

Chronic Diseases

Coronary Heart Disease

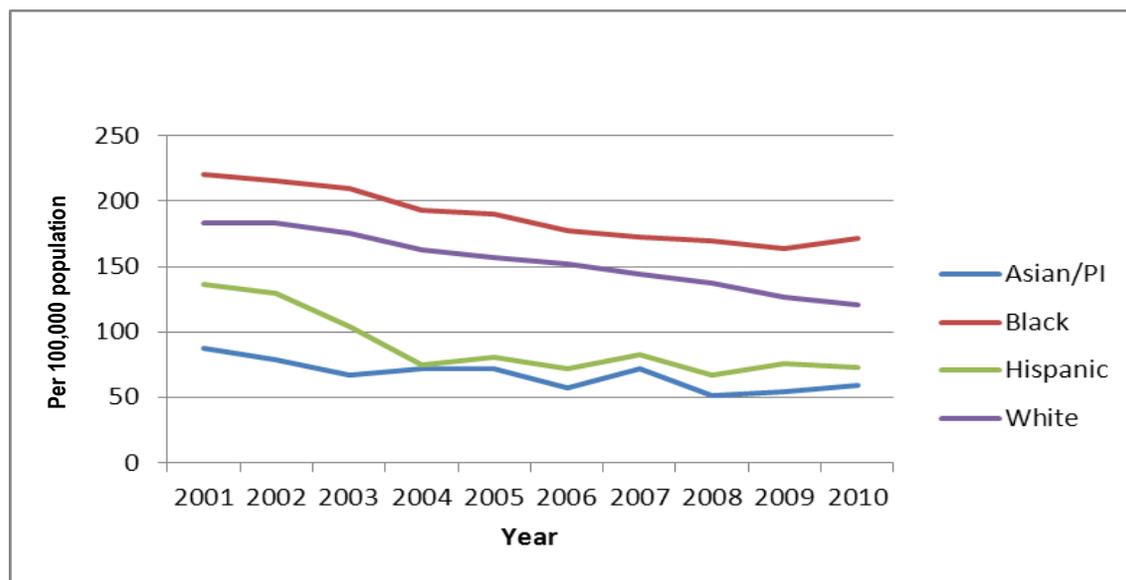
Heart disease is any affliction that impairs the structure or function of the heart. The most common type is coronary heart disease (CHD). CHD occurs when the arteries that supply blood to the heart become hardened and narrowed from fatty plaque buildup on the artery walls, a process called atherosclerosis. Plaque buildup can cause blood clots to form, and these can block the arteries, narrow the arteries so less blood flows to the heart (experienced as chest pain or angina), or completely block the arteries and the flow of blood to the heart, causing a heart attack, or myocardial infarction. In 2010, heart disease was the number one leading cause of death in the United States.¹ It was also the leading cause of death in Pennsylvania, for both men and women.²

Mortality

Mortality rates related to CHD have steadily declined in Pennsylvania among white non-Hispanics, black non-Hispanics and Hispanics from 2001 to 2010. The age-adjusted mortality rate fell from 183 deaths per 100,000 population in 2001 to 121 deaths per 100,000 population in 2010 for white non-Hispanics, a nearly 66 percent decrease.³

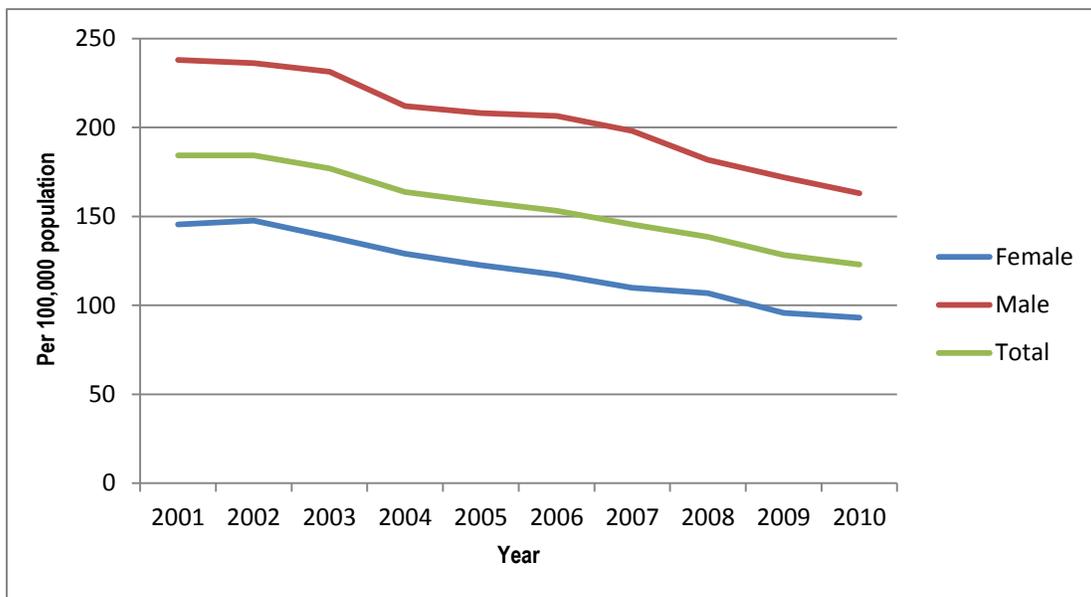
Black non-Hispanics consistently had higher mortality rates than white non-Hispanics, who in turn had higher mortality rates than Hispanics from 2001 to 2010. Age-adjusted mortality rates for black non-Hispanics were almost twice as high as the rates for Hispanics over the years from 2001 to 2010.

Figure 10.1 Coronary Health Disease, Age-Adjusted Mortality Rate by Race and Ethnicity, Pennsylvania, 2001 to 2010⁴



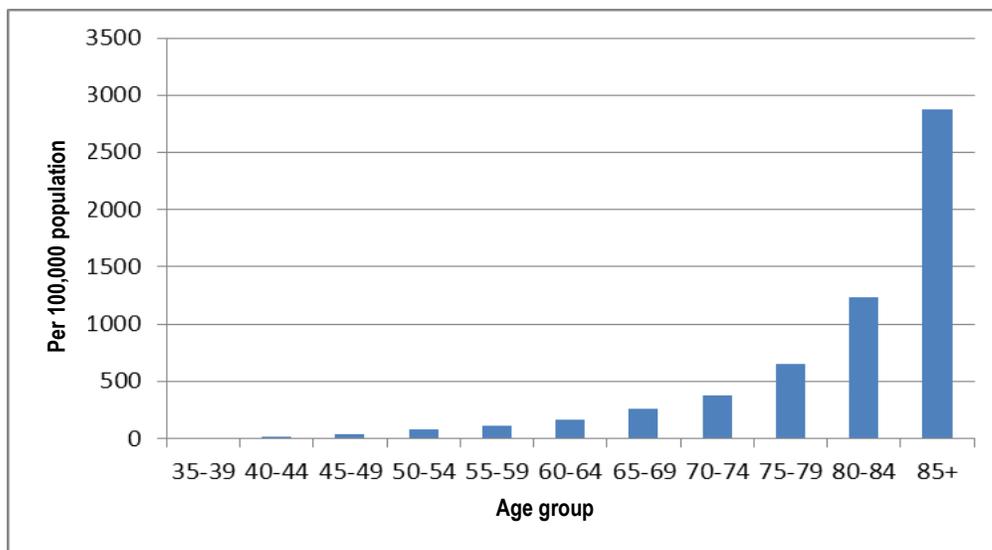
CHD mortality rates have steadily declined in Pennsylvania for both males and females, from 2001 to 2010. Mortality rates for males were consistently about 65 percent higher than rates for females.

Figure 10.2 Coronary Heart Disease, Age-Adjusted Mortality Rate by Sex, Pennsylvania, 2001 to 2010⁵



CHD prevalence increases exponentially with age. CHD is more than twice as prevalent among Pennsylvania residents aged 65 and older as among those aged 55 to 64 years old. At the same time, the CHD prevalence rate for persons 55 to 64 is about three times the rate of CHD among adults younger than 45 years of age.

Figure 10.3 Coronary Heart Disease, Age-Adjusted Mortality Rate by Age Group, Pennsylvania, 2008 to 2010 Combined⁶



Although statewide mortality rates for CHD generally declined between 1990 and 2010, rate differences exist among counties in Pennsylvania. The age-adjusted death rate for Pennsylvania for 2008 to 2010 was 129.6 per 100,000 population. However, twenty counties had higher rates for this period than the state average, including Allegheny, Philadelphia, Adams, Blair, Cambria, Carbon, Clinton, Clearfield, Columbia, Delaware, Fayette, Lackawanna, Luzerne, Northumberland, Schuylkill, Somerset, Warren, Wayne, Westmoreland and Wyoming.

Age-adjusted rates of hospitalization due to CHD for both males and females decreased consistently between 2000 and 2011. Rates of hospitalization for CHD continued to be higher for males than females, as shown in Figure 10.7.

Figure 10.6 Hospitalizations due to Coronary Heart Disease, Cases and Age-adjusted Rates, Pennsylvania, 2000 to 2011¹⁰

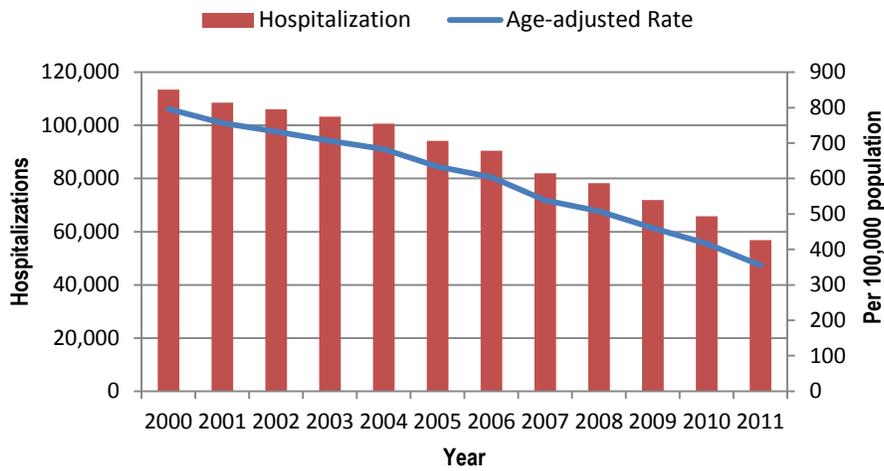
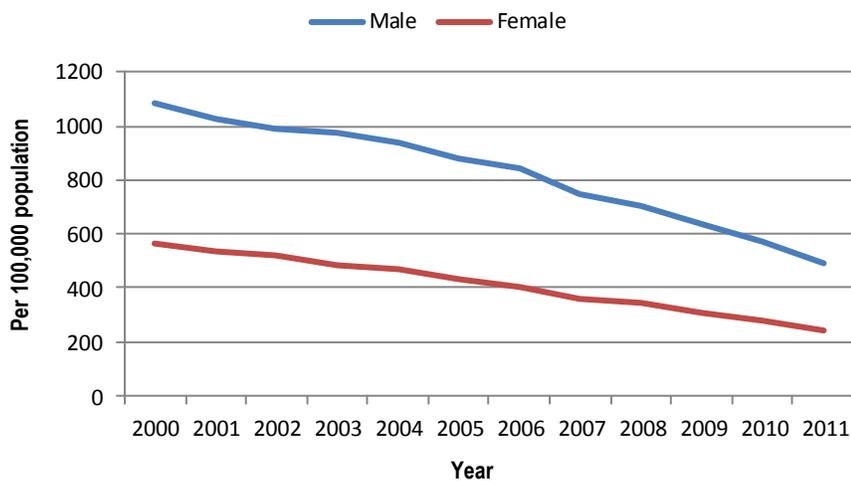


Figure 10.7 Coronary Heart Disease, Age-adjusted Hospitalization Rates by Sex, Pennsylvania, 2000 to 2011¹¹



Risk Factors

CHD typically occurs as the result of atherosclerosis, the build-up of a fatty cholesterol plaque within the arterial walls, which usually happens when one or more of the risk factors listed below is present. Each of these independently increases a person’s risk of developing coronary heart disease. Studies suggest persons with fewer risk factors have a greater life expectancy than those with more risk factors.

High cholesterol—While cholesterol is an important component of a healthy body, too much cholesterol can increase the risk of developing CHD. High cholesterol can result from a genetic predisposition, or it can be caused by lifestyle, such as consuming a diet high in saturated and trans fats.

High blood pressure—Persons with high blood pressure are two to four times as likely as those who do not have high blood pressure to develop CHD.

Tobacco use—Cigarette smokers are two to three times more likely than nonsmokers to die as the result of coronary heart disease. In addition, nonsmokers who are exposed to secondhand smoke routinely, such as at home or work, increase their risk of developing heart disease by 25 to 30 percent.¹²

Physical inactivity—People who are physically inactive are twice as likely to develop CHD as those who are physically active. A lack of sufficient physical activity at moderate or vigorous intensity is as important a risk factor for developing coronary heart disease as high blood cholesterol, high blood pressure or cigarette smoking.

Obesity—Overweight and obesity are associated with an increased relative risk of developing CHD. Obesity is responsible for an estimated 16 percent of deaths due to CHD in men and 17 percent of such deaths in women.¹³

Diabetes—Heart disease and stroke account for nearly 65 percent of deaths among persons with diabetes. Adults with diabetes have mortality rates due to CHD that are about two to four times higher than rates of peers without diabetes.¹⁴

Other factors—Many additional risk factors for CHD are not listed, including a diet low in fruits and vegetables, and psychosocial stress. (Conversely, moderate alcohol consumption has been shown to be a protective factor for the development of CHD.)

Knowledge about signs of a heart attack—Survival rates following a heart attack improve dramatically when medical attention is given quickly. Knowing the signs and symptoms of a heart attack, and understanding the urgency of quick medical attention, is key to decision-making about summoning emergency responders when appropriate.

Modifiable risks—Pennsylvania's adult residents have a high prevalence of modifiable risk factors for diabetes, heart disease and stroke, with 22.4 percent smokers, 31.4 percent hypertensive and 28.6 percent obese.

- Among adults \geq 35 years old with hypertension, 23.0 percent have diabetes, 16.6 have heart disease and 6.6 percent have had a stroke.
- Among adults \geq 35 years old who are obese, 22.9 percent have diabetes, 12.2 have heart disease and 4.2 have had a stroke.
- In a multivariate model, after simultaneously accounting for smoking status, age, race and ethnicity, sex, income, education, high cholesterol, physical inactivity, and stroke co-morbidity, those with hypertension were 2.8 times as likely to have both diabetes and heart disease. Similarly, when these factors were accounted for, obese adults were 2.9 times more likely to have both diabetes and heart disease.¹⁵

Intervention Strategies

Control risk factors. Controlling cholesterol and blood pressure levels can delay or prevent CHD. For example, for every 1 percent decrease in LDL-cholesterol level, there is an estimated 1 percent reduction in CHD risk. A 12 to 13 point reduction in systolic blood pressure may reduce total cardiovascular disease deaths by 25 percent.¹⁶

Pennsylvania's Department of Health (DOH) has become the fifth state health department to pledge support for the Million Hearts Initiative, with a stated commitment to prevent one million heart attacks statewide by 2017. The pledge addresses modifiable risk factors for heart disease, including: access to healthy foods through procurement guidelines; tobacco use and exposure; community initiatives to improve nutrition and increase physical activity (e.g., Safe Routes to School, worksite wellness programs); availability of patient-centered medical homes and health care extenders; public information campaigns; and partner involvement.

Effort will be made to increase resident participation in physical activity, increase access to healthy foods, and decrease and prevent tobacco use.

Increase awareness of the importance of prompt treatment. Public awareness campaigns have typically provided information about signs and symptoms of a heart attack and directed people to call 911. However, evidence suggests that knowing the signs and symptoms does not reduce delay in seeking treatment. The longest delay occurs between the onset of symptoms and the decision to seek medical help. Reperfusion therapy to restore blood flow and oxygen to the heart reduces both morbidity and mortality when administered soon after the onset of symptoms; current recommendations suggest initiating reperfusion therapy within 90 minutes, for maximum benefit. Because treatment options are time-sensitive, reducing treatment delays is important. Awareness messages should emphasize the urgency and benefits of receiving prompt transport to hospitals where reperfusion therapy is readily available.

Improve emergency response. The U.S. has no national standard for training and certifying emergency medical system personnel, nor is there a system to coordinate medical services with hospital emergency departments.

Improve quality of care. For people with chronic disease, both process and outcome measures must be improved in the primary care setting. Quality improvements must improve both inpatient and outpatient care. Hospital-based quality initiatives should address heart disease and stroke.

National investments in health information technology seek to improve health care delivery and patient care. Electronic health records (EHRs) are critical to improving health care quality through clinical decision supports, alerts, patient registry functions, patient reminders and improvement of care coordination with information-exchange functionality.

Meaningful Use, led by Centers for Medicare and Medicaid Services (CMS) and Office of the National Coordinator for HIT, offers incentive payments to eligible professionals or hospitals engaged in efforts to use EHR technology to standardize functionality using MU criteria. The incentive for sizeable financial rewards will draw health systems into this national movement, and they will receive training on EHR, and technical assistance so they can meet the requirements of MU Stage 2. Working with the project team, health systems will use these tools to improve disease management, quality of care and use of preventive services. Increased quality in EHRs in health systems will support implementation of evidence-based treatment guidelines through clinical decision support. Patients with uncontrolled hypertension and diabetes will be targeted for closer management and improved coordination of care using information-exchange functionality built into recently certified EHR products in compliance with MU Stage 2.

In collaboration with the Hospital and Health System Association of Pennsylvania, Quality Insights of Pennsylvania (QIP) and DOH will develop and conduct a survey of health systems in NE PA to assess the effective use of EHR systems. One or more health systems with a minimum of 40 unique practice sites will be recruited and guided through various levels of HIT improvements using their EHRs to ensure that effective chronic disease modules and MU Stage 2 requirements are in place. This will increase the proportion of health systems able to create reports identifying and tracking patients with diabetes and hypertension, report NQF measures 18 & 59, and evolve with MU compliance. Incidence and severity of diabetes and hypertension are known to be affected by racial, socioeconomic and geographic determinants. Mortality rates for diabetes are significantly higher in five counties in NE PA; therefore, the project will initially focus on those counties and health systems identified by an environmental scan, with the goal of maximizing the number of patients with diabetes and hypertension being cared for by providers with effective EHRs in place.

- **Health Literacy:** Specifically to improve quality of care through better health literacy, DOH has partnered with the Health Care Improvement Foundation (HCIF) to implement a cardiovascular health literacy program, with the goal of improving health literacy to address disparate outcomes in hypertension, coronary artery disease, congestive heart failure and stroke in those ≥ 50 years old, with an emphasis on low income and diverse populations. The main goal is to improve communication between older cardiovascular disease patients and their health care providers.
- **Patient Management:** To improve quality of care through patient management, Pennsylvania's Improving Performance in Practice (IPIP) program is, at its core, a Chronic Care Model (CCM). Based on a national program, this multi-faceted, evidence-based model improves care because it helps practices deliver what the current system cannot: consistent use of guidelines, population management, effective teamwork, engaged patients and proactive planned care. The IPIP Residency Program Collaborative (RPC) and Community Health Center Collaboratives (CHCC) focus on performance improvement and patient-centeredness. The RPC is a program

designed to coordinate learning collaboratives of family medicine and internal medicine residency programs to improve patient outcomes in chronic care. RPC/CHCC started in June 2010; IPIP focuses on adult patients 18 to 85 years old with diabetes, heart disease and stroke. The approach will be inclusive of populations that are disproportionately affected by chronic disease, since many IPIP practices serve large populations of Medicaid participants. By implementing components of the CCM, the sites become National Committee for Quality Assurance (NCQA) recognized patient-centered medical homes. The learning collaborative curriculum teaches systems change, so that performance improvement and patient-centeredness affect everyone at the practice site. The RPC is improving the care provided in health care clinics serving at-risk and/or underserved populations. Such clinics not only allow faculty and residents to practice, but also graduate residents who are committed to continuous quality improvement.

Resources

Pennsylvania Department of Health, Bureau of Health Promotion & Risk Reduction

United States Department of Health and Human Services, Centers for Disease Control & Prevention (CDC)—
<http://www.cdc.gov>

Pennsylvania Department of Health, Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)—
<http://www.health.state.pa.us/stats>

Pennsylvania Department of Health, Bureau of Health Statistics & Research—<http://www.health.state.ps.us/stats>

Endnotes

¹ United States Department of Health and Human Services, Centers for Disease Control and Prevention. (2010) *National vital statistics report, deaths: final data for 2010*. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_06.pdf

² Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2010). *Vital statistics report 2010*. Retrieved from <http://www.portal.state.pa.us/portal/server.pt?open=514&objID=596032&mode=2>

³ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.ps.us/stats>

⁴ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.ps.us/stats>

⁵ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.ps.us/stats>

⁶ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2103). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.ps.us/stats>

⁷ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.ps.us/stats>

⁸ Pennsylvania Health Care Cost Containment Council (PHC4), *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

⁹ Pennsylvania Health Care Cost Containment Council (PHC4), *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹⁰ Pennsylvania Health Care Cost Containment Council (PHC4), *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹¹ Pennsylvania Health Care Cost Containment Council (PHC4), *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹² United States Department of Health and Human Services, *The health consequences of Involuntary exposure to tobacco smoke: a report of the surgeon general*. Retrieved from http://www.cdc.gov/tobacco/sqr/sqr_2006/index.htm.

¹³ Wilson, P. W. F., D'Agostine, R. B., Sullivan, L., Parise, H., & Kannel, W. B., Overweight and obesity as detriment of cardiovascular risk: the Framingham experience, *Archives of Internal Medicine*, 162, 1867-1872.

¹⁴ United States Department of Health and Human Services, Centers for Disease Control and Prevention. (2005). *National diabetes factsheet: general information and national estimates on diabetes in the United States*. Retrieved from <http://www.cdc.gov>

¹⁵ Pennsylvania Department of Health. (2011). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>

¹⁶ United States Department of Health and Human Services, Centers for Disease Control and Prevention, *Prevention works: CDC strategies for a heart healthy and stroke-free America*. Retrieved from http://www.cdc.gov/DHDSP/library/prevention_works/pdfs/Prevention_works.pdf.

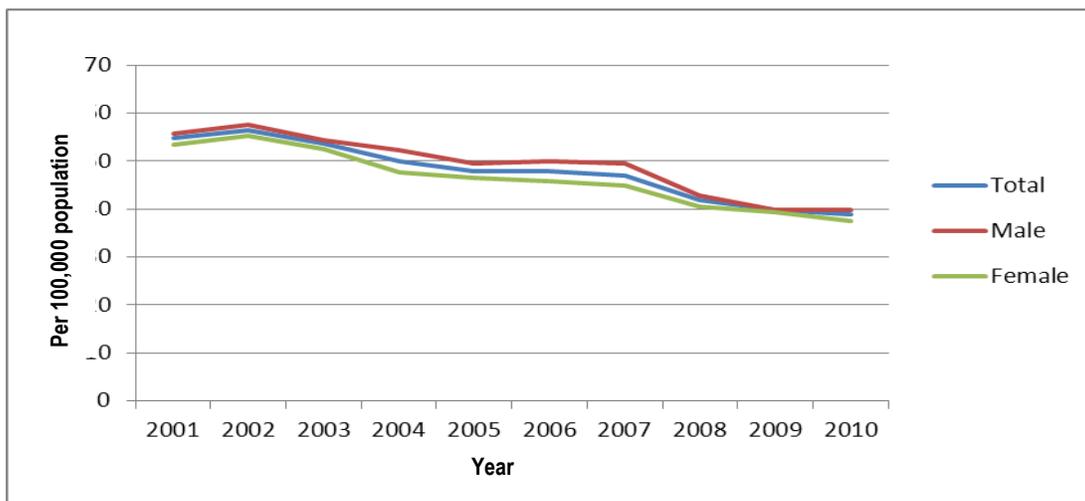
Stroke (Cerebrovascular Disease)

Collectively, stroke refers to a group of brain dysfunctions related to disease of the blood vessels supplying the brain. A stroke is sometimes called a “brain attack,” because it occurs when a clot blocks the blood supply to the brain or when a blood vessel in the brain bursts.¹ In 2010, stroke was the fourth leading cause of death in the United States.² In Pennsylvania, stroke caused 6,629 deaths (age-adjusted death rate 38.9 per 100,000 population) in 2010, and was the third leading cause of death and the leading cause of disability.³

Mortality

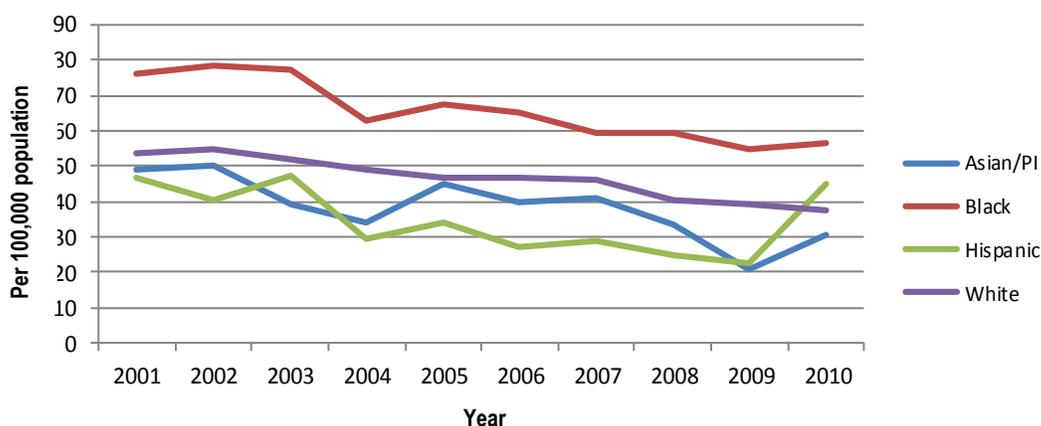
In Pennsylvania, the number of deaths due to stroke declined more than 25 percent from 2001 to 2010.⁴ Overall stroke age-adjusted mortality rates decreased for both males and females during this time period. Although males consistently had a higher age-adjusted mortality rate than females from 2001 to 2010, the difference was small.⁵

Figure 10.8 Stroke, Age-Adjusted Mortality Rate by Sex, Pennsylvania, 2001 to 2010⁶



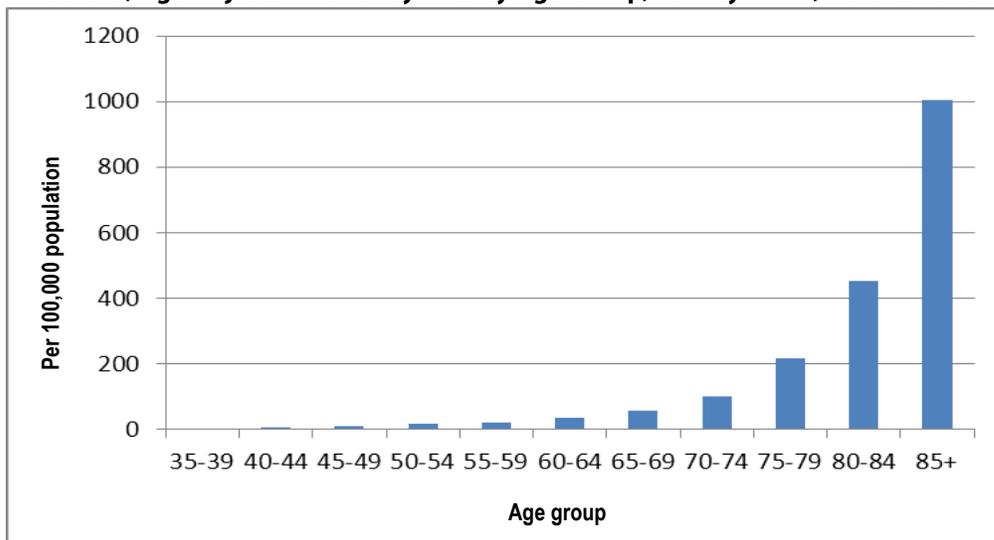
Rates of mortality due to stroke decreased between 2001 and 2009 for persons of every race and ethnicity. However, only white adults’ stroke mortality rate continued to decline in 2010; black adults, Hispanic adults and Asian/Pacific Islanders all saw increases in the mortality rate between 2009 and 2010. Black adults continue to have stroke-related mortality rates nearly 50 percent higher than rates of white adults.

Figure 10.9 Stroke, Age-Adjusted Mortality Rate by Race and Ethnicity, Pennsylvania, 2001 to 2010⁷



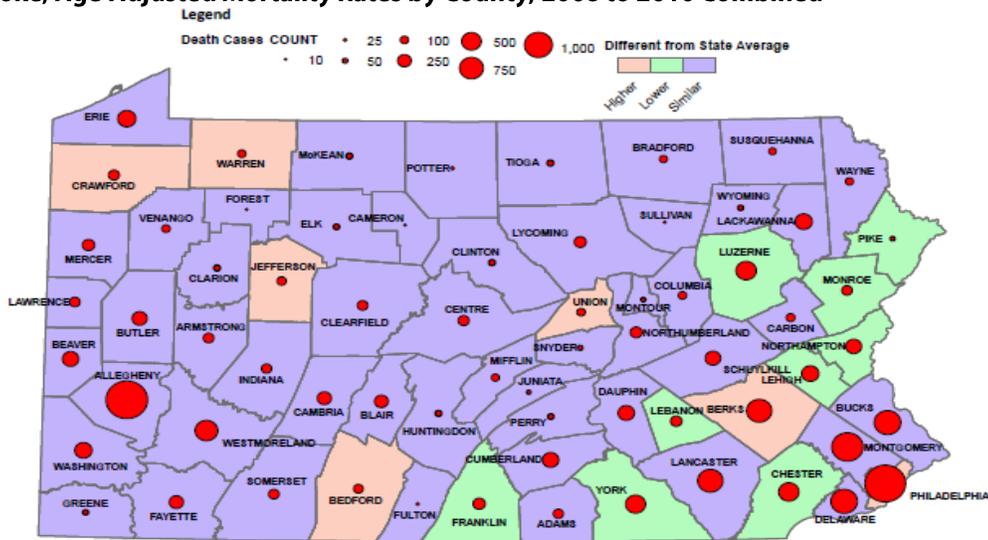
Prevalence of stroke increases exponentially with age. Stroke is more than twice as prevalent among adults aged 65 and older than it is among those 55 to 64 years old, who in turn had almost three times the prevalence of those who were younger than 45 years of age.

Figure 10.10 Stroke, Age-Adjusted Mortality Rate by Age Group, Pennsylvania, 2008 to 2010 Combined⁸



Rates of deaths due to stroke differ among Pennsylvania’s 67 counties. The statewide age-adjusted mortality rate for stroke was 40.1 per 100,000 population in the period of 2008 to 2010. Seven counties had higher rates during this period, including: Bedford, Berks, Crawford, Jefferson, Philadelphia, Union and Warren. Nine counties had 2008 to 2010 rates that were lower than the state average, including: Chester, Franklin, Lebanon, Lehigh, Luzerne, Monroe, Northampton, Pike and York.

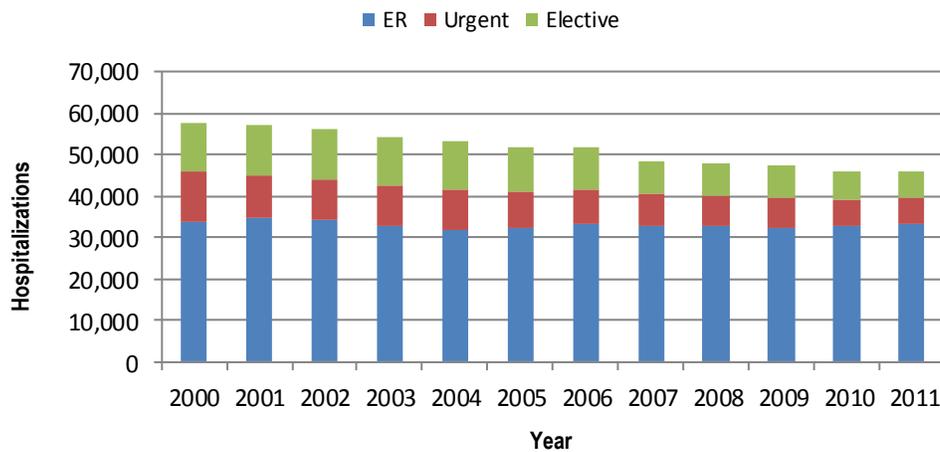
Figure 10.11 Stroke, Age-Adjusted Mortality Rates by County, 2008 to 2010 Combined⁹



Hospitalizations

In Pennsylvania, the overall totals of hospital admissions due to strokes decreased between 2000 and 2011 for all admission types, including urgent, emergency department and elective hospital admission.¹⁰

Figure 10.12 Hospitalizations due to Stroke, Pennsylvania, 2000 to 2011¹¹



In addition, the age-adjusted stroke hospitalization rate decreased for persons of every race and ethnicity between 2000 and 2011. Still, the rate of stroke hospitalization for black adults was consistently over 50 percent higher than the rate for white adults. Hispanic adults had higher rates of stroke-related hospitalization than white for all years except 2006 and 2011.

Age-adjusted hospitalization rates for both men and women decreased consistently between 2000 and 2011, although hospitalization rates for men due to stroke were higher than for women.

Figure 10.13 Age-Adjusted Rates of Hospitalization due to Stroke, by Race and Ethnicity, 2000 to 2011¹²

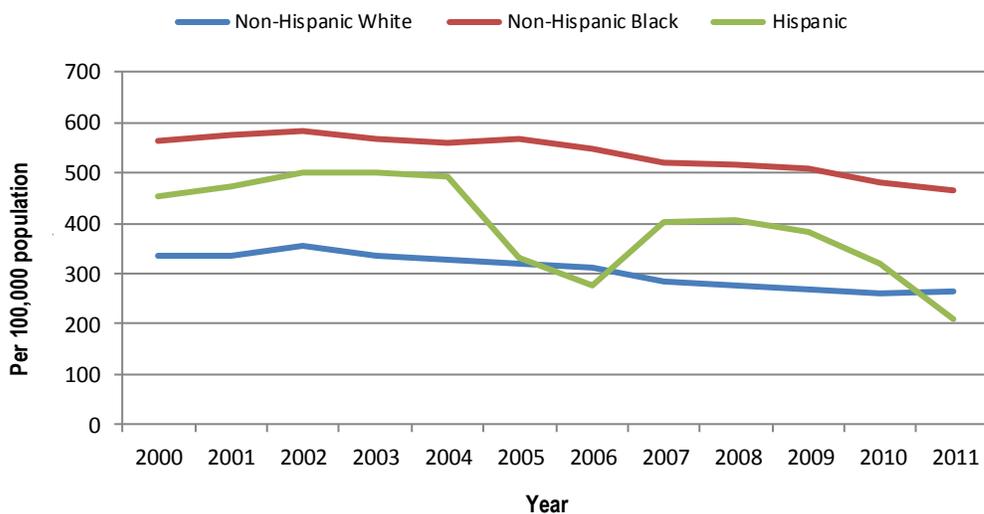


Figure 10.14 Age-Adjusted Rates of Hospitalization due to Stroke, by Sex, 2000 to 2011¹³

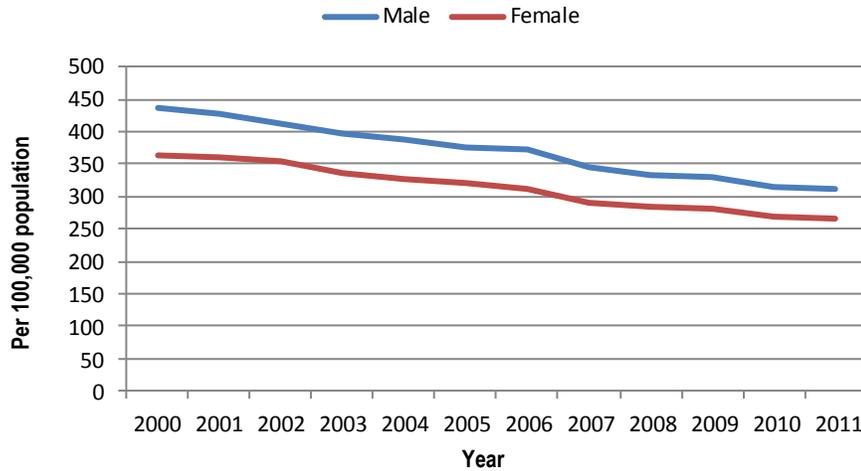
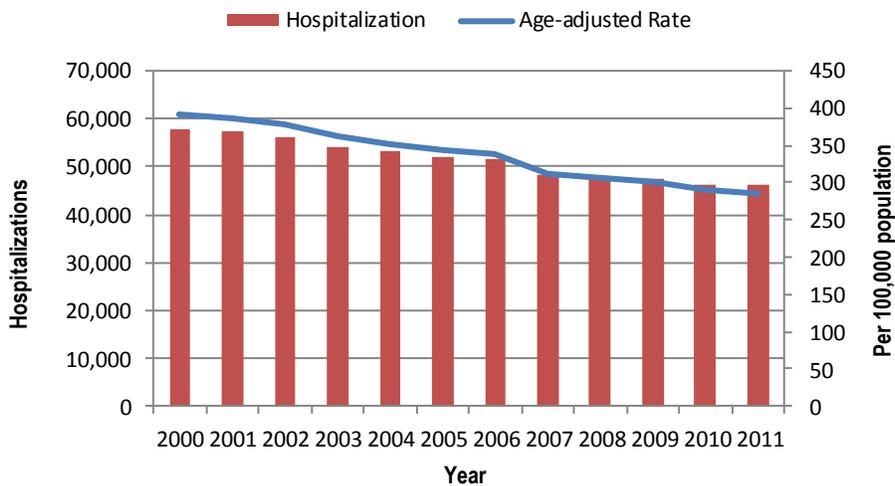


Figure 10.15 Hospitalizations due to Stroke, Cases and Age-adjusted Rates, Pennsylvania, 2000 to 2011¹⁴



Risk Factors

High blood pressure—High blood pressure (hypertension) is the leading risk factor for stroke. Control of high blood pressure helps prevent strokes, heart attacks, congestive heart failure and renal failure.

High cholesterol—Too much cholesterol can increase the risk of stroke. It can be the result of family history, or caused by lifestyle, such as a diet high in saturated or trans fats.

Tobacco use—Cigarette smoking is a leading risk factor for stroke.

Physical inactivity—Persons who are physically inactive are at higher risk of stroke than those who are physically active.

Obesity—Overweight and obesity increase the risk of high blood pressure, high blood cholesterol and stroke.

Diabetes—Heart disease and stroke account for nearly 65 percent of deaths among persons with diabetes. Adults with diabetes have heart disease rates that are two to four times higher than for adults without diabetes.

Knowledge of symptoms of stroke—Stroke outcomes improve when patients receive medical care within three hours of symptom onset. Knowing the signs and symptoms of a stroke, and seeking prompt medical care can reduce stroke-related impairments. Symptoms include: numbness on one side of the body, confusion, dizziness, sudden loss of vision and severe unexplained headache.

Modifiable risks—Pennsylvania’s adult residents have a high prevalence of modifiable risk factors for diabetes, heart disease and stroke, with 22.4 percent smokers, 31.4 percent hypertensive and 28.6 percent obese.

- Among adults ≥ 35 years old with hypertension, 23.0 percent have diabetes, 16.6 have heart disease and 6.6 percent have had a stroke.
- Among adults ≥ 35 years old who are obese, 22.9 percent have diabetes, 12.2 have heart disease and 4.2 have had a stroke.
- In a multivariate model, after simultaneously accounting for smoking status, age, race and ethnicity, sex, income, education, high cholesterol, physical inactivity, and stroke co-morbidity, those with hypertension were 2.8 times as likely to have both diabetes and heart disease. Similarly, when these factors were accounted for, obese adults were 2.9 times more likely to have both diabetes and heart disease.¹⁵

Intervention Strategies

Focus on primary prevention. Treating the risk factors of stroke can prevent some strokes from occurring, and reduce the severity of those that do. Not smoking, being physically active and eating a healthy diet can all help prevent strokes.

Raise public awareness. Public awareness campaigns can include education to improve recognition and treatment of stroke risk factors and encourage those with symptoms to seek treatment early.

Improve quality of care. For people with chronic disease, both process and outcome measures must be improved in the primary care setting. Quality improvements must improve both inpatient and outpatient care. Hospital-based quality initiatives should address heart disease and stroke.

Resources

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¹ United States Department of Health and Human Services, Centers for Disease Control and Prevention. (2013). *Stroke facts*, Retrieved from <http://www.cdc.gov/stroke/>

² United States Department of Health and Human Services, Centers for Disease Control and Prevention. (2010). *National vital statistics report, deaths: final data for 2010*. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_06.pdf

³ Pennsylvania Department of Health. *Vital Statistics Report*. (2010). Retrieved from www.health.state.pa.us/stats

- ⁴ Pennsylvania Department of Health, Bureau of Health Statistics & Research. (2012). Annual number of deaths have declined since 2000: largest declines recorded for heart disease and stroke, *Statistical News, Vol.35 No.1, pgs. 6-7*, Retrieved from <http://www.portal.state.pa.us/portal/server.pt?open=514&objID=600189&mode=2>
- ⁵ Pennsylvania Department of Health. (2011). *Chronic disease burden report, cerebrovascular disease*. Retrieved from <http://www.health.state.pa.us/pdf/ChronicDiseaseBurdenReport.pdf>
- ⁶ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.pa.us/stats>
- ⁷ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.pa.us/stats>
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- ¹⁰ Pennsylvania Health Care Cost Containment Council (PHC4), *Hospital discharge data, 2000-2011* [Data file], Retrieved from <http://www.phc4.org/>
- ¹¹ Pennsylvania Health Care Cost Containment Council (PHC4), *Hospital discharge data, 2000-2011* [Data file], Retrieved from <http://www.phc4.org/>
- ¹² Pennsylvania Health Care Cost Containment Council (PHC4), *Hospital discharge data, 2000-2011* [Data file], Retrieved from <http://www.phc4.org/>
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- ¹⁴ Pennsylvania Health Care Cost Containment Council (PHC4), *Hospital discharge data, 2000-2011* [Data file], Retrieved from <http://www.phc4.org/>
- ¹⁵ Pennsylvania Department of Health. (2011). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>

Chronic Obstructive Pulmonary Disease

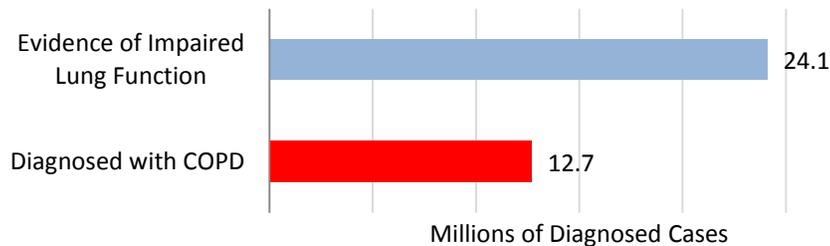
Chronic obstructive pulmonary disease (COPD) is a preventable and treatable respiratory disease characterized by airflow limitation that is not fully reversible. COPD is progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases; most often, cigarette smoking is the cause.

Although a collective term encompassing several lung diseases (e.g., emphysema, chronic bronchitis), COPD has significant systemic consequences as well, including muscle wasting and loss of bone density.^{1,2} COPD has no cure and is progressive in nature.

COPD is a significant public health and economic burden in the U.S. It is the third leading cause of death nationwide, and incidence is not decreasing nearly as quickly as the top two leading causes of death.³ An estimated 12.7 million adults aged 18 and older have been diagnosed with COPD by a physician. However, as many as 24 million adults nationwide show some evidence of impaired lung function, indicating the disease may be under-diagnosed. Since 2000, more women than men have died of COPD.⁴

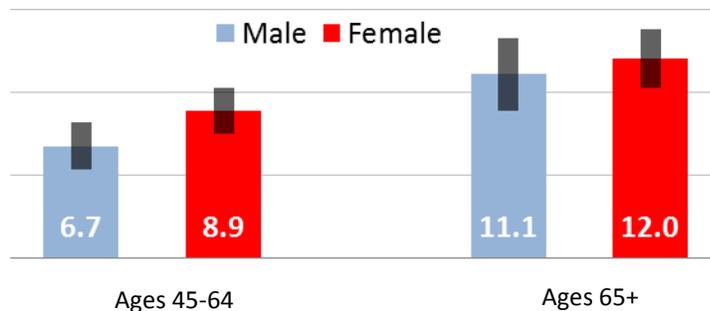
Recent estimates from 2007 put the annual cost of COPD at about \$42.6 billion, including \$26.7 billion in direct health care expenditures, \$8.0 billion in indirect morbidity costs and \$7.9 billion in indirect mortality costs.⁵

Figure 10.16 COPD and Impaired Lung Function, United States, 2011⁶



In Pennsylvania, seven percent of adults indicate they have been told by a doctor that they have “(COPD) chronic obstructive pulmonary disease, emphysema or chronic bronchitis,” according to data from the 2011 Behavioral Risk Factor Surveillance System (BRFSS) survey. Adults 65 years and older accounted for most of these responses.

Figure 10.17 Diagnosed with COPD, Emphysema, or Chronic Bronchitis, by Age Groups and Sex, Pennsylvania 2011⁷



Based on BRFSS data, the American Lung Association estimates that 666,029 persons in Pennsylvania were affected by COPD in 2011. According to the Pennsylvania Health Care Cost Containment Council (PHC4), the state’s hospitalization rates for COPD were higher than national rates for both 2004 and 2007. PHC4 also indicates that hospitalizations for COPD are on the rise. While hospitalization rates for diabetes increased 4.3 percent and asthma 7.3 percent between 2004 and 2008, the rate of hospitalization for COPD increased 17.8 percent. During the same time period, the hospitalization rate for heart failure decreased 16.2 percent.⁸

In 2010, COPD caused more deaths among women than men in Pennsylvania, with 3,098 and 2,885 deaths, respectively. In both sexes, an overwhelming percent of deaths from COPD occurred among persons aged 65 and older; this corresponds with greater diagnosis of COPD among older adults.⁹

Figure 10.18 COPD, Age-Adjusted Mortality Rate and Cases, Pennsylvania, 1999 to 2010¹⁰

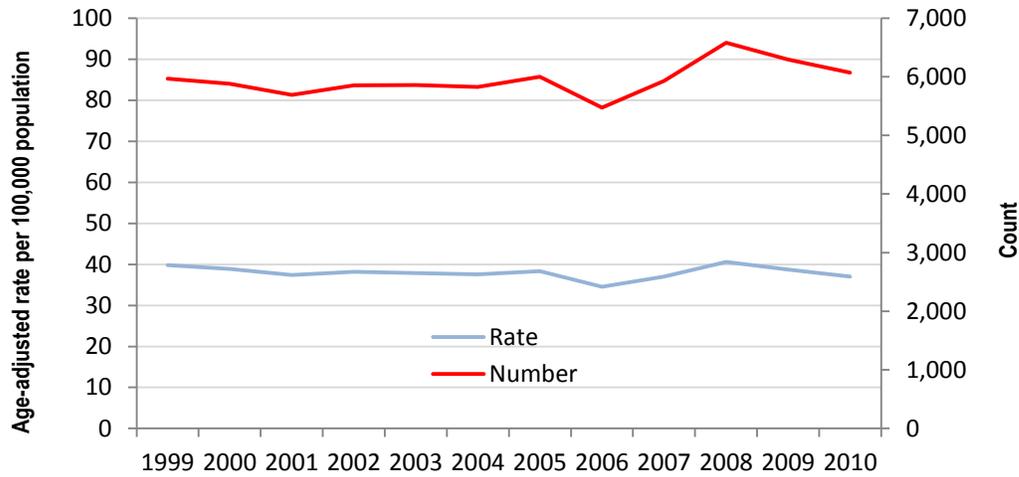
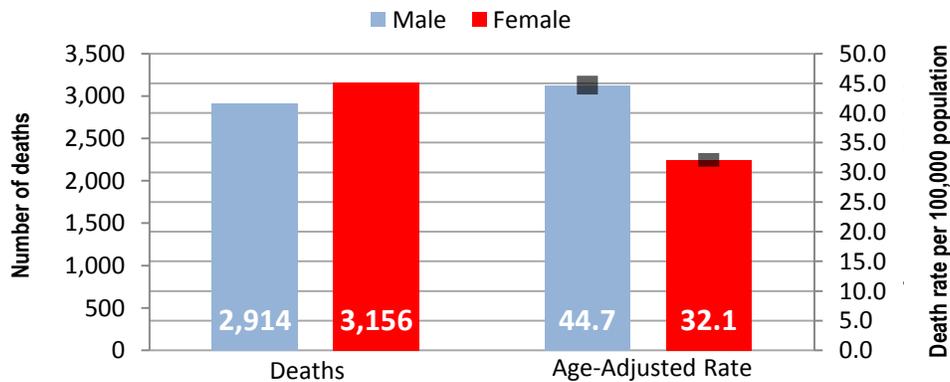


Figure 10.19 COPD, Age-Adjusted Mortality Rate by Sex, Pennsylvania, 2010¹¹



Risk Factors

Estimates suggest that 90 percent of COPD cases are caused by smoking. Other risk factors include: air pollution, secondhand smoke, history of childhood respiratory infections and heredity.

Resources

United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC)—
<http://www.cdc.gov/nchs/fastats/copd.htm>

Pennsylvania Health Care Cost Containment Council (PHC4)—<http://www.phc4.org>

The American Lung Association Estimated Prevalence Report—<http://www.lung.org/finding-cures/our-research/trend-reports/estimated-prevalence.pdf>

United States Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, COPD Fact Sheets, PA COPD Fact Sheet—
http://www.cdc.gov/copd/maps/docs/pdf/PA_COPDFactSheet.pdf

Endnotes

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² Vandivier R., Voelkel N. The challenges of chronic obstructive pulmonary disease (COPD) – a perspective. *COPD: Journal of Chronic Obstructive Pulmonary Disease*. Vol. 2, No.1, 2005; 178.

³ United States Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. (June 2012; 60(03)). *National vital statistics reports. Deaths: final data for 2009*. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf

⁴ United States Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. (June 2012; 60(03)). *National vital statistics reports. Deaths: final data for 2009*. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf

⁵ National Heart, Lung, and Blood Institute. *Morbidity and mortality: 2007 chart book on cardiovascular, lung, and blood disease*. Retrieved from <http://www.nhlbi.nih.gov/resources/docs/cht-book.htm>

⁶ United States Department of Health and Human Services, Centers for Disease Control and Prevention, COPD surveillance-US, 1971-2000. *MMWR*. 2002, (51(SS-6)). CDC. NHIS, 2011. Retrieved from <http://www.cdc.gov/MMWR/pdf/ss/ss5106.pdf>

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⁸ Pennsylvania Health Care Cost Containment Council (PHC4), *Chronic health conditions in Pennsylvania; diabetes, asthma, COPD, heart failure. A state of health care in Pennsylvania report, June 2010*. Retrieved from <http://www.phc4.org/reports/chroniccare/10/docs/chroniccare2010report.pdf>

⁹ Pennsylvania Department of Health, Bureau of Health Statistics and Research, table: *Resident deaths by age, sex, race and four digit ICD code, Pennsylvania 2010*.

¹⁰ CDC Wonder, 1999-2010. [Data file]. Retrieved from <http://wonder.cdc.gov/controller/datarequest/D77;jsessionid=54FA6684CE0C250772470888B91FB884>

¹¹ CDC Wonder, 2010. [Data file]. Retrieved from <http://wonder.cdc.gov/controller/datarequest/D77;jsessionid=54FA6684CE0C250772470888B91FB884>

Asthma

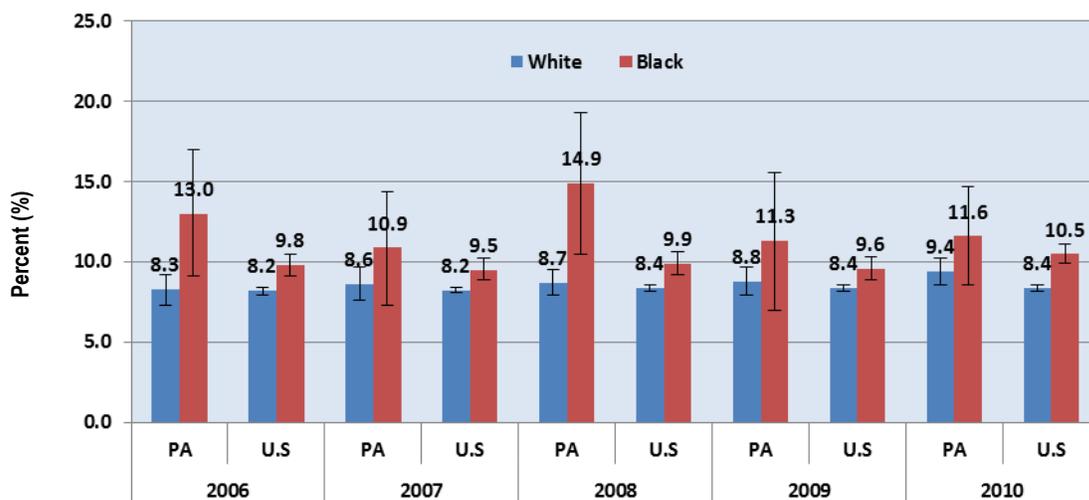
Asthma is a widespread and serious health threat. Asthma is a chronic inflammatory disorder of the airways characterized by episodes of reversible breathing problems due to airway narrowing and obstruction. These episodes can range in severity from mild to life threatening. Symptoms of asthma include wheezing, coughing, chest tightness and shortness of breath. Asthma symptoms can be controlled with appropriate medical treatment, including immunotherapy, self-management education and allergen avoidance. Although most people with asthma can be free of symptoms with appropriate management, poor asthma control continues to be associated with emergency department visits, hospitalizations and medical costs.

Estimates suggest that more than 25 million persons in the United States have asthma, about 8.2 percent of adults and 9.4 percent of children.¹ Asthma is the third leading cause of hospitalization among persons under 18 years of age and remains the most common chronic condition of childhood in the United States. In general, during the 10-year period from 2001 to 2010, the annual prevalence estimates of lifetime asthma among adults in both Pennsylvania and the U.S have increased significantly.²

Prevalence

Between 2006 and 2010, U.S. asthma prevalence of blacks and whites varied significantly. In Pennsylvania, asthma prevalence was higher among black adults than white adults every year and significantly higher in 2008.

Figure 10.20 Adult Self-Reported Current Asthma Prevalence Estimates by Race, Pennsylvania and United States, 2006 to 2010³



Note: Vertical bars denote the 95% confidence interval.

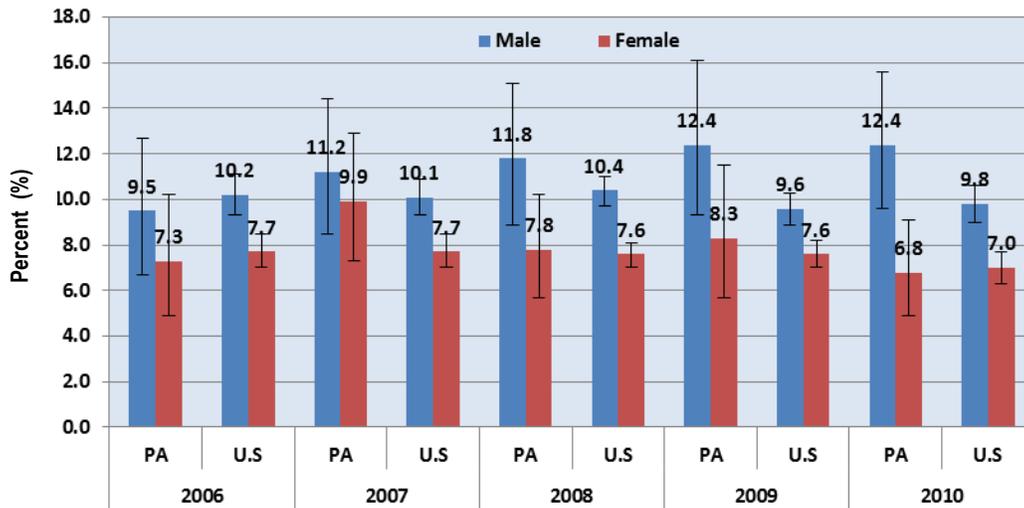
In Pennsylvania, during the five-year period of 2006 to 2010, the prevalence of asthma among males was higher than females every year and was significantly higher in 2010. Since 2007, the rate of asthma among children in Pennsylvania has been higher than the national rate.

In Pennsylvania, the child current asthma prevalence among males increased from 2006 to 2010 by approximately 30 percent. For the same time period, the comparable U.S. rate shows relatively little change.

From 2007 to 2011, the rate of children whose parents reported “they have asthma” on the Behavioral Risk Factor Surveillance System (BRFSS) survey was stable and without significant changes. Since 2007, self-reported current asthma prevalence among male children has been higher than females, although significant differences were found only in 2011. Pennsylvania State Health Assessment, 2013

There were no significant differences found among age groups, with the exception of 2011, in which significantly more 10 to 14 year olds were reported as having asthma than 0 to 4 year olds.

Figure 10.21 Child Current Asthma Prevalence Estimates by Sex, Pennsylvania and United States, 2006 to 2010⁴



Note: Vertical bars denote the 95% confidence interval.

Table 10.1 Current Asthma Prevalence Among Children, by Age Group and Sex, Pennsylvania 2007 to 2011⁵

	2007		2008		2009		2010		2011	
	Percent (%)	95% CI								
Overall	11	9-13	10	8-12	11	9-13	10	8-12	10	8-12
Sex										
Male	11	9-14	12	9-15	11	9-14	12	9-15	13	10-17
Female	10	8-13	8	6-10	10	8-13	8	6-10	7	5-9
Ages										
0 to 4 years	8	5-12	8	5-12	8	5-12	8	5-12	5	3-9
5 to 9 years	11	8-15	10	7-14	11	8-15	10	7-14	11	7-18
10 to 14 years	12	9-15	10	7-13	12	9-15	10	7-13	12	9-16
15 to 17 years	12	9-17	14	10-19	12	9-17	14	10-19	10	6-14

Note: CI denotes confidence interval.

From 2007 to 2011, the percent of adults who responded they “have asthma” on the BRFSS survey was stable. Self-reported current asthma prevalence among adults was significantly higher for females than males. It was also significantly higher for 18 to 29 year olds, compared to other age groups.

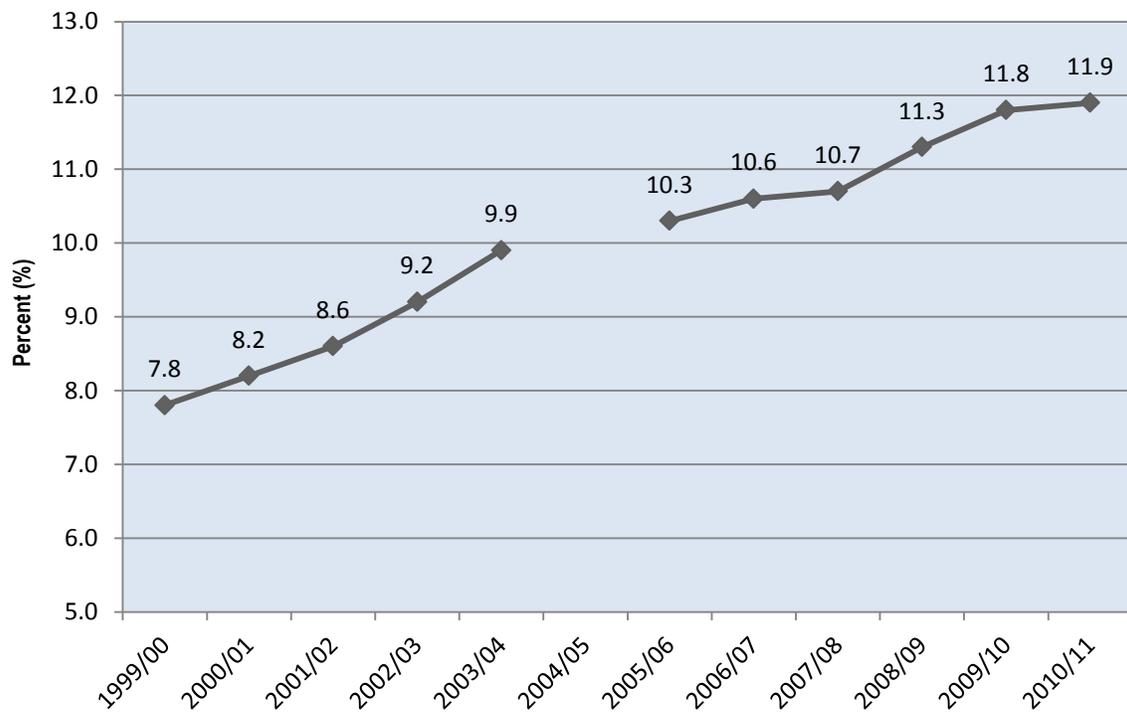
Table 10.2 Current Asthma Prevalence Among Adults, by Age Group and Sex, Pennsylvania, 2007 to 2011⁶

	2007		2008		2009		2010		2011	
	Percent (%)	95% CI								
Overall	9	8-10	9	8-10	9	8-10	10	9-11	9	8-10
Sex										
Male	7	6-9	7	6-8	7	5-8	8	6-9	7	6-8
Female	11	10-13	12	10-13	11	10-13	12	11-13	11	10-12
Ages										
18 to 29 years	15	11-20	10	8-14	12	9-16	13	10-16	12	9-15
30 to 44 years	8	7-10	9	8-11	10	9-12	9	8-11	10	8-11
45 to 64 years	8	7-10	9	8-11	8	7-9	11	10-12	8	7-9
≥65 years	7	6-8	8	7-10	7	6-8	8	7-9	7	6-9

Note: CI denotes confidence interval.

Data from school students shows increases in lifetime asthma prevalence among children. From the 1999-2000 school year to the 2010-2011 school year, the prevalence of lifetime asthma increased almost 52 percent. Approximately 160,700 Pennsylvania school students in kindergarten through 12th grade had been diagnosed with asthma in 1999-2000; by 2010-2011, that figure had increased to more than 228,800 students.

Figure 10.22 Lifetime Asthma Prevalence among School Students, Pennsylvania, 1999-2000 to 2010-2011⁷

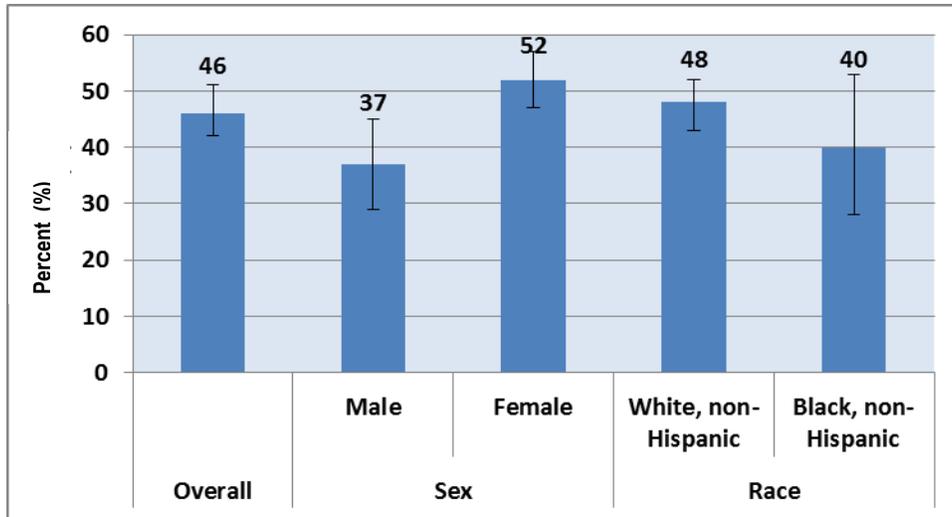


Management

In Pennsylvania, among adults who currently have asthma, 46 percent reported having one or more asthma attacks within the preceding 12 months, in response to the BRFSS question: "During the past 12 months, have you had an episode of asthma or an asthma attack?"

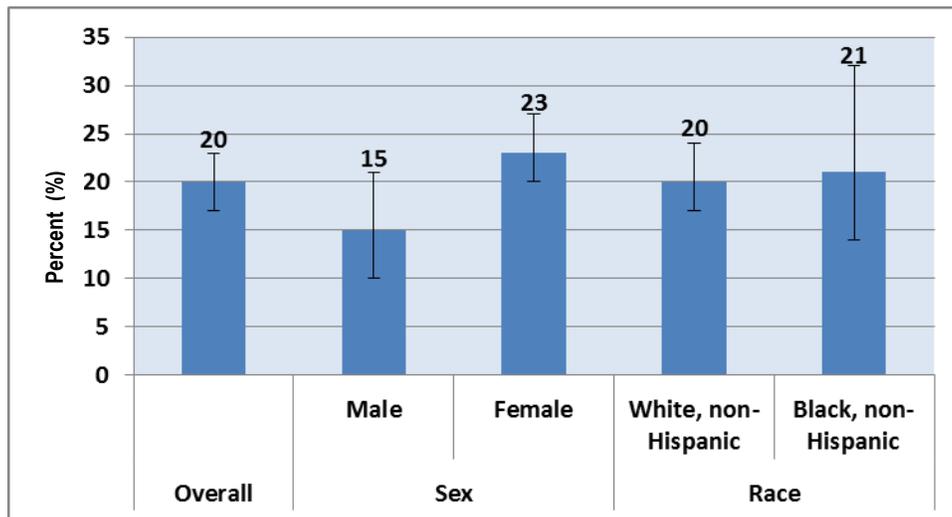
In addition, one out of five Pennsylvania adults with asthma reported being unable to work or carry out usual activities for at least one day during the past 12 months, in response to the BRFSS question: "During the past 12 months, how many days were you unable to work or carry out your usual activities because of asthma?"

Figure 10.23 Percent of Adults with Asthma Who Had an Asthma Episode Attack in the Past Year, Pennsylvania, 2010⁸



Note: Vertical bars denote the 95 percent confidence interval.

Figure 10.24 Percent of Adults with Asthma Who Were Unable to Work or Do Usual Activities \geq Once In the Past Year, Pennsylvania, 2010⁹



Note: Vertical bars denote the 95 percent confidence interval.

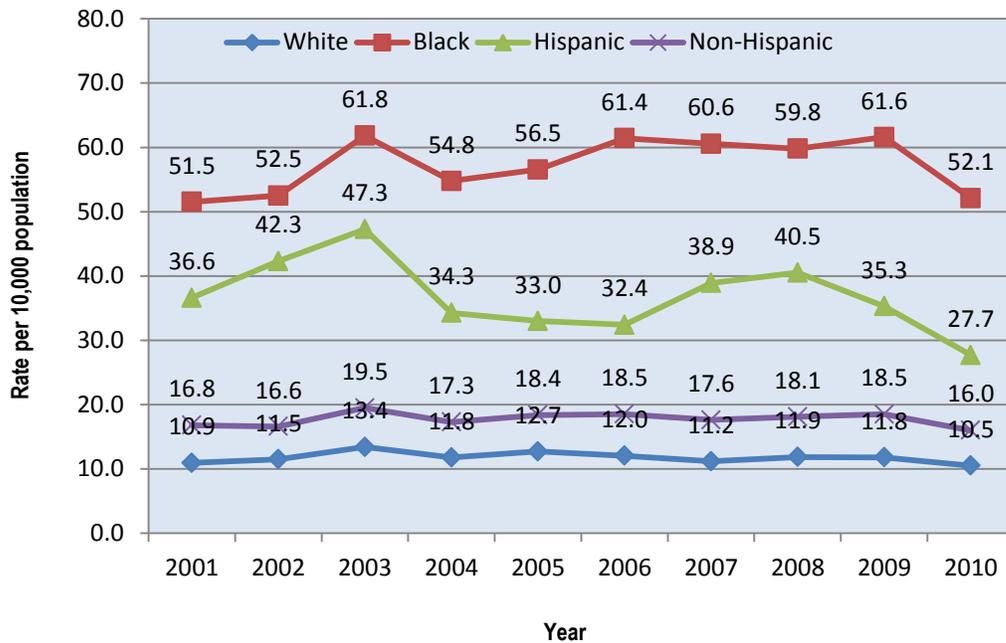
Hospitalizations

Figures 10.24 through 10.27 provide details about hospitalizations for asthma; that is, hospitalizations in which asthma was listed as the primary discharge diagnosis (ICD -9 code 493.00-493.99).

During the period between 2001 and 2010, Pennsylvania’s black residents had higher rates of inpatient hospitalization with asthma as the primary discharge diagnosis than white or Hispanic residents, and white residents had lower rates than other groups. Overall, between 2003 and 2010, rates of hospitalization due to asthma decreased.

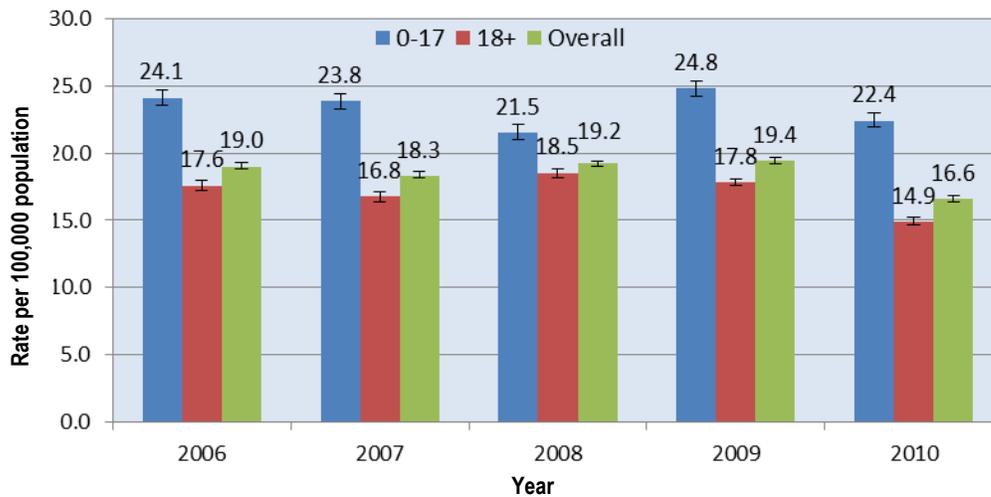
Between 2006 and 2010, rates of hospitalization with asthma as the primary discharge diagnosis were significantly higher among children than adults, by a range of 20 to 50 percent.

Figure 10.25 Trends of Inpatient Hospitalization with Asthma as the Primary Discharge Diagnosis, by Race and Ethnicity, Pennsylvania, 2001 to 2010¹⁰



In 2006-2010, inpatient hospitalization rates among children with asthma as the primary discharge diagnosis were significantly higher compared to adults (by approximately 20 percent to 50 percent depending on the year).

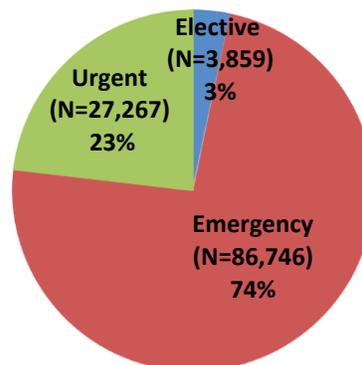
Figure 10.26 Rates of Inpatient Hospitalization with Asthma as the Primary Discharge Diagnosis Among Children and Adults, Pennsylvania, 2006 to 2010¹¹



Note: Vertical bars denote the 95% confidence interval.

Between 2006 and 2010, approximately 74 percent of all admissions with asthma as the primary discharge diagnosis entered hospitals through the emergency department. Around 23 percent of all such admissions entered the hospital through “urgent care” services, and nearly 3 percent were admitted electively. Reducing the number of emergency department visits may lead to improved quality of life and significant cost savings.

Figure 10.27 Admission Types for Inpatient Hospitalizations with Asthma as the Primary Discharge Diagnosis, Pennsylvania, 2006 to 2010 Combined¹²



In 2006 through 2010, the average charges for inpatient hospitalization with asthma as the primary discharge diagnosis were higher among adults compared to children (by approximately 50 to 90 percent). Overall, average charges were on the rise.

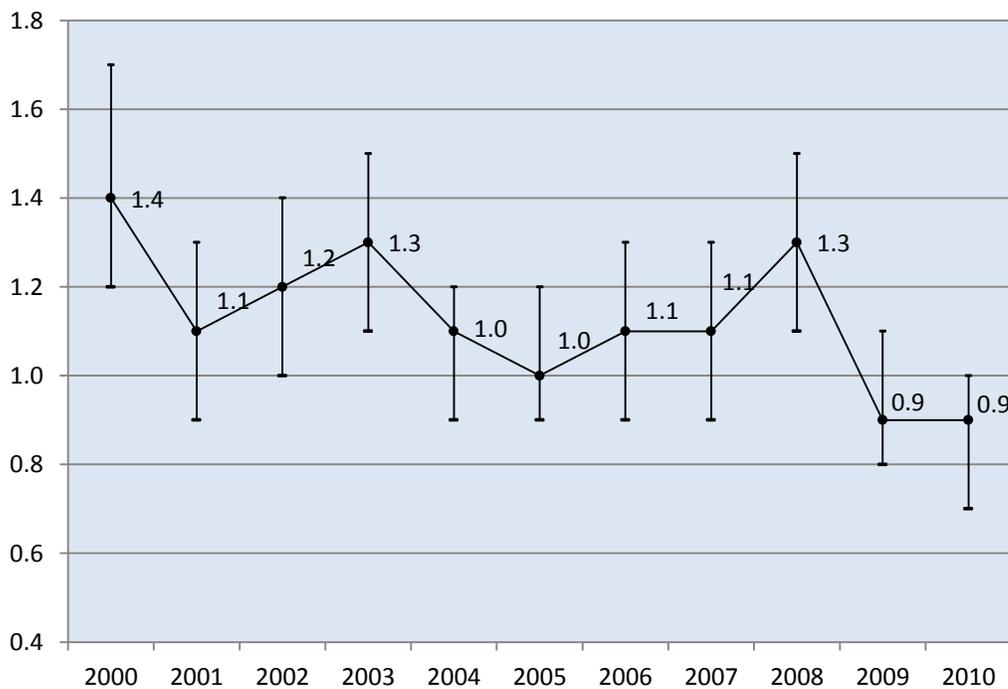
Figure 10.28 Average Charges per Inpatient Hospitalization with Asthma as the Primary Discharge Diagnosis, Children and Adults, Pennsylvania, 2006 to 2010¹³



Mortality

Looking only at data for deaths with asthma listed as the underlying cause, between 2000 and 2010, Pennsylvania's mortality rates due to asthma significantly decreased.

Figure 10.29 Age-Adjusted Asthma Death Rates, Pennsylvania, 2000 to 2010¹⁴



Note: Vertical bars denote the 95% confidence interval. Only includes deaths with asthma listed as the underlying cause.

Risk Factors

Asthma is a complex disease, and the exact cause is unknown. Risk factors¹⁵ for asthma under investigation include:

- **Genetic predisposition**—Including atopy or an allergic reaction, this can be detected by specific serum IgE or skin-test reactivity to environmental allergens, is often associated with asthma.
- **Sensitization to allergens and irritants**—This may include cat and other animal dander, dust mites, cockroaches, diesel exhaust particles, mold, house dust, pollen, fungus, medicine, workplace contaminants, and other triggers.
- **Contributing factors**—These may include respiratory infections (e.g., influenza, common cold), indoor and outdoor air quality, and cigarette smoke. Researchers have found sufficient data to suggest that air pollutants, such as ozone and particulate matter, decrease lung function, trigger exacerbations of asthma and increase rates of hospitalization for asthma.⁵

The disease can be controlled with medicine, immunotherapy, and avoiding triggers. If appropriate disease management is employed, persons with asthma can expect to prevent asthma symptoms during both day and night, reduce the number of absences from work or school, decrease the need for emergency department visits and hospitalizations, and maintain normal activity levels.

Endnotes

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³ United States Department of Health and Human Services, Centers for Disease Control and Prevention, National Asthma Triggers. (2006). *You can control your asthma: a guide to understanding asthma and its triggers* brochure. Retrieved from <http://www.cdc.gov/asthma/triggers.html>

⁴ United States Department of Health and Human Services, Centers for Disease Control and Prevention: National Center for Health Statistics, *National Hospital Discharge Surveys. 1995-2010*. Retrieved from <http://www.cdc.gov/nchs/nhds.htm>

⁵ United States Department of Health and Human Services, Centers for Disease Control and Prevention: National Center for Health Statistics, *National Health Interview Surveys*. Retrieved from <http://www.cdc.gov/nchs/nhis.htm>

⁶ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>

⁷ Pennsylvania Department of Health, Bureau of Community Health Systems (BCHS), Division of School Health

⁸ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>

⁹ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>

¹⁰ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹¹ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹² Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹³ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹⁴ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.pa.us/stats>

¹⁵ Asthma. (n.d.). *WebMD*. Retrieved from <http://www.webmd.com/asthma/guide/asthma-risk-factors>

Cancer

Cancer is a collective term for a group of diseases related to the uncontrolled growth and spread of abnormal cells, which can result in death. If detected early and treated promptly, many cancers can be cured.

Tobacco, diet and obesity are believed to be major contributors to the development of cancer. Other risk factors include: sedentary lifestyle, occupation, family history, viruses or biologic agents, prenatal factors or growth, reproductive factors, alcohol, socioeconomic status, environmental pollution, ionizing or ultraviolet radiation, and certain drugs or prescription medicines.

Primary prevention includes avoiding oncogenic exposures (e.g., tobacco, sun exposure, excess dietary fat). Secondary prevention includes early detection and treatment of benign precursor lesions. Depending on the type, cancer may be treated through surgery, radiation, chemotherapy, hormones and immunotherapy.

Although cancer can develop at any age, incidence rises with age and exposure to risk factors.

Table 10.3 Most Common Types of Cancer and New Diagnoses, Pennsylvania, 2009¹

Rank	Type of Cancer	New Cases in 2009
1	Lung and bronchus	10,608
2	Female breast	10,421
3	Prostate	9,742
4	Colon and rectum	7,316
5	Urinary bladder	3,846

About 75,781 Pennsylvania residents were diagnosed with invasive cancer in 2009; about 79,155 new cases were estimated for 2012. About 28,635 persons in Pennsylvania are projected to die from cancer in 2012; about 28,809 Pennsylvania residents died of cancer in 2010.

Overall, annual age-adjusted cancer incidence rates increased between 1990 and 2009, from 443.2 cases per 100,000 population to 503.9 cases per 100,000 population. The number of invasive cancers increased from 58,588 diagnosed in 1990 to an all-time high of 75,781 diagnosed cancers in 2009.

In 2010, the age-adjusted rate (179.4) for cancer deaths was the lowest recorded during the period 1990-2010. Similarly, cancer death rates among men and women have declined since 1990 and both had their lowest rates in 2010.

A cancer cluster is a larger than expected number of cancer cases diagnosed during a limited time period in a specific geographic area. Cancer clusters are investigated by examining data from cancer registries, and by comparing the observed number of cancers in a specific geographic area to the expected number.

Estimates

Using a basic statistical model, the Pennsylvania Department of Health calculates the estimated number of cancer diagnoses among Pennsylvania residents on a regular basis. For 2012, the "Average Day of Projected Cancer Cases" is as follows:

Sex—On average, an estimated 108 male residents were expected to be diagnosed with invasive cancer each day during 2012, totaling about 39,510 males. Prostate cancer was projected to be the most common cancer diagnosis for men, followed by lung/bronchus and colon/rectum cancers. An estimated 40 male deaths were expected from cancer in Pennsylvania each day. Lung and bronchus cancers are most deadly among males, accounting for an expected average of 11 deaths per day in 2012.

The DOH expected, on average, 109 females in Pennsylvania to be diagnosed with invasive cancer each day of 2012, for an estimated total of 39,640 cases. The most common cancer among women, breast cancer, is expected to have an average of 30 cases diagnosed each day. An estimated 38 deaths of females were expected from cancer each day of 2012. Lung and bronchus cancers are the most deadly among female residents, accounting for an expected average of 10 deaths per day in 2012.

Figure 10.30 Projected Daily Cancer Cases and Deaths for Major Primary Cancer Sites, Males, Pennsylvania, 2012

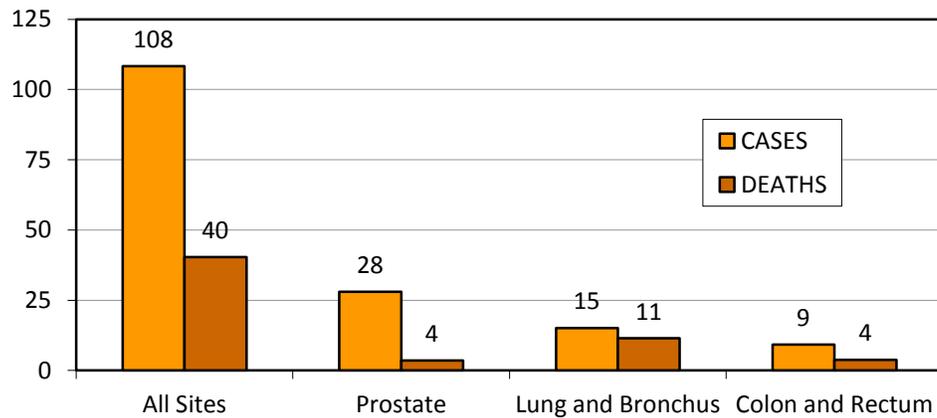
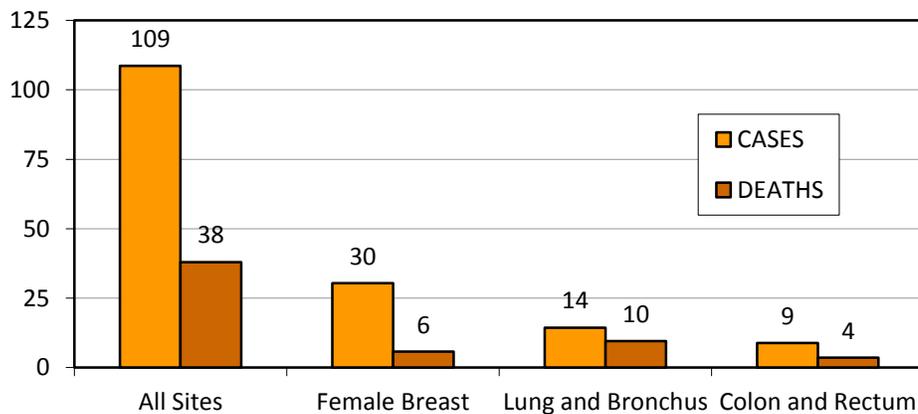


Figure 10.31 Projected Daily Cancer Cases and Deaths for Major Primary Cancer Sites, Females, Pennsylvania, 2012



Incidence

Overall, the age-adjusted cancer incidence rates for cancers in Pennsylvania have increased slightly between 1999 and 2009. During this period, state cancer rates decreased from 510.2 cases per 100,000 population in 2001 to 488.6 cases per 100,000 population in 2004. By 2007, the age-adjusted cancer incidence rate rose to an all-time high of 511.7 cases per 100,000 population, but it declined to 503.9 by 2009.

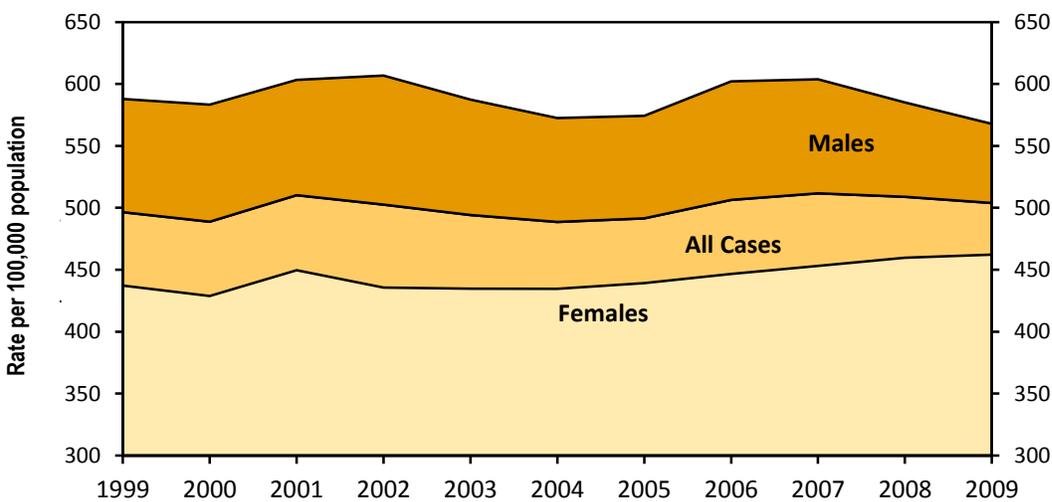
Analysis reveals that many different types of cancer contributed to the increase, including lung/bronchus, skin melanoma, non-Hodgkin's lymphoma, thyroid and kidney/renal pelvis. However, cancer rates have decreased among

Pennsylvania’s residents for several major primary sites during the 1999 to 2009 period, including cancers of the colon/rectum and prostate.

Sex—Age-adjusted cancer incidence rate for males in Pennsylvania increased from 587.9 per 100,000 population in 1999 to a high of 606.8 in 2002. The rate then decreased to a low of 572.5 in 2004, followed by an increase to 603.8 in 2007. The rate dropped to 567.8 in 2009. Cancers of the kidney/renal pelvis, melanoma, thyroid, liver/intrahepatic bile duct and non-Hodgkin’s lymphoma had the largest increases of cases among males during this period. However, cancers of the colon/rectum and prostate had the largest decreases among males. In general, for Pennsylvania’s residents, male cancer rates have been consistently higher than female cancer rates. The age-adjusted incidence rate for males in 2009 was 567.8 per 100,000 population; it was 462.2 for females. In 1999, the age-adjusted incidence rate for males was 587.9 per; for females, it was 437.2.

From 1999 to 2009, the age-adjusted cancer incidence rate among female residents has generally increased, from 437.2 to an all-time high for females in the state of 462.2 per 100,000 population. Cancers of the lung/bronchus, thyroid, corpus uterus and kidney/renal pelvis had the largest increases of cases during this timeframe. Decreases were observed for colon/rectum and ovary cancers among females in Pennsylvania. Over the years, females in Pennsylvania have had much lower cancer rates than their male peers.

Figure 10.32 Age-Adjusted Invasive Cancer Incidence Rates by Sex, Pennsylvania, 1999 to 2009



Note: Age-adjusted rates are computed by the direct method, using 2000 U.S. standard million population.

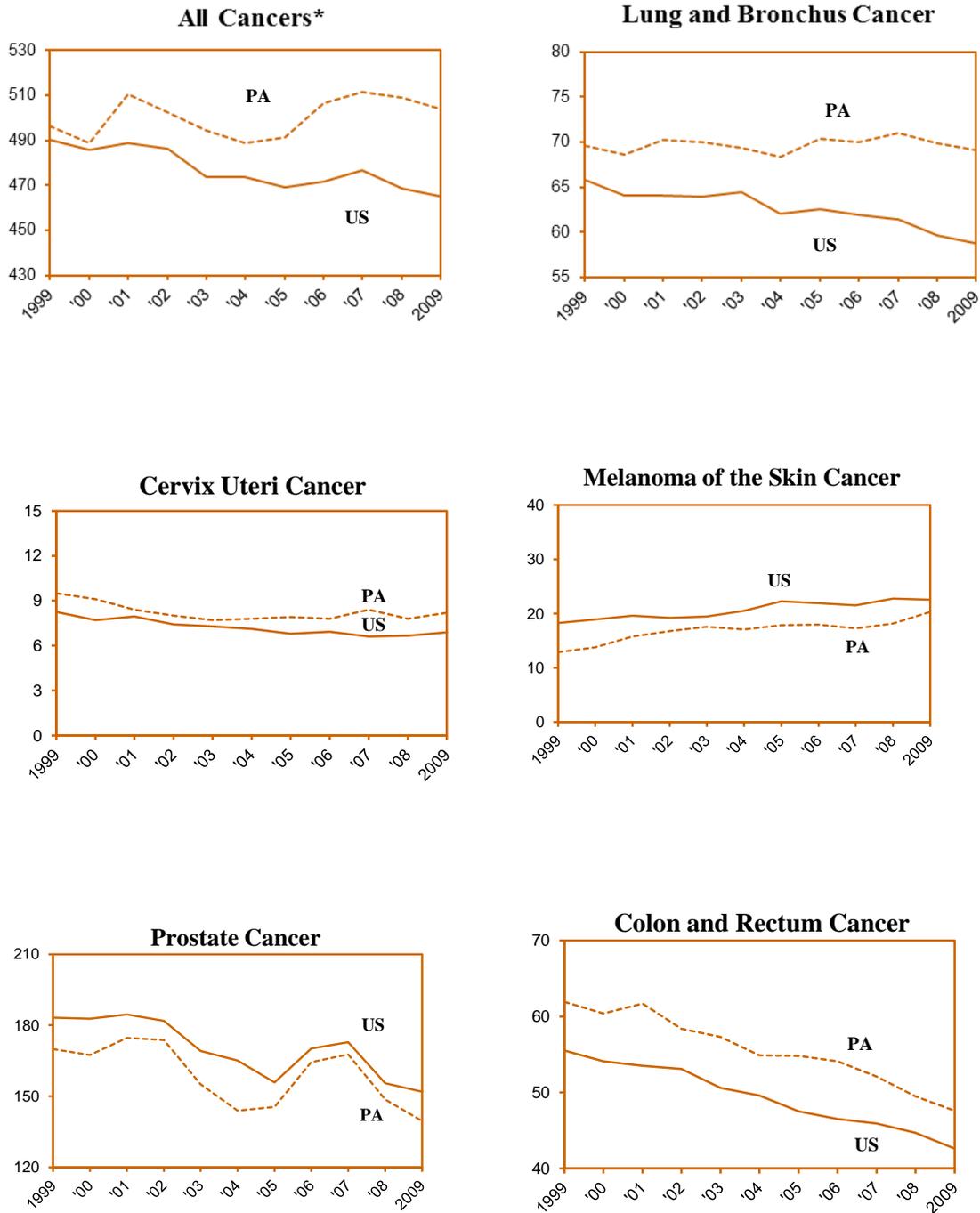
Race and Ethnicity—Among white residents of Pennsylvania, the annual age-adjusted cancer incidence rate had small increases and decreases between 1999 and 2009. Specifically, the 1999 rate of 482.9 per 100,000 population increased to a high of 506.3 per 100,000 population in 2001 and then decreased to 482.3 per 100,000 in 2004 before rebounding to 502.00 in 2007. The 2009 rate was ultimately 493.7 per 100,000.

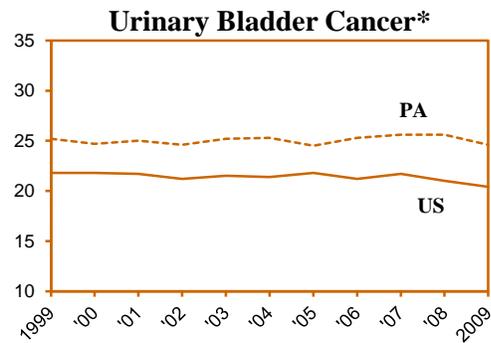
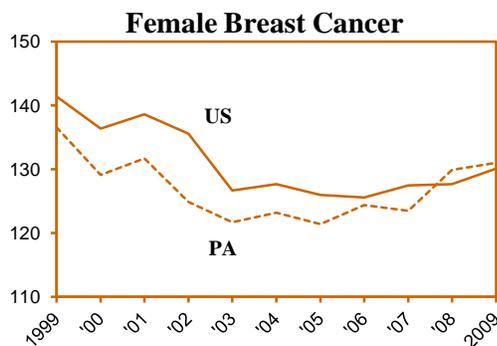
For black residents of Pennsylvania, between 1999 and 2009, age-adjusted incidence rates fluctuated between a high of 562.3 per 100,000 population in 2001 and a low of 521.2 in 2006. Since 2007, cancer incidence rates among blacks have been climbing consistently, compared to whites.

Incidence: Pennsylvania and United States

Age-adjusted incidence rates for all invasive cancers collectively show Pennsylvania had rates similar to the United States in 1999 and 2000. However, it had higher rates for 2001 to 2009. In 2009, the state rate of 503.9 per 100,000 population was 8 percent higher than the national rate of 464.9 per 100,000 population.

Figure 10.33 Incidence of Invasive Cancer by Type, Pennsylvania and United States, 1999 to 2009





NOTES: Age-adjusted rates are computed by the direct method using the 2000 U.S. standard million population. U.S. age-adjusted rates were calculated from the National Cancer Institute's SEER program (based on 9 registries).

*Includes in situ urinary bladder cancers

Lung and Bronchus—From 1999 to 2009, age-adjusted incidence rates for lung and bronchus cancer were higher for Pennsylvania than the U.S. The 2009 state rate of 69.1 per 100,000 population was 18 percent greater than the U.S. rate of 58.8 per 100,000 population. Overall, Pennsylvania's rate was unchanged during the time period, while U.S. rates declined. In 2009, about 75 percent of lung and bronchus cancers in Pennsylvania were diagnosed at a late (regional or distant) stage of the disease; for 8 percent of cases, the stage at diagnosis was unknown. A total of 10,608 cases were reported in 2009; projected figures for 2012 put the number of cases at about 10,755.

Cervix Uteri—From 1999 to 2009, age-adjusted incidence rates for cervix uteri cancer were higher for Pennsylvania than the U.S. The highest rates occurred during 1999 for both the U.S. and the state. In both Pennsylvania and the U.S., cervix uteri is one of the least commonly occurring types of cancer, with incidence rates showing very little change over time.

Melanoma of the Skin—From 1999 to 2009, age-adjusted incidence rates for melanoma of the skin were lower in Pennsylvania than for the nation as a whole. However, both state and U.S. rates increased during this time. Pennsylvania's rate increased 57 percent, from 12.9 cases per 100,000 population in 1999 to 20.3 cases per 100,000 population in 2009. The U.S. rate increased 23 percent, from 18.3 cases per 100,000 population in 1999 to 22.6 per 100,000 population in 2009.

Prostate—From 1999 to 2009, age-adjusted incidence rates for prostate cancer were lower in Pennsylvania than the U.S. Both areas had their highest rates from 1999 to 2002 and again in 2007. Rates have since decreased to their lowest number since 2009. In addition, during the period 1999 to 2009, the state's annual age-adjusted incidence rate for prostate cancer fluctuated substantially. Overall, there are no obvious trends. About 10,240 cases were projected for 2012, compared to 9,742 cases in 2009.

Colon and Rectum—Age-adjusted incidence rates for colon and rectum cancer among Pennsylvania residents were consistently higher than U.S. rates between 1999 and 2009. Overall, both Pennsylvania and U.S. rates have declined since 1999. The age-adjusted incidence rate for Pennsylvanians diagnosed with invasive colon and rectum cancer has generally been on the decline since 1999; the number of new cases projected for 2012 is 6,605, about 10 percent lower than the 7,316 reported cases for 2009.

Female Breast—From 1999 to 2007, age-adjusted incidence rates for female breast cancer in Pennsylvania were consistently lower than the U.S. rates, but since 2008 the state's rates have been slightly higher than U.S. figures. Rates for both areas decreased since 1999 but increased slightly in recent years. The 2009 rate of invasive female breast cancer for Pennsylvania was 131.0 per 100,000 population, which is down from the 1999 rate of 136.6 per 100,000 population but

higher than the 1005 rate of 121.4 per 100,000. Recent data on staging show more diagnoses at the in situ stage, compared to past years. About 11,100 diagnoses were expected for 2012, compared to 10,421 in 2009.

Urinary Bladder—Age-adjusted incidence rates for urinary bladder cancer were higher for Pennsylvania than the U.S. throughout the 1999 to 2009 period. Incidence rates have not changed much since 1999 for either area.

Mortality

Pennsylvania’s age-adjusted cancer mortality rate for all cancers declined between 1999 and 2010. Specifically, the 2010 rate of 179.4 per 100,000 population was 14 percent lower than the 1999 rate of 208.3 per 100,000 population. The decline has been consistent, with the highest rate in 1999 and the lowest in 2010. Declining numbers of death from cancer during this period were observed among several major primary sites, including lung/bronchus, color/rectum, female breast, prostate, non-Hodgkin’s lymphoma and stomach cancers. Increasing death counts were observed for pancreatic, liver/intrahepatic bile duct, melanoma, esophageal and urinary bladder cancers.

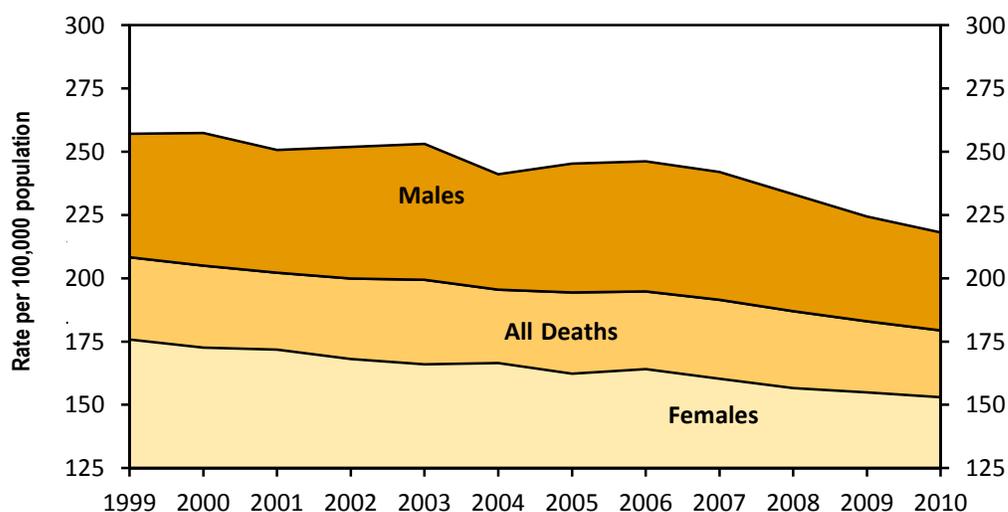
Sex—In 1999, the age-adjusted mortality rate for all cancers among males was 257.1 per 100,000 population. By 2010, the rate declined about 18 percent to 218.1 per 100,000 population. During this period, the highest rate of 257.4 per 100,000 population occurred in 2000, while the lowest rate occurred in 2010. However, the 2010 cancer mortality rate for males in Pennsylvania was 43 percent higher than the rate of cancer mortality for female residents.

As with male residents, the age-adjusted mortality rate for cancer among females consistently declined between 1999 and 2010. The 2010 rate of 153.0 per 100,000 population was nearly 13 percent lower than the 1999 rate of 175.8 per 100,000 population. During the 12-year period, the highest rate occurred in 1999, and the lowest rate occurred in 2010. Cancer death rates among women in Pennsylvania have been lower than male rates, consistently.

Race and Ethnicity—Annual age-adjusted cancer death rates for white residents have generally been on the decline since 1999. The 2010 rate of 178.5 per 100,000 population was 12 percent lower than the 1999 rate of 202.0. During this period, the highest rate (202.0 per 100,000) and the lowest rate, of 178.5 per 100,000 population occurred in 2010.

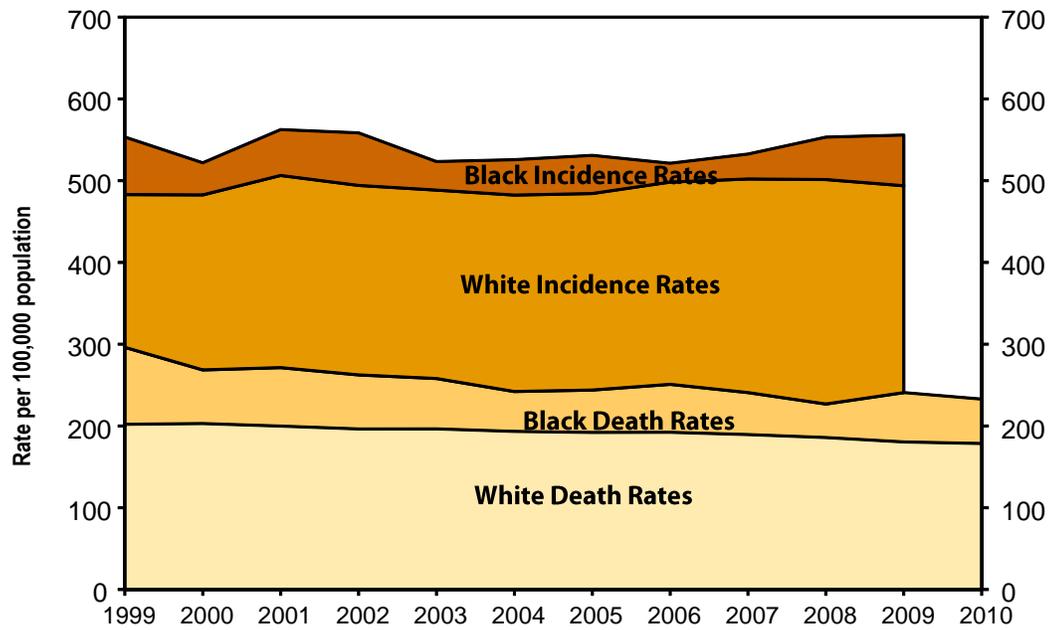
Among black residents of Pennsylvania, the annual age-adjusted cancer mortality rates between 1999 and 2010 showed an overall decline; from a high of 296.1 per 100,000 in 1000, the mortality rate decreased about 23 percent. The 2010 cancer death rate for black residents (232.8 per 100,000) was 30 percent higher than the corresponding weight for white residents, 178.5 per 100,000 population.

Figure 10.34 Age-Adjusted Invasive Cancer Death Rates by Sex, Pennsylvania, 1999 to 2010



Note: Age-adjusted rates are computed by the direct method, using 2000 U.S. standard million population.

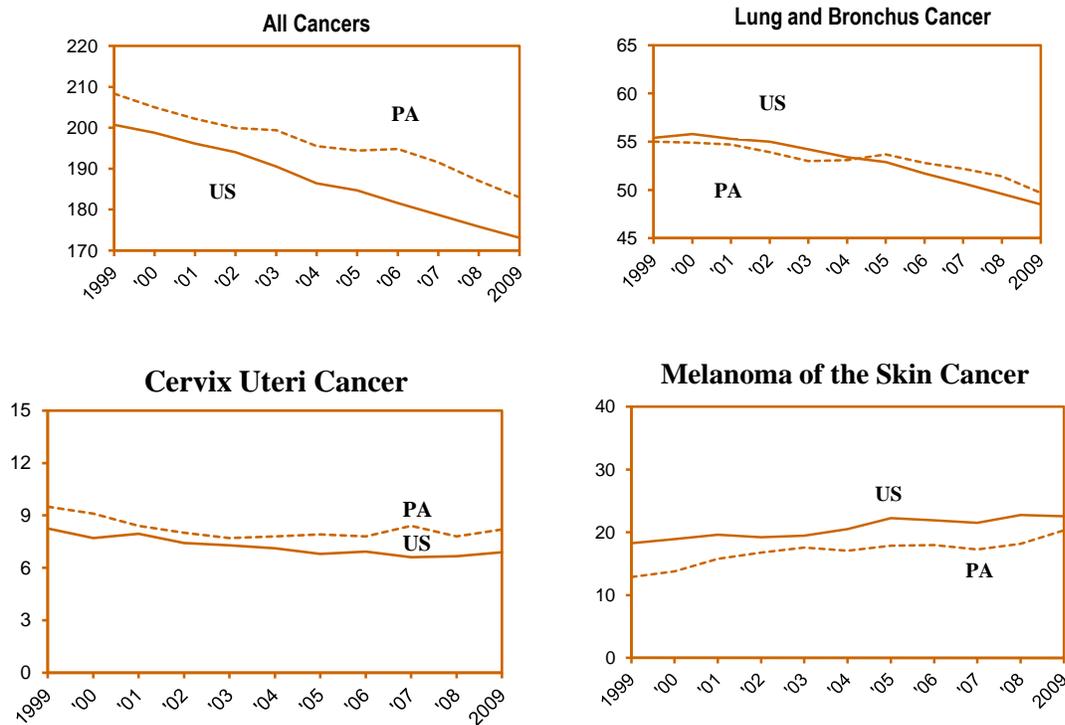
Figure 10.35 Age-Adjusted Invasive Cancer Incidence and Death Rates by Race, Pennsylvania, 1999 to 2010

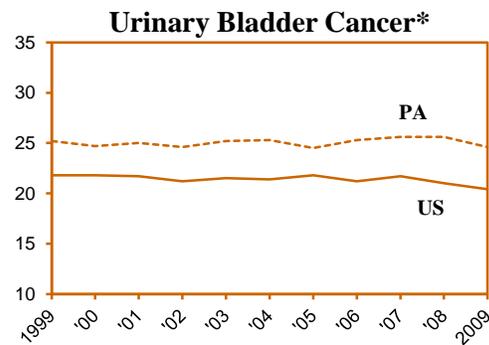
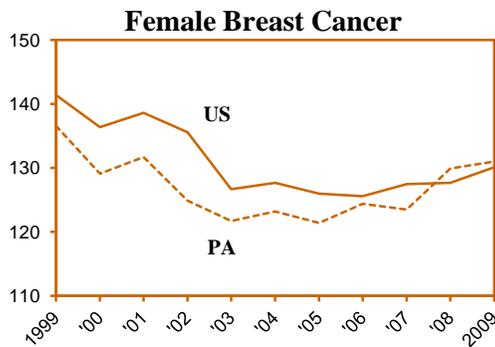
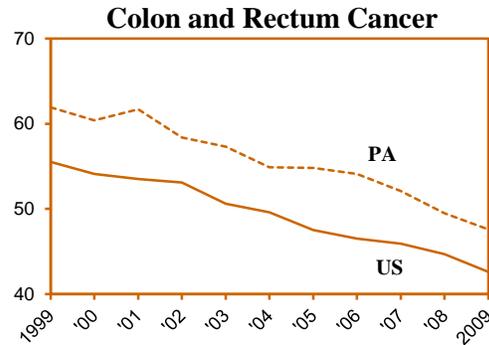
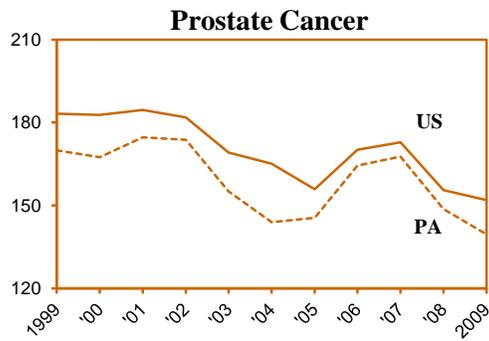


Note: Age-adjusted rates are computed by the direct method using the 2000 U.S. standard million population. Incidence rates are based on invasive (and in situ urinary bladder) cancers.

Mortality: Pennsylvania and the United States

Figure 10.36 Mortality of Invasive Cancer by Type, Pennsylvania and United States, 1999 to 2009





NOTE: Age-adjusted rates are computed by the direct method using the 2000 U.S. standard million population. U.S. age-adjusted rates were calculated from the National Cancer Institute's SEER program.

All Cancers – Between 1999 and 2009, the annual age-adjusted cancer mortality rates in Pennsylvania and the U.S. have generally declined, but Pennsylvania's rates were consistently higher than comparable U.S. mortality rates.

Lung and Bronchus Cancer – Annual age-adjusted mortality rates for lung and bronchus cancer were similar for both Pennsylvania residents and the U.S. during the period of 1999-2009. The mortality rates for both the U.S. and Pennsylvania have decreased during this 11-year period. Pennsylvania deaths are projected to be about 7,610 in 2012.

Cervix Uteri Cancer – Overall, the age-adjusted mortality rates for cervix uteri cancer were similar for both Pennsylvania residents and the U.S. during the period of 1999-2009 with a gradual decline.

Melanoma of the Skin Cancer – Overall, the age-adjusted mortality rates for Melanoma of the skin cancer were similar for both Pennsylvania residents and the U.S. during the period of 1999-2009 with a gradual increase.

Prostate Cancer – Overall, age-adjusted mortality rates for prostate cancer have been on the decline since 1999 for both the U.S. and Pennsylvania. However, mortality rates in Pennsylvania had a few minor increases over the 11-year period.

Colon and Rectum Cancer – Age-adjusted mortality rates for colon and rectum cancer in both Pennsylvania and the U.S. have declined since 1999. However, the rates for Pennsylvania were consistently higher than the rates for the U.S. between the years 1999 and 2009. The number of Pennsylvania resident deaths for 2012 is expected to be slightly lower – 2,665 compared to 2,755 in 2010.

Female Breast Cancer – Between 1999 and 2009, the annual age-adjusted mortality rates for female breast cancer decreased in Pennsylvania and the U.S. The rates for Pennsylvania residents remained slightly higher than U.S. figures throughout this 11-year period. The number of breast cancer deaths in 2012 is estimated to be about 2,080 – slightly more than the 2,071 deaths reported in 2010.

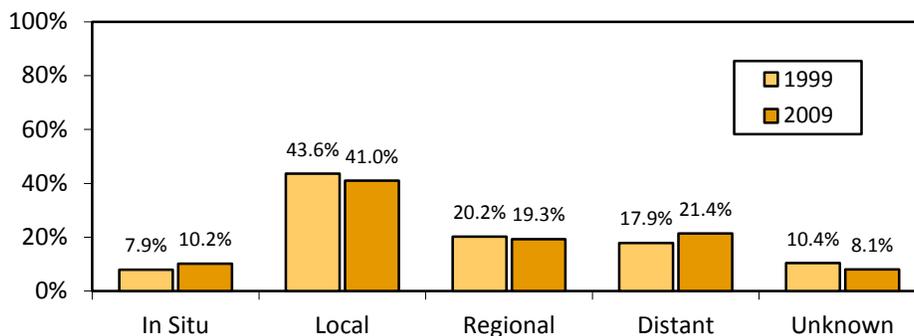
Urinary Bladder Cancer – Mortality rates for urinary bladder cancer have not changed much over the years. Between 1999 and 2009, most mortality rates were slightly higher for residents of Pennsylvania than for the U.S.

Diagnosis

When cancers are diagnosed during an early (in situ or local) stage, treatment can be effective, and survival rates are higher than for cancers diagnosed during a late (regional or distant) stage. According to the National Cancer Institute’s Surveillance, Epidemiology and End Results (SEER) program, late stage cancer diagnoses are more difficult to treat successfully and have lower survival rates than early stage diagnoses.

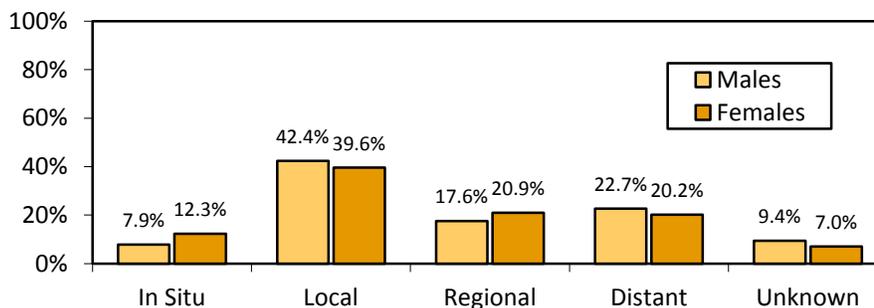
In Pennsylvania, early stage diagnosis accounted for approximately 51 percent of cases in 1999 and also 2009. During this timeframe, in situ diagnoses have increased from 7.9 percent to 10.2 percent, while local stage diagnoses decreased slightly from 43.6 percent to 41.0 percent. Regional stage diagnoses also had a small decrease, from 20.2 percent to 19.3 percent. However, diagnoses during the distant stage increased from 17.9 percent to 21.4 percent. The stage of diagnosis was unknown for 10.4 percent of diagnoses in 1999 and 8.1 percent in 2009.

Figure 10.37 Cancer Cases by Stage at Diagnosis, Pennsylvania, 1999 and 2009



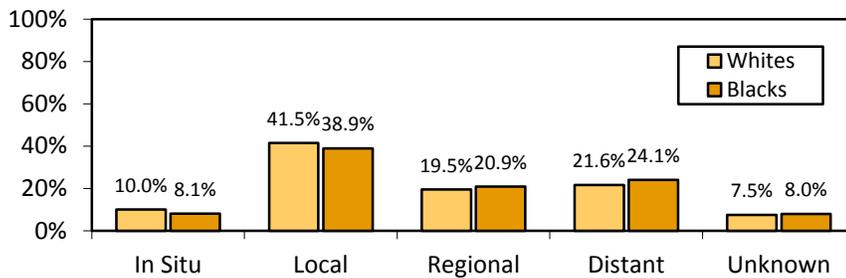
Sex– In 2009, there were only small differences in stage of diagnosis between men and women for all cancers. Early stage diagnoses occurred for 50.3 percent of men and 51.9 percent of women, respectively. Women did have a higher percentage of in situ diagnoses, 12.3 percent versus 7.9 percent. However, cancer diagnosis at the local stage was higher for men, at 42.4 percent, than for women, 39.6 percent. Overall, women had a slightly higher percent of late stage diagnosis at 41.1 percent, compared to males’ 40.3 percent. Men also had a smaller percent of cancers diagnosed at the regional stage. However, men had a larger percent of diagnoses at the distant stage than women did. The percent of “unknown stage” cases was slightly lower among women than men, at 7.0 percent and 9.4 percent, respectively.

Figure 10.38 Cancer Cases by Stage at Diagnosis, by Sex, Pennsylvania, 2009



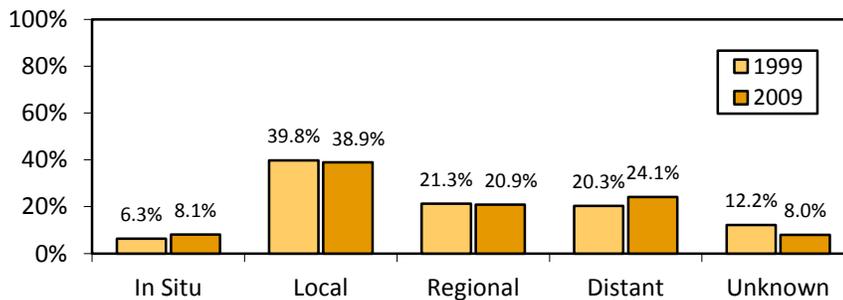
Race and ethnicity– In 2009, the percent of early stage (in situ and local) cancer diagnoses in Pennsylvania was slightly higher for white residents than black residents. For white residents, in situ stage made up 10.0 percent of diagnoses and local stage 41.5 percent; for black residents, in situ diagnoses were made in 8.1 percent of cases for black residents, and local stage diagnosis occurred in 38.9 percent of cases. The percent of diagnoses of regionally staged cancers was slightly lower among whites than blacks, at 19.5 percent and 20.9 percent, respectively. Black residents had a higher percent of cancers diagnosed at the distant stage, at 24.1 compared to 21.6 of diagnoses for white Pennsylvania residents. The percentage of diagnoses listed as “unknown” stage was slightly higher among black residents than whites, at 8.0 percent and 7.5 percent.

Figure 10.39 Cancer Cases by Stage at Diagnosis, by Race and Ethnicity, Pennsylvania, 2009



Comparing data from 1999 and 2009, the percent of in situ cases diagnosed among black Pennsylvania residents increased from 6.3 percent to 8.1 percent during that time frame. The percent of diagnoses made at the local and regional stages of disease progression were slightly lower in 2009 than in 2008, while the percent made at the distant stage seemed to increase, from 20.3 percent to 24.1 percent. However, diagnosis was made at an “unknown” stage in 12.2 percent of cases in 1999 and 8.0 percent of cases in 2009, making it difficult to interpret small differences.

Figure 10.40 Cancer Cases by Stage at Diagnosis, Black Residents, Pennsylvania, 1999 and 2009



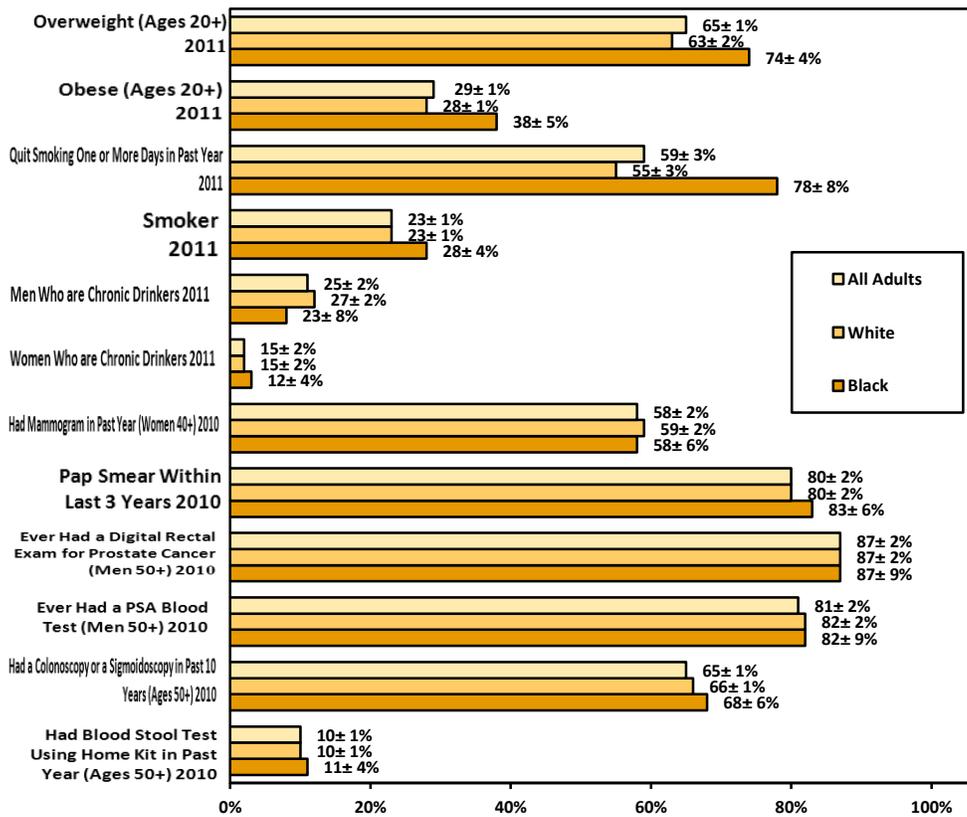
Risk Factors

As part of the Behavioral Risk Factor Surveillance System (BRFSS), the Pennsylvania Department of Health conducts an annual telephone survey of a random sample of adult residents age 18 and older. Results from the 2011 survey for those risk factors identified as relevant to cancer incidence are shown below for all respondents, white non-Hispanic respondents, and black non-Hispanic respondents.

As shown below according to BRFSS data, in Pennsylvania, black residents aged 20 and older had a significantly higher prevalence of overweight (74 percent) and obesity (38 percent), compared to white peers (65 percent and 29 percent

respectively). White adults were significantly less likely to report that they had quit smoking one or more days in the past year than were blacks, at rates of 55 percent and 78 percent, respectively.

Figure 10.41 Selected Behavioral Risk Factors by Race, Pennsylvania, 2010 and 2011



NOTES: The estimated percent prevalences were calculated using weighted data (i.e., the age, sex and race distribution of the estimated state population) and were age-adjusted to the 2000 U.S. standard million population. Data include 95percent confidence intervals (±). Data for whites and blacks exclude Hispanics.

Projected Incidence

The number of invasive cancer cases among Pennsylvania residents is projected to increase by 4.5 percent between 2009 and 2012, from 75,781 to 79,155. Eight cancer sites – female breast, thyroid, prostate, kidney/renal pelvis, corpus/uterus, liver/intrahepatic bile duct, oral cavity/pharynx and urinary bladder – are projected to have the largest increases. The only sizeable decline is expected to occur for cancers of the colon/rectum. Overall, 22 of the 23 primary cancer sites are expected to show increases in 2012 compared to 2009, although many of the increases are expected to be small.

Sex-- Among males, the number of cancer cases is projected to increase by 4.1 percent between 2009 and 2012, from 37,960 to 39,510. The largest increases are expected for prostate (498 more cases), kidney/renal pelvis (210 more cases), thyroid (208 more cases), liver/intrahepatic bile duct (141 more cases) and oral cavity/pharynx (102 more cases). The largest decreases are expected for cancer of the colon/rectum (317 fewer cases) and lung/bronchus (114 fewer cases).

Among females, cancer cases are expected to increase by 4.8 percent between 2009 and 2012, from 37,820 to 39,640. Sites with the largest expected increases include: breast (679 more cases), thyroid (451 more cases), lung/bronchus (261 more cases), corpus/uterus (230 more cases) and oral cavity/pharynx (98 more cases). The only sizeable decrease is expected to occur for cancers of the colon/rectum (399 fewer cases).

Table 10.4 Projected and Observed Cases of Invasive Cancer by Sex, Pennsylvania, 2009 and 2012

	ALL CASES			MALES			FEMALES		
	2012 Projected	2009 Observed	Percent (%) Change	2012 Projected	2009 Observed	Percent (%) Change	2012 Projected	2009 Observed	Percent (%) Change
TOTAL	79,155	75,781	4.5	39,510	37,960	4.1	39,640	37,820	4.8
Brain and other nervous system	990*	976	1.4	530*	530	0.0	460*	446	3.1
Cervix uteri	570	559	2.0	--	--	--	570	559	2.0
Colon and rectum	6,605	7,316	-9.7	3,375	3,692	-8.6	3,225	3,624	-11.0
Corpus/uterus NOS	2,825	2,595	8.9	--	--	--	2,825	2,595	8.9
Esophagus	835*	827	1.0	685	655	4.6	185*	172	7.6
Female breast	11,100	10,421	6.5	--	--	--	11,100	10,421	6.5
Hodgkin's lymphoma	470	446	5.4	265	236	12.3	200*	210	-4.8
Kidney/renal pelvis	2,735	2,492	9.8	1,710	1,500	14.0	970*	992	-2.2
Larynx	605*	571	6.0	480*	423	13.5	150	148	1.4
Leukemia	1,960	1,937	1.2	1,140	1,107	3.0	795*	830	-4.2
Liver/intrahepatic bile duct	1,335	1,110	20.3	935	794	17.8	400	316	26.6
Lung and bronchus	10,755	10,608	1.4	5,500	5,614	-2.0	5,255	4,994	5.2
Melanoma of skin	3,080	2,940	4.8	1,755	1,656	6.0	1,325	1,284	3.2
Myeloma	1,030	948	8.6	560	506	10.7	470	442	6.3
Non-Hodgkin's lymphoma	3,445	3,302	4.3	1,820	1,773	2.7	1,620	1,529	6.0
Oral cavity/pharynx	1,870	1,670	12.0	1,250	1,148	8.9	620	522	18.8
Ovary	1,085*	1,076	0.8	--	--	--	1,085*	1,076	0.8
Pancreas	2,065	1,948	6.0	1,015	949	7.0	1,050	999	5.1
Prostate	10,240*	9,742	5.1	10,240*	9,742	5.1	--	--	--
Stomach	1,060*	1,030	2.9	665*	638	4.2	370	392	-5.6
Testis	410	381	7.6	410	380	7.9	--	--	--
Thyroid	3,345	2,686	24.5	860	652	31.9	2,485	2,034	22.2
Urinary bladder	4,045	3,845	5.2	3,065	2,867	6.9	975*	978	-0.3

Note: Males and females may not sum to the total due to independent analysis by sex and by total. Projections are rounded to the nearest whole five. Pennsylvania's cancer primary site groupings match the definitions used by the SEER program. *The arithmetic mean for 2005 to 2009 was used to estimate the number of cases. See Technical Notes in *Cancer Facts and Figures, Pennsylvania 2012* for additional information.

Projected Mortality

The projected number of cancer deaths among Pennsylvania residents in 2012 is about 28,635, down from 28,809 in 2010. Among the 23 anatomical sites of cancer, 14 are expected to cause fewer deaths in 2012 compared to 2010. The largest and only sizeable increase in the number of deaths is expected for cancers of the liver/intrahepatic bile duct (89 more deaths). The greatest declines in the number of cancer deaths are projected for cancer of the lung/bronchus (119 fewer deaths) and colon/rectum (90 fewer deaths).

Sex—Males are projected to have about 14,730 cancer deaths in 2012, down from 14,773 in 2010. Among the 23 sites, the largest drops in cancer deaths among males between 2010 and 2012 are lung/bronchus (136 fewer deaths) and

colon/rectum (68 fewer deaths). The largest and only sizeable increase in cancer deaths for males is expected for liver/intrahepatic bile duct cancer (92 more deaths).

The number of cancer deaths for females in Pennsylvania is also expected to decrease, from 14,036 in 2010 to 13,870 in 2012. Among the 23 sites, the largest decline is expected to be for colon/rectum (75 fewer deaths), and the largest increase is expected for lung/bronchus cancer deaths (52 more deaths in 2012 than 2010).

Table 10.5 Projected and Observed Deaths from Invasive Cancer by Sex, Pennsylvania, 2010 and 2012

	ALL CASES			MALES			FEMALES		
	2012 Projected	2010 Observed	Percent (%) Change	2012 Projected	2010 Observed	Percent (%) Change	2012 Projected	2010 Observed	Percent (%) Change
TOTAL	28,635	9	-0.6	0*	14,773	-0.3	13,870	14,036	-1.2
Brain and other nervous system	705	651	8.3	400	364	9.9	280*	287	-2.4
Cervix uteri	140	149	-6.0	--	--	--	140	149	-6.0
Colon and rectum	2,665	2,755	-3.3	1,390*	1,370	1.5	1,310	1,385	-5.4
Corpus/uterus NOS	440*	479	-8.1	--	--	--	440*	479	-8.1
Esophagus	765*	769	-0.5	605*	576	5.0	160*	193	-17.1
Female breast	2,080	2,071	0.4	--	--	--	0*	2,071	0.4
Hodgkin's lymphoma	35	53	-34.0	10	27	-63.0	25*	26	-3.8
Kidney/renal pelvis	615*	623	-1.3	405	385	5.2	240*	238	0.8
Larynx	165	168	-1.8	150*	132	13.6	30	36	-16.7
Leukemia	1,150*	1,127	2.0	635*	621	2.3	475	506	-6.1
Liver/intrahepatic bile duct	970	881	10.1	675	583	15.8	275*	298	-7.7
Lung and bronchus	7,610	7,729	-1.5	4,170	4,306	-3.2	3,475*	3,423	1.5
Melanoma of skin	500	462	8.2	320	298	7.4	180	164	9.8
Myeloma	525*	573	-8.4	270*	280	-3.6	255*	293	-13.0
Non-Hodgkin's lymphoma	1,065	1,074	-0.8	570*	566	0.7	495	508	-2.6
Oral cavity/pharynx	380	360	5.6	255	244	4.5	110*	116	-5.2
Ovary	700	724	-3.3	--	--	--	700	724	-3.3
Pancreas	1,810	1,882	-3.8	885*	927	-4.5	955	955	0.0
Prostate	1,295	1,363	-5.0	1,295	1,363	-5.0	--	--	--
Stomach	495	521	-5.0	300	307	-2.3	210*	214	-1.9
Testis	30	23	30.4	30	23	30.4	--	--	--
Thyroid	100	89	12.4	30*	37	-18.9	65	52	25.0
Urinary bladder	795	792	0.4	595	577	3.1	200	215	-7.0

Note: Males and females may not sum to the total due to independent analysis by sex and by total. Projections are rounded to the nearest whole five. Pennsylvania's cancer primary site groupings match the definitions used by the SEER program. *The arithmetic mean for 2005 to 2009 was used to estimate the number of cases. See Technical Notes in *Cancer Facts and Figures, Pennsylvania 2012* for additional information.

Table 10.6 Projected and Observed Cases of Invasive Cancer by County, Pennsylvania, 2009 and 2012

County	2012 Projected	2009 Observed	Percent Change	County	2012 Projected	2009 Observed	Percent Change
All Counties	79,155	75,781	4.5	Juniata	115 *	104	10.6
Adams	635	569	11.6	Lackawanna	1,445	1,404	2.9
Allegheny	8,010 *	7,973	0.5	Lancaster	2,925	2,723	7.4
Armstrong	450 *	468	-3.8	Lawrence	650 *	579	12.3
Beaver	1,070	1,130	-5.3	Lebanon	830	779	6.5
Bedford	315 *	307	2.6	Lehigh	1,970 *	1,980	-0.5
Berks	2,235 *	2,261	-1.1	Luzerne	2,165 *	2,230	-2.9
Blair	860	789	9.0	Lycoming	905	768	17.8
Bradford	405 *	417	-2.9	McKean	270 *	248	8.9
Bucks	4,120	3,788	8.8	Mercer	870	832	4.6
Butler	1,325	1,169	13.3	Mifflin	290 *	282	2.8
Cambria	1,065	1,021	4.3	Monroe	905	872	3.8
Cameron	60	48	25.0	Montgomery	5,020	4,684	7.2
Carbon	425 *	494	-14.0	Montour	125 *	118	5.9
Centre	595 *	590	0.8	Northampton	2,075	1,893	9.6
Chester	2,945	2,737	7.6	Northumberland	650	628	3.5
Clarion	370	292	26.7	Perry	255 *	264	-3.4
Clearfield	545 *	533	2.3	Philadelphia	8,065 *	8,057	0.1
Clinton	240 *	233	3.0	Pike	425	362	17.4
Columbia	480	427	12.4	Potter	85	101	-15.8
Crawford	550 *	504	9.1	Schuylkill	1,060	1,038	2.1
Cumberland	1,485	1,372	8.2	Snyder	235	216	8.8
Dauphin	1,365 *	1,376	-0.8	Somerset	470	502	-6.4
Delaware	3,480	3,452	0.8	Sullivan	60	55	9.1
Elk	260	249	4.4	Susquehanna	225	247	-8.9
Erie	1,510 *	1,493	1.1	Tioga	285 *	279	2.2
Fayette	950 *	936	1.5	Union	240 *	249	-3.6
Forest	25	29	-13.8	Venango	415	356	16.6
Franklin	1,010	903	11.8	Warren	310 *	325	-4.6
Fulton	105	90	16.7	Washington	1,370 *	1,343	2.0
Greene	265	251	5.6	Wayne	365	334	9.3
Huntingdon	245 *	238	2.9	Westmoreland	2,430 *	2,509	-3.1
Indiana	410	459	-10.7	Wyoming	270	193	39.9
Jefferson	300	282	6.4	York	2,485	2,347	5.9

Note: Projections were rounded to the nearest whole five. *The arithmetic mean for the five-year period of 2005 to 2009 was used to estimate the number of cases. See Technical Notes in the *Cancer Facts and Figures, Pennsylvania 2012* report for additional information. **All cancer cases staged as in situ are excluded except for urinary bladder cancers.

Table 10.7 Projected and Observed Deaths from Invasive Cancer by County, Pennsylvania, 2010 and 2012

County	2012 Projected	2010 Observed	Percent Change	County	2012 Projected	2010 Observed	Percent Change
All Counties	28,635	28,809	-0.6	Juniata	65	58	12.1
Adams	240	227	5.7	Lackawanna	495	508	-2.6
Allegheny	3,030	3,126	-3.1	Lancaster	1,050 *	1,048	0.2
Armstrong	180 *	158	13.9	Lawrence	260 *	251	3.6
Beaver	425	446	-4.7	Lebanon	345	331	4.2
Bedford	115 *	131	-12.2	Lehigh	725 *	735	-1.4
Berks	815 *	816	-0.1	Luzerne	810	800	1.3
Blair	365	352	3.7	Lycoming	270 *	252	7.1
Bradford	190	180	5.6	McKean	90	113	-20.4
Bucks	1,375	1,332	3.2	Mercer	365	336	8.6
Butler	390 *	380	2.6	Mifflin	110 *	119	-7.6
Cambria	390 *	395	-1.3	Monroe	300 *	301	-0.3
Cameron	5	10	-50.0	Montgomery	1,640 *	1,676	-2.1
Carbon	170 *	174	-2.3	Montour	20	27	-25.9
Centre	205 *	206	-0.5	Northampton	710	701	1.3
Chester	925	927	-0.2	Northumberland	250 *	239	4.6
Clarion	90 *	94	-4.3	Perry	105 *	110	-4.5
Clearfield	200	216	-7.4	Philadelphia	3,050	3,158	-3.4
Clinton	90 *	87	3.4	Pike	80	79	1.3
Columbia	160 *	163	-1.8	Potter	35	42	-16.7
Crawford	220 *	219	0.5	Schuylkill	390	401	-2.7
Cumberland	460 *	496	-7.3	Snyder	75 *	69	8.7
Dauphin	540 *	573	-5.8	Somerset	170	194	-12.4
Delaware	1,300 *	1,331	-2.3	Sullivan	20 *	18	11.1
Elk	90 *	94	-4.3	Susquehanna	110 *	106	3.8
Erie	625 *	617	1.3	Tioga	100 *	111	-9.9
Fayette	405 *	417	-2.9	Union	80 *	82	-2.4
Forest	25	25	0.0	Venango	185	155	19.4
Franklin	320 *	309	3.6	Warren	120	104	15.4
Fulton	40	34	17.6	Washington	570 *	559	2.0
Greene	95 *	96	-1.0	Wayne	120	125	-4.0
Huntingdon	100 *	114	-12.3	Westmoreland	980 *	990	-1.0
Indiana	180 *	170	5.9	Wyoming	70 *	72	-2.8
Jefferson	140	133	5.3	York	925	891	3.8

Note: Projections were rounded to the nearest whole five. *The arithmetic mean for the five-year period of 2005 to 2009 was used to estimate the number of cases. See Technical Notes in the *Cancer Facts and Figures, Pennsylvania 2012* report for additional information. **All cancer cases staged as in situ are excluded except for urinary bladder cancers.

Intervention Strategies

The American Cancer Society has developed a set of screening guidelines for early detection of cancer in asymptomatic persons, as follows:²

General cancer-related checkup

It is important to have periodic general health examinations that include a specific cancer-related checkup. These checkups should include health counseling and, depending on a person's age, might include examinations for cancers of the thyroid, testes, ovaries, lymph nodes, oral cavity, and skin, as well as for some nonmalignant diseases.

Breast

- Starting at age 20, women should be aware of the benefits and limitations of breast self-examinations and should report breast changes promptly to a health care provider.
- A clinical breast exam is recommended at least every three years for women ages 20 to 39 and every year starting at age 40.
- Starting at age 40, women in good health should have annual mammograms following clinical breast exams.
- Free breast and cervical cancer screenings are available to women ages 40 to 64 years. To ascertain eligibility, call 1-800-215-7494 or visit www.PAHealthyWoman.com.

Colon and rectum

Beginning at age 50, men and women should follow one of the exam schedules below:

- Fecal occult blood test (FOBT) or fecal immunochemical test (FIT) every year;
- Stool DNA test (interval uncertain);
- Flexible sigmoidoscopy (FSIG) every five years;
- Double-contrast barium enema every five years;
- Colonoscopy every 10 years; or
- CT Colonography (Virtual Colonoscopy) every five years.

Note that FOBT during a digital rectal exam in the doctor's office is not adequate for screening. A take-home multiple sample kit should be used. Guaiac based FOBT is not recommended.

Free colorectal cancer screening is available to eligible men and women ages 50 to 64 who are residents of Philadelphia County. To check eligibility, call 1-215-685-6560 or visit www.health.state.pa.us/cancer (Click on 'Colorectal Cancer Control Program.')

Prostate

The ACS recommends that, beginning at age 50, men with a life expectancy of at least 10 years be given information about the benefits and limitations of prostate cancer screening so that an informed decision can be made. The prostate-specific antigen (PSA) blood test, and a digital rectal exam (DRE), is used to screen for prostate cancer.

Uterus

Cervix: All women who are or have been sexually active for approximately three years or who are 21 and older should have an annual conventional Pap test or a liquid-based Pap test every two years. At or after age 30, those who have three normal tests in a row can be screened every two to three years, with cervical cytology (either a conventional or liquid-based Pap test), or every three years with an HPV DNA test plus cervical cytology. Women aged 70 and older with three or more normal Pap tests in a row in the previous 10 years may choose to stop screening. Screening is not necessary after a total hysterectomy, unless surgery was for cervical cancer treatment.

Free breast and cervical cancer screenings are available to women ages 40 to 64 years. To ascertain eligibility, call 1-800-215-7494 or visit www.PAHealthyWoman.com.

Endometrium: At the time of menopause, women at average risk should be informed about risks and symptoms of endometrial cancer and strongly encouraged to report any unexpected bleeding or spotting to their physician.

Summary

- Number of Pennsylvania residents expected to be diagnosed with cancer in 2012: 79,155
- Number of Pennsylvania residents expected to die from cancer in 2012: 28,635
- Chance that male U.S. residents get cancer in their lifetime: 1 in 2
- Chance that female U.S. residents get cancer in their lifetime: 1 in 3

Resources

“67 Women, 67 Counties: Facing Breast Cancer in Pennsylvania” is a free breast cancer photo exhibit. Call 1-800-377-8828 to discuss bringing this FREE exhibit to your county.

More info about cancer control programs in Pennsylvania at <http://www.health.state.pa.us/cancer>

National statistics and information

- National Cancer Institute—<http://www.cancer.gov>
- American Cancer Society—<http://www.cancer.org>
- Cancer Care—<http://www.cancercares.org>
- Y-ME National Breast Cancer Organization—<http://www.y-me.org>
- Prostate Cancer:
 - USTOO International—<http://www.ustoo.org>
 - Prostate Cancer Foundation—<http://www.pcf.org>
 - Zero – The Project to End Prostate Cancer—<http://www.zerocancer.org>
- Skin Cancer:
 - American Academy of Dermatology—<http://www.aad.org>
 - Skin Cancer Foundation—<http://www.skincancer.org>
- National Ovarian Cancer Coalition—<http://www.ovarian.org>

State and local statistics and information

- Pennsylvania Department of Health:
 - Health Statistics—<http://www.health.state.pa.us/stats> (717) 783-2548
 - Cancer Prevention/Control Section—<http://www.health.state.pa.us/cancer> (717) 787-5251
- Your local American Cancer Society
- Your local Department of Health
- Your local American Lung Association

Technical Notes³

Incidence data—Cancer abstracts collected by the Pennsylvania Cancer Registry (PCR) are the source for Pennsylvania cancer incidence data shown here. Data from the PCR were used to project the expected number of cancer cases listed in this report. Primary cancer sites follow the definitions used by the National Cancer Institute’s SEER Program and are therefore comparable. In situ cases for sites other than urinary bladder cancer are not included in any calculation or projection contained in this report. Cancer cases were coded using *International Classification of Diseases for Oncology – Third Edition (ICD-O-3)* and staged according to the SEER Summary Staging categories. Currently, 2009 is the latest year of available incidence data for Pennsylvania.

Mortality data—Pennsylvania's Certificate of Death is the source document for Pennsylvania cancer mortality data. The actual numbers of Pennsylvania cancer deaths reported were used to forecast the expected number of cancer deaths listed in this report. Currently, 2010 is the latest year of available mortality data for Pennsylvania.

Incidence and mortality projections—The projections of new cancer cases in this report were obtained by producing a regression line using the method of least squares. This approach utilized the actual number of cases reported to the PCR with a diagnosis year of 2005 through 2009. This method constructed the regression line that minimizes the sum of the squared residuals. A residual is the difference between each data point (actual or observed event) and the regression line (predicted event). Once a regression line has been computed, the population standard error of the estimate is computed. This estimate measures the variability of the line. The population standard deviation of the dependent variable (year of diagnosis) is also computed. This is a measure of the variability of projected cancer cases based on the arithmetic mean of cancer cases for the five years of 2005 through 2009. The population standard error of the estimate was then compared to the population standard deviation of the mean to identify which method had less variability. If the population standard deviation was lower, then the arithmetic mean for the five-year period was used as the projected number of cancer cases. This same method was applied to projecting the number of cancer deaths. However, since the cancer mortality file is more current, the five-year period of 2006 through 2010 was used to project the number of cancer deaths.

Precision of projections—Estimates of new cancer cases and new cancer deaths have been rounded to the nearest whole five. The projected figures should be used cautiously. Considerable variation may occur, particularly with estimates of small numbers.

Age-adjusted rates (Direct method)—Age-specific rates for a selected population are applied to a standard population (in this report, the 2000 U.S. standard million population for 18 age groups) in order to calculate what rate would be expected if the selected population had the same age distribution as the standard. The total of these expected events divided by the total of the standard population and multiplied by 100,000 yields the age-adjusted rate per 100,000. It is important to use the same standard population in the computation of each age-adjusted rate to allow comparability. Age-adjusted rates should never be compared with any other type of rate or be used as absolute measurements of vital events. All state population figures used for calculating rates are estimates produced jointly by the U.S. Census Bureau and the Pennsylvania State Data Center of Penn State at Harrisburg.

Data use and limitations—It is highly recommended that any user of the data presented in this report read the information provided in the Technical Notes section carefully and review as many of the cited references as possible. Of primary concern when using forecasted values is the high probability of chance variation due to unknown (or uncontrollable) factors. This includes the concern of chance variation associated with the small number of events that can occur when using county statistics.

Endnotes

¹ Pennsylvania Department of Health, Bureau of Health Statistics and Research, *2009 Pennsylvania Cancer Incidence and Mortality*. Retrieved from <http://www.portal.state.pa.us/portal/server.pt?open=514&objID=596531&mode=2>.

² American Cancer Society. *Cancer Prevention & Early Detection Facts & Figures 2011*. Retrieved from <http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-029459.pdf>

³ Pennsylvania Department of Health, Bureau of Health Statistics & Research, *Cancer Facts and Figures Report, Technical notes section*. Retrieved from <http://www.portal.state.pa.us/portal/server.pt?open=514&objID=596538&mode=2>.

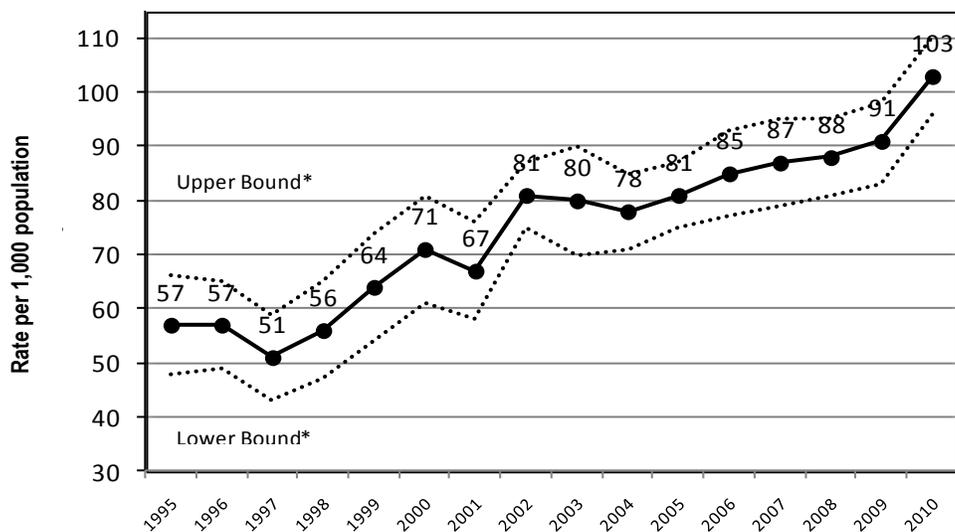
Diabetes

Diabetes is a chronic disease affecting the way the body processes food for energy. It is caused by the inability of the pancreas to make enough insulin or, if it does make enough, to use it properly. It is a disease that is lifelong, complicated and costly. In Pennsylvania, an estimated 991,000 adults age 18 and older have been diagnosed with diabetes. Diabetes prevalence can vary significantly by age, education, income, and race and ethnicity.

In Type 1 diabetes, the body does not produce insulin as the result of an autoimmune disorder; this is typically diagnosed in childhood. In Type 2 diabetes, the body does not produce enough insulin or does not use it. Pre-diabetes is characterized by blood glucose levels that are higher than normal, but not high enough for a diabetes diagnosis. Gestational diabetes is the development of high blood glucose levels during pregnancy, which typically resolves at childbirth but can indicate future diabetes risk.

Data from the Behavioral Risk Factor Surveillance System (BRFSS) survey show an increase in diagnosed diabetes prevalence per 1,000 Pennsylvania adults from 1995 to 2010. According to 2010 BRFSS data, an estimated 10 percent (95% confidence interval (CI): 10-11) of adults 18 and older were ever told by a doctor they had diabetes.

Figure 10.42 Prevalence of Diagnosed Diabetes, Adults, Pennsylvania, 1995 to 2010¹



Note: The lower and upper bounds make up the 95% confidence interval.

Diabetes is often undetected for a period of time. Therefore, the true percent of adults with diabetes is likely higher than the 10 percent figure from the 2010 BRFSS. According to the Centers for Disease Control and Prevention (CDC), undiagnosed diabetes accounts for about 7.0 million persons, of the 25.8 million nationwide who are estimated to have diabetes.²

National Goals

As part of the Healthy People 2020 national health effort, the U.S. Department of Health and Human Services set several objectives to improve the lives of those with diabetes, as well as those at risk for the disease. Baseline and target figures are set to track the nation's progress over time. The state of Pennsylvania also tracks these goals when the data is available at the same level.

Table 10.8 Healthy People 2020 Diabetes Objectives, Pennsylvania and United States, 2008, 2010, and 2020 Goal³

	2008 U.S. Baseline Percent (%)	U.S. Target Percent (%)	2010 PA Percent (%)	Confidence Interval (95% CI)
Annual foot exams	68.0%	74.8%	68%	61 to 75
Annual dilated eye exams	53.4%	58.7%	60%	53 to 67
Glycosylated hemoglobin measurement	64.6%	71.1%	77%	71 to 83
Blood glucose self-monitoring	64.0%	70.4%	65%	59 to 72
Diabetes education	56.8%	62.5%	59%	52 to 66

Note: Figures are age-adjusted to U.S. 2000 standard million population distribution.

Prevalence

Table 10.9 Estimated Diabetes Prevalence by Region, 2008 to 2010 Combined⁴

Region	Percent (%)	Confidence Interval (95% CI)
PENNSYLVANIA	9	9 to 9
Philadelphia	11	9 to 13
Bucks	8	6 to 11
Montgomery	7	5 to 9
Chester	7	5 to 9
Delaware	9	6 to 11
Lancaster	8	6 to 10
Berks, Schuylkill	8	6 to 10
Carbon, Lehigh, Northampton	8	6 to 9
Pike, Monroe, Susquehanna, Wayne	9	7 to 12
Lackawanna, Luzerne, Wyoming	8	7 to 10
Adams, Franklin, Fulton	9	7 to 12
York	9	7 to 11
Cumberland, Perry	11	9 to 15
Dauphin, Lebanon	9	7 to 12
Bedford, Blair, Huntingdon, Juniata, Mifflin	11	9 to 14
Centre, Columbia, Montour, Northumberland, Snyder, Union	8	7 to 10
Bradford, Sullivan, Tioga, Lycoming, Clinton, Potter	9	7 to 11
Erie	9	7 to 11
Crawford, Lawrence, Mercer, Venango	10	8 to 12
Forest, Elk, Cameron, Clearfield, Jefferson, Clarion, McKean, Warren	11	9 to 14
Allegheny	9	8 to 10
Westmoreland	9	7 to 11
Indiana, Cambria, Somerset, Armstrong	11	9 to 13
Beaver, Butler	9	7 to 11
Fayette, Greene, Washington	11	9 to 13

Age and Sex

According to the Pennsylvania BRFSS survey conducted in 2010, there were no significant differences in diabetes prevalence rates of men and women in the state. An estimated 11 percent of adult males (CI: 10-13) and 9 percent of adult females (CI: 9-10) had diabetes.

By comparison, diabetes prevalence rates increase dramatically with age. Pennsylvania adults aged 65 and older are disparately affected and have the highest diabetes prevalence of any age group.

Table 10.10 Diabetes Prevalence by Age and Sex, Pennsylvania, 2010⁵

	Percent (%)	Confidence Interval (95% CI)
Sex		
Male	11	10 to 13
Female	9	9 to 10
Age Group		
18 to 29 years	2	1 to 3
30 to 44 years	4	3 to 5
45 to 64 years	12	11 to 14
≥ 65 years	22	21 to 24

Race and Ethnicity

In 2010, black, non-Hispanic adults in Pennsylvania had a significantly higher rate of diabetes prevalence, compared to white, non-Hispanic peers. There were no significant differences between non-Hispanic white adults and Hispanic adults, or between non-Hispanic black adults and Hispanic adults.

Table 10.11 Diabetes Prevalence by Race and Ethnicity, Pennsylvania, 2010⁶

	Percent (%)	Confidence Interval (95% CI)
Black, non-Hispanic adults	16	12 to 20
White, non-Hispanic adults	10	9 to 11
Hispanic adults	9	5 to 14

Education and Income

In 2010, estimated diabetes prevalence decreased with an increase in education level. Pennsylvania adults with a college degree had a significantly lower rate of diabetes than those with less education.

Diabetes prevalence also decreased as income increased. Adults in Pennsylvania with income of \$50,000 or more had significantly lower diabetes prevalence than those who made less than \$50,000.

Table 10.12 Diabetes Prevalence by Education and Income, Pennsylvania, 2010⁷

	Percent (%)	Confidence Interval (95% CI)
Education level		
< High school	17	14 to 20
High school	13	12 to 14
Some college	10	9 to 12
College degree	7	6 to 8
Income group		
< \$15,000	20	17 to 23
\$15,000 to \$24,999	16	14 to 18
\$25,000 to \$49,999	12	10 to 14
\$50,000 to \$74,999	8	6 to 9
≥\$75,000	5	4 to 6

Mortality

Diabetes and its complications are the seventh leading cause of death in Pennsylvania.⁹ In 2010, diabetes was listed as the underlying cause of death for 3,184 adult residents of Pennsylvania, a mortality rate of 19.6 per 100,000 population.⁹ This is comparable to about nine deaths each day of the year. Diabetes was listed as a contributing cause of death for an additional 8,002 Pennsylvania residents who died in 2010.¹⁰

Hospitalizations

Proper medical care, along with proper self-management practices, can help control diabetes and prevent the need for more expensive care in hospitals and other settings. The Pennsylvania Health Care Containment Council (PHC4) is the independent agency responsible for addressing the problem of escalating health care costs, while ensuring that Pennsylvania residents receive quality health care.

Risk Factors

Diabetes is associated with a number of risk factors. Some are non-modifiable, such as age, race, and genetic predisposition. Others are modifiable, such as weight status, diet, exercise and physical activity, weight status, and smoking status. These should be discussed, as they can impact development of diabetes or its complications.

Efforts to improve diabetes management and prevent diabetes complications must address key risk factors and behaviors.

Pre-diabetes—An estimated six percent (CI:6-7) of non-diabetic Pennsylvania adults have ever been told that they have pre-diabetes or borderline diabetes. As estimated 59 percent (CI:57-60) of these adults had a test for high blood sugar or diabetes in the past three years.¹¹

Gestational and pre-pregnancy diabetes—According to the Pennsylvania Bureau of Health Statistics and Research, 4.5 percent of all births during 2008 to 2010 occurred with mothers who had gestational diabetes. From 2006 to 2008, a total of 3,278 live births occurred to women who had pre-pregnancy diabetes.¹²

Resources

United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC)—
<http://www.cdc.gov/diabetes>

Behavioral Risk Factor Surveillance System (BRFSS)—<http://www.cdc.gov/brfss>

Pennsylvania Department of Health, Bureau of Health Statistics and Research—<http://www.health.state.pa.us/stats>

Pennsylvania Department of Health, Diabetes Prevention and Control Program—<http://www.health.state.pa.us/diabetes>

Pennsylvania Health Care Cost Containment Council (PHC4)—<http://www.phc4.org>

American Diabetes Association—<http://www.diabetes.org>

Healthy People 2020—<http://www.healthypeople.gov/2020/default.aspx>

Pennsylvania Department of Health, Chronic Disease Burden Report—
http://www.portal.state.pa.us/portal/server.pt/community/chronic_disease/20619

Endnotes

- ¹ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS) 1995-2010* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>
- ² United States Department of Health and Human Services, Centers for Disease Control and Prevention. (2011). *National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011*. Retrieved from <http://www.cdc.gov/diabetes/pubs/factsheet11.htm>
- ³ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>
- ⁴ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS) 2008-2010* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>
- ⁵ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>
- ⁶ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>
- ⁷ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>
- ⁸ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2012). *Pennsylvania vital statistics 2010*. Retrieved from <http://www.portal.state.pa.us/portal/server.pt?open=18&objID=1275199&mode=2>
- ⁹ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2012). *Pennsylvania vital statistics 2010*. Retrieved from <http://www.portal.state.pa.us/portal/server.pt?open=18&objID=1275199&mode=2>
- ¹⁰ Pennsylvania Department of Health, Bureau of Health Statistics and Research. 2010 *Pennsylvania death certificates* [Data file].
- ¹¹ Pennsylvania Department of Health. (2010). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://www.portal.state.pa.us/portal/server.pt?open=514&objID=596553&mode=2>
- ¹² Pennsylvania Department of Health, Bureau of Health Statistics and Research. 2008-2010 *Pennsylvania certificates of live birth* [Data file].

Chronic Kidney Disease

Chronic kidney disease (CKD) is a condition in which the kidneys are damaged and cannot filter the blood as well as possible. This can cause wastes to accumulate in the body and lead to other health problems, including cardiovascular disease (CVD), anemia, and bone disease. In most cases, people with early CKD tend to be asymptomatic.

CKD is detected through a blood test to estimate kidney function, and a urine test to indicate kidney damage. It is present when a patient’s glomerular filtration rate remains below 60 milliliters per minute for more than three months, or when the urine albumen-to-creatinine ratio is over 30 milligrams (mg) of albumin for each gram of creatinine. It is usually irreversible and progressive in nature, and can lead to kidney failure (End Stage Renal Disease, ESRD) over time, if left untreated.

Fortunately, CKD can be treated through medication and lifestyle changes that slow down the disease progression, or prevent and delay the onset of kidney failure. However, the only treatment options for kidney failure are dialysis or transplant.

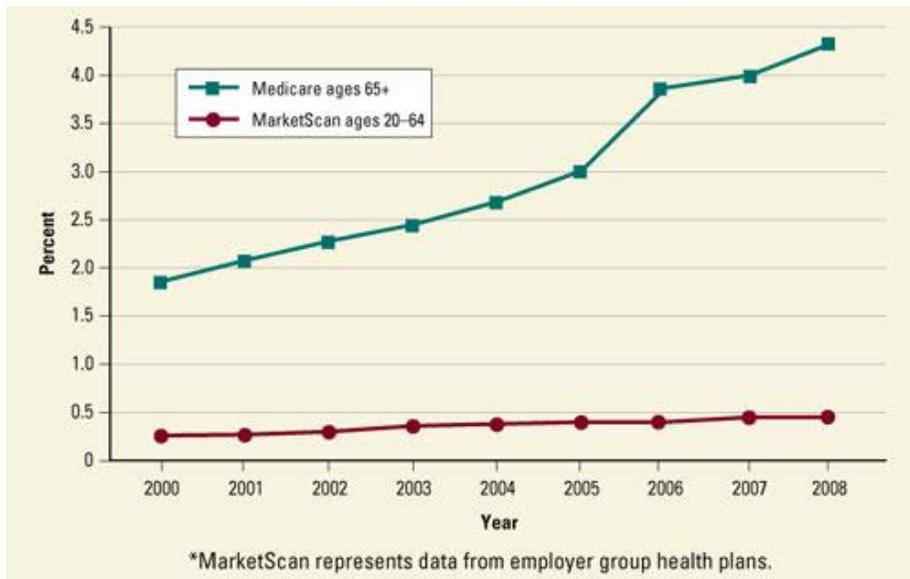
National Goals

As part of the Healthy People 2020 national health effort, the U.S. Department of Health and Human Services set several objectives to improve the lives of those with chronic kidney disease, as well as those at risk for the disease. Baseline and target figures are set to track the nation’s progress over time. The state of Pennsylvania also tracks these goals when the data is available at the same level.

Prevalence

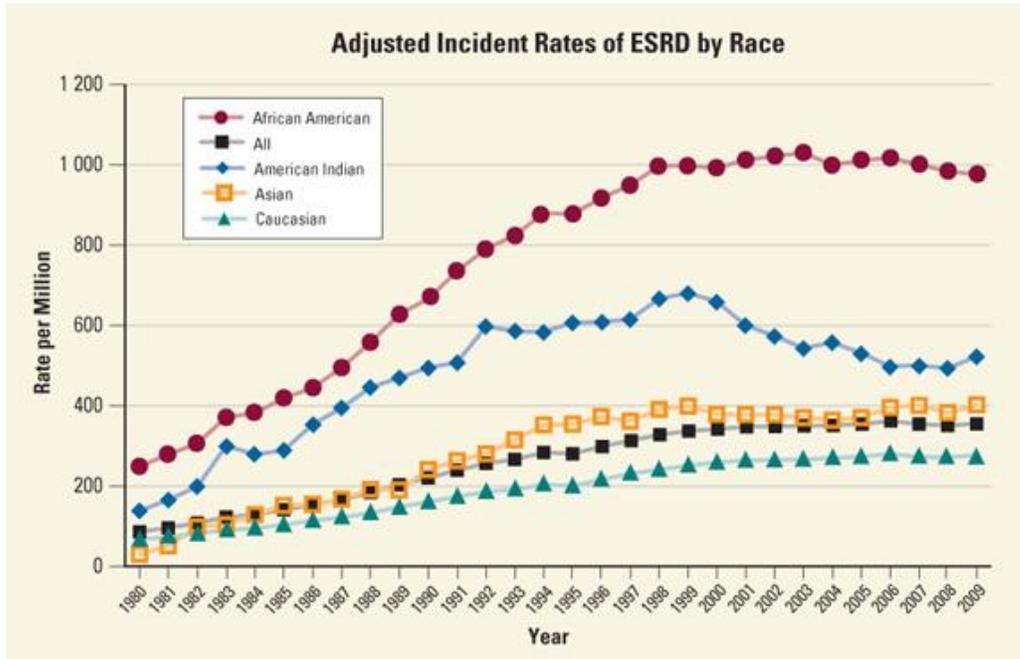
The incidence of chronic kidney disease is increasing most rapidly in persons age 65 years and older. Among this age group, the incidence of recognized CKD more than doubled between 2000 and 2008. For adults younger than 65 years old, the incidence of diagnosed CKD is less than 0.5 percent.

Figure 10.43 Prevalence of Chronic Kidney Disease by Age Group, Adults, United States, 2000 to 2008¹



The incidence of end-stage renal disease is more than three times higher for black adults than for white adults. After increasing between 1980 and 2000, the incident rates for all races and ethnicities stabilized.

Figure 10.44 Age-adjusted Incident Rate of End-Stage Renal Disease by Race and Ethnicity, Adults, United States, 1980 to 2009²



Prevalence

Table 10.13 End State Renal Disease Patients by County, Pennsylvania, 2012³

County	Number	County	Number	County	Number
Adams	70	Elk	35	Montgomery	772
Allegheny	1,783	Erie	307	Montour	26
Armstrong	92	Fayette	240	Northampton	360
Beaver	226	Forest	10	Northumberland	106
Bedford	52	Franklin	129	Perry	56
Berks	369	Fulton	8	Philadelphia	3,590
Blair	172	Greene	52	Pike	28
Bradford	60	Huntingdon	41	Potter	13
Bucks	479	Indiana	98	Schuylkill	156
Butler	148	Jefferson	46	Snyder	27
Cambria	192	Juniata	19	Somerset	80
Cameron	6	Lackawanna	218	Sullivan	3
Carbon	82	Lancaster	407	Susquehanna	22
Centre	70	Lawrence	152	Tioga	40
Chester	316	Lebanon	113	Union	28
Clarion	43	Lehigh	354	Venango	48
Clearfield	106	Luzerne	320	Warren	36
Clinton	32	Lycoming	114	Washington	247
Columbia	74	McKean	60	Wayne	44
Crawford	80	Mercer	129	Westmoreland	403
Cumberland	200	Mifflin	53	Wyoming	40
Dauphin	380	Monroe	169	York	330
Delaware	707			TOTAL	15,268

Mortality

Figure 10.45 Age-adjusted Kidney Disease Death Rate by Age Group, Adults, Pennsylvania, 2008 to 2010 Combined⁴

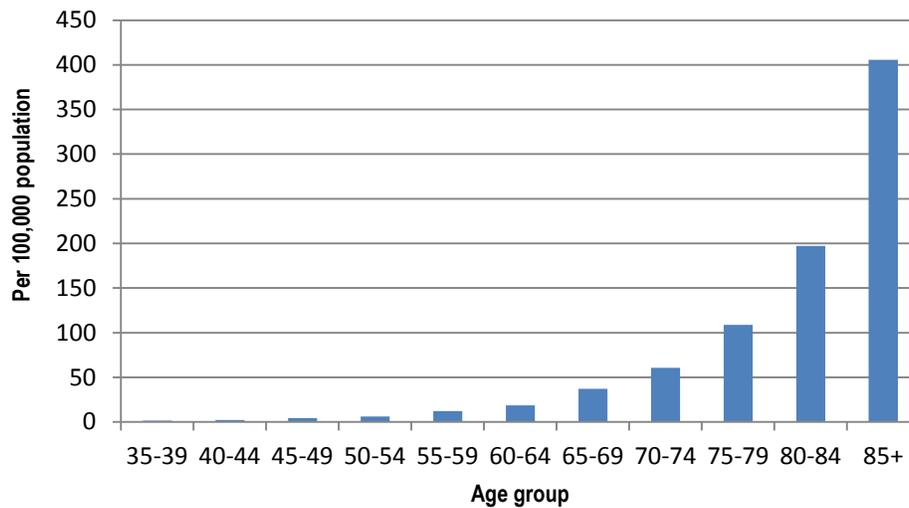
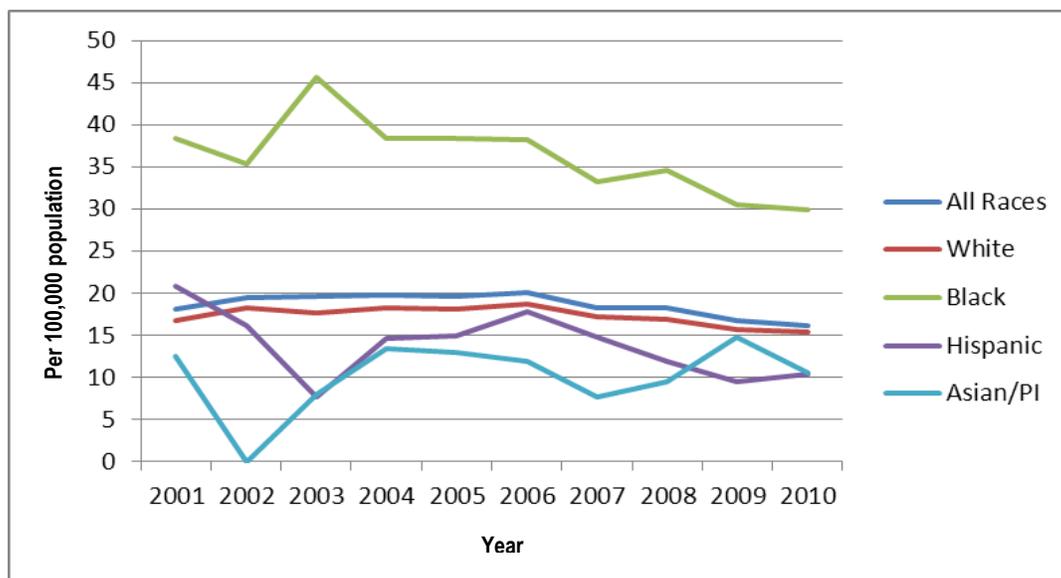


Figure 10.46 Age-adjusted Renal Failure Death Rate by Race and Ethnicity, Pennsylvania, 2001 to 2010⁵



Health Costs

According to the United States Renal Data System,⁶ determining the economic impact of CKD on the healthcare system is challenging since CKD is often associated with cardiovascular disease, diabetes, stroke and infectious complications.

In 1972, Congress passed legislation making people of any age with permanent kidney failure eligible for Medicare. Medicare data on patients with CKD, who represent 8.4 percent of the population, account for 17.0 percent of total expenditures. These assessments do not include ESRD patients on dialysis or with a kidney transplant, who account for another 6.4 percent of fee-for-service expenditures. The combined CKD and ESRD populations thus account for 24 percent of the budget, a number greater than that associated with congestive heart failure (CHF).

CKD patients incur per person per year (PPPY) costs of just over \$23,000, compared to \$8,000 for patients without ESRD, CKD, diabetes, or CHF. Patients with more severe CKD (stage 4 or 5) have yearly expenditures of \$28,508, demonstrating the impact of the more advanced stage of the disease and its increasing complications. In patients with both Stage 4–5 CKD and CHF, costs are slightly more than \$38,000 for whites, and approach \$48,000 for blacks/African Americans. In addition, Part D expenditures account for \$3,300 per year. CKD patients overall incur nearly half the costs of the hemodialysis population—a group which, with the exception of some populations with rare diseases, is the most expensive in the Medicare system.

Risk Factors

Adults who have diabetes or hypertension are at increased risk of developing CKD. Other risk factors for CKD include cardiovascular disease, obesity, elevated cholesterol and a family history of chronic kidney disease. The risk of developing CKD increases with age largely because risk factors for kidney disease become more common with aging.

Inadequately controlled diabetes and hypertension increase the risk of CKD progression to kidney failure. Repeated episodes of acute kidney injury from various causes (e.g., infections, drugs, toxins injurious to the kidney) can also contribute to disease progression, especially in the elderly. While CKD is more common among women, men with CKD are about 50 percent more likely to have their disease progress to kidney failure.⁷

Intervention Strategies

Provide screening. Federal and state governments, together with various national organizations, have developed comprehensive strategies to address the burden of kidney disease in the United States. By and large, the most efficient way to reduce the burden of kidney disease is to prevent and treat its risk factors, diabetes and hypertension. Screening persons at high risk for CKD (e.g., persons older than 50 years old, persons with a family history of CKD) may prevent or delay kidney failure.

Increase awareness. CKD screening demonstration projects have been underway in Pennsylvania for the past several years. They help residents understand individual risks for kidney disease while raising awareness of kidney disease and its impact on overall health and well-being.

Pennsylvania Chronic Renal Disease Program. Pennsylvania is one of several states with a Chronic Renal Disease Program (CRDP) that provides life-saving care and treatment for adults with end-stage renal disease. The CRDP, administered by the Department of Health, assists with costs related to dialysis services, renal transplantation, medical management, inpatient and outpatient service, home dialysis supplies and equipment, medications, and limited patient transportation.

Eligibility is limited to people with end-stage renal disease; residents of Pennsylvania for at least 90 days before the date of application, U.S. citizen or legal alien; and income within the guidelines of the Pennsylvania Department of Health.

Pennsylvanians with End Stage Renal Disease. ESRD Network 4 is part of 18 non-profit organizations contracted through the Centers for Medicare & Medicaid Services (CMS) whose mission is to ensure quality in care and quality in life for individuals with end stage renal disease. ESRD Network 4 serves the renal communities of Pennsylvania and Delaware with over 250 dialysis facilities, 19 transplant centers and 14,000 individuals living with Stage 5 Chronic Kidney Disease.⁸

Network 4 is also responsible for the collection, analysis and validation of data regarding patients receiving some form of treatment through an accredited dialysis facility.

Resources

United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), Chronic Kidney Disease Initiative—<http://www.cdc.gov/diabetes/projects/kidney/index.htm>

Healthy People 2020—<http://www.healthypeople.gov/2020/default.aspx>

United States Department of Health and Human Services, National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC)—<http://kidney.niddk.nih.gov/index.aspx>

Endnotes

¹ National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC) Retrieved from <http://kidney.niddk.nih.gov/KUDiseases/pubs/kustats/index.aspx#3>.

² National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC). Retrieved from <http://kidney.niddk.nih.gov/KUDiseases/pubs/kustats/index.aspx#5>.

³ The Renal Network, Inc. ESRD Network 4. Retrieved from <http://www.esrdnetwork4.org/index.htm>

⁴ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.ps.us/stats>

⁵ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.ps.us/stats>.

⁶ United States Renal Data System Annual Data Report (ADR) 2012

⁷ United States Department of Health and Human Services, Centers for Disease Control and Prevention. *National chronic kidney disease fact sheet: general information and national estimates on chronic kidney disease in the United States, 2010*. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2010.

⁸ The Renal Network 4, Retrieved from <http://www.esrdnetwork4.org/index.htm>

Organ and Tissue Donation and Transplantation

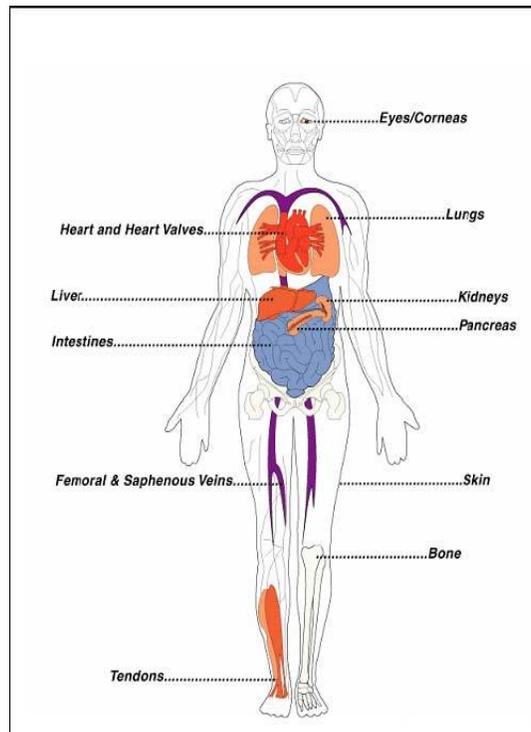
In spite of advances in medical technology, transplantation of a donated organ remains an important option for many persons with chronic diseases. Given the increasing success rate of organ transplantation, it is still the most economical option and the one that provides the best quality of life for some conditions. For example, when kidney failure occurs, transplantation is a better option than hospitalization or long-term dialysis.

A common theme in the field of organ transplantation is the imbalance between the supply of available organs and the numbers of persons awaiting transplant. According to the Organ Procurement and Transplantation Network (OPTN), about 118,088 persons are on the U.S. organ donor transplant waiting list. In Pennsylvania, about 8,369 residents are awaiting an organ transplant, and thousands of others are awaiting a tissue transplant.

Organ and tissue donation is the removal of specific organs and tissues from a deceased person, or the removal of a specific organ or part of an organ from a living person, for the purpose of transplanting it into someone needing the organ for survival.

Organs that can be transplanted are: heart, lungs, kidneys, liver, intestines and pancreas. Tissues that can be donated are: corneas, bone, tendons, veins, ligaments, skin and heart valves. See figure 10.47 for details.

Figure 10.47 Organs and Tissues for Donation



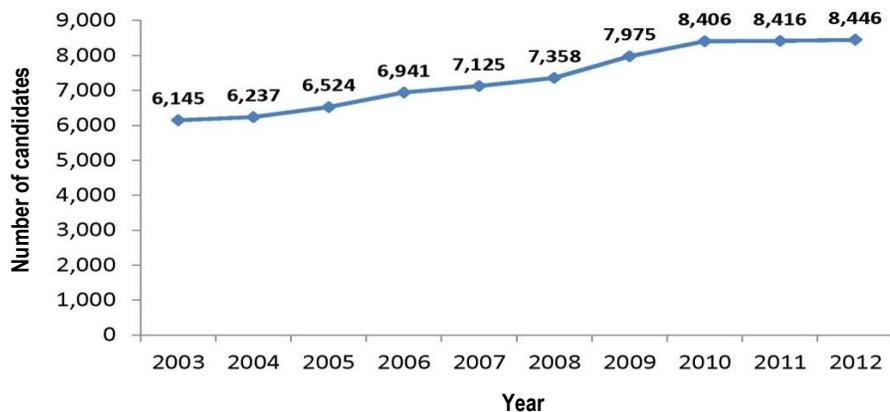
In Pennsylvania, any adult 18 years and older of sound mind can register as an organ donor, to be indicated on their driver's license or state ID card. First-time drivers who receive their license at the age of 16 must receive parental consent, until the age of 18. Any minor younger than age 18 must have parental consent before being designated as an organ donor, although organs are needed for patients of all ages.

Transplant Waiting List

In the United States, the scarcity of organs and waiting times for routine healthcare treatment generally decrease as transplant organs become more widespread, but the waiting time for organ transplants has increased. The current system is unable to meet demand, which has continued to grow in part due to increases in obesity over the last few decades, and the chronic diseases that are attributed to it, such as diabetes, high blood pressure and cardiovascular disease. This has created a public health crisis; it's estimated that 18 people die each day waiting for a lifesaving organ transplant.

Nationwide, more than 118,000 men, women and children are on the organ transplant waiting list. That is more people than can fit in both PNC Park and Citizens Bank Park with sellout crowds. More than 8,400 persons are currently on the Pennsylvania waiting list, an increase of almost 40 percent over the past decade.

Figure 10.48 Candidates Waiting for an Organ Transplant at Year End, Pennsylvania, 2003 to 2012



Based on OPTN Data as of May 10, 2013

As shown in the graph above, there were 6,145 persons waiting for an organ transplant in Pennsylvania at the end of 2003 and 8,446 waiting at the end of 2012. A number of variables have influenced growth in the waiting list over time.

First, the most significant increase is in the number of patients awaiting a kidney transplant, which has more than doubled in the last ten years. In 2003, kidney patients comprised 51 percent of the total Pennsylvania transplant waiting list; in 2012, kidney patients made up 75 percent of the total waitlist at Pennsylvania centers. This growth can be attributed in part to increasing demand for kidney transplants, based on increasing incidence of end stage renal disease (ESRD) in Pennsylvania residents, particularly those in the western region of the state. The incidence rate of reported ESRD reached its highest rate, with 377.5 per million population in 2006.

Also, patients who need a kidney transplant can continue to live for years while on the waiting list, thanks to dialysis treatment. By comparison, patients who need a liver, heart or lung are likely to die without a transplant due to limited options for maintenance treatments to prolong life while waiting.

While the number of patients listed for a kidney transplant in Pennsylvania more than doubled between 2003 and 2012, the number of persons listed for a lung transplant decreased by almost 75 percent from 563 to 143. This can be attributed to an increase in the number of transplants performed, better management of the waiting list and selection criteria for patients to optimize successful outcomes, and expanded acceptance and use of donor lungs for treatments. By comparison, the number of patients waiting for hearts has remained relatively stable since 2005.

Figure 10.49 Candidates Waiting for Abdominal Organ Transplant at Year End, Pennsylvania, 2003 to 2012

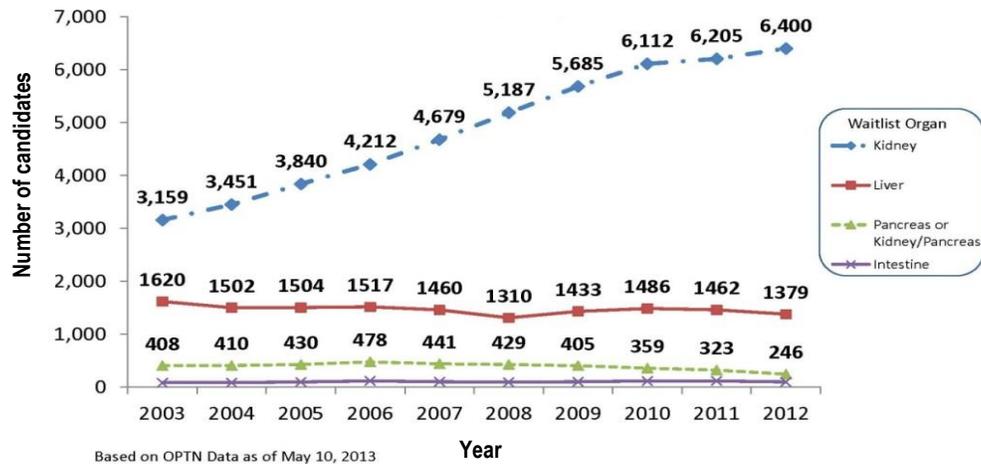
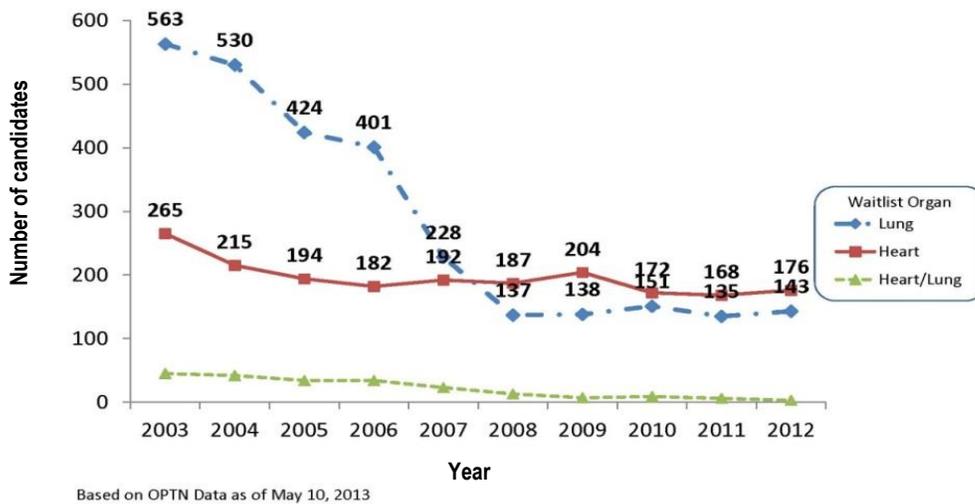


Figure 10.50 Candidates Waiting for Cardiothoracic Organ Transplant at Year End, Pennsylvania, 2003 to 2012



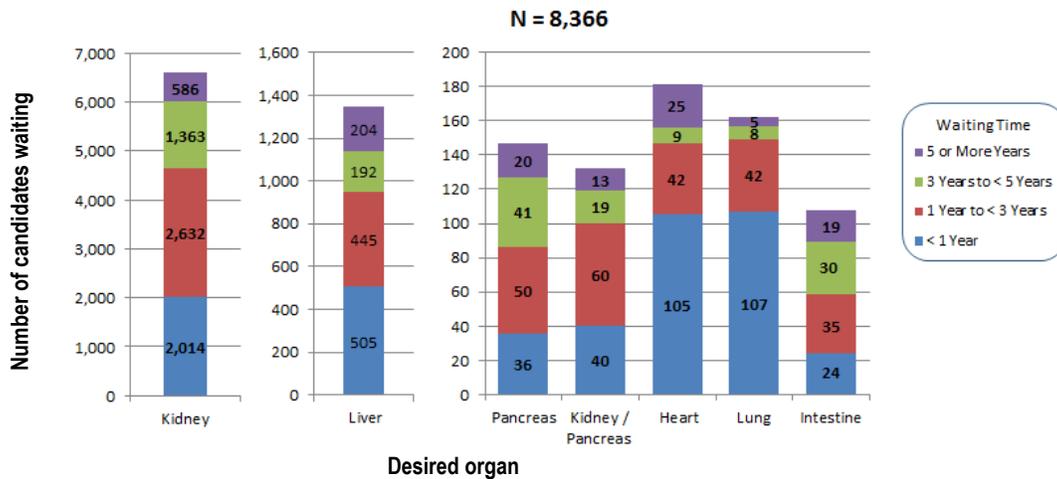
The number of patients currently waiting for an organ transplant in Pennsylvania by organ and the length of time they have been on the waiting list is shown in Table 10.14 and Figure 10.50. How long a patient will wait for a transplant, if they survive, depends on various factors, including blood type, severity of illness and length of time they have already waited relative to other patients on the list. About 30 percent of patients currently waiting for an organ transplant in Pennsylvania have been waiting longer than three years.

Table 10.14 Candidates Waiting for Organ Transplant by Organ and Wait, Pennsylvania and United States, 2013

	Needed Organ	Waiting time				TOTALS
		< 1 Year	1 to <3 Years	3 Years to < 5 Years	5 or More Years	
Waiting at transplant centers in Pennsylvania	Kidney	2,014	2,632	1,363	586	6,531
	Liver	505	445	192	204	1,340
	Pancreas	36	50	41	20	147
	Kidney/Pancreas	40	60	19	13	132
	Heart	105	42	9	25	181
	Lung	107	42	8	5	162
	Heart/Lung	2	1	0	0	3
	Intestine	24	35	30	19	108
	TOTALS	2,755	3,225	1,620	857	8,366
Waiting at transplant centers in U.S.	Kidney	30,259	38,816	18,430	12,801	95,961
	Liver	6,101	4,853	2,130	2,980	15,846
	Pancreas	386	392	200	213	1,187
	Kidney/Pancreas	950	760	263	179	2,115
	Heart	1,831	1,034	354	269	3,478
	Lung	977	468	133	130	1,687
	Heart/Lung	19	7	3	22	51
	Intestine	85	84	52	41	260
	TOTALS	39,464	45,543	21,236	16,438	117,774

Note: Based on OPTN data as of May 3, 2013.

Figure 10.51 Candidates Waiting for Organ Transplant by Organ and Wait, Pennsylvania, 2013



Based on OPTN data as of 4/13/2013; not shown: 3 heart-lung candidates waiting: 2 for < 1 Year, 1 for 1 Year to < 3 Years

Patients do not know how long it will take to receive an organ transplant after being added to the UNOS (OPTN) waiting list. The median time to transplant, or the amount of time it takes for half of the patients listed to receive a transplant, varies by organ. The median wait for patients in UNOS Region 2, which covers Pennsylvania, New Jersey, Delaware, Maryland, West Virginia and the District of Columbia is shown in the table below by organ type. The median wait for a kidney transplant is a little over 4 years and the median wait for a liver transplant is under 2 years while the median wait for a heart transplant is a little under 5 months and the median wait for a lung transplant is about 3 months.

Table 10.15 Median Wait of Persons Waiting for Organ Transplant by Organ, UNOS Region 2 and United States

	Median Time to Transplant (Months)	
	UNOS Region 2 Includes PA, NJ, DE, MD, DC & WV	United States
Kidney	51.7	53.0
Liver	20.4	12.5
Heart	4.7	5.6
Kidney/Pancreas	17.1	13.7
Pancreas	Not available	22.9
Lung	2.9	4.6
Intestine	15.1	5.7

Race and Ethnicity

Although 11 percent of Pennsylvania's overall population, blacks make up nearly 32 percent of the names on Pennsylvania's waiting list for organ transplants. Of the more than 2,900 black Pennsylvanians waiting for transplants, 91 percent are in need of kidney transplants. A kidney transplant is a viable medical option for those suffering from heart disease, diabetes, hypertension and other chronic diseases, all of which affect people of color disproportionately in our society. In 2012, the 929 living and deceased donors were 81 percent white and 12 percent blacks. While ethnic matching is not essential, it does greatly diminish the incidence of organ rejection.

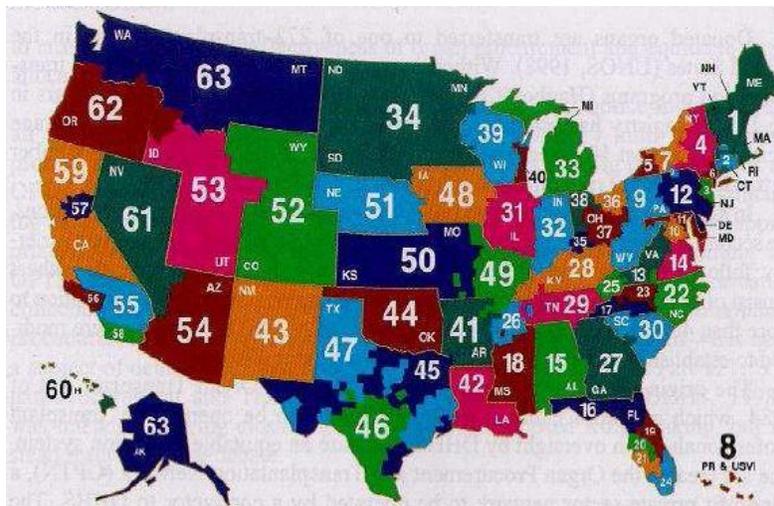
Table 10.16 Candidates Waiting for Organ Transplant by Organ and Race and Ethnicity, Pennsylvania, 2012¹

	All Organs	Kidney	Liver	Pancreas	Kidney/ Pancreas	Heart	Lung	Heart /Lung	Intestine
All	8,696	6,609	1,357	148	131	181	159	2	109
White	4,877	3,204	1,064	129	103	143	126	2	70
Black	2,903	2,634	159	12	24	30	23	0	21
Hispanic	499	368	101	4	3	4	8	0	11
Asian	361	320	28	2	1	3	2	0	5
American Indian/ Alaska Native	14	12	1	0	0	0	0	0	1
Pacific Islander	7	5	1	1	0	0	0	0	0
Multiracial	35	30	3	0	0	1	0	0	1

Table 10.17 Organ Donors by Race and Ethnicity, and Type, Pennsylvania, 2012²

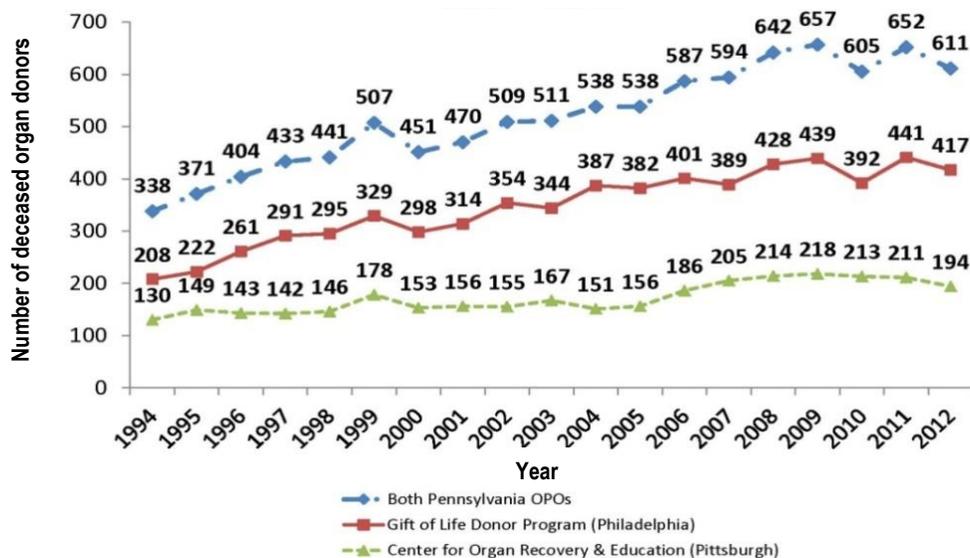
	All Donor Types	Deceased Donor	Living Donor
All	929	611	318
White	752	480	272
Black	114	86	28
Hispanic	44	34	10
Asian	15	8	7
American Indian/ Alaska Native	--	--	--
Pacific Islander	1	1	0
Multiracial	3	2	1

Figure 10.53 Organ Procurement Organization Service Areas, United States



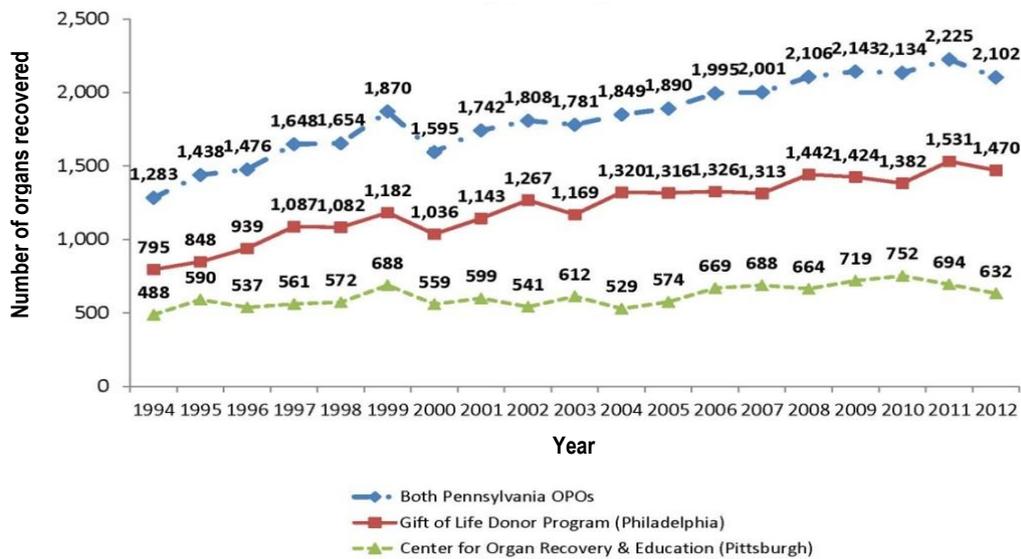
CORE and GLDP are two of the highest performing OPOs in the United States and have grown significantly over the past two decades. Shown in the table below are the number of organ donors from 1994 through 2012. GLDP has more than doubled the number of donors from 208 in 1994 to more than 400 in 2012. CORE has grown from 130 in 1994 to 194 in 2012. The number of organs recovered for transplant has also nearly doubled during that time period.

Figure 10.54 Deceased Donors by Organ Procurement Organization, Pennsylvania, 1994 to 2012



Based on OPTN Data as of May 10, 2013

Figure 10.55 Organs Recovered for Transplant from Deceased Donors by Organ Procurement Organizations, Pennsylvania, 1994 to 2012



Based on OPTN Data as of May 10, 2013

Pennsylvania Act 1994-102

With the passage of Act 1994-102, an amendment of the state’s Anatomical Gift Act, Pennsylvania was at the forefront of developing a comprehensive approach to increasing organ donation through education and routine referral to OPOs. Today, Pennsylvania is a national leader both in state government support of organ donation awareness and education and in transplantation.³

Act 102 heightened public awareness with a redesign of the driver’s license and state ID forms to include the question: “Do you wish to have the organ donor designation printed on your driver’s license?” It also brought forth the multi-state agency collaboration of the Departments of Health, Education, Transportation and Revenue along with the creation of a 15-member Organ Donation Advisory Committee (ODAC), which has many roles including:

- Advise the Secretary of Health on matters relating to the administration of the Governor Robert P. Casey Memorial Organ and Tissue Donation Awareness Trust Fund
- Recommend priorities in expenditures from the fund
- Review progress in the area of organ and tissue donation in the Commonwealth
- Recommend education and awareness training programs
- Recommend legislation as it deems necessary to fulfill the statutory chapter on anatomical gifts
- Submit a progress report annually to the General Assembly

The Trust Fund was also established with the addition of the opportunity to donate \$1 on the forms for driver’s license/state ID, car registration forms or any amount on the state tax refund form. These funds support educational initiatives, develop awareness campaigns and provide a mechanism for sustainability. The Trust Fund is mandated by legislation to be distributed annually as follows:

- 10 percent for reasonable hospital and other medical expenses incurred by a donor or donor family
- 50 percent to certified Organ Procurement Organizations for awareness programs
- 15 percent to Project Make-A-Choice, educational materials available at Penn DOT centers
- 25 percent to the Department of Education for implementing public awareness programs in the secondary schools

Within Pennsylvania, efforts to increase organ and tissue donation designations operate under the auspices of Donate Life Pennsylvania, a collaboration between the Gift of Life Donor Program, the Center for Organ Recovery & Education, and the Pennsylvania Departments of Health and Transportation. The program is wholly committed to increasing organ, eye and tissue donation to meet the growing need across the state.

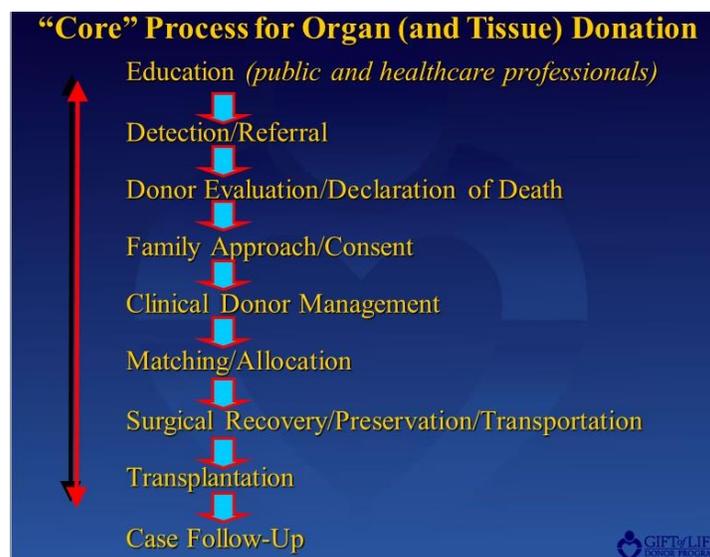
Organ Donation Designation Rate

As of June 2012, of the 9.8 million registered drivers and state ID card holders in Pennsylvania, just over 4.4 million carry the organ donor designation symbol. Donate Life America ranks Pennsylvania 33 out of 50 states with a 45 percent designation rate.⁴ The Donor Designation Collaborative (DDC), which includes all 50 states, District of Columbia and Puerto Rico, was established in 2006 and set a designation rate goal of 50 percent. Although 90 percent of Americans think organ donation is the right thing to do, roughly only 30 percent have taken the appropriate steps to join their states' donor registry. While this represents great support for organ donation, the actual act of designating oneself as a donor remains the main focus of closing the gap on the transplant waiting list.

Organ Donation Process

The OPOs coordinate the recovery of organs and tissues for transplant. Traditional organ donation requires a patient to be in a hospital and on a ventilator when they are pronounced brain dead. If a patient experiences cardiac death, which means the heart has stopped and will not work again, they will be evaluated for tissue and cornea donation. Of the 2.2 million people that die each year, only approximately 2 percent are eligible to be an organ donor.

Figure 10.56 Organ and Tissue Donation Process



The manner in which a person dies determines what organs and tissues can be donated. In most cases, persons who are evaluated for organ donation have suffered fatal head injuries (e.g., car accidents, strokes, aneurysms). Persons who die at home, at the scene of an accident or in the hospital from cardiac death are eligible for tissue and cornea donation only.

The appearance of the donor is not affected, and open-casket funerals are still possible. After the recovery process has occurred, the donor family can proceed with funeral or burial plans, which are not affected by the organ donation procedure. Organ and tissue donation is a dignified and respectful process.

The OPO follows up each donation by sending letters to the donor family, hospital staff, physicians and nurses regarding the organs and tissues that have been recovered. About 14 days after donation, the donor's family will receive a letter

from the OPO describing how their loved one helped the transplant recipient(s). One organ, tissue and cornea donor can save or enhance the lives of up to 50 recipients. The OPOs provide aftercare for the donor families including grief counseling and remembrance ceremonies. The donors and their families are the most important asset as, without them, there would not be recipients. There is no cost to the donor's family for providing the gift of life. All costs related to organ and tissue donation are paid by the respective OPOs.

Transplant Centers

Pennsylvania has eighteen hospitals that perform transplants, as listed below. The number of organ transplants in Pennsylvania peaked in 2006 with 1,860 organs transplanted. The reason for a decline in the number of transplants has to do with changes in transplant center waiting lists for certain organs and the number of available organs that are available from other regions of the United States to be matched with Pennsylvania patients.

Table 10.18 Currently Active Transplant Centers and Types of Transplants, Pennsylvania, 2013

Transplant Center	Transplant Programs						Number of Programs
	Kidney	Heart	Liver	Lung	Pancreas	Intestine	
Albert Einstein Medical Center (PAAE) Philadelphia	●		●		●		3
Allegheny General Hospital (PAAG) Pittsburgh	●	●	●	●	●		5
Crozer-Chester Medical Center (PACC) Upland	●						1
Children's Hospital of Pittsburgh of UPMC (PACH) Pittsburgh	●	●	●	●	●	●	6
Children's Hospital of Philadelphia (PACP) Philadelphia	●	●	●	●			4
Geisinger Medical Center (PAGM) Danville	●		●		●		3
Penn State Milton S Hershey Medical Center (PAHE) Hershey	●	●	●		●		4
Harrisburg Hospital (PAHH) Harrisburg	●				●		2
Hahnemann University Hospital (PAHM) Philadelphia	●	●	●		●		4
The Lankenau Hospital (PALH) Wynnewood	●						1
Lehigh Valley Hospital (PALV) Allentown	●				●		2
University of Pittsburgh Medical Center (PAPT) Pittsburgh	●	●	●	●	●	●	6
St. Christophers Hospital for Children (PASC) Philadelphia	●		●				2
Thomas Jefferson University Hospital (PATJ) Philadelphia	●	●	●		●		4
Temple University Hospital (PATU) Philadelphia	●	●	●	●			4
The Hospital of the University of PA (PAUP) Philadelphia	●	●	●	●	●		5
VA Pittsburgh Healthcare System (PAVA) Pittsburgh	●		●				2
Geisinger Wyoming Valley Medical Center (PAWV) Wilkes-Barre	●						1
Number of Transplant Programs	18	9	13	6	11	2	59

Based on UNOS data as of May 3, 2013

Table 10.19 Transplants by Donor Type, Transplant Type, Transplant Year, Pennsylvania, 2003 to 2012

Donor Type	Transplant Type	Transplant Year										All Years
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Deceased Donor	Kidney	708	685	760	885	721	753	682	644	604	564	7,006
	Liver	494	524	491	458	462	431	461	436	428	401	4,586
	Pancreas	44	67	57	40	48	45	32	43	13	13	402
	Kidney / Pancreas	52	53	53	53	32	20	44	41	35	45	428
	Heart	169	145	156	210	185	178	196	202	155	140	1,736
	Lung	93	109	166	161	215	207	200	202	167	163	1,683
	Heart / Lung	5	11	5	9	7	7	5	8	3	3	63
	Intestine	48	53	46	44	52	42	37	27	20	9	378
All Organs	1,613	1,647	1,734	1,860	1,722	1,683	1,657	1,603	1,425	1,338	16,282	
Living Donor	Kidney	351	368	320	338	293	293	316	288	249	280	3,096
	Liver	39	48	56	52	40	20	33	40	34	25	387
	All Organs	390	416	376	390	333	313	349	328	283	305	3,483
All Donor Types	Kidney	1,059	1,053	1,080	1,223	1,014	1,046	998	932	853	844	10,102
	Liver	533	572	547	510	502	451	494	476	462	426	4,973
	Pancreas	44	67	57	40	48	45	32	43	13	13	402
	Kidney / Pancreas	52	53	53	53	32	20	44	41	35	45	428
	Heart	169	145	156	210	185	178	196	202	155	140	1,736
	Lung	93	109	166	161	215	207	200	202	167	163	1,683
	Heart / Lung	5	11	5	9	7	7	5	8	3	3	63
	Intestine	48	53	46	44	52	42	37	27	20	9	378
All Organs	2,003	2,063	2,110	2,250	2,055	1,996	2,006	1,931	1,708	1,643	19,765	

Based on OPTN data as of May 3, 2013

Table 10.20 Transplants by Organ Procurement Organization, Pennsylvania, 2003 to 2012

Number of Organ Transplants Performed in Pennsylvania Over the Last 10 Years

Transplant Center	Transplant Year										All Years
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Albert Einstein Medical Center (PAAE) Philadelphia	124	151	176	140	142	153	141	151	94	87	1,014
Allegheny General Hospital (PAAG) Pittsburgh	84	86	73	110	109	107	91	121	103	120	326
Crozer-Chester Medical Center (PACC) Upland	0	0	0	0	0	0	0	0	0	3	4
Children's Hospital of Pittsburgh of UPMC (PACH) Pittsburgh	100	98	98	104	111	105	99	66	79	59	15
Children's Hospital of Philadelphia (PACF) Philadelphia	47	44	37	48	37	44	50	42	41	41	1,359
Geisinger Medical Center (PAGM) Danville	45	59	52	59	51	60	49	56	39	48	748
Penn State Milton S Hershey Medical Center (PAHE) Hershey	95	72	89	102	91	64	76	83	74	70	74
Harrisburg Hospital (PAHH) Harrisburg	63	90	79	82	85	72	63	81	68	68	23
Hahnemann University Hospital (PAHM) Philadelphia	134	141	134	134	102	104	69	58	58	65	20
The Lankenau Hospital (PALH) Wynnewood	25	34	37	38	30	32	30	34	30	22	134
Lehigh Valley Hospital (PALV) Allentown	31	26	33	70	60	70	78	65	58	62	5
University of Pittsburgh Medical Center (PAPT) Pittsburgh	594	639	651	709	586	489	536	516	342	338	1,004
St. Christophers Hospital for Children (PASC) Philadelphia	9	8	8	5	5	3	4	0	3	1	3
Thomas Jefferson University Hospital (PATJ) Philadelphia	175	97	102	136	129	150	150	139	158	120	3
Temple University Hospital (PATU) Philadelphia	83	56	49	30	60	71	71	45	50	56	166
The Hospital of the University of PA (PAUP) Philadelphia	369	409	422	398	387	397	397	390	424	384	376
VA Pittsburgh Healthcare System (PAVA) Pittsburgh	25	53	70	84	66	57	89	64	67	87	74
Geisinger Wyoming Valley Medical Center (PAWV) Wilkes-Barre	0	0	0	1	4	18	13	20	20	12	6
All PA Centers	2,003	2,063	2,110	2,250	2,055	1,996	2,006	1,931	1,708	1,643	5,354
All UNOS Region 2 Centers	3,486	3,722	3,826	4,043	3,804	3,701	3,910	3,699	3,544	3,501	37,236
All US Centers	25,473	27,040	28,118	28,940	28,366	27,964	28,459	28,661	28,537	28,053	279,611

Based on OPTN data as of May 3, 2013

There are three types of living donation: **direct donation** is when the donor knows the recipient and wants to donate directly to that person; **paired exchange donation** is when a kidney exchange donor donates their kidney to another recipient that also has an incompatible or poorly compatible donor; and a **good samaritan or altruistic donation** is when the donation is given to a stranger. Sometimes incompatible pairs of donors and recipients can create a chain of transplants over a period of time.

Organ transplants have become more successful since the 1950s when the first kidney transplants were performed. A measurement of success is the number of patients who still have the organ functioning after a period of time called graft survival. Graft survival of a transplanted organ is tracked at three different time points after transplantation: 1 month, 1 year and 3 years. Graft survival is shown in Table 10.21 by center and organ transplanted at each of these time points for all adult patients transplanted in Pennsylvania, as well as in the nation, between 7/1/2006 and 6/30/2011. Patients were followed from time of transplant to failure of the transplanted organ or death, whichever comes first, to calculate the survival percentages shown which indicate the percentage of patients who were alive with a functioning graph at each specific time point following transplant. In the U.S., 86 percent of patients who received a kidney transplant were alive with a functioning kidney 3 years after their transplant, compared to 76 percent of liver recipients, 81 percent of heart recipients and 64 percent of lung recipients.

Table 10.21 Organ Survival Rates in Pennsylvania Transplant Centers by Organ Type

Transplant Center	Kidney Graft Survival Post-Transplant			Liver Graft Survival Post-Transplant			Heart Graft Survival Post-Transplant			Lung Graft Survival Post-Transplant		
	One Month	One Year	Three Years	One Month	One Year	Three Years	One Month	One Year	Three Years	One Month	One Year	Three Years
Albert Einstein Medical Center (PAAE)	96%	90%	77%	92%	77%	72%	-	-	-	-	-	-
Allegheny General Hospital (PAAG)	98%	91%	81%	94%	91%	92%	100%	93%	85%	100%	33%	0%
Children's Hospital of Pittsburgh of UPMC (PACH)*	100%	94%	78%	99%	96%	91%	100%	100%	84%	100%	100%	80%
Children's Hospital of Philadelphia (PACP)*	100%	96%	91%	100%	95%	93%	93%	93%	74%	86%	71%	89%
Geisinger Medical Center (PAGM)	100%	99%	83%	82%	75%	81%	-	-	-	-	-	-
Penn State Milton S Hershey Medical Center (PAHE)	100%	94%	82%	100%	88%	77%	91%	88%	84%	-	-	-
Harrisburg Hospital (PAHH)	97%	92%	90%	-	-	-	-	-	-	-	-	-
Hahnemann University Hospital (PAHM)	94%	88%	65%	100%	84%	80%	100%	100%	77%	-	-	-
The Lankenau Hospital (PALH)	95%	88%	83%	-	-	-	-	-	78%	-	-	-
Lehigh Valley Hospital (PALV)	96%	92%	83%	-	-	-	-	-	-	-	-	-
University of Pittsburgh Medical Center (PAPT)	98%	94%	82%	96%	80%	75%	93%	87%	81%	96%	85%	65%
St. Christophers Hospital for Children (PASC)	-	-	100%	-	-	-	-	-	-	-	-	-
Thomas Jefferson University Hospital (PATJ)	97%	92%	85%	93%	84%	74%	91%	82%	87%	-	-	-
Temple University Hospital (PATU)	95%	88%	77%	87%	72%	-	82%	70%	93%	88%	65%	41%
The Hospital of the University of PA (PAUP)	98%	96%	90%	98%	87%	71%	95%	88%	81%	97%	84%	68%
VA Pittsburgh Healthcare System (PAVA)	99%	89%	88%	95%	82%	65%	-	-	-	-	-	-
Geisinger Wyoming Valley Medical Center (PAWV)	95%	93%	87%	-	-	-	-	-	-	-	-	-
All Transplant Centers in the U.S. (Adult Patients)	98%	94%	86%	95%	87%	76%	96%	90%	81%	95%	84%	64%
All Transplant Centers in the U.S. (Pediatric Patients)	98%	96%	87%	92%	88%	83%	96%	91%	82%	95%	81%	58%

Based on Scientific Registry of Transplant Recipients (SRTR) June 2012 Center Specific Reports (CSRs)

Adult (recipients 18 years of age and older) graft survival by PA center & organ at 1 month, 1 year and 3 years post-transplant. One month & one year graft survival is shown for transplants performed 1/1/2009 - 6/30/2011. Three year graft survival is shown for transplants performed 7/1/2006 - 12/31/2008.*Survival rates for Children's Hospital of Pittsburgh of UPMC and Children's Hospital of Philadelphia are shown for pediatric patients only.

Pennsylvania has been a leader in organ donation and transplantation for more than three decades and is positioned to maintain its leadership through public support for organ donation, an increase in the number of registered organ donors through awareness and education, excellent medical centers, transplant personnel expertise, and significant cooperation between hospitals and organ procurement organizations. With this strong foundation and the generosity of individual donors and donor families who choose to give the gift of life, more lives will be saved through organ transplantation.

Resources

For more information about being an organ donor go to <http://www.donatelifepa.org> or <http://www.donatelifenet.net>.

You can find out more about living donation, paired donation and chains at <http://organdonor.gov/about/livedonation.html> and <http://www.unos.org>.

Endnotes

¹ United States Department of Health and Human Services, Health Resources and Services Administration. (2013). *Organ procurement and transplantation network (OPTN)*. [Data file]. Based on OPTN data as of 04/26/13. Retrieved from <http://optn.transplant.hrsa.gov/latestData/viewDataReports.asp>

² United States Department of Health and Human Services, Health Resources and Services Administration. (2013). *Organ procurement and transplantation network (OPTN)*. [Data file]. Based on OPTN data as of 04/26/13. Retrieved from <http://optn.transplant.hrsa.gov/latestData/viewDataReports.asp>

³ Pennsylvania Legislative Budget and Finance Committee. (2007). *A performance evaluation of Pennsylvania's organ and tissue donor awareness program*.

⁴ Donate Life America. (2012). *2012 National donor designation report card*. Retrieved from <http://donatelife.net/2012-national-donor-designation-report-card-released/>

Arthritis

Arthritis is defined as a disease which causes chronic inflammation of the joints.¹ Early diagnosis and appropriate management of arthritis, including self-management activities (e.g., self-help courses, weight control, physical activity) can help people with arthritis function better, stay productive and lower health care costs.

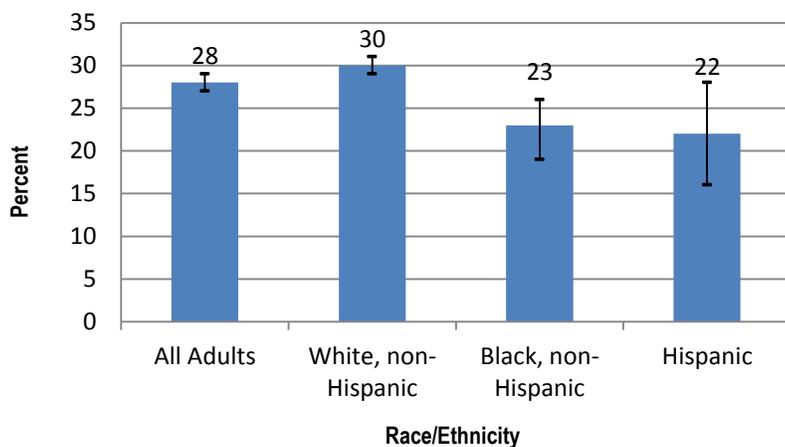
According to the Centers for Disease Control and Prevention (CDC), arthritis is the most common cause of chronic pain and disability in the United States, limiting the activities of nearly 21 million adults.² The most common form of arthritis is osteoarthritis. Other common rheumatic conditions include gout, fibromyalgia and rheumatoid arthritis. Arthritis affects joints, and the surrounding and other connective tissue, and causes chronic pain, aching, stiffness and/or swelling in and around a joint. It may even involve vital organs with systemic disorders.³ In 2009, Pennsylvania reported 31 percent or more than 2.95 million Pennsylvania adults were told by a doctor they have arthritis; of this group: 75 percent had pain, swelling or stiffness around their joints in the past 30 days; 35 percent reported their usual activity was limited due to arthritis; and arthritis is seen with other conditions that may include lupus.

Musculoskeletal conditions, including arthritis, low-back pain and repetitive motion strain, were the leading causes of work absenteeism in the country. It's been estimated that over 500,000 adults are out of work or have work limitations due to their arthritis or chronic joint symptoms.² In Pennsylvania, approximately 593,000 arthritis cases were in adults younger than 45 years of age.

Arthritis affects persons of all race and ethnic groups. Risk of arthritis increases with age, and the condition is more common among women than men. However, approximately one in every 250 children have some form of arthritis or rheumatic condition, and more than half of adults with diabetes or heart disease also have arthritis. In 2009, an estimated 49.9 million adults (just over one in five adults) in the United States reported being told by a doctor that they had some form of arthritis, rheumatoid arthritis, gout, lupus or fibromyalgia.

According to the Pennsylvania Behavioral Risk Factor Surveillance System (PA BRFSS), in 2011, the percent of adults in Pennsylvania who reported they were ever told by a medical professional that they have arthritis was slightly higher for non-Hispanic whites compared to all other races.⁴

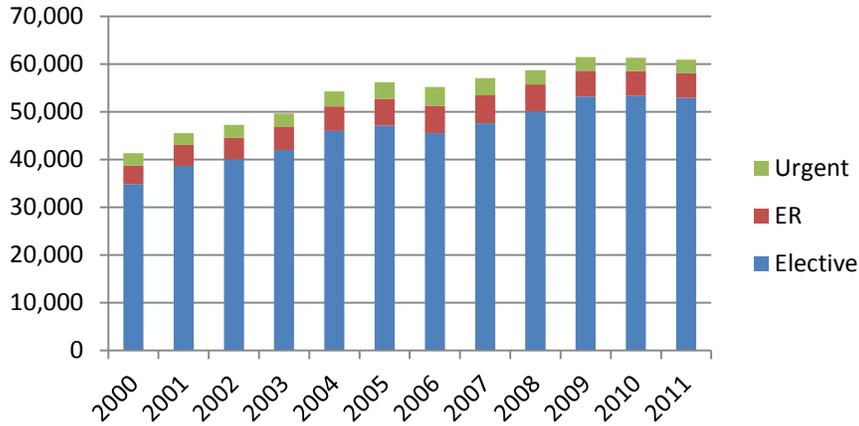
Figure 10.57 Adult Arthritis Diagnoses by Race and Ethnicity, Pennsylvania, 2011⁵



Hospitalizations

Overall, hospitalizations due to arthritis increased between 2000 and 2011 in all admission types including urgent, emergency room and elective hospital admission types.

Figure 10.58 Arthritis Hospitalizations by Type, Pennsylvania, 2000 to 2011⁶



Age and Sex

The age-adjusted hospitalization rates for arthritis increased from 2000 to 2009, and then decreased slightly in 2010 and 2011.

Age-adjusted hospitalization rates for arthritis among both males and females generally increased since 2000. Since 2010, rates have decreased slightly in both genders. Over the past decade, female arthritis hospitalization rates were consistently higher than those for males.

Figure 10.59 Age-adjusted Rates of Arthritis Hospitalization, Pennsylvania, 2000 to 2011⁷

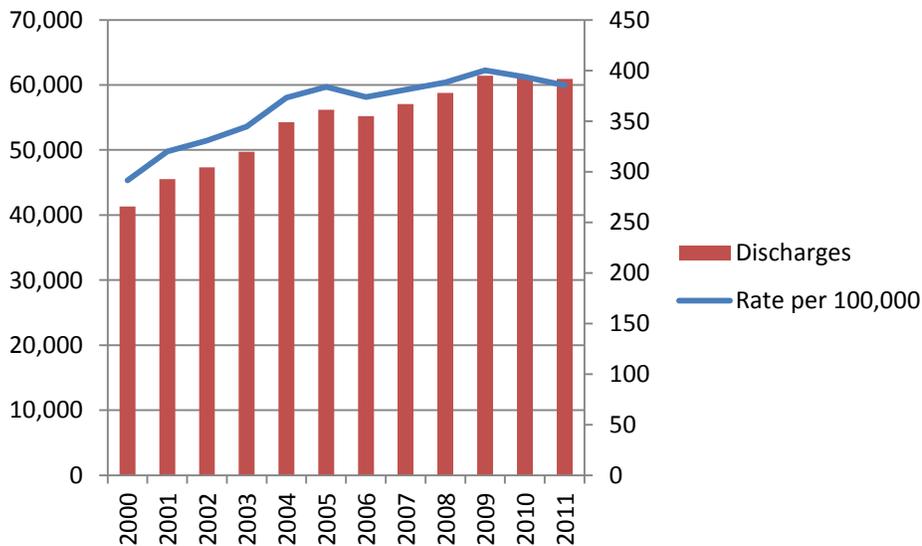
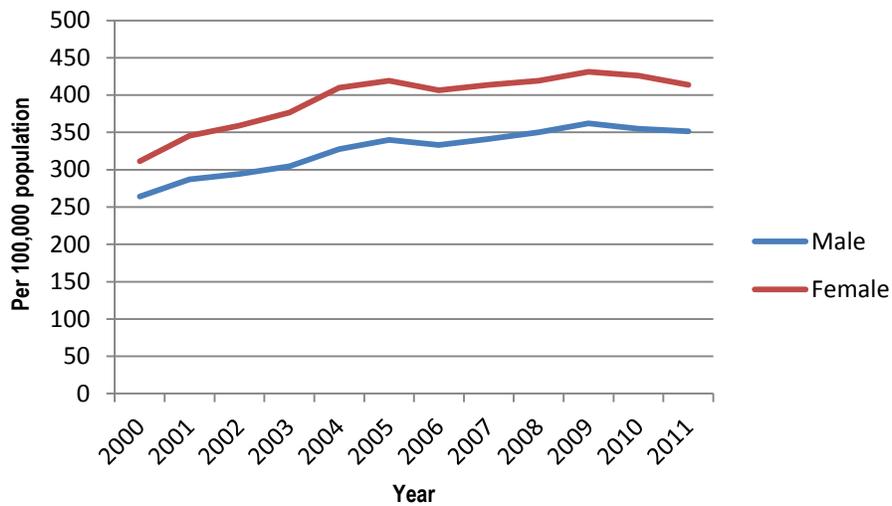


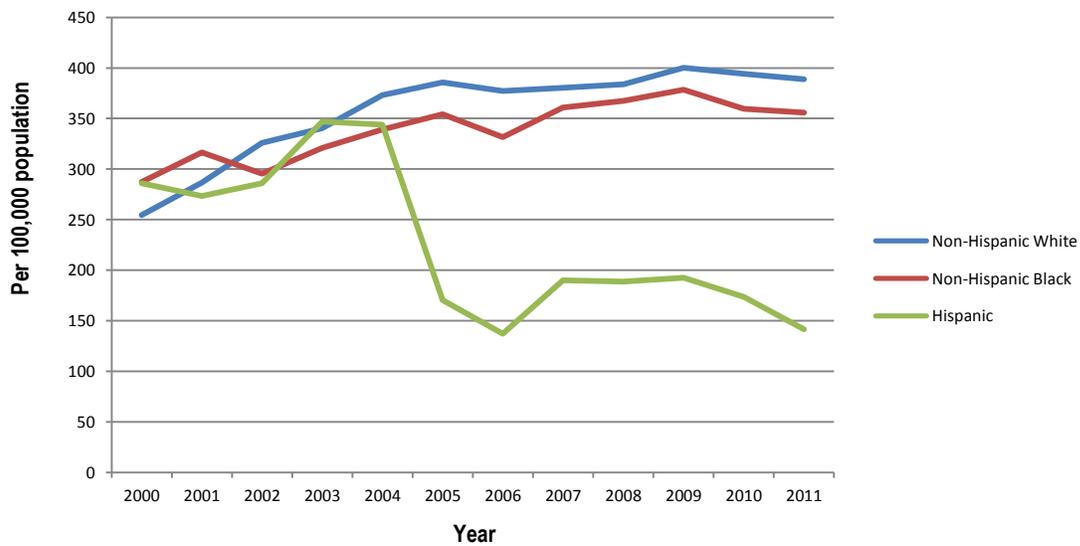
Figure 10.60 Age-adjusted Arthritis Hospitalization Rates by Sex, Pennsylvania, 2000 to 2011⁸



Race and ethnicity

Non-Hispanic whites had the highest age-adjusted hospitalization rates between 2000 and 2011. Hispanics decreased by half between 2003 and 2006, increased slightly in 2007 and then decreased again in 2010 and 2011.

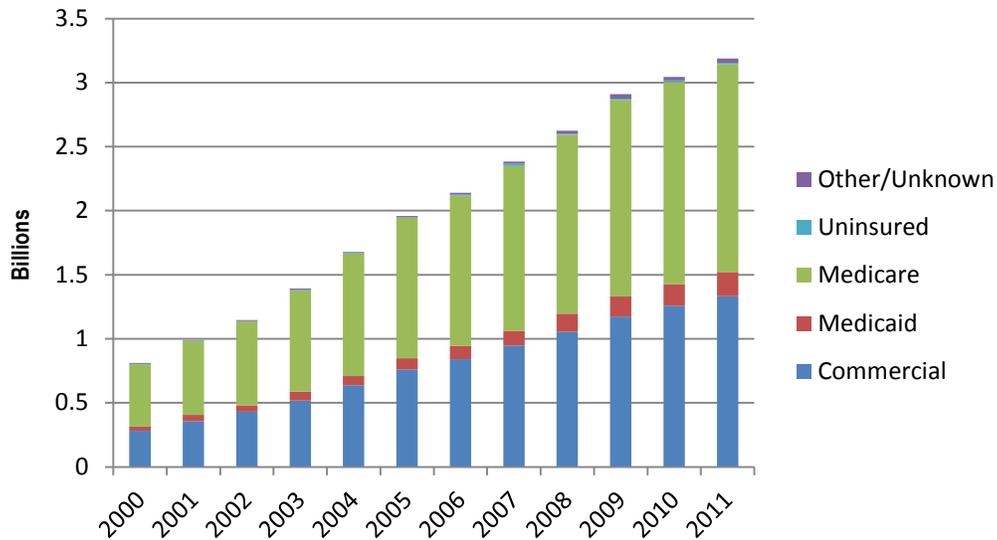
Figure 10.61 Age-adjusted Arthritis Hospitalization Rates by Race and Ethnicity, Pennsylvania, 2000 to 2011⁹



Health Costs

The overall arthritis hospitalization charges increased consistently every year between 2000 and 2011. Hospitalization charges for Medicare more than tripled, while commercial insurance charges quadrupled between 2000 and 2011.

Figure 10.62 Charges by Insurance Type for Arthritis Hospital Admissions, Pennsylvania, 2000 to 2011¹⁰



Resources

United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC)—
<http://www.cdc.gov/arthritis>

Behavioral Risk Factor Surveillance System (BRFSS)—<http://www.cdc.gov/brfss>

Pennsylvania Health Care Cost Containment Council (PHC4)—<http://www.phc4.org>

Pennsylvania Department of Health—<http://www.health.state.pa.us/arthritis>

National Arthritis Foundation—<http://www.arthritis.org>

Endnotes

¹ Arthritis. (n.d.) *WebMD*. Retrieved from <http://arthritis.webmd.com/>

² United States Department of Health and Human Services, Centers for Disease Control and Prevention. (2013). *Arthritis*. Retrieved from <http://www.cdc.gov/arthritis/>

³ United States Department of Health and Human Services, Centers for Disease Control and Prevention. (2011). *Fact sheet about arthritis*. Retrieved from <http://www.cdc.gov/arthritis/press/factsheet.htm>

⁴ United States Department of Health and Human Services, Centers for Disease Control and Prevention. *Behavioral Risk Factor Surveillance System Survey (BRFSS) [Data file]*.

⁵ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011 [Data file]*. Retrieved from <http://www.phc4.org/>

⁶ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

⁷ United States Department of Health and Human Services, Centers for Disease Control and Prevention. *Behavioral Risk Factor Surveillance System Survey (BRFSS)* [Data file].

⁸ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

⁹ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹⁰ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

¹¹ Pennsylvania Health Care Cost Containment Council (PHC4) *Hospital discharge data, 2000-2011* [Data file]. Retrieved from <http://www.phc4.org/>

Osteoporosis

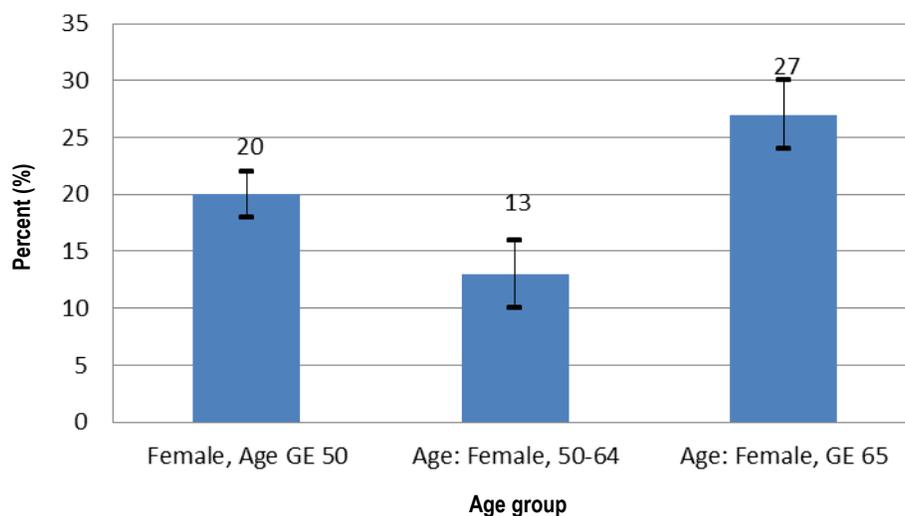
Osteoporosis is known as a pediatric disease with geriatric consequences. Osteoporosis develops when bone removal occurs too quickly or if replacement occurs too slowly. A person will develop osteoporosis if they did not reach their maximum peak bone mass during the bone building years.¹

Prevalence

The Pennsylvania Department of Health annually conducts the Behavioral Risk Factor Surveillance System (BRFSS) survey, a sample telephone survey of Pennsylvania adults regarding physical activity, eating habits, smoking and health status. Reviewing the data from BRFSS is one way to evaluate the progress toward the Healthy People 2010 goal of reducing the proportion of adults with osteoporosis. In 2008, 20 percent of Pennsylvania women aged 50 years and older were told they have osteoporosis, compared to the national median of 16 percent.¹

The BRFSS also finds that many women in Pennsylvania, aged 18 and older, are at risk of developing osteoporosis. Eighteen percent eat foods high in calcium three or more times per day. Nine percent do daily physical activities specifically designed to strengthen muscles. Fifty-seven percent were told by a health professional how to prevent osteoporosis. Thirty-nine percent had a bone density test. Forty-six percent were currently taking calcium supplements or antacids containing calcium.¹

Figure 10.63 Diagnosed with Osteoporosis, Women Age 50 and Older, Pennsylvania, 2008²



Risk Factors

Some factors that increase the risk of developing osteoporosis include cigarette smoking, early menopause (before age 45), Caucasian race or Asian ethnicity, small body frame, family history of osteoporosis, certain medications (e.g., steroid medication, those prescribed due to organ transplants), and certain conditions (e.g., malabsorption, history of an eating disorder).¹

Scientific evidence shows that implementing prevention and education initiatives during the early childhood years establishes lasting healthy behaviors that help to maintain bone health. There are several things that can be done to maintain strong bones and prevent osteoporosis including the following: avoid alcohol and smoking; bone mineral density testing if at risk or 65 and older; calcium intake of 1000 – 1300 mg every day, according to age; eat a diet that is rich in foods with calcium and vitamin D; and exercise including daily weight bearing exercise that helps reduce bone mineral loss and maintains good muscle tone and heart function.¹

Intervention Strategies

Pennsylvania Osteoporosis Prevention and Education Strategic Plan. Developed to provide direction for comprehensive and coordinated initiatives to reduce the burden of osteoporosis on the citizens of Pennsylvania, this aims to build capacity in Pennsylvania through implementing environmental, policy and system lifestyle changes that promote healthy behavior. Collaborative efforts between the Department and community partners help to advance the Plan objectives to reduce the osteoporosis burden in Pennsylvania. Pennsylvania's Plan focuses on population-specific strategies for all ages to raise awareness for bone health and increase prevention efforts for osteoporosis in the: bone building years (0-30); bone maintenance years (30-50); and bone loss years (50 and older).¹

Strong Women. This national initiative provides an opportunity for mid-life and older women at risk for osteoporosis to participate in the evidence-based strength-training program developed by the John Hancock Center for Physical Activity and Nutrition at Tufts University. The effort to reach Pennsylvania women is led by the Pennsylvania State University (PSU) Cooperative Extension Office and has been supported by the Department since March 2005. The program provides participants the opportunity to engage in weight-bearing physical activity led by a certified trainer. During the 8-12 week sessions, in addition to leading the exercises, the trainer educates the participants on bone health and nutrition.¹

Pennsylvania Department of Health, Bureau of Health Promotion and Risk Reduction programs. These focus on policy, environmental and systems change that address shared risk factors for chronic disease, such as poor nutrition, lack of physical activity and tobacco use. Osteoporosis prevention continues to be addressed through safe and healthy lifestyle interventions provided by the County and Municipal Health Departments, worksites, and community organizations.¹

Resources

John Hancock Center for Physical Activity and Nutrition at Tufts University, StrongWomen Program—<http://jhcpn.nutrition.tufts.edu/programs/index.html#strongwomen/>

The National Osteoporosis Foundation—<http://www.nof.org/>

Endnote

¹ Pennsylvania Department of Health, Bureau of Health Promotion and Risk Reduction. (2010). *Osteoporosis prevention and education program annual report to the general assembly*. Retrieved from <http://www.portal.state.pa.us/portal/server.pt/community/osteoporosis/14220>

² Pennsylvania Department of Health. (2008). *Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS)* [Data file]. Retrieved from <http://apps.health.pa.gov/epiqms/Asp/ChooseDataset.asp>

Alzheimer's Disease

Alzheimer's disease is a progressive, degenerative disorder that attacks the brain's nerve cells, or neurons, resulting in loss of memory, thinking and language skills, and behavioral changes.¹ It is a form of dementia, which is the loss of cognitive functioning to such an extent that it interferes with a person's daily life. Alzheimer's disease is the most commonly diagnosed form of dementia.²

In 2010, Alzheimer's disease was the underlying cause for a total of 83,494 deaths³ and was classified as a contributing cause for an additional 26,488 deaths nationally. In Pennsylvania, total deaths due to Alzheimer's in 2010 were 3,566.⁴ Alzheimer's disease was the sixth leading cause of death in the United States and Pennsylvania, and the fifth leading cause for people aged 65 years and over.⁵ Nearly one in every three seniors who dies each year has Alzheimer's or another dementia.

Figure 10.64 Age-adjusted Alzheimer's Disease Death Rate by Sex, Pennsylvania, 2001 to 2010⁶

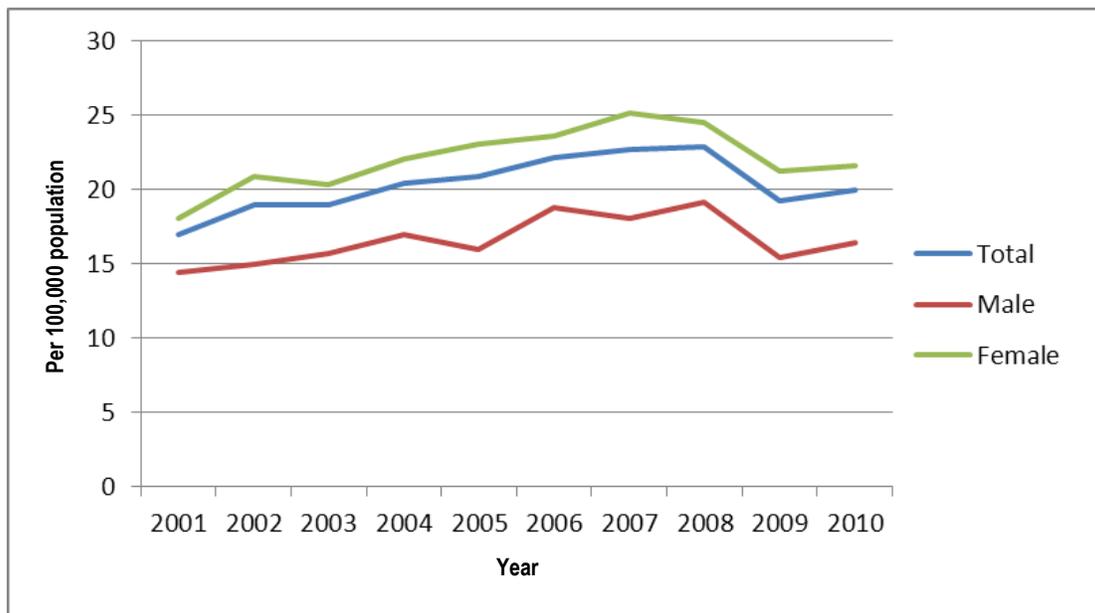


Figure 10.65 Deaths Due to Alzheimer's Disease by Sex, Pennsylvania, 2010

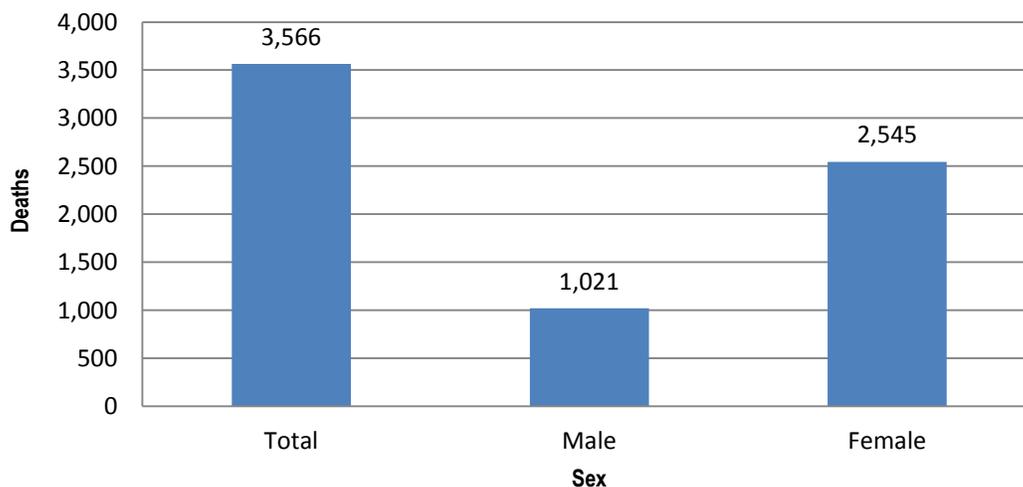
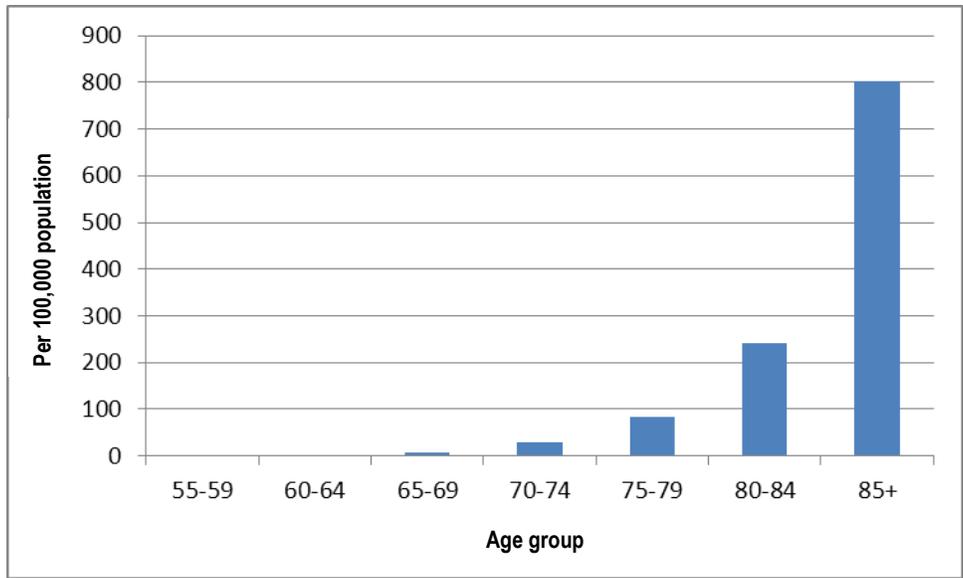


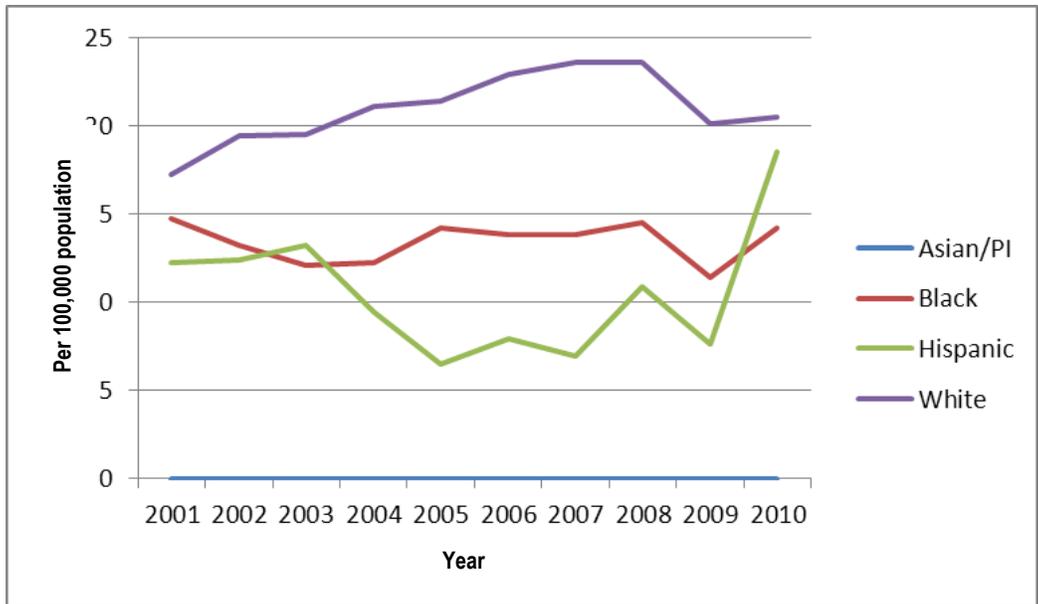
Figure 10.66 Age-adjusted Death Rate for Alzheimer’s Disease by Age Group, Pennsylvania, 2008 to 2010 Combined



Race and Ethnicity

The age-adjusted death rate for Alzheimer’s disease was higher for women than for men, and higher for the non-Hispanic white population than for the non-Hispanic black population and the Hispanic origin population.

Figure 10.67 Age-adjusted Death Rate for Alzheimer’s Disease by Race and Ethnicity, Pennsylvania, 2001 to 2010



Alzheimer’s disease mortality rates have steadily increased in Pennsylvania for both males and females from 1990 to 2010. However, rate differences exist among counties in Pennsylvania. The age-adjusted death rate for Pennsylvania for the period 2008-2010 was 20.6, with a total of 10,944 deaths.⁷ Twenty-two (22) counties had higher 2008-2010 age-adjusted death rates than the state average including Adams, Armstrong, Beaver, Bradford, Butler, Cambria, Carbon, Clarion, Crawford, Elk, Greene, Huntingdon, Lackawanna, Lancaster, Lehigh, Lycoming, Montour, Somerset,

⁵ United States Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, *NCHS data brief – no. 116*, March 2013.

⁶ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.pa.us/stats>

⁷ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2012). *PA County Health Profiles* Retrieved from <http://www.health.state.pa.us/stats>.

⁸ Pennsylvania Department of Health, Bureau of Health Statistics and Research. (2013). *Pennsylvania death certificates* [Data file]. Retrieved from <http://www.health.state.pa.us/stats>