



The 2004  
Surgeon General's Report

*The Health  
Consequences of  
Smoking*

what it means to  
**you**



U.S. DEPARTMENT  
OF HEALTH AND  
HUMAN SERVICES

# about

## the surgeon general's report

The Surgeon General is appointed by the President of the United States to help promote and protect the health of our citizens. As the nation's highest-ranking public health officer, the Surgeon General can direct studies on health risks—such as smoking.

The 2004 *Surgeon General's Report on the Health Consequences of Smoking* was prepared by 19 of the country's top scientists, doctors, and public health experts. The full report is nearly 1,000 pages long and took more than 3 years to complete. It is written for a scientific audience. However, the Surgeon General believes that the findings are very important to everyone and asked that this booklet be created. This booklet explains what the report says and what it means to you.

### **Suggested Citation:**

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**S**ince the first Surgeon General's report on smoking and health in 1964, medical experts have written 27 more reports for the Surgeon General on tobacco use. In each report, leading scientists have found that using tobacco causes people to become sick, disabled, or to die.

This report goes even further in detailing the bad health effects of smoking. Everyone knows smoking hurts you. This report shows that it is worse than you know.

## **Costs of Smoking in Dollars and Lives**

Deaths Since 1964	12 Million Americans Dead
Costs to the Nation	\$157.7 Billion Each Year
Number of Adults and High School Students Who Smoke	About 1 Out of Every 4 Adults and Students
Number of Young People Who Smoke Their 1st Cigarette	More Than 4,000 Each Day

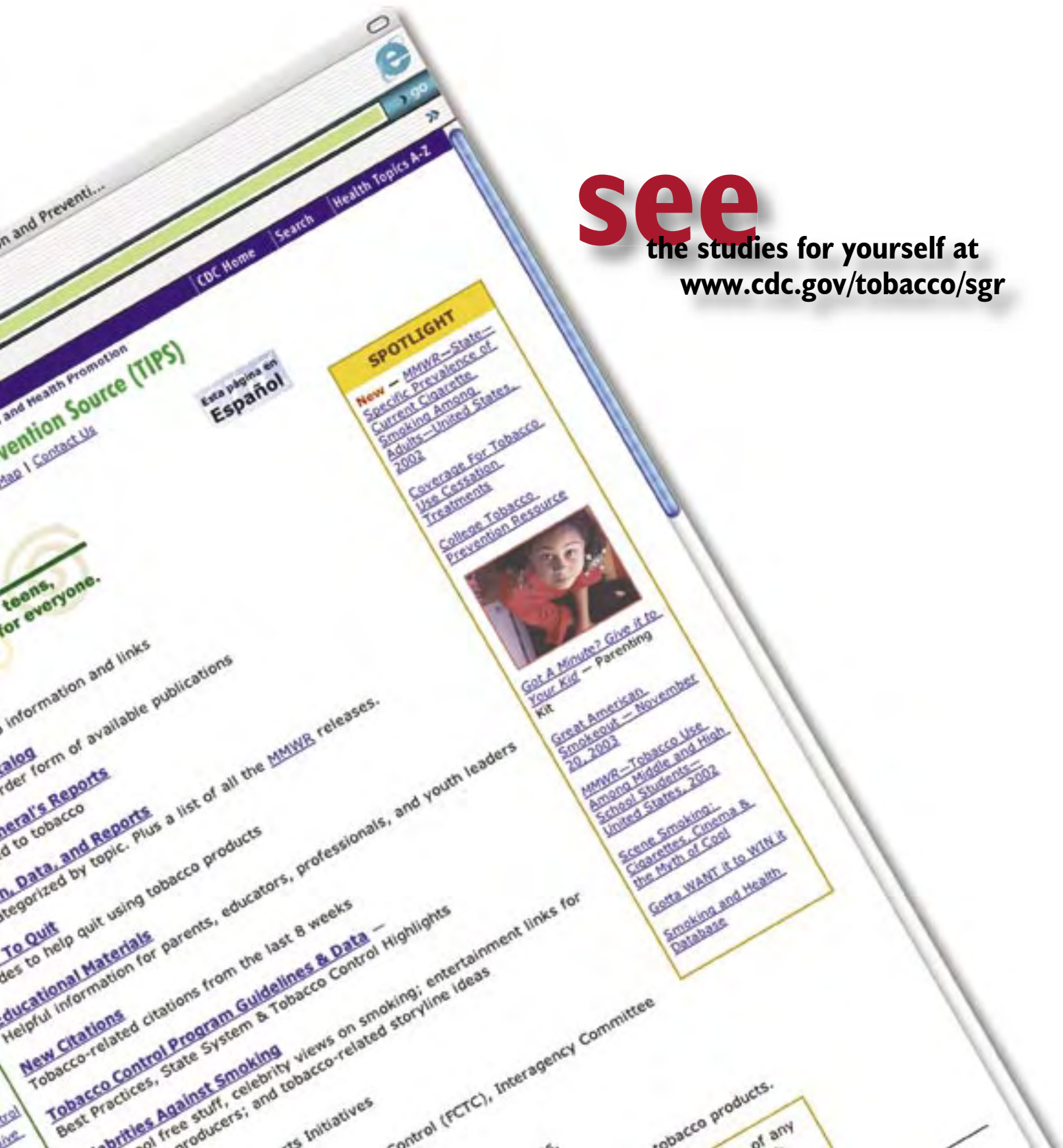
The Surgeon General of the United States, working with a team of leading experts on smoking and health, released a new report in 2004. After reviewing scientific evidence, researchers reached these important conclusions:

- ◆ **Smoking harms nearly every organ of your body. It causes diseases and worsens your health.**
- ◆ **Quitting smoking has many benefits. It lowers your risk for diseases and death caused by smoking and improves your health.**
- ◆ **Low-tar and low-nicotine cigarettes are not safer to smoke.**
- ◆ **The list of diseases that we know are caused by smoking has grown even longer. The list now includes cancers of the cervix, pancreas, kidneys, and stomach, aortic aneurysms, leukemia, cataracts, pneumonia, and gum disease.**

The 2004 Surgeon General's report has new information about how smoking harms your health. A new database of more than 1,600 articles cited in this report is available on the Internet. By going to the CDC Web site at [www.cdc.gov/tobacco/sgr/sgr\\_2004/](http://www.cdc.gov/tobacco/sgr/sgr_2004/) you can search many of the studies cited in this report. Topics



include cancer, cardiovascular diseases, respiratory diseases, reproductive effects, and other harmful health effects.



see the studies for yourself at  
[www.cdc.gov/tobacco/sgr](http://www.cdc.gov/tobacco/sgr)



# **smoking** causes cancer

**Cancer was among  
the first diseases  
found to be caused  
by smoking.**

**C**ancer is the second leading cause of death in the United States. One out of every four people in this country dies because of cancer. In 2003, researchers estimated that more than half a million Americans—that's over 1,500 people a day—would die of cancer. The cost of treating cancer in the United States is overwhelming. In 2002, cancer cost our nation over \$170 billion. This included more than \$110 billion in lost work by people who were disabled or who died, and at least \$60 billion for medical treatments.

Cancer was among the first diseases found to be caused by smoking. The earliest major studies, carried out in the 1950s and 1960s, focused on lung cancer. The number of lung cancer cases among smokers reached very high levels during that time.

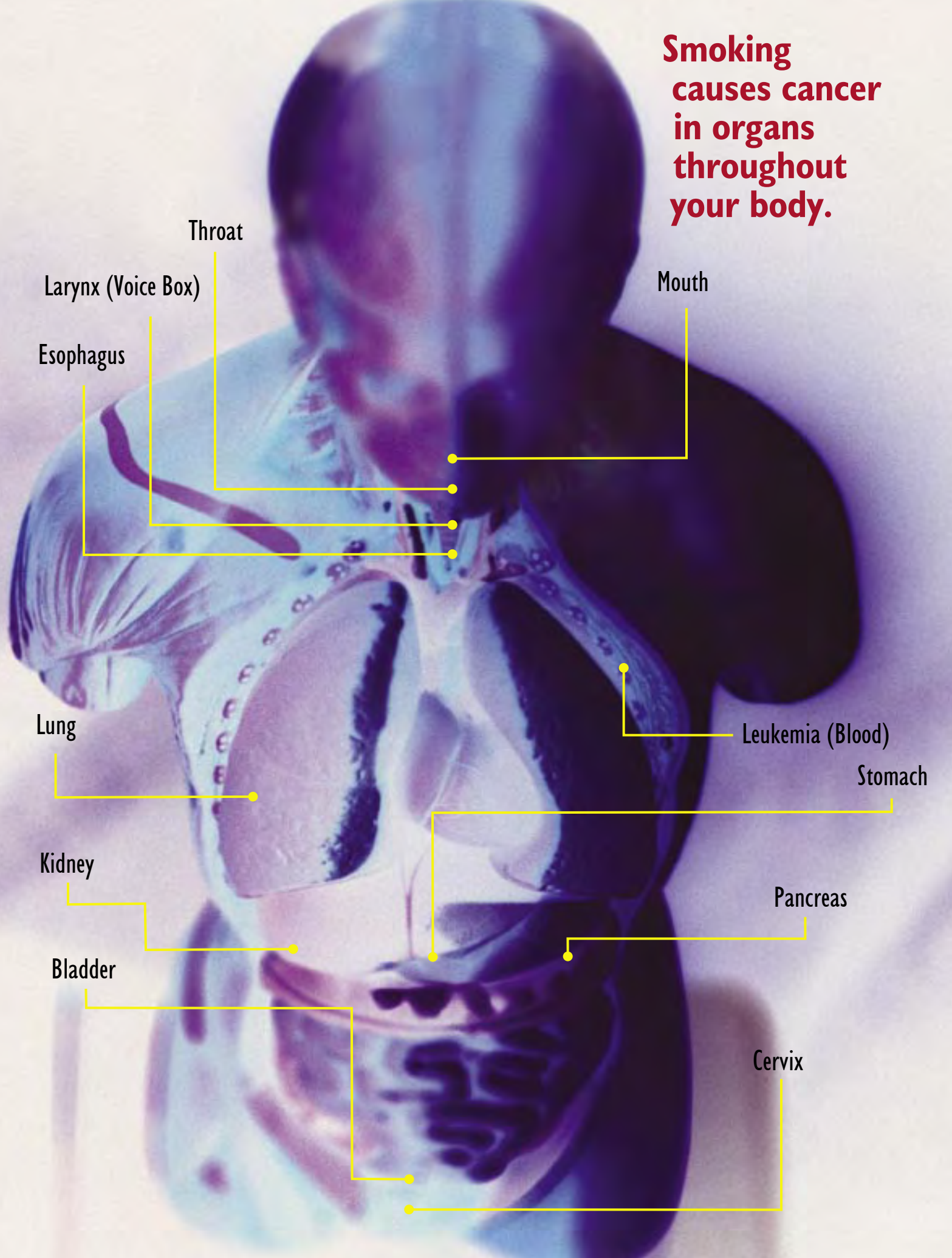
Since the first Surgeon General's report on smoking in 1964 concluded that smoking causes lung cancer, the list of diseases linked to smoking has grown to include cancers in organs throughout the body. Your risk for these cancers increases with the number of cigarettes you smoke and the number of years you smoke. Your risk decreases after quitting completely.



**Your risk  
for cancer  
increases  
with the  
number of  
cigarettes  
you smoke  
and the  
number of  
years you  
smoke.**



**Smoking causes cancer in organs throughout your body.**



Throat

Larynx (Voice Box)

Mouth

Esophagus

Lung

Leukemia (Blood)

Stomach

Kidney

Pancreas

Bladder

Cervix



# facts you should know

- ◀ **Smoking causes cancers of the mouth, throat, larynx (voice box), lung, esophagus, pancreas, kidney, and bladder.**
- ◀ **Smoking causes cancers of the stomach, cervix, and acute myeloid leukemia, which is a cancer of the blood.**
- ◀ **Cigarette smoking causes most cases of lung cancer. Smokers are about 20 times more likely to develop lung cancer than nonsmokers. Smoking causes about 90 percent of lung cancer deaths in men and almost 80 percent in women.**
- ◀ **Using both cigarettes and alcohol causes most cases of larynx cancer.**
- ◀ **Certain agents in tobacco smoke can damage important genes that control the growth of cells and lead to cancer.**
- ◀ **Smoking low-tar cigarettes does not reduce your risk for lung cancer.**

**Smoking causes  
90% of lung cancer  
deaths in men and  
80% in women.**



# smoking

**causes cardiovascular diseases**

**Cigarette smoke  
damages the cells  
lining your blood  
vessels and heart.**

**H** eart disease and stroke are cardiovascular (heart and blood vessel) diseases caused by smoking. Heart disease and stroke are also the first and third leading causes of death in the United States.

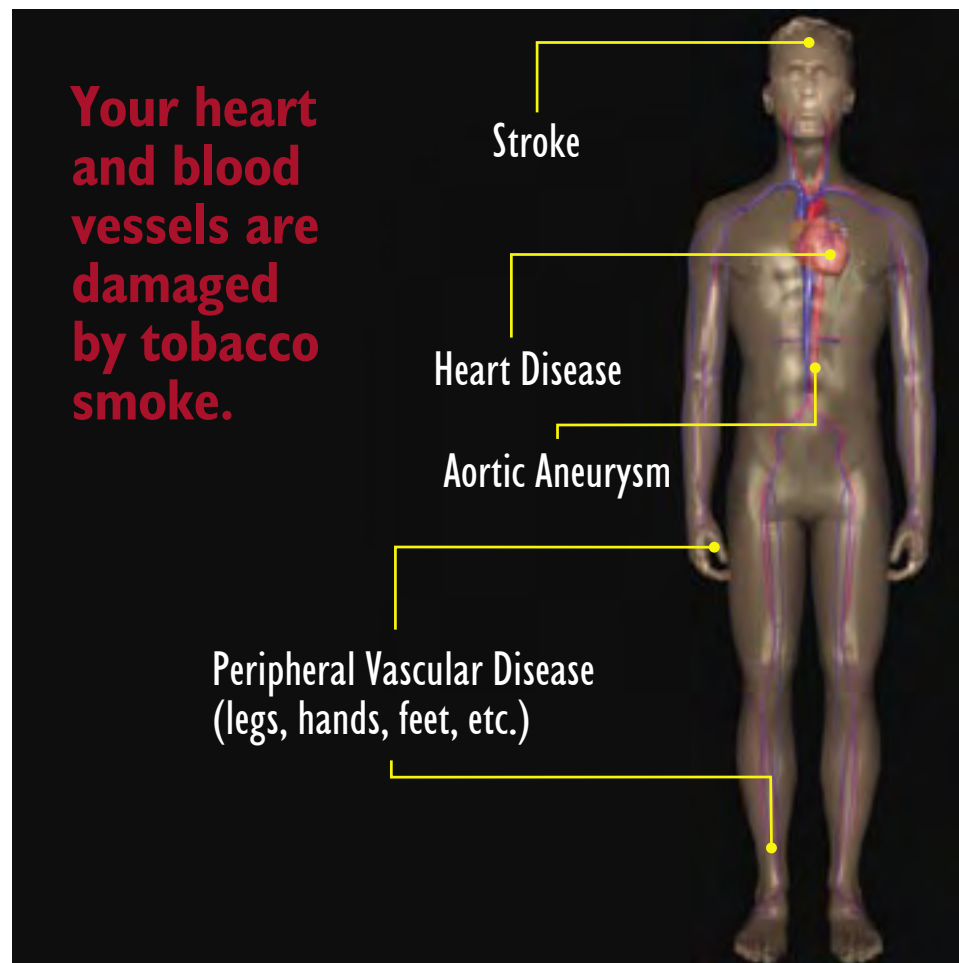
More than 61 million people in the United States suffer from some form of heart and blood vessel disease. This includes high blood pressure, coronary heart disease, stroke, and congestive heart failure. Nearly 2,600 Americans die every day as a result of cardiovascular diseases. This is about 1 death every 33 seconds. You are up to four times more likely to die from heart disease if you smoke. In 2003, heart disease and stroke cost the United States an estimated \$351 billion in health care costs and lost productivity from death and disability.

The link between smoking and heart disease was noted in the first Surgeon General's report in 1964. Later reports revealed a much stronger connection. Researchers found that smoking is a major cause of diseases of blood vessels inside and outside the heart.

Most cases of these diseases are caused by atherosclerosis, a hardening and narrowing of the arteries. Damage to your arteries and blood clots that block blood flow can cause heart attacks or strokes.

Cigarette smoking speeds up this process even in smokers in their 20s. Cigarette smoke damages the cells lining the blood vessels and heart. The damaged tissue swells. This makes it hard for blood vessels to get enough oxygen to cells and tissues. Your heart and all parts of your body must have oxygen. Perhaps most important, cigarette smoking can increase your risk of dangerous blood clots, both because of swelling and redness and by causing blood platelets to clump together.

Cigarettes aren't the only dangerous kind of tobacco. Even smokeless tobacco can lead to heart and blood vessel disease.



# **facts** **you should know**

- ◆ **Coronary heart disease is the leading cause of death in the United States.**
- ◆ **You are up to four times more likely to die from coronary heart disease if you smoke.**
- ◆ **In 2000, about 1.1 million Americans had heart attacks.**
- ◆ **Even with treatment, 25 percent of men and 38 percent of women die within one year of a heart attack.**
- ◆ **Smoking causes atherosclerosis, or hardening and narrowing of your arteries.**
- ◆ **Smoking causes coronary heart disease.**
- ◆ **Smoking low-tar or low-nicotine cigarettes rather than regular cigarettes does not reduce the risk of coronary heart disease.**
- ◆ **Smoking causes strokes.**
- ◆ **Smoking causes abdominal aortic aneurysm, a dangerous weakening and ballooning of the major artery near your stomach.**



# smoking

causes respiratory diseases

Smoking causes more than 90 percent of deaths from COPD each year.

**S**moking harms your lungs. If you smoke, your lungs can't fight infection well and this causes injuries to lung tissues. Tissue injury leads to chronic obstructive pulmonary disease (COPD), sometimes called emphysema, and other respiratory diseases. People with COPD slowly start to die from lack of air.

COPD is the fourth leading cause of death in the United States. It is responsible for more than 100,000 deaths per year. Smoking causes more than 90 percent of these deaths.

Most sudden respiratory illnesses, such as bronchitis or pneumonia, are caused by viral or bacterial infections. They are usually diagnosed as upper respiratory tract infections (nose, throat, and larynx) or lower respiratory tract infections (below the larynx). Smokers have more upper and lower respiratory tract infections than nonsmokers. This happens because smoking damages your body's defenses against infections.

Normally, your body helps keep dangerous viruses and bacteria out by clearing your nose with mucus. But this defense takes almost twice as long in smokers as in nonsmokers. Once viruses and bacteria are inside your body, cells in your immune system usually kill them and prevent infection. But in smokers, some of the cells that destroy germs are decreased while others are increased. This imbalance makes a smoker's immune system weaker.



**Mothers who  
smoke during  
pregnancy  
hurt their  
babies' lungs.**



Chronic lung diseases are long lasting. They usually affect your airways and the tiny sacs where oxygen is absorbed into your lungs. Lung injury in smokers begins when smoke causes lung tissues to become red and swollen. This releases unwanted oxygen molecules that damage the lung. It also causes enzymes to be released that can eat delicate lung tissue.

Normally, your body fights damaging oxygen molecules with antioxidants. It fights the destructive enzymes with defensive enzymes. Smoking makes antioxidants and defensive enzymes less effective. Over time, redness and swelling cause scarring and destroy your lungs, causing COPD.

Smoking harms people of all ages.

**Infants.** Effects of smoking on lung development can begin before birth. When mothers smoke during pregnancy, it hurts their babies' lungs.

**Children.** Children and teens who smoke are less physically fit and have more breathing problems. Smoking at this age can slow lung growth. If you smoke as a teenager, your lung function begins to decline years earlier than nonsmokers. This hurts you when you want to be active.

**All Ages.** At any age, smoking damages your lungs. The more cigarettes you smoke, the faster this happens. Air pollution, being overweight, and not eating enough fresh fruit increase your risk of lung disease even more if you smoke. However, if you quit smoking, your lungs can gradually return to normal for your age.



# **facts** you should know

- ◆ **Smoking causes injury to the airways and lungs, leading to a deadly lung condition.**
- ◆ **Smokers are more likely than nonsmokers to have upper and lower breathing tract infections.**
- ◆ **Mothers who smoke during pregnancy hurt the lungs of their babies.**
- ◆ **If you smoke during childhood and teenage years, it slows your lung growth and causes your lungs to decline at a younger age.**
- ◆ **Smoking is related to chronic coughing, wheezing, and asthma among children and teens.**
- ◆ **Smoking is related to chronic coughing and wheezing among adults.**
- ◆ **After stopping smoking, former smokers eventually return to normal age-related lung function.**

**think**  
about it

Do you know anyone who has been diagnosed with COPD? Do you know if they smoked cigarettes?



# **smoking**

**harms reproduction**

**Babies whose mothers  
smoked during pregnancy  
weigh less and have a  
greater risk of infant  
death and disease.**

**S**moking harms every phase of reproduction. Women who smoke have more difficulty becoming pregnant and have a higher risk of never becoming pregnant. Women who smoke during pregnancy have a greater chance of complications, premature birth, low birth weight infants, stillbirth, and infant mortality.

Low birth weight is a leading cause of infant deaths. Many of these deaths are linked to smoking. Even though we now know the danger of smoking during pregnancy, fewer than one out of four women quit smoking once they become pregnant.

**High Risk Pregnancy.** Smoking makes it more difficult for women to become pregnant. Once they are pregnant, women who smoke have more complications. One complication is *placenta previa*, a condition where the placenta (the organ that nourishes the baby) grows too close to the opening of the womb. This condition frequently requires delivery by caesarean section. Pregnant women who smoke are also more likely to have *placental abruption*. In this condition, the placenta separates from the wall of the womb earlier than it should. This can lead to preterm delivery, stillbirth, and early infant death. If you smoke while you are pregnant, you are also at a



**Babies whose mothers smoke before and after birth are 3 to 4 times more likely to die from sudden infant death syndrome.**



higher risk that your water will break before labor begins. All these conditions make it more likely that, if you smoke, your baby will be born too early.

**Low Birth Weight Babies.** Babies of mothers who smoked during pregnancy have lower birth weights, often weighing less than 5.5 pounds. Low birth weight babies are at greater risk for childhood and adult illnesses and even death. Babies of smokers have less muscle mass and more fat than babies of nonsmokers. Nicotine causes the blood vessels to constrict in the umbilical cord and womb. This decreases the amount of oxygen to the unborn baby. This can lead to low birth weight. It also reduces the amount of blood in the baby's system. Pregnant smokers actually eat more than pregnant nonsmokers, yet their babies weigh less. If you quit smoking before your third trimester (the last 3 months), your baby is more likely to be close to normal weight.

**Sudden Infant Death Syndrome.** The death rate from sudden infant death syndrome (SIDS) has fallen by more than half since the "Back to Sleep" campaign began in the 1990s. This campaign reminds parents that babies should lie on their backs while sleeping. Yet more can be done. Babies exposed to secondhand smoke after birth have double the risk of SIDS. Babies whose mothers smoke before and after birth are three to four times more likely to die from SIDS.

# facts you should know

- ◆ Smoking causes lower fertility in women.
- ◆ Babies of women who smoke are more likely to be born too early.
- ◆ Smoking during pregnancy causes *placenta previa* and *placental abruption*. These conditions can cause a baby to be born too early and then be sick.
- ◆ The nicotine in cigarette smoke reduces the amount of oxygen reaching the fetus.
- ◆ Smoking causes reduced fetal growth and low birth weight.
- ◆ Smoking by the mother can cause SIDS.

**think**  
about it

If you were a woman who smokes, would you quit smoking to help protect the life of your child?

other effects of

**smoking**

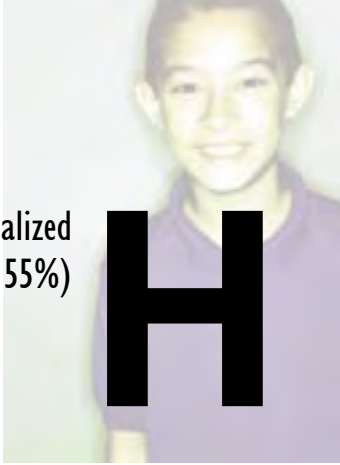
**Overall health  
in smokers is  
poorer than in  
nonsmokers.**

**S**moking damages your health in many other ways. Smokers are less healthy overall than nonsmokers. Smoking harms your immune system and increases your risk of infections.

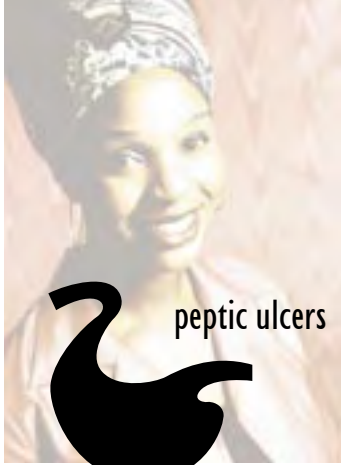
The toxic ingredients in cigarette smoke travel throughout your body. For example, nicotine reaches your brain within 10 seconds after you inhale smoke. It has been found in every organ of the body, as well as in breast milk. If you smoke, your cells will not get the amount of oxygen needed to work properly. This is because carbon monoxide keeps red blood cells from carrying a full load of oxygen. Carcinogens, or cancer-causing poisons, in tobacco smoke bind to cells in your airways and throughout your body.

Smoking harms your whole body. It increases your risk of fractures, dental diseases, sexual problems, eye diseases, and peptic ulcers. If you smoke, your illnesses last longer and you are more likely to be absent from work. In a study of U.S. military personnel, those who smoked were hospitalized 28 percent to 55 percent longer than nonsmokers. And the more cigarettes they smoked, the longer their hospitalization. Smokers also use more medical services than nonsmokers.

Among people younger than 65 enrolled in a health maintenance organization, or HMO, health care costs for smokers were 25 percent higher than for nonsmokers.



being hospitalized  
(by up to 55%)



peptic ulcers



sexual and  
reproductive  
problems



E  
F P  
T O Z

cataracts

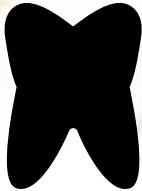
hip  
fractures



respiratory  
infections



complications  
after  
surgery



gum disease and tooth  
loss (half of all cases)

**smoking**  
also increases  
your risk of...



# facts you should know

- ◆ **Smokers are less healthy than nonsmokers.**
- ◆ **Smokers are more likely to be absent from work than nonsmokers.**
- ◆ **Smokers use medical care services more often than nonsmokers.**
- ◆ **After surgery, smokers have more problems with wound healing and more respiratory complications.**
- ◆ **For women, smoking causes your bones to lose density after menopause.**
- ◆ **Smoking increases your risk of hip fractures.**
- ◆ **Smoking causes half of all cases of adult periodontitis, a serious gum infection that can cause pain and tooth loss.**
- ◆ **For men, smoking may cause sexual problems.**
- ◆ **Smoking increases your risk for cataracts, a leading cause of blindness in the United States and worldwide. Smokers are two to three times more likely to develop cataracts than nonsmokers.**
- ◆ **Smoking causes peptic ulcers in smokers with *Helicobacter pylori* infections. Compared with nonsmokers, smokers with this infection are more likely to develop ulcers and to have complications of an ulcer. In severe cases, this condition can lead to death.**



**benefits of not  
smoking**

**From 1995 to 1999, smoking  
caused about 440,000  
people to die early each year  
in the United States,  
or one in every  
five deaths.**

**C**igarette smoking is the leading cause of preventable disease and death in the United States. It is also costly to our nation.

Cigarette smoking has caused an estimated 12 million deaths since the first Surgeon General's report on smoking in 1964. These include

**4.1 million deaths from cancer**

**5.5 million deaths from cardiovascular (heart and blood vessel) diseases**

**1.1 million deaths from respiratory diseases, and**

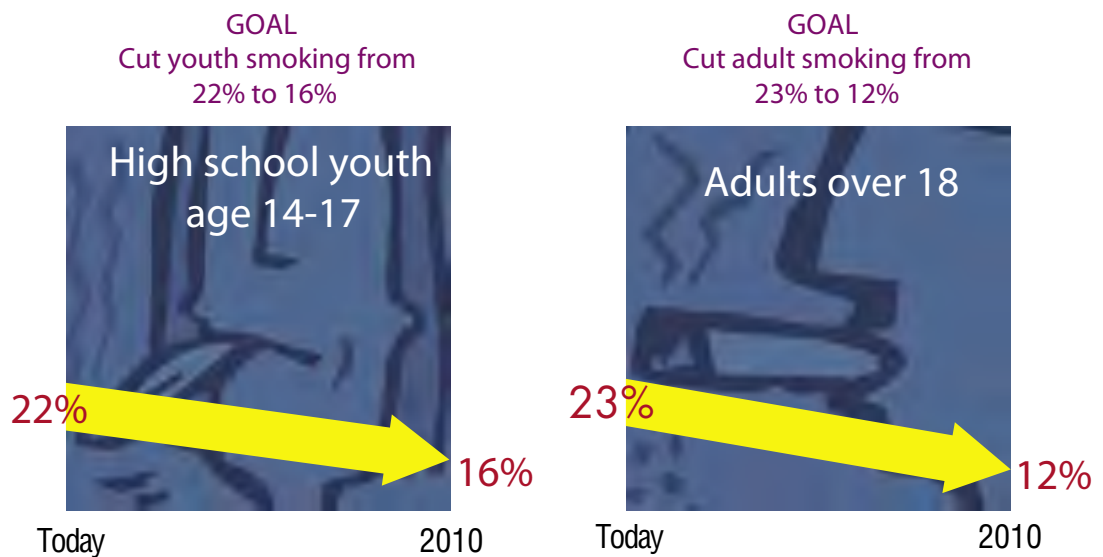
**94,000 fetal and infant deaths.**

From 1995 to 1999, smoking caused about 440,000 people to die early each year in the United States. That was one in every five deaths. Adults who smoke die an average of 13 to 14 years early.

The U.S. Public Health Service has set goals to reduce smoking in our country by the year 2010. The first goal is to cut smoking rates among

**T**he economic burden of cigarette use is enormous. From 1995 to 1999, smoking-related costs totaled \$157.7 billion each year. This figure includes more than \$75 billion in direct medical costs for adults (ambulatory care, hospital care, prescription drugs, nursing homes, and other care), about \$82 billion in indirect costs from lost productivity, and \$366 million for neonatal care. This equals an estimated \$3,000 per smoker per year.

high school aged youth from 22 percent to 16 percent. Among adults, the goal is to reduce smoking from 23 percent to 12 percent. If these goals are met, about 7.1 million early deaths will be prevented after 2010. Although adult and youth smoking rates have gone down in recent years, the diseases caused by smoking will continue for many years.



The numbers shown in this chart are the latest from CDC Surveillance Summaries on May 21, 2004. They show that fewer kids are smoking now than last year.

# **facts** **you should know**

- ◆ **More than 12 million deaths have been caused by smoking since the first published Surgeon General's report on smoking in 1964.**
- ◆ **Cigarette smoking has caused about 440,000 early deaths each year from 1995 to 1999, or more than 1,200 people every day.**
- ◆ **One half of all lifetime smokers will die early because of their decisions to smoke.**
- ◆ **The economic costs of smoking in the United States each year from 1995 to 1999 were \$157.7 billion.**
- ◆ **Meeting our national health goals for reducing smoking will prevent 7.1 million early deaths after 2010.**
- ◆ **Adults who smoke lose an average of 13 to 14 years of their lives.**

# the benefits of quitting

## Compared to smokers, your...

**Stroke** risk is reduced to that of a person who never smoked after 5 to 15 years of not smoking.

**Cancers of the mouth, throat, and esophagus** risks are halved 5 years after quitting.

**Cancer of the larynx** risk is reduced after quitting.

**Coronary heart disease** risk is cut by half 1 year after quitting and is nearly the same as someone who never smoked 15 years after quitting.

**Chronic obstructive pulmonary disease** risk of death is reduced after you quit.

**Lung cancer** risk drops by as much as half 10 years after quitting.

**Ulcer** risk drops after quitting.

**Bladder cancer** risk is halved a few years after quitting.

**Peripheral artery disease** goes down after quitting.

**Cervical cancer** risk is reduced a few years after quitting.

**Low birthweight baby** risk drops to normal if you quit before pregnancy or during your first trimester.

# quitting isn't easy

- ◆ Most ex-smokers try to quit several times before succeeding. About one-third of smokers who quit for a year may start again. However, the longer you stay quit, the less likely you are to start smoking again.
- ◆ According to polls, nearly three out of four smokers say that they would like to quit.
- ◆ Only 19 percent of people who smoke have **never** tried to quit.
- ◆ Each year, about 15 million smokers quit for at least a day, but fewer than 5 percent of them are able to stay tobacco-free for 3 to 12 months.
- ◆ Remember, smokers often try to quit more than once before they succeed.

# within

## 20 minutes of quitting...

Within 20 minutes after you smoke that last cigarette, your body begins a series of changes that continue for years.

### **20 Minutes After Quitting**

Your heart rate drops.

### **12 Hours After Quitting**

Carbon monoxide level in your blood drops to normal.

### **2 Weeks to 3 Months After Quitting**

Your heart attack risk begins to drop.

Your lung function begins to improve.

### **1 to 9 Months After Quitting**

Your coughing and shortness of breath decrease.

### **1 Year After Quitting**

Your added risk of coronary heart disease is half that of a smoker's.

### **5 Years After Quitting**

Your stroke risk is reduced to that of a nonsmoker's 5-15 years after quitting.

### **10 Years After Quitting**

Your lung cancer death rate is about half that of a smoker's.

Your risk of cancers of the mouth, throat, esophagus, bladder, kidney, and pancreas decreases.

### **15 Years After Quitting**

Your risk of coronary heart disease is back to that of a nonsmoker's.



## quit tips



- ◆ Nibble on low-calorie snacks like carrot sticks, celery, and apples.
- ◆ Chew gum.
- ◆ Stretch out your meals. Eat slowly and pause between bites.
- ◆ After dinner, instead of a cigarette, suck on a hard candy or sip your favorite beverage.
- ◆ Take a deep breath and exhale slowly. Remember, the desire to smoke will pass.

- ◆ See your doctor, call a telephone quitline, or join a group program to learn new skills and behaviors to deal with situations where you want to smoke.
- ◆ Get ready and set a quit date.
- ◆ Get support and encouragement from family and friends.
- ◆ Get medication and use it correctly.
- ◆ Be prepared for relapse or difficult situations.



## about weight gain

- ◆ Nearly 80 percent of those who quit smoking gain weight. But 56 percent of people who continue to smoke gain weight, too.
- ◆ The average weight gain after quitting smoking is just 5 pounds.
- ◆ The bottom line: The health benefits of quitting far exceed any risks from the average weight gain that may follow quitting.

# helpful hints

To limit weight gain after you quit smoking, eat a well-balanced diet and avoid extra calories in sugary and fatty foods. If you crave sweets, eat small pieces of fruit. Have low-calorie snacks on hand for nibbling. Drink 6 to 8 glasses of water each day. Build exercise into your life by walking 30 minutes per day, or choose another exercise like running, swimming, cycling, or gardening. Talk to your doctor about an exercise program that is right for you.

# acknowledgments

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For more information on smoking and your health, or for advice on how to quit smoking, talk to your doctor.

More facts and advice are available from CDC's Office on Smoking and Health or on the Web at:

## **Office on Smoking and Health**

Mail Stop K-50

4770 Buford Highway, NE

Atlanta, GA 30341-3717

770-488-5705, press 3

*or*

**[www.cdc.gov/tobacco](http://www.cdc.gov/tobacco)**

To find out if your state has a telephone quitline, or to talk to a trained counselor from the National Cancer Institute, call

**I-877-44U-QUIT**

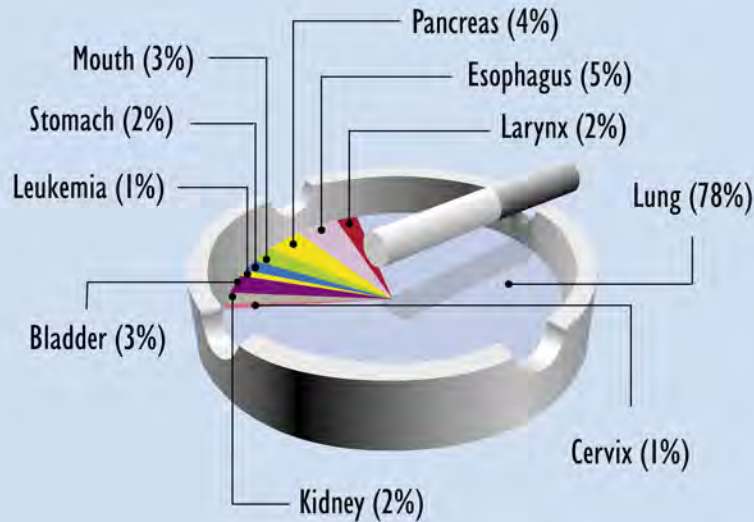
or visit the Web at

**[www.smokefree.gov](http://www.smokefree.gov)**

# Smoking

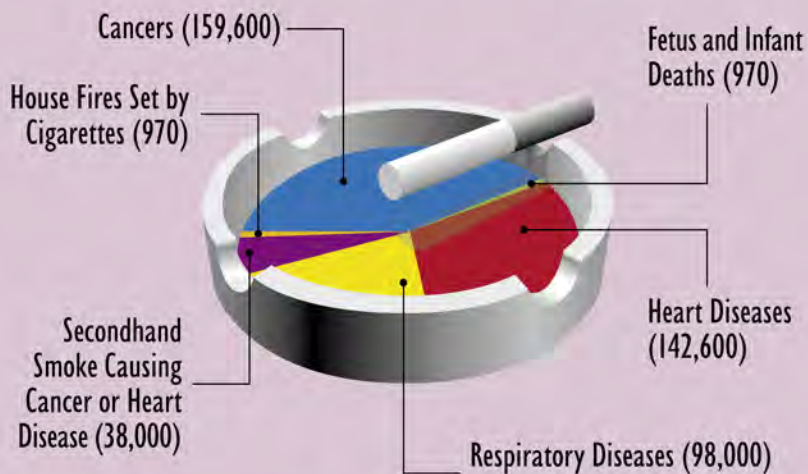
## cancer, death, and you

### Cancers You Get From Smoking



Percentage of total 159,600 individual cases  
All numbers are rounded.

### 440,000 Deaths Each Year Caused by Smoking



All numbers are rounded.