke?” for the adult population.

- Diabetes: “{Other than during pregnancy, has/Has} a doctor ever told you that you have diabetes or sugar diabetes? How old were you when a doctor first told you that you have diabetes? Were you told that you had Type 1 or Type 2 diabetes? Are you now taking insulin? Do you now take diabetic pills to lower your blood sugar? About how many times per day, per week, or per month do you or a family member or friend check your blood for glucose or sugar” for the adult and teen populations. These results include the pre-diabetes population.

- Asthma: “Has a doctor ever told you that you have asthma? Do you still have asthma? During the past 12 months, have you had an episode of asthma or an asthma attack? During the past 12 months, how often have you had asthma
symptoms such as coughing, wheezing, shortness of breath, chest tightness or phlegm? During the past 12 months, have you had to visit a hospital emergency room or urgent care clinic because of your asthma? Are you now taking a daily medication to control your asthma that was prescribed or given to you by a doctor? During the past 12 months, how many days of work did you miss due to asthma? Has a doctor or other health professional ever given you an asthma management plan?” for the population over age 1.

• Cancer: “Has a doctor ever told you that you had a cancer of any kind? What kind of cancer was it?” for the adult population.

• Mental illness: "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good? During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation? About how often during the past 30 days did you feel nervous—Would you say all of the time, most of the time, some of the time, a little of the time, or none of the time? During the past 30 days, about how often did you feel hopeless—all of the time, most of the time, some of the time, a little of the time, or none of the time? During the past 30 days, about how often did you feel restless or fidgety? Often did you feel so depressed that nothing could cheer you up? During the past 30 days, about how often did you feel that everything was an effort? During the past 30 days, about how often did you feel worthless? Not counting overnight stays, emergency room visits, or visits for drug or alcohol problems, in the past 12 months, have you seen a psychiatrist, psychologist, social worker, or counselor for emotional or mental health problems? During the past 12 months, did you think you needed help for emotional or mental health problems, such as feeling sad, anxious or nervous? During the past 12 months, did you take any prescription medications, such as an antidepressant or sedative, almost daily for two weeks or more, for an emotional or personal problem?” for the adult population, CHIS 2001.

Health Behaviors:

• High blood pressure: “Ever diagnosed with high blood pressure” for the adult population.

• Colon cancer: “Ever had colonoscopy or fecal occult blood test” for adult population over age 40, CHIS 2001.

• Prostate cancer: “Ever had PSA test” for adult men over age 40.

• Skin cancer: “Uses SPF 15+ when outside” for population over age 1, CHIS 2001.

• Cervical cancer: “Most recent Pap test” for all adult women

• Breast cancer: “Most recent mammogram” for adult women over age 30.

• Tobacco use: “Current smoker” for teens and adults.

• Exercise: “Level of exercise per week” for adults, CHIS 2001.

• Overweight or Obese: “Height and Weight” for teens and adults processed to BMI. BMI greater than 25 indicates overweight or obesity for adults. For
adolescents, "Overweight or obese" includes the respondents who have a BMI in the highest 95 percentile with respect to their age and gender.

7.5 Medical Expenditure Panel Survey (MEPS)

The Medical Expenditure Panel Survey (MEPS) is a set of large-scale surveys of families and individuals that collects information on health care utilization and expenditures, health insurance, and health status, as well as a variety of demographic, social, and economic characteristics of a representative sample of Americans. The most recent complete dataset is for 2003. [www.meps.ahrq.gov](http://www.meps.ahrq.gov)

7.6 National Center for Chronic Disease Prevention and Health Promotion: Cardiovascular Health (CVH)

This system operates through a division of the Centers for Disease Control (CDC) and compiles cardiovascular mortality rates. This website features interactive heart disease and stroke death rate maps by state and allows for statistics by county, gender and race/ethnicity. [http://apps.nccd.cdc.gov/giscvh](http://apps.nccd.cdc.gov/giscvh)

7.7 National Health Interview Survey

The NHIS is a cross-sectional household interview survey that monitors the health status of the national non-institutionalized adult population. Data is classified by sex, age, race and Hispanic origin, education, family income, poverty status, health insurance coverage, marital status, place of residence, and region of residence for chronic condition prevalence, health status, functional limitations, health care access and utilization, health behaviors, and human immunodeficiency virus testing. In 2004, data were collected for 31,326 adults for the Sample Adult questionnaire. The conditional response rate (the number of completed interviews divided by the total number of eligible sample adults) was 83.8%, and the final response rate (the conditional rate multiplied by the overall family response rate of 86.5%), was 72.5%. The health information for adults in this report was obtained from one randomly selected adult per family. In very rare instances where the sample adult was not able to respond for him or herself, a proxy was allowed. The most recent complete dataset is for 2004. [www.cdc.gov/nchs/nhis](http://www.cdc.gov/nchs/nhis)

Prevalence information is age-adjusted based on the following questions from the NHIS 2004 dataset:

- Heart disease: “Have you EVER been told by a doctor or other health professional that you had...Hypertension, also called high blood pressure?”; “Have you EVER been told by a doctor or other health professional that you had... Coronary heart disease?... Angina, also called angina pectoris? ... A heart attack (also called myocardial infarction)?... Any kind of heart condition or heart disease (other than the ones I just asked about)?... A stroke?” for the adult population.

- Diabetes: “Have you EVER been told by a doctor or health professional that you have diabetes or sugar diabetes? Are you NOW taking insulin? Are you
NOW taking diabetic pills to lower your blood sugar? These are sometimes called oral agents or oral hypoglycemic agents." For the adult population, excluding pre-diabetes and pregnancy-related diabetes.

- Asthma: “Have you EVER been told by a doctor or other health professional that you had asthma? Do you still have asthma? During the PAST 12 MONTHS, have you had an episode of asthma or an asthma attack? During the PAST 12 MONTHS, have you had to visit an emergency room or urgent care center because of asthma? DURING THE PAST 12 MONTHS, HOW MANY DAYS were you UNABLE to work because of your asthma? An asthma management plan is a printed form that tells when to change the amount or type of medicine, when to call the doctor for advice, and when to go to the emergency room. Has a doctor or other health professional EVER given you an asthma management plan?” for the adult population.

- Cancer: “Have you EVER been told by a doctor or other health professional that you had... Cancer or a malignancy of any kind?” for adult population.

(1) Bladder  (12) Leukemia  (23) Skin (Don’t know what kind)
(2) Blood  (13) Liver  (24) Soft Tissue (muscle or fat)
(3) Bone  (14) Lung  (25) Stomach
(4) Brain  (15) Lymphoma  (26) Testis
(5) Breast  (16) Melanoma  (27) Throat — pharynx
(6) Cervix  (17) Mouth/tongue/lip  (28) Thyroid
(7) Colon  (18) Ovary  (29) Uterus
(8) Esophagus  (19) Pancreas  (30) Other
(9) Gallbladder  (20) Prostate  (96) More than 3 kinds
(10) Kidney  (21) Rectum  (97) Refused
(11) Larynx-windpipe  (22) Skin (non-melanoma)  (99) Don’t know

- Mental illness-depression proxy: " During the PAST 30 DAYS, how often did you feel... So sad that nothing could cheer you up? Nervous? Restless or fidgety? Hopeless? That everything was an effort? Worthless? Altogether, how MUCH did these feelings interfere with your life or activities: a lot, some, a little, or not at all?” “During the PAST 12 MONTHS, that is since {12 month ref.date}, have you seen or talked to any of the following health care providers about your own health? ...A mental health professional such as a psychiatrist, psychologist, psychiatric nurse, or clinical social worker?” for the adult population

7.8 United States Census Data

Data from the U.S. Census in 2000 and the American Community Survey in 2004 provided many of the local statistics used to calculate demographic rates in California, Fresno, and the nation. [www.census.gov](http://www.census.gov)

7.9 Prevalence Rates & Cost Estimates

Estimates for the U.S.
As discussed in the body of this report, chronic diseases include diagnosed diabetes (both type 1 and type 2), cardiovascular disease (heart disease, hypertension, and stroke), asthma, COPD, cancer, and mental health problems.

Combined direct and indirect annual cost estimates were obtained from national sources as follows:

- **CVD** – American Heart Association ($403.1 billion)
- **Cancer** – National Cancer Institute ($189 billion)
- **Diabetes** – American Diabetes Association ($132 billion)
- **Asthma** – National Heart, Lung and Blood Institute ($16.1 billion)
- **Mental illness (depression)** – National Institute for Mental Health ($83 billion)

These costs sum to $823.2 billion.

**Estimates for Fresno**

As discussed in the body of this report, chronic diseases include diagnosed diabetes (both type 1 and type 2), cardiovascular disease (heart disease, hypertension, and stroke), asthma, COPD, cancer, and mental health problems. Numbers and percentages of individuals counted in the prevalence estimates are based on 2004 NHIS combined prevalence rates for the West region, broken out by age, gender, and race. (The West region includes the following states: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii.) These rates were applied by age, gender, and race to 2004 Census estimates for Fresno County, CA. They were further adjusted for known prevalence rates by disease that are specific to Fresno County, using data from CHIS.

The percent of families affected is based on an assumption that the 34.7% of individuals with at least one disease are randomly distributed among families, and that average family size is 3.66 individuals (from US Census data).

Combined direct and indirect per capita cost estimates were obtained from national sources as follows:

- **CVD** – American Heart Association ($5,654)
- **Cancer** – National Cancer Institute ($9,594)
- **Diabetes** – American Diabetes Association ($6,346)
- **Asthma** – National Heart, Lung and Blood Institute ($1,464)
- **Mental illness** – National Institute for Mental Health ($4,415)
These estimates were also checked against direct costs as calculated using 2003 Medical Expenditure Panel Survey data.

To derive cost estimates for Fresno, these per capita costs were first multiplied by the prevalence numbers, and second, multiplied by the wage index for Fresno (1.10) as found in the Fiscal Year 2006 Medicare Prospective Payment System (Federal Register, August 12, 2005). The cost estimate computations are:

- CVD – $5,654 * 159,905 * 1.10 = $994,439,268
- Cancer – $9,594 * 47,000 * 1.10 = $496,005,076
- Diabetes – $6,346 * 44,000 * 1.10 = $307,153,846
- Asthma – $1,464 * 126,000 * 1.10 = $202,860,000
- Mental illness – $4,415 * 31,000 * 1.10 = $150,547,872

These costs sum to: $2,151,006,063.