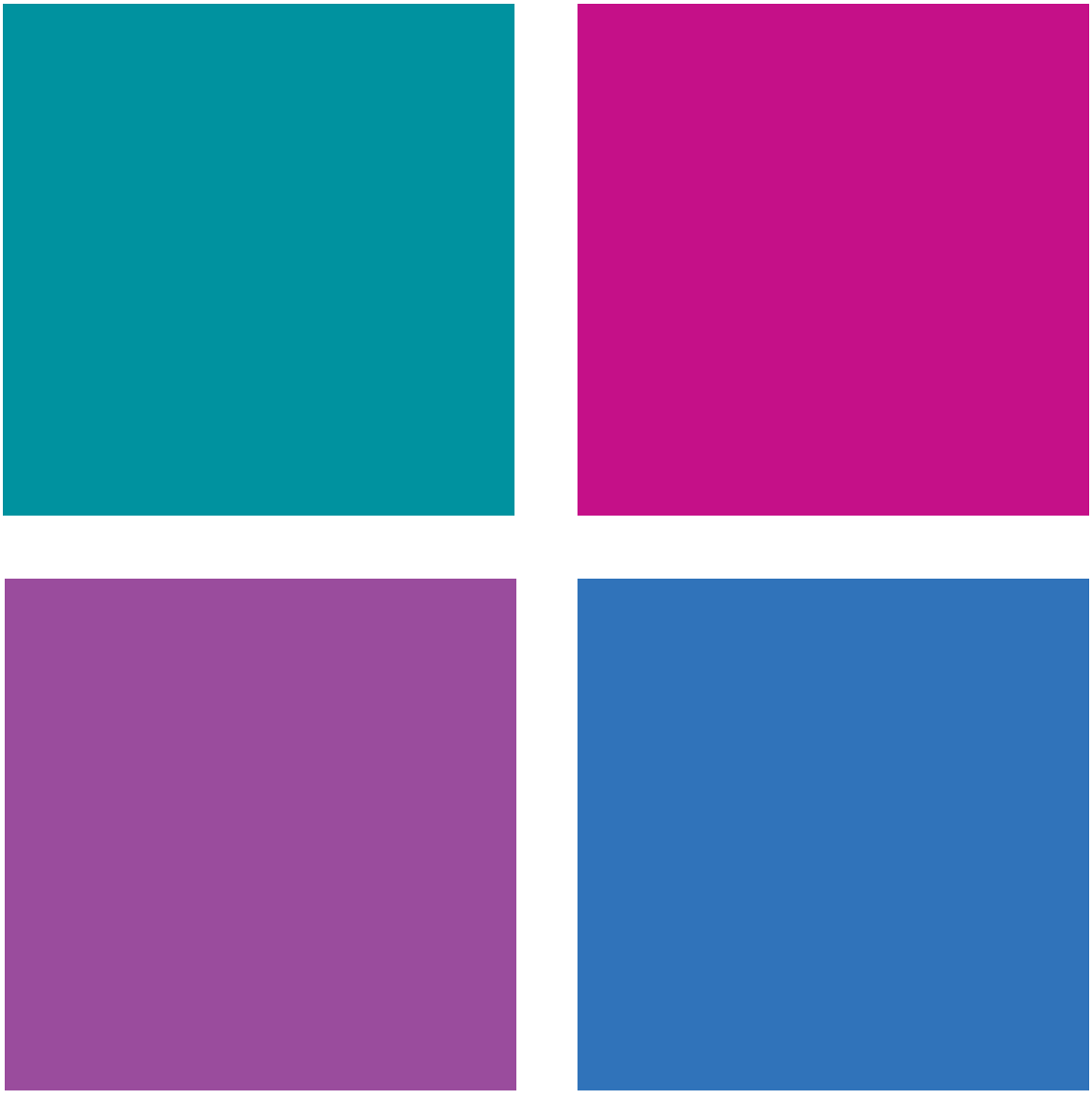
Chronic Health Conditions in Pennsylvania

Diabetes • Asthma • COPD • Heart Failure



A State of Health Care in Pennsylvania Report

PHC4

Pennsylvania Health Care Cost Containment Council
June 2010

Executive Summary

The Pennsylvania Health Care Cost Containment Council (PHC4) is required by statute to make annual reports to the General Assembly on health care costs and quality. In 2007, PHC4 produced a report – *Critical Condition: The State of Health Care in Pennsylvania* – that provided a global view of the issues and challenges confronting health care stakeholders. This report on chronic diseases serves as a periodic update on the state of health care in the Commonwealth.

Chronic conditions are the leading causes of death, disability and rising health care costs, accounting for 80% of all health care costs and hospitalizations in Pennsylvania.[1] This report focuses on four of the most costly conditions: diabetes, asthma, chronic obstructive pulmonary disease (COPD) and heart failure. The purpose of this report is to provide information about the burden of these illnesses and insights as to where prevention efforts can be directed. After all, the present health care system was designed to treat acute illness, rather than control chronic disease in a coordinated and comprehensive fashion.

Each section on the four conditions follows a similar format: definitions, risk factors, national and state statistics, and in-depth information on hospitalizations. Some sections include detailed information about a specific modifiable health risk factor, such as tobacco use or obesity, which may contribute to the disease.

The report's notable highlights include:

- Pennsylvania's hospitalization rates for diabetes, asthma, COPD and heart failure were all higher than the national rates for these conditions in both 2004 and 2007.
- In Pennsylvania, hospitalization rates for three of the four conditions – diabetes, asthma and COPD – increased from 2004 to 2008.
- A greater percentage of Pennsylvania adults in 2008 were current smokers and were either overweight or obese, compared to adults nationwide. The same was true for those with high blood pressure in 2007.
- For the four conditions, significant variations in hospitalization rates exist based on race/ethnicity. Black (non-Hispanic) residents tended to have higher rates than white (non-Hispanic) and Hispanic residents.
- The vast majority of hospitalizations for the four conditions were considered potentially avoidable based on the federal Agency for Healthcare Research and Quality's Prevention Quality Indicators and may have been prevented with better access to high-quality outpatient care and behavior modification.
- More than 25% of the individual patients admitted for any one of the four conditions were readmitted to the hospital for the same condition within one year.
- These four conditions impose a high burden on state health care resources. For example, in 2008, there were almost 25,000 hospitalizations for these conditions among Medicaid recipients and uninsured persons.
- Based on the average Medicare payments for each condition, total Medicare payments for all hospitalizations for the four conditions in 2007 were estimated at $615 million in Pennsylvania.

Executive Summary

Medicare payment data sheds some light on the financial impact. If all payers paid at the Medicare rate, total payments for hospitalizations for the four conditions would have totaled slightly more than $1 billion in 2007. It is also worth pointing out that commercial health insurers, who are the largest payer for all general acute care hospital services, pay higher reimbursement rates than government payers for many conditions. Therefore, the financial toll is in all likelihood higher.

While this report does not explore other major medical expenditures, such as physician office visits and outpatient prescriptions, the information on inpatient hospitalizations highlights opportunities to contain health care costs and to improve the quality of life for Pennsylvanians with chronic diseases. Future reports will describe opportunities and challenges that lie ahead for stakeholders working to improve health status and reduce health care spending in the Commonwealth.

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Key Findings

Hospitalization Rates* Pennsylvania and United States

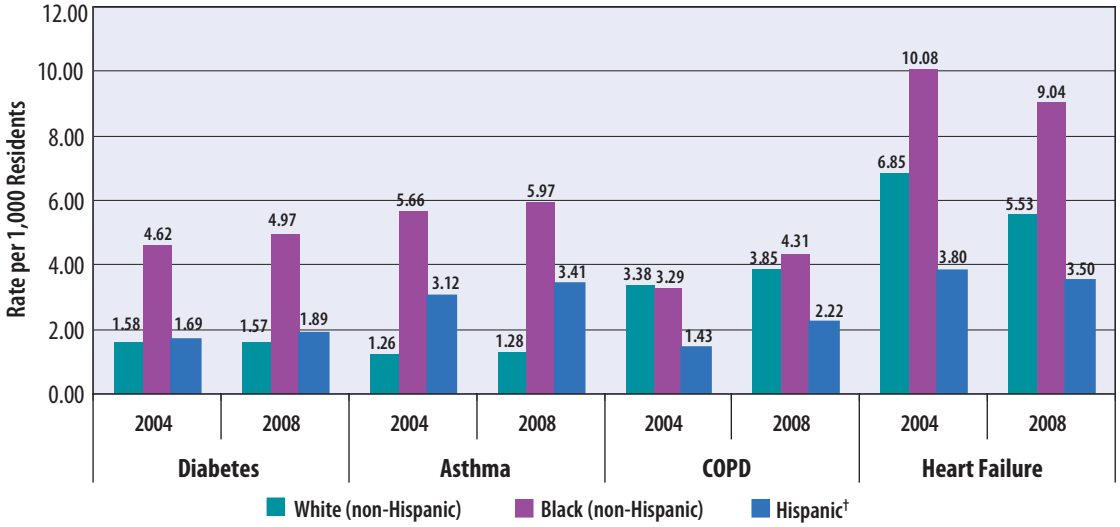
	2004		2007		2008
	PA	US	PA	US	PA
Diabetes	1.88	1.75	1.96	1.77	1.96
Asthma	1.79	1.43	1.84	1.33	1.92
COPD	3.26	2.51	3.23	2.59	3.84
Heart Failure	6.96	5.02	6.16	4.50	5.83

Note: The most recent U.S. rates available are for 2007.

* Per 1,000 residents. Diabetes and asthma hospitalization rates are for residents of all ages, while COPD and heart failure hospitalization rates are for adults age 18 and older.

- Pennsylvania's hospitalization rates for diabetes, asthma, COPD and heart failure were higher than the U.S. rates for both 2004 and 2007.
- Pennsylvania's hospitalization rates increased 4.3% for diabetes, 7.3% for asthma and 17.8% for COPD from 2004 to 2008, while its hospitalization rate for heart failure decreased 16.2% during this same time period.

Hospitalization Rates* by Race/Ethnicity, Pennsylvania, 2004 and 2008



* Per 1,000 residents. Diabetes and asthma hospitalization rates are for residents of all ages, while COPD and heart failure hospitalization rates are for adults age 18 and older.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- In general, black (non-Hispanic) residents tended to have higher hospitalization rates for the four conditions reported, compared to white (non-Hispanic) and Hispanic residents. The one exception was COPD, where white (non-Hispanic) residents had the highest hospitalization rate in 2004.
- Among Pennsylvanians age 65 and older, approximately one in 24 white (non-Hispanic) residents, one in 15 black (non-Hispanic) residents, and one in 15 Hispanic residents were likely to be hospitalized for one of the four conditions reported in 2008.

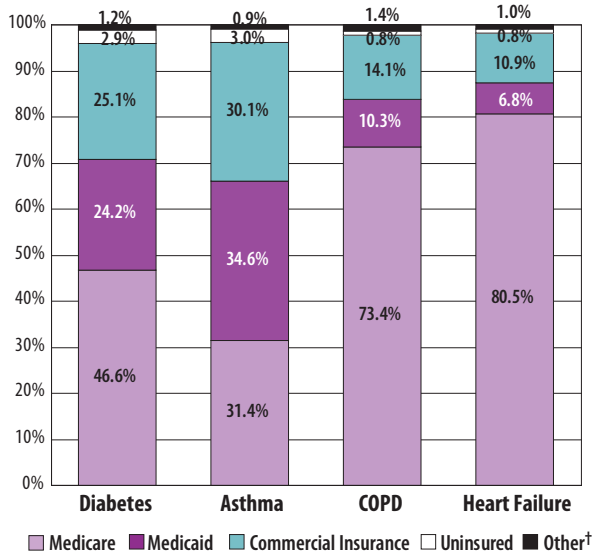
Key Findings

Patients with Multiple Readmissions within One Year in Pennsylvania

Of the 112,930 individuals hospitalized for one of the four conditions reported, 29,286 or 25.9% were readmitted for this same condition within one year.

- 18,430 or 16.3% were readmitted once within 365 days.
- 10,856 or 9.6% were readmitted more than once within 365 days.

Hospitalizations* by Payer, Pennsylvania, 2008



* Includes Pennsylvania and out-of-state residents. Diabetes and asthma hospitalizations are for residents of all ages, while COPD and heart failure hospitalizations are for adults age 18 and older.

† Includes other government payers and hospitalizations where the payer was unknown or designation was invalid or missing.

- Medicare was the primary payer for the largest percentage of diabetes, COPD and heart failure hospitalizations; for asthma hospitalizations, the primary payers were more evenly distributed among Medicaid (34.6%), Medicare (31.4%) and commercial insurance (30.1%).
- Among Pennsylvania patients of all ages, Medicare and Medicaid were the primary payers for 70.8% of diabetes hospitalizations and 66.0% of asthma hospitalizations.
- For children under age 18, Medicaid was the primary payer for 62.2% of asthma hospitalizations, and commercial insurers were the primary payers for 58.9% of diabetes hospitalizations.
- Among Pennsylvania patients age 18 and older, Medicare and Medicaid were the primary payers for 83.7% of COPD hospitalizations and 87.3% of heart failure hospitalizations.

Medicare Payments for Hospitalizations* Pennsylvania, 2007

	Average Medicare Payment	Total Actual Medicare Payments†	Total Estimated Medicare Payments‡
Diabetes	$7,683	$41,587,051	$69,946,032
Asthma	$5,299	$14,790,793	$26,839,435
COPD	$5,735	$73,302,588	$124,696,105
Heart Failure	$8,176	$248,358,005	$393,805,216

* Includes Pennsylvania and out-of-state residents.

† Includes the hospital admissions for which PHC4 was able to match Medicare payment data.

‡ Estimate of total Medicare payments based on total number of hospitalizations among Medicare beneficiaries.

- In 2007, Pennsylvania's total Medicare payments for the diabetes, asthma, COPD and heart failure hospitalizations with available payment data were more than $378 million.
- Extrapolating the average Medicare payment for each condition to all 2007 Medicare hospitalizations, total Medicare payments for hospitalizations for these four conditions can be estimated at $615 million.

Introduction

In Pennsylvania and the United States, chronic diseases are the main causes of death and disability. They are the most common and costly of all public health problems and, yet, are among the most preventable. Chronic conditions are typically defined as health problems that last 12 months or longer and restrict an individual's self-care, independent living, and social interactions or require ongoing intervention with medical products, services, and special equipment.[2] Many chronic diseases can be attributed to modifiable health risk behaviors, such as smoking, poor eating habits, lack of exercise, and excessive alcohol consumption.

United States – At a Glance

- Chronic diseases are the cause of 70% of American deaths each year, and almost half of all U.S. adults have at least one chronic condition.[3]
- In 2007, chronic conditions were a principal or secondary diagnosis for 74% of all U.S. hospitalizations.[4]
- About 25% of people with chronic conditions have one or more daily activity limitations.[5]
- Health disparities in chronic disease incidence and mortality are widespread among members of racial and ethnic minorities.[6]
- More than 75% of the nation's health care spending is on people with chronic diseases.[7]
- The annual economic impact of chronic disease on the United States due to productivity loss and treatments is estimated to reach $4.2 trillion by 2023.[8]

Pennsylvania – At a Glance

- More than 60% of the state's population suffers from a chronic condition, and almost 70% of all deaths are caused by chronic disease.[9]
- Chronic disease patients account for 80% of all health care costs and hospitalizations, 76% of all physician visits and 91% of all filled prescriptions.[10]
- Only 56% of patients with chronic disease receive the evidence-based care that is recommended for their conditions.[11]
- For 2007, it was projected that avoidable hospital admissions for chronic conditions topped $4 billion in hospital charges, not including emergency room visits.[12]
- The annual economic impact of chronic disease on the Commonwealth due to productivity loss and treatments is estimated to reach $170.2 billion by 2023.[13]

Introduction

State Demographic Profile

Several key demographic characteristics provide an important context for examining the impact of chronic conditions in Pennsylvania.

Population Growth: Pennsylvania's population only grew 1.0% from 2004 (12,335,652) to 2008 (12,448,279).[14]

65 and Older: In 2008, Pennsylvania was one of the "oldest" states, with 15.4% of its residents age 65 and older.[15] Pennsylvania's age 85 and older population grew 14.4% from 2004 (271,198) to 2008 (310,242).[16]

Life Expectancy: The median age at death varies by gender and race/ethnicity in Pennsylvania. In 2007, the median age at death was 82.8 years for females and 76.4 for males.[17] In terms of race/ethnicity, the median age at death was 80.7 years for white residents, 69.2 years for black residents, and 60.5 years for Hispanic residents.[18]

Poverty: In 2008, 11.0% of all Pennsylvanians were living below the poverty level, compared to 13.2% nationally.[19]

Rural and Urban: Of the 67 counties in Pennsylvania, 48 are considered rural, and 19 are urban.[20] Approximately 72.4% of Pennsylvanians are urban residents, and 27.6% are rural residents.[21]

Health Insurance Coverage: Approximately 9.9% of Pennsylvanians were uninsured in 2008, compared to 15.4% of all persons nationwide.[22] In 2008, an estimated 74.1% of Pennsylvanians were covered by private health insurance plans, and 29.5% were covered by government health insurance programs.[23]

Pennsylvania Population Statistics, 2008

	Number of Residents	Percent of Residents
Total	**12,448,279**	**100%**
By Age Group		
<1	148,912	1.2%
1-17	2,613,092	21.0%
18-44	4,361,703	35.0%
45-64	3,414,001	27.4%
65-84	1,600,329	12.9%
85+	310,242	2.5%
By Gender		
Male	6,060,170	48.7%
Female	6,388,109	51.3%
By Race/Ethnicity		
White (Non-Hispanic)	10,134,483	81.4%
Black (Non-Hispanic)	1,278,965	10.3%
Hispanic	593,986	4.8%
Other	440,845	3.5%

Source: U.S. Census Bureau Data as of July 1, 2008.

Health Insurance Coverage in Pennsylvania by Type of Insurance, 2008

	Number of Residents	Percent of Residents
Private Insurance	9,040,000	74.1%
Employment-based	7,710,000	63.2%
Direct Purchase	1,318,000	10.8%
Government	3,593,000	29.5%
Medicaid	1,624,000	13.3%
Medicare	2,054,000	16.8%
Military	294,000	2.4%
No Insurance	1,211,000	9.9%

Source: U. S. Census Bureau
Note: Some persons are covered by more than one source so numbers and percentages do not add up to category totals. In 2008, 10.3% of persons were covered by both Medicare and private insurance, 2.9% were covered by Medicaid and private insurance, and 2.1% were covered by Medicare and Medicaid. All figures are estimates.

About the Data

Where does the data come from?

The Pennsylvania data used in this analysis was submitted to PHC4 by Pennsylvania's general acute care hospitals for calendar years 2004 through 2008. Hospitalization rates for Pennsylvania residents were calculated using PHC4 hospitalization data and U.S. Census Bureau data.

U.S. hospitalization data came from the Healthcare Cost and Utilization Project (HCUP), which is sponsored by the Agency for Healthcare Research and Quality (AHRQ). National data is included to provide comparisons; the most recent U.S. figures available are for 2007.

The Centers for Medicare and Medicaid Services (CMS) provided Medicare payment data. The most recent Medicare payment data available from CMS for use in this report is for 2007.

The Behavioral Risk Factor Surveillance System (BRFSS) data used in this report is collected by the Pennsylvania Department of Health (PA DOH) and reported to the Centers for Disease Control and Prevention. The BRFSS is a sample-based survey, making it necessary to weight the data for calculating percentages. This adjusts for under-representation of subgroups. For the confidence intervals associated with the BRFSS statistics reported, see the PA DOH website cited in the References section in the back of this report.

What is measured in this report?

Number and Percent of Hospitalizations: This is the number and percent of hospitalizations for each condition analyzed in the report. The conditions featured in this report – diabetes, asthma, chronic obstructive pulmonary disease and heart failure – were defined using AHRQ's Clinical Classifications Software. For calculations focused on population-based rates, non-Pennsylvania residents (approximately 2.5%) were excluded.

Hospitalization Rate: This is the rate of hospitalization for a condition per 1,000 residents. Non-Pennsylvania residents were excluded to focus on population-based rates. Rates were age- and sex-adjusted when analyzing county rates. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

Average Length of Stay and Total Number of Days: Average (mean) length of stay represents the number of days, on average, a patient stayed in the hospital for a condition. Total number of days represents the sum of all lengths of stay for all patients. How long a patient stays in the hospital may reflect upon the success of the treatment.

Potentially Preventable Hospitalizations: Potentially preventable hospitalizations were calculated based on Prevention Quality Indicators (PQIs), a tool distributed by AHRQ. PQIs were developed to look at hospitalizations among adults. PQIs are a set of measures that can be used with hospital inpatient discharge data to provide information about potentially preventable hospitalizations for "ambulatory care-sensitive conditions." These are conditions for which better access to high-quality outpatient care may potentially prevent the need for inpatient hospitalization or for which early intervention may prevent complications or more severe disease. It is important to note that factors outside the direct control of the health care system – such as poor environmental conditions or lack of patient adherence to treatment recommendations – can result in hospital admissions. The statistics on potentially preventable admissions include both Pennsylvania and out-of-state residents treated in Pennsylvania hospitals.

Single and Multiple Readmissions: These measures look at the number of times within 365 days that a patient was readmitted to a hospital with a principal diagnosis for a condition – after an initial hospitalization with a principal diagnosis for the same condition. While some readmissions will always occur, high-quality inpatient and outpatient care may lessen the need for subsequent hospitalizations. The total number of readmissions may be underreported, because some patients may have been readmitted to hospitals in neighboring states or may have had missing or invalid data, such that readmissions could not be identified. The analysis on readmissions includes both Pennsylvania and out-of-state residents treated in Pennsylvania hospitals.

Hospitalizations by Payer: The payer analysis shows who was the primary payer for the hospitalizations. The analysis on hospitalizations by payer includes both Pennsylvania and out-of-state residents treated in Pennsylvania hospitals.

Average and Total Medicare Payments: Average (mean) Medicare payment is the average amount hospitals were paid for care of Medicare patients in the fee-for-service system. Total Medicare payments represent the sum of all Medicare payments in the fee-for-service system. Payments from Medicare Advantage plans (Medicare HMOs) are not included. The amount paid is different from a hospital charge. The average payment reported is for the entire length of stay. Average payments were not trimmed for outliers or case-mix adjusted. The analysis on Medicare hospitalizations includes both Pennsylvania and out-of-state residents treated in Pennsylvania hospitals.

Diabetes

Diabetes is characterized by the presence of too much glucose in the blood. High levels of blood glucose (also known as blood sugar) can result from the inability of the body to produce or properly use insulin. Insulin is a hormone needed to convert sugar, starches and other food into energy needed for daily life. Diabetes may be associated with premature death and serious complications, including heart disease, hypertension and stroke. It also is a leading cause of new cases of blindness, end-stage renal disease, and non-traumatic lower extremity amputation.

United States – At a Glance

- Diabetes is the seventh leading cause of death in the United States.[24]
- Approximately 23.6 million Americans had diabetes in 2007. Of this number, 17.9 million had been diagnosed, and another 5.7 million people had undiagnosed diabetes.[25]
- Hospital stays for diabetes increased 27.8% between 1997 (417,549 discharges) and 2007 (533,421 discharges).[26]
- In 2007, the average medical expenditures among people with diabetes were 2.3 times higher than expenditures for those without diabetes.[27]
- One in ten U.S. health care dollars is directly attributable to diabetes and its complications.[28]
- The direct cost (medical care) and indirect cost (lost productivity and premature mortality) of diabetes in the United States totaled about $174 billion in 2007.[29]

Pennsylvania – At a Glance

- In 2007, diabetes was the seventh leading cause of death in Pennsylvania and the underlying cause of 3,420 deaths.[30]
- In 2008, 8.8% of Pennsylvania adults age 18 and older had been diagnosed with diabetes, compared to 8.3% of adults nationwide.[31]
- In 2008, black (non-Hispanic) adults had significantly higher diabetes prevalence (15.4%), compared to white (non-Hispanic) adults (8.3%) and Hispanic adults (5.5%).[32]
- Hospital stays for diabetes increased 24.7% between 1997 (20,226 discharges) and 2007 (25,221 discharges).[33]
- In Pennsylvania, the direct cost (medical care) and indirect cost (lost productivity and premature mortality) of diabetes totaled about $8.3 billion in 2004.[34]

Types of Diabetes

Type 1 diabetes develops when the body's immune system destroys the cells that produce insulin. A person with type 1 diabetes must take insulin daily to live. This type usually begins in childhood, but onset can begin at any age. It was previously called insulin-dependent or juvenile-onset diabetes. Risk factors may include autoimmune, genetic, and environmental factors.

Type 2 diabetes occurs as the body develops insulin resistance or the pancreas loses the ability to produce insulin. Type 2 diabetes is the most common form of diabetes. It is associated with both biological and behavioral factors including age, obesity, physical inactivity, and a family history of diabetes. Normally seen in adults, type 2 diabetes is on the rise in children and young adults.

Gestational diabetes is caused by glucose intolerance that develops in some women during pregnancy. Women with gestational diabetes are at increased risk of developing type 2 diabetes after pregnancy.

Pre-diabetes is a condition in which blood glucose levels are higher than normal, but not high enough for a diagnosis of type 2 diabetes. People with pre-diabetes have an increased risk of developing type 2 diabetes, heart disease and stroke. People with pre-diabetes can prevent or delay the onset of type 2 diabetes with weight loss and increased physical activity. An estimated 57 million people in the United States have pre-diabetes.[35]

Diabetes

RISK FACTOR

Type 2 Diabetes Risk Factors

The likelihood of developing type 2 diabetes is influenced by both biology and behavior. Risk factors include:

- ***Obesity***
- ***Poor diet***
- ***Sedentary lifestyle***
- ***Age over 45***
- ***Family history of diabetes***
- ***Race/ethnicity*** (More common among blacks, Hispanics, Asians, Pacific Islanders, Native Americans, and Alaska Natives)
- ***History of metabolic syndrome***
- ***History of gestational diabetes***

Pennsylvania Overweight/Obesity Facts

Obesity is a serious health epidemic in the United States and Pennsylvania. There is a strong link between obesity and the most expensive chronic conditions, including type 2 diabetes, heart disease and high blood pressure.

- Almost two-thirds (64.4%) of the Pennsylvania adult population was either overweight or obese in 2008, compared to 63.2% of adults nationwide.[36]
- The percent of obese adults in Pennsylvania was 28.4% in 2008, compared to 26.6% of adults nationwide.[37]
- The percent of obese adults in Pennsylvania increased from 19.4% in 1998 to 28.4% in 2008.[38]
- The percent of overweight adults in Pennsylvania was 36.0% in 2008, compared to 36.6% of adults nationwide.[39]
- The percent of overweight adults in Pennsylvania decreased from 39.2% in 1998 to 36.0% in 2008.[40]
- In 2008, approximately 72% of adult males in Pennsylvania were either overweight or obese, compared to 57% of adult females.[41]
- In 2008, approximately 48% of Pennsylvania adults age 18 to 29 were overweight or obese, compared to 66% of Pennsylvanians age 30 to 44, 72% of those age 45 to 64, and 66% of those age 65 and older.[42]
- In 2008, approximately 40% of black (non-Hispanic) adults in Pennsylvania were obese, compared to 33% of Hispanic adults and 27% of white (non-Hispanic) adults.[43]
- Significant disparities in obesity rates exist based on education level (more education associated with lower rates) and income (higher income associated with lower rates).[44]
- In 2007, 29.7% of Pennsylvania children age 10 to 17 were overweight or obese, compared to 31.6% of children the same age nationwide.[45]
- Out of all states, Pennsylvania ranks 20th in overall prevalence of overweight or obese children.[46]

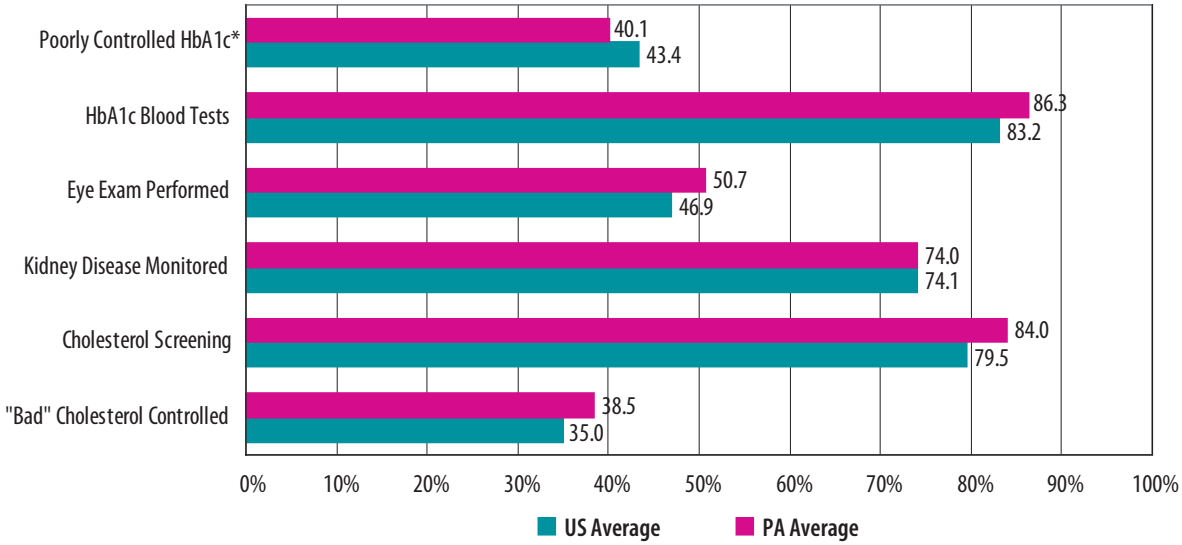
Defining Overweight and Obesity

Overweight and obesity ranges are determined by using weight and height to calculate a number called the body mass index (BMI). An overweight adult has a BMI of 25 to 29.9, while obese adults have a BMI of 30 or higher. For children and adolescents, BMI is age- and sex-specific and is referred to as BMI-for-age.

Staying Healthy with Diabetes

Preventive care practices are effective in reducing the incidence and progression of diabetes-related complications. The performance measures reported below are Healthcare Effectiveness Data and Information Set (HEDIS) measures from the National Committee for Quality Assurance (NCQA). The graph shows the percent of commercially insured adults (age 18 to 75) with diabetes who were screened, tested, or monitored for each measure in 2007. For five of the six diabetes preventive care measures, the Pennsylvania average was better than the national average.

Preventive Care Practices for Commercially Insured Adults with Diabetes
United States and Pennsylvania, 2007



Note: U.S. and Pennsylvania averages are based on NCQA data. U.S. averages were calculated by NCQA, and Pennsylvania averages were calculated by PHC4.
* This is the only measure in which a lower percentage is a better outcome.

Poorly Controlled HbA1c Levels – Regular Hemoglobin A1c (HbA1c) blood tests are recommended to monitor diabetes. The graph shows the percent of members with diabetes who had poorly controlled HbA1c levels (> 9.0%).

Hemoglobin A1c Blood Tests – The graph shows the percent of members with diabetes who had their HbA1c tested at least once during the year.

Eye Exams Performed – Retinal eye exams are recommended on a regular basis (usually annually) to reduce the risk of blindness from diabetes. The graph shows the percent of members with diabetes who received an eye exam during the year.

Monitoring Kidney Disease – Kidney disease may be a problem for persons with diabetes. The graph shows the percent of members with diabetes who were screened or treated for kidney disease during the year.

Cholesterol Screening – Cholesterol screening (LDL-C or low-density lipoprotein cholesterol) is recommended on a regular basis for persons with diabetes. The graph shows the percent of members with diabetes who received a cholesterol screening during the year.

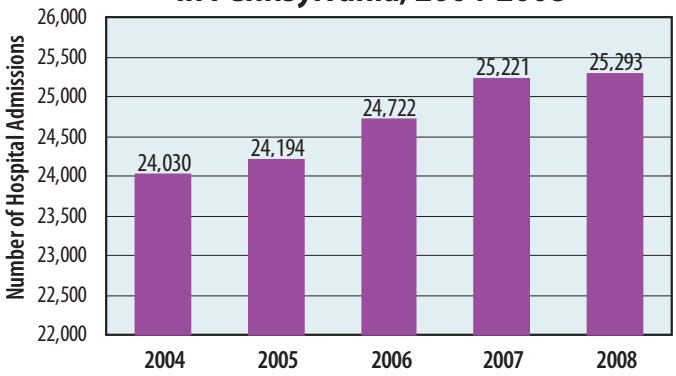
"Bad" Cholesterol Controlled – The graph shows the percent of members with diabetes whose LDL-C ("bad" cholesterol) levels were under control (<100 mg/dL).

Diabetes

Hospital Admissions

Timely diagnosis, effective outpatient care and appropriate disease management may reduce the need for diabetes hospitalizations. Yet, there were 25,293 hospitalizations for diabetes in 2008. This same year, almost all (96.0%) diabetes hospitalizations among adults in Pennsylvania were considered potentially preventable based on the federal Agency for Healthcare Research and Quality's Prevention Quality Indicators. While diabetes is more common among adults, it can affect people of all ages. Therefore, the following analysis includes hospitalizations for persons of all ages with a principal diagnosis of type 1 or type 2 diabetes.

Hospital Admissions* for Diabetes in Pennsylvania, 2004-2008



* Includes Pennsylvania and out-of-state residents.

- The number of diabetes hospitalizations in Pennsylvania increased 5.3% from 2004 to 2008.
- The largest single-year increase (2.2%) occurred between 2005 and 2006.

Diabetes Hospitalizations in Pennsylvania, 2008

	Number	Percent	Rate*	Average Length of Stay	Total Days
Total	**24,456**	**100.0%**	**1.96**	**5.0**	**121,845**
By Age Group					
<1	12	<0.1%	0.08	10.3	124
1-17	1,294	5.3%	0.50	2.4	3,151
18-44	5,894	24.1%	1.35	3.7	21,922
45-64	8,619	35.2%	2.52	5.4	46,499
65-84	7,186	29.4%	4.49	5.9	42,141
85+	1,451	5.9%	4.68	5.5	8,008
By Gender					
Male	12,747	52.1%	2.10	5.1	65,549
Female	11,709	47.9%	1.83	4.8	56,296
By Race/Ethnicity					
White (non-Hispanic)	15,943	65.2%	1.57	5.0	80,257
Black (non-Hispanic)	6,356	26.0%	4.97	4.9	30,975
Hispanic†	1,120	4.6%	1.89	4.7	5,231
Other	1,037	4.2%	2.35	5.2	5,382

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.
† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

Hospital Admissions

Age

- In 2008, persons age 85 and older had the highest hospitalization rate for diabetes (4.68 per 1,000 residents) in Pennsylvania, followed by persons age 65 to 84 (4.49 per 1,000).
- Diabetes hospitalization rates in Pennsylvania increased as age increased.
- While persons age 45 to 64 accounted for 27.4% of Pennsylvania's population in 2008, more than one-third of diabetes hospitalizations (35.2%) were for persons in this age group.
- Infants under age one had the longest average length of stay (10.3 days). Note: There was a small number (12) of hospitalizations for infants under age one.

Gender

- Even though 48.7% of Pennsylvania's population in 2008 was male, 52.1% of all diabetes hospitalizations were for males.
- In 2008, Pennsylvania's hospital admission rate for diabetes among males was 14.8% higher than the rate among females.

Race/Ethnicity

- Even though black (non-Hispanic) residents made up 10.3% of Pennsylvania's population in 2008, they accounted for 26.0% of all diabetes hospitalizations.
- In 2008, black (non-Hispanic) residents had a higher rate of hospitalization for diabetes (4.97 per 1,000 residents), compared to Hispanic residents (1.89 per 1,000) and white (non-Hispanic) residents (1.57 per 1,000).

- In Pennsylvania, diabetes hospitalization rates for all age groups increased from 2004 to 2008, except among persons age 65 to 84.
- From 2004 to 2008, Pennsylvania's diabetes hospitalization rate for persons age 18 to 44 increased 9.8% — the largest increase among the age categories excluding infants under age one.
- In 2004 and 2007, Pennsylvania's total diabetes hospitalization rates were higher than the total national rates.
- From 2004 to 2007, Pennsylvania's total diabetes hospitalization rate increased 4.3%, while the national diabetes hospitalization rate increased 1.1%.

Diabetes Hospitalization Rates*
Pennsylvania and United States

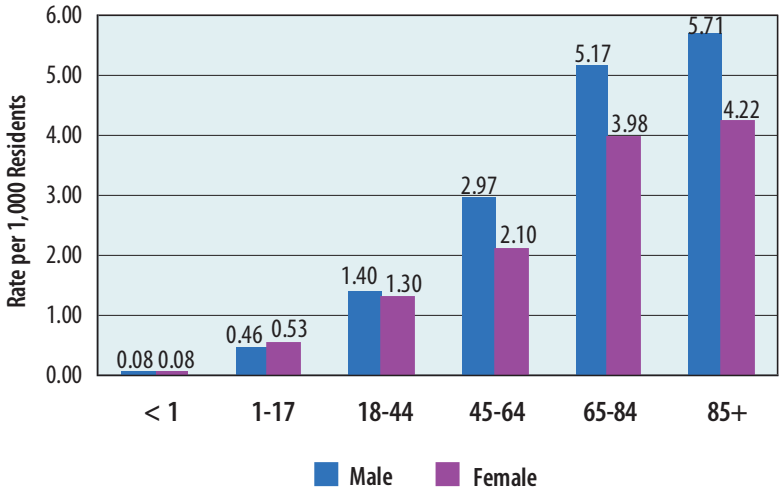
	2004		2007		2008
	PA	US	PA	US	PA
Total	**1.88**	**1.75**	**1.96**	**1.77**	**1.96**
By Age Group					
<1	0.04	NA	0.07	NA	0.08
1-17	0.47	0.45	0.50	0.40	0.50
18-44	1.23	1.22	1.30	1.33	1.35
45-64	2.45	2.54	2.52	2.50	2.52
65-84	4.65	4.57	4.74	4.29	4.49
85+	4.44	4.32	4.56	4.24	4.68
By Gender					
Male	1.99	1.80	2.11	1.87	2.10
Female	1.78	1.69	1.83	1.67	1.83

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.
NA - U.S. rate is not available for this age group.

Diabetes

Hospital Admissions

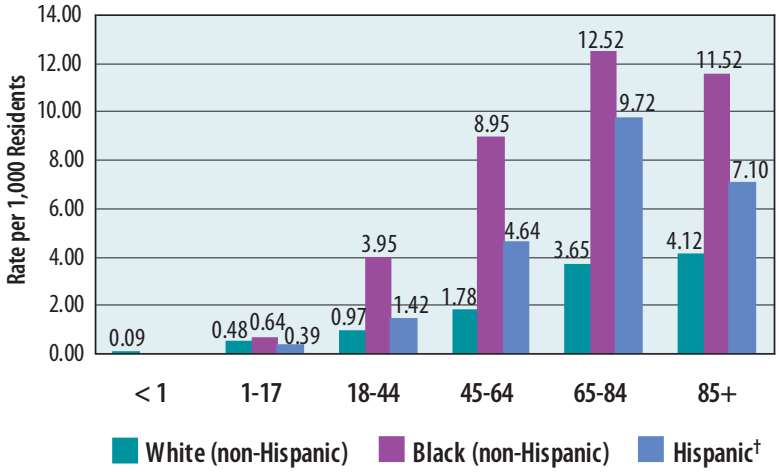
Hospitalization Rate* for Diabetes by Gender and Age, Pennsylvania, 2008



* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

- The diabetes hospitalization rates among males in every adult age group were higher than the rates among females in every adult age group.
- The most pronounced difference in rates among males and females was in the 45 to 64 age group, where the rate among males was 41.4% higher.

Hospitalization Rate* for Diabetes by Race/Ethnicity and Age, Pennsylvania, 2008



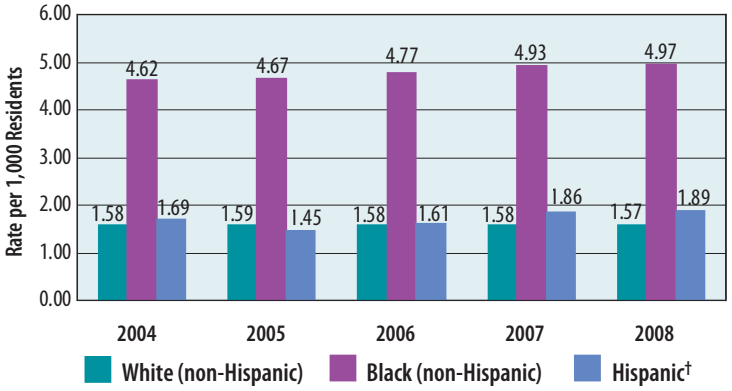
* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- For all age groups, excluding infants under age one, black (non-Hispanic) residents had higher hospitalization rates than both Hispanic and white (non-Hispanic) residents.
- There were no hospitalizations for black (non-Hispanic) and Hispanic residents under age one.

Hospital Admissions

Hospitalization Rate* for Diabetes by Race/Ethnicity, Pennsylvania, 2004-2008

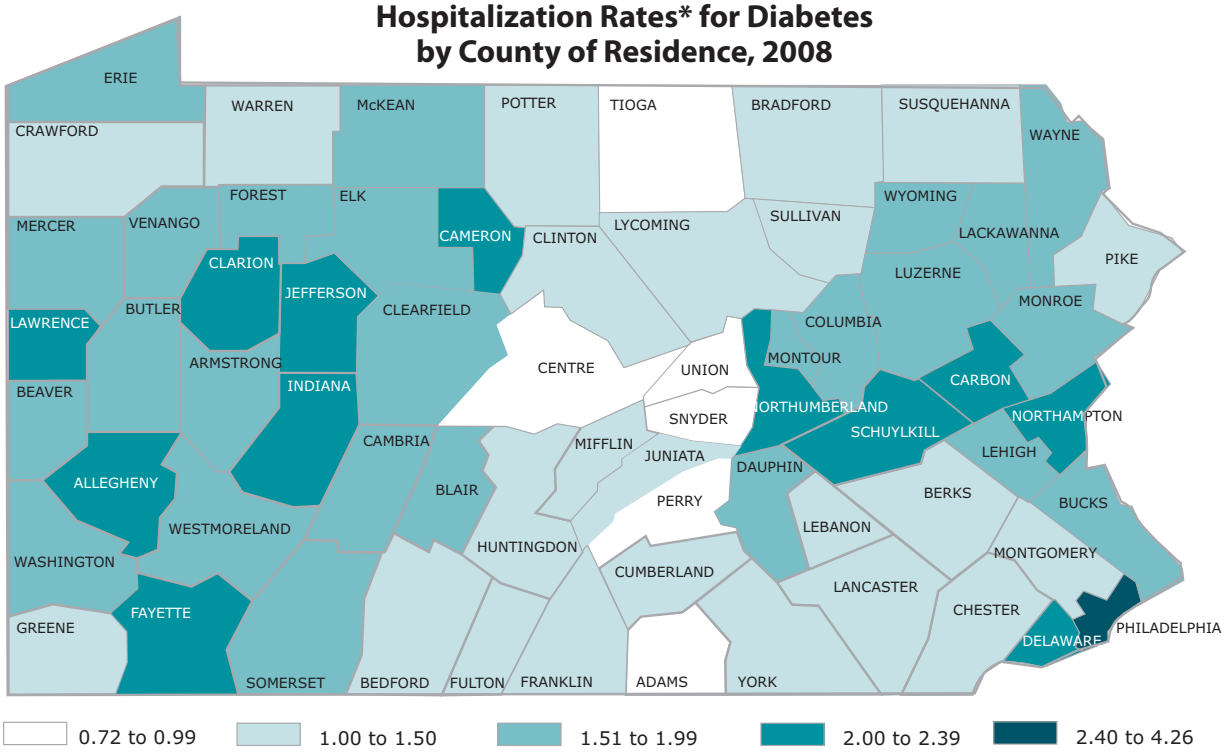


* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- In every year from 2004 to 2008, the diabetes hospitalization rate for black (non-Hispanic) residents was more than two and a half times as high as the rates for Hispanic and white (non-Hispanic) residents.
- Diabetes hospital admission rates for black (non-Hispanic) residents increased every year from 2004 to 2008.

Hospitalization Rates* for Diabetes by County of Residence, 2008



* Per 1,000 residents. Rates are adjusted for age and sex differences among county populations. Rates for counties with small populations are very sensitive to small changes in the number of hospitalizations; that is, higher rates may be reflective of minor fluctuations in the number of hospitalizations.

The lowest, county-level hospitalization rate for diabetes was 0.72 per 1,000 residents; the highest was 4.26 per 1,000 residents. The statewide hospitalization rate for diabetes was 1.96 per 1,000 residents.

Readmissions

The following table and pie chart look at single and multiple readmissions for diabetes that occurred within one year of the patient being discharged from an initial hospitalization for diabetes. The analysis of readmissions to Pennsylvania hospitals included 19,981 individuals who were initially admitted for diabetes during Quarter 3, 2007 through Quarter 2, 2008. These individuals were followed for 365 days to determine how often they were readmitted to a Pennsylvania hospital for diabetes. Thus, the analysis included 28,051 total hospitalizations that occurred during Quarter 3, 2007 through Quarter 2, 2009.

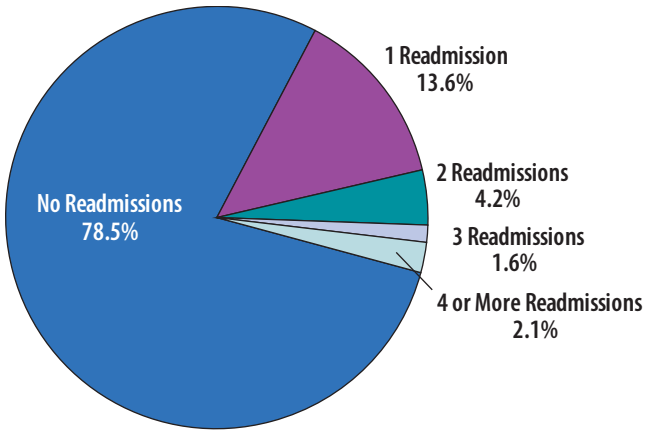
Readmissions* for Diabetes to a Pennsylvania Hospital within One Year

Readmissions within...	Number	Percent	Average Length of Stay	Total Days
0–7 days	1,075	13.3%	5.4	5,763
8–30 days	1,720	21.3%	5.3	9,047
31–60 days	1,363	16.9%	5.4	7,342
61–90 days	922	11.4%	5.2	4,837
91–120 days	723	9.0%	5.2	3,724
121–180 days	899	11.1%	5.0	4,526
181–365 days	1,368	17.0%	5.0	6,817
Total	**8,070**	**100.0%**	**5.2**	**42,056**

* Includes Pennsylvania and out-of-state residents.

- For the 28,051 hospitalizations for diabetes that occurred during Quarter 3, 2007 through Quarter 2, 2009, 8,070 or 28.8% were associated with readmissions within 365 days of discharge from the initial hospitalization.
- Almost two-thirds (62.9%) of the readmissions occurred within 90 days of the initial hospitalization.
- More than one-third (34.6%) of the readmissions occurred within 30 days of the initial hospitalization.

Patients with Multiple Readmissions* within One Year



* Includes Pennsylvania and out-of-state residents.

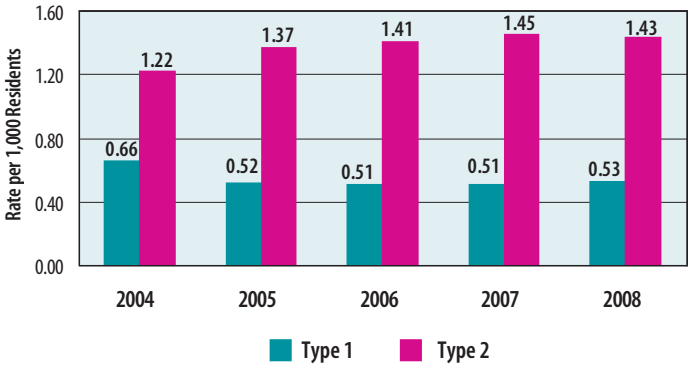
There were 19,981 individual patients that accounted for the 28,051 hospitalizations included in the readmission analysis. Of these 19,981 individual patients:

- 4,288 or 21.5% were readmitted for diabetes within one year.
  - 2,710 or 13.6% were readmitted once within 365 days.
  - 1,578 or 7.9% were readmitted more than once.

Hospital Admissions for Type 1 and Type 2 Diabetes

The analysis on this page shows the differences in hospitalization rates between type 1 and type 2 diabetes in Pennsylvania. Nationally, type 1 diabetes accounts for 5% to 10% of all diagnosed diabetes cases, and type 2 accounts for 90% to 95% of all diagnosed diabetes cases.[47]

Hospitalization Rate* by Type of Diabetes, Pennsylvania, 2004-2008



* Per 1,000 residents.

- The hospitalization rate for type 1 diabetes decreased 19.7% from 2004 to 2008.
- The hospitalization rate for type 2 diabetes increased steadily from 2004 to 2007 and then decreased slightly in 2008. Overall, the type 2 diabetes hospitalization rate increased 17.2% from 2004 to 2008.

Diabetes Hospitalizations by Type of Diabetes, Pennsylvania, 2008

	Type 1 Diabetes		Type 2 Diabetes	
	Number	Rate*	Number	Rate*
Total	**6,613**	**0.53**	**17,807**	**1.43**
By Age Group				
< 1	9	0.06	2	0.01
1-17	1,181	0.45	101	0.04
18-44	3,559	0.82	2,329	0.53
45-64	1,441	0.42	7,170	2.10
65-84	369	0.23	6,810	4.26
85+	54	0.17	1,395	4.50
By Gender				
Male	3,243	0.54	9,487	1.57
Female	3,370	0.53	8,320	1.30
By Race/Ethnicity				
White (non-Hispanic)	4,424	0.44	11,494	1.13
Black (non-Hispanic)	1,608	1.26	4,740	3.71
Hispanic†	336	0.57	781	1.31
Other	245	0.56	792	1.80

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

Age

- The hospitalization rate (0.82 per 1,000 residents) for type 1 diabetes was highest among persons age 18 to 44.
- The hospitalization rate (4.50 per 1,000 residents) for type 2 diabetes was highest among persons age 85 and older.

Gender

- The hospitalization rates for type 1 diabetes for males and females were similar.
- The hospitalization rate for type 2 diabetes was 20.8% higher among males than females.

Race/Ethnicity

- Among all race/ethnic groups, black (non-Hispanic) residents had the highest hospitalization rates for both type 1 and type 2 diabetes.

Long-term Complications

Hospitalizations for long-term complications of diabetes (chronic problems such as heart disease, stroke, blindness, amputation, and kidney disease) may be a reflection of how well patients are managing their diabetes over a period of years or even decades. This page focuses on hospitalizations among adults for two long-term complications – end-stage renal disease and lower extremity amputation – where diabetes was either the principal or secondary diagnosis.

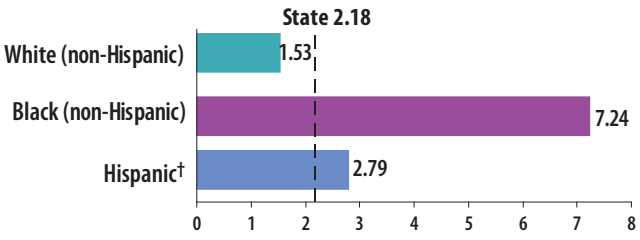
Adult Hospitalizations for End-Stage Renal Disease, Pennsylvania, 2008

	Number	Rate*
Total	**21,095**	**2.18**
By Age Group		
18-44	1,891	0.43
45-64	8,278	2.43
65-84	9,987	6.24
85+	939	3.03
By Race/Ethnicity		
White (non-Hispanic)	12,389	1.53
Black (non-Hispanic)	6,635	7.24
Hispanic†	1,034	2.79
Other	1,037	3.46

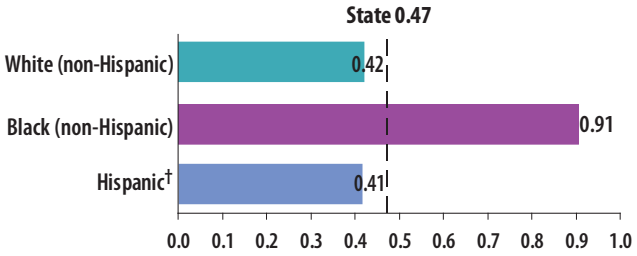
Adult Hospitalizations for Lower Extremity Amputation, Pennsylvania, 2008

	Number	Rate*
Total	**4,558**	**0.47**
By Age Group		
18-44	315	0.07
45-64	1,875	0.55
65-84	2,035	1.27
85+	333	1.07
By Race/Ethnicity		
White (non-Hispanic)	3,400	0.42
Black (non-Hispanic)	830	0.91
Hispanic†	153	0.41
Other	175	0.58

Adult Hospitalization Rate* for End-Stage Renal Disease by Race/Ethnicity, 2008



Adult Hospitalization Rate* for Lower Extremity Amputation by Race/Ethnicity, 2008



- The likelihood of being hospitalized for end-stage renal disease was 157% greater among adults age 65 to 84, compared to adults age 45 to 64.
- Black (non-Hispanic) adults had a hospitalization rate for end-stage renal disease (7.24 per 1,000 residents) more than three times as high as the state average for all residents (2.18 per 1,000).

- The likelihood of being hospitalized for lower extremity amputation was 131% greater among adults age 65 to 84, compared to adults age 45 to 64.
- Black (non-Hispanic) adults had a hospitalization rate for lower extremity amputation (0.91 per 1,000 residents) almost twice as high as the state average for all residents (0.47 per 1,000).

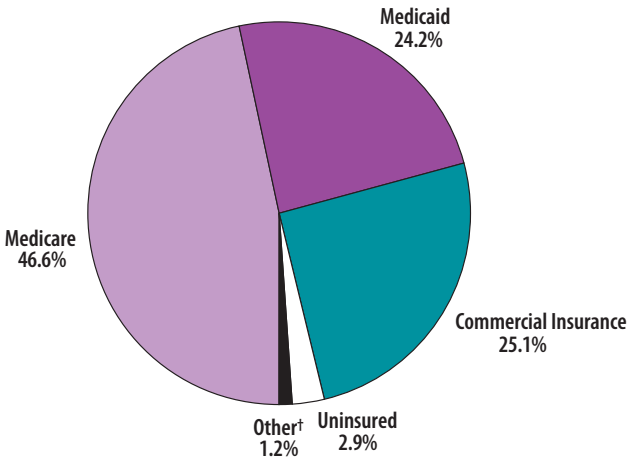
* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

Hospital Admissions and Payer Type

Diabetes hospitalization data by payer sheds light on the financial impact of the disease. A recent study found that 50% of diabetes health care spending is for inpatient hospital care.[48] Diabetes medications and supplies, prescriptions to treat complications, and physician office visits are other large spending components.

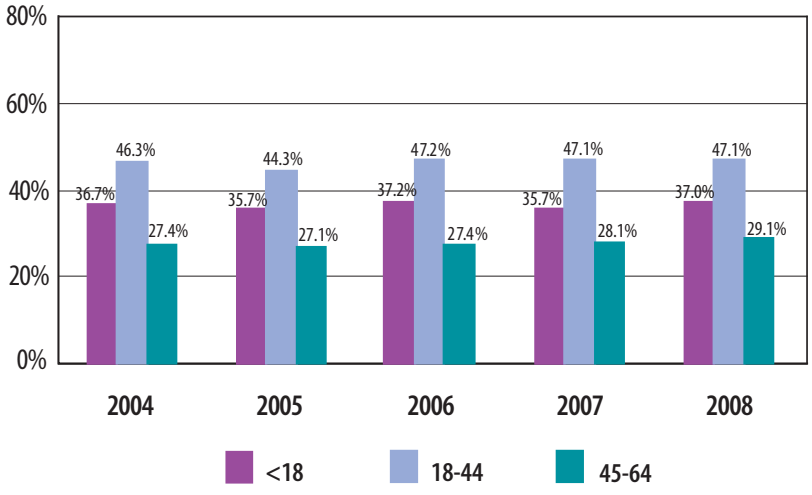
Diabetes Hospitalizations* by Payer Pennsylvania, 2008



* Includes Pennsylvania and out-of-state residents.
† Includes other government payers and hospitalizations where the payer was unknown or designation was invalid or missing.

- Whereas Medicare was the primary payer for 43.9% of all 2008 hospitalizations in Pennsylvania, it was the primary payer for 46.6% of diabetes hospitalizations.
- Whereas Medicaid was the primary payer for 17.4% of all 2008 hospitalizations in Pennsylvania, it was the primary payer for 24.2% of diabetes hospitalizations.
- Combined, Medicare and Medicaid were the primary payers for for 70.8% of diabetes hospitalizations.

Percent of Diabetes Hospitalizations* with Medicaid as Primary Payer by Age, Pennsylvania, 2004-2008



* Includes Pennsylvania and out-of-state residents.

- From 2004 to 2008, the percentage of diabetes hospitalizations among persons age 18 to 44 for which Medicaid was the primary payer ranged from 44.3% to 47.2%.
- From 2004 to 2008, the percentage of diabetes hospitalizations among persons under age 18 for which Medicaid was the primary payer ranged from 35.7% to 37.2%.

Medicare Admissions and Payments

In 2007, there were 9,104 diabetes hospitalizations for Medicare beneficiaries age 65 and older in Pennsylvania. This analysis includes the 5,413 hospital admissions for which PHC4 was able to match Medicare payment data.

Diabetes Hospitalizations* for Medicare Patients, Pennsylvania, 2007

	Number of Hospital Admissions	Average Length of Stay	Total Number of Days	Average Medicare Payment	Total Medicare Payments
Total	**5,413**	**5.9**	**32,108**	**$7,683**	**$41,587,051**
By Age Group					
65-74	2,103	6.2	13,046	$8,550	$17,981,386
75-84	2,333	5.9	13,696	$7,352	$17,151,507
85+	977	5.5	5,366	$6,606	$6,454,158
By Gender					
Male	2,537	6.2	15,711	$8,329	$21,129,695
Female	2,876	5.7	16,397	$7,113	$20,457,356
By Race/Ethnicity					
White (Non-Hispanic)	4,304	5.9	25,437	$7,408	$31,884,360
Black (Non-Hispanic)	800	6.2	4,924	$9,182	$7,345,662
Hispanic†	136	6.2	847	$7,949	$1,081,064
Other	173	5.2	900	$7,376	$1,275,965

* Includes Pennsylvania and out-of-state residents.
† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- In 2007, Pennsylvania's total Medicare payments for the 5,413 diabetes hospitalizations with available payment data were almost $41.6 million. These 5,413 hospitalizations represent only 21.5% of all diabetes hospitalizations in 2007.
- Medicare payments for diabetes hospitalizations in Pennsylvania averaged $7,683.
- Based on an average Medicare payment of $7,683, total Medicare payments for the 9,104 diabetes hospitalizations among Medicare beneficiaries can be estimated at $70.0 million.
- Male Medicare patients had a longer average length of stay and a correspondingly higher average Medicare payment than female Medicare patients.
- Even though black (non-Hispanic) Medicare patients and Hispanic Medicare patients had the same average length of stay, black (non-Hispanic) beneficiaries had a higher average Medicare payment than Hispanic beneficiaries.

Asthma

Asthma is a chronic disease characterized by inflammation of the airways in the lungs, which restricts the passage of air and leads to episodes of wheezing, coughing, chest tightness, and shortness of breath. Asthma attacks can be triggered by exposures and conditions such as: respiratory infections, house dust mites, cockroaches, animal dander, mold, pollen, cold air, exercise, stress, tobacco smoke, and indoor and outdoor air pollutants. The severity of asthma attacks can range from mild to life-threatening. The cause of asthma is unknown, and no cure exists.

United States – At a Glance

- In 2008, an estimated 23.3 million Americans reported that they currently had asthma, of which 12.7 million had an asthma attack or an episode in the same year.[49]
- Asthma is the most common chronic disorder in childhood, currently affecting an estimated 7.0 million children under age 18.[50]
- Asthma is the third leading cause of hospitalization among children under age 15.[51]
- Hospital stays for asthma decreased 5.6% between 1997 (425,798 discharges) and 2007 (402,088 discharges).[52]
- In 2008, the total annual cost of asthma to the U.S. economy was $15.6 billion in direct costs (physician visits, hospital stays, and medications) and $5.1 billion in indirect costs (lost productivity).[53]

Pennsylvania – At a Glance

- In 2008, approximately 9.3% of Pennsylvania adults were told that they currently have asthma, compared to 8.7% of adults nationwide.[54]
- Women are more likely than men to report that they currently have asthma (11.5% vs. 6.9%) or to have ever been diagnosed with asthma (15.6% vs. 10.8%).[55]
- An estimated 282,400 Pennsylvania children currently have asthma, while approximately 395,300 have had a diagnosis of asthma at some point in their lives.[56]
- Hospital stays for asthma increased 10.6% between 1997 (21,069 discharges) and 2007 (23,298 discharges).[57]
- In 2004, Pennsylvania's direct costs of asthma were estimated at $683.5 million, and indirect costs were estimated at $516.2 million.[58]

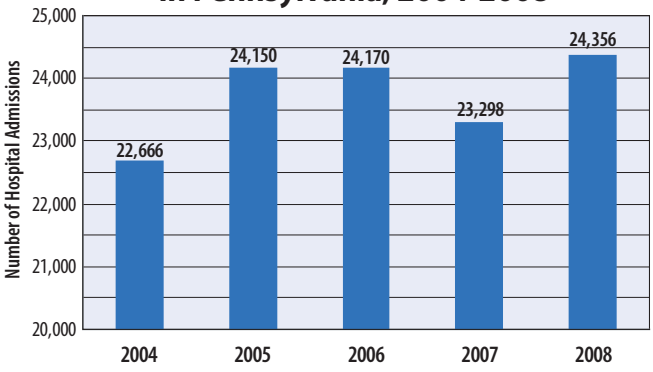
Asthma Major Risk Factors

- *Genetics*
- *Frequent respiratory infections as a child*
- *Environmental exposures, including tobacco smoke and air pollution*
- *Occupational exposures, such as chemicals used in farming, hairdressing and manufacturing*
- *Low birth weight*
- *Being overweight*

Hospital Admissions

Asthma is a largely controllable condition. When patients follow appropriate management guidelines (out-patient care, medication, trigger avoidance, etc.), hospitalizations can be prevented. Yet, there were 24,356 hospitalizations for asthma in 2008. Nearly all (99.5%) of Pennsylvania's adult asthma hospitalizations in 2008 were considered potentially preventable based on the federal Agency for Healthcare Research and Quality's Prevention Quality Indicators. The following analysis includes hospitalizations for persons of all ages with a principal diagnosis of asthma.

Hospital Admissions* for Asthma in Pennsylvania, 2004-2008



* Includes Pennsylvania and out-of-state residents.

- The number of asthma hospitalizations in Pennsylvania increased 7.5% overall from 2004 to 2008, even though the number fluctuated in the intervening years.
- The largest-single year increase (6.5%) occurred between 2004 and 2005.

Asthma Hospitalizations in Pennsylvania, 2008

	Number	Percent	Rate*	Average Length of Stay	Total Days
Total	**23,868**	**100.0%**	**1.92**	**3.5**	**84,052**
By Age Group					
<1	359	1.5%	2.41	2.1	752
1-17	5,723	24.0%	2.19	2.0	11,179
18-44	4,719	19.8%	1.08	3.0	14,221
45-64	7,143	29.9%	2.09	4.0	28,510
65-84	4,760	19.9%	2.97	4.8	23,058
85+	1,164	4.9%	3.75	5.4	6,332
By Gender					
Male	8,394	35.2%	1.39	2.9	24,137
Female	15,474	64.8%	2.42	3.9	59,915
By Race/Ethnicity					
White (non-Hispanic)	12,984	54.4%	1.28	4.0	51,967
Black (non-Hispanic)	7,638	32.0%	5.97	3.0	22,667
Hispanic†	2,024	8.5%	3.41	2.8	5,702
Other	1,222	5.1%	2.77	3.0	3,716

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.
† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

Hospital Admissions

Age

- In 2008, persons age 85 and older had the highest hospitalization rate for asthma (3.75 per 1,000 residents) in Pennsylvania, followed by persons age 65 to 84 (2.97 per 1,000).
- In Pennsylvania, pediatric (persons under age 18) asthma hospitalizations had the shortest average lengths of stay, while persons age 65 and older had the longest average stays.
- In total, Pennsylvania children under age 18 spent nearly 12,000 days in the hospital for asthma in 2008. Pennsylvania adults spent more than 72,000 days in the hospital – nearly all of which were considered potentially preventable.

Gender

- Even though 51.3% of Pennsylvania's population in 2008 was female, 64.8% of all asthma hospitalizations were for females.
- In 2008, Pennsylvania's hospital admission rate for asthma among females was 74.1% higher than the rate among males.

Race/Ethnicity

- Even though black (non-Hispanic) residents made up 10.3% of Pennsylvania's population in 2008, they accounted for 32.0% of all asthma hospitalizations.
- In 2008, black (non-Hispanic) residents had a higher rate of hospitalization for asthma (5.97 per 1,000 residents), compared to Hispanic residents (3.41 per 1,000) and white (non-Hispanic) residents (1.28 per 1,000).
- White (non-Hispanic) residents had a longer average length of stay (4.0 days), compared to black (non-Hispanic) residents (3.0 days) and Hispanic residents (2.8 days).

- In Pennsylvania, asthma hospitalization rates for pediatric (under 18) age groups decreased from 2004 to 2008, while rates for all adult age groups increased.
- From 2004 to 2008, Pennsylvania's asthma hospitalization rate for infants under age one decreased 40.2%.
- In 2004 and 2007, Pennsylvania's asthma hospital admission rates were higher than national rates in all age groups and both gender categories.
- From 2004 to 2007, Pennsylvania's total asthma hospitalization rate increased 2.8%, while the national asthma hospitalization rate decreased 7.0%.

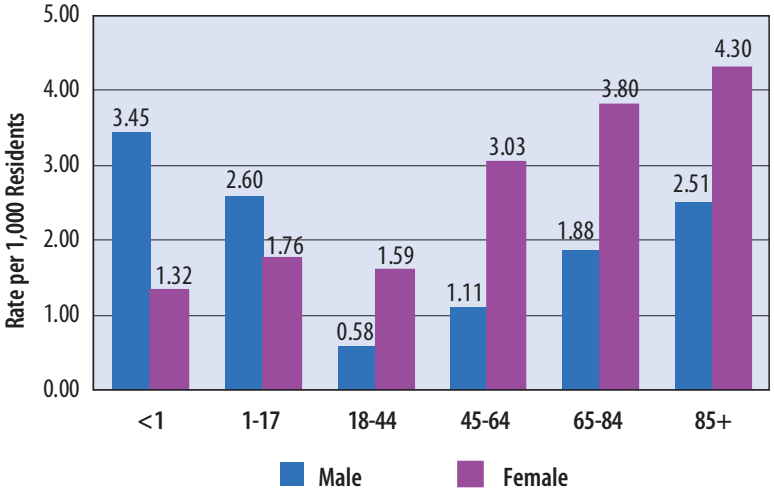
Asthma Hospitalization Rates*
Pennsylvania and United States

	2004		2007		2008
	PA	US	PA	US	PA
Total	**1.79**	**1.43**	**1.84**	**1.33**	**1.92**
By Age Group					
<1	4.03	3.68	3.09	2.53	2.41
1-17	2.32	1.92	2.39	1.65	2.19
18-44	1.05	0.75	1.05	0.70	1.08
45-64	1.78	1.46	1.92	1.47	2.09
65-84	2.55	2.22	2.56	2.16	2.97
85+	3.15	2.52	3.05	2.45	3.75
By Gender					
Male	1.40	1.14	1.40	1.05	1.39
Female	2.17	1.69	2.26	1.60	2.42

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

Hospital Admissions

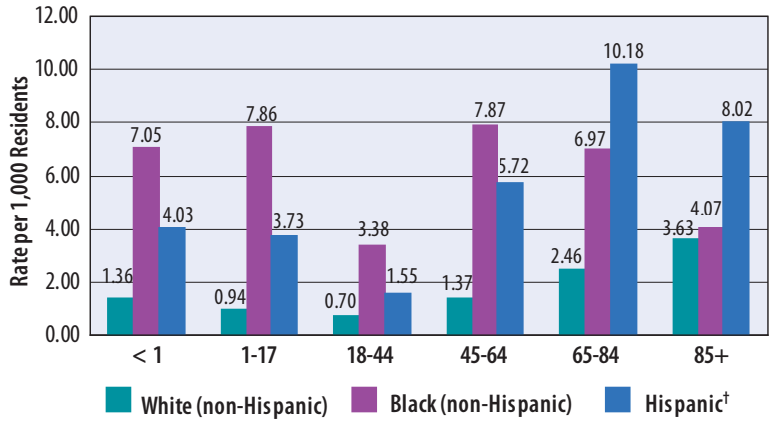
Hospitalization Rate* for Asthma by Gender and Age, Pennsylvania, 2008



* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

- The rates of asthma hospitalization among females in pediatric (under 18) age groups were lower than the rates among males in pediatric age groups.
- The rates of asthma hospitalization among females in every adult age group were higher than the rates among males in every adult age group.

Hospitalization Rate* for Asthma by Race/Ethnicity and Age, Pennsylvania, 2008



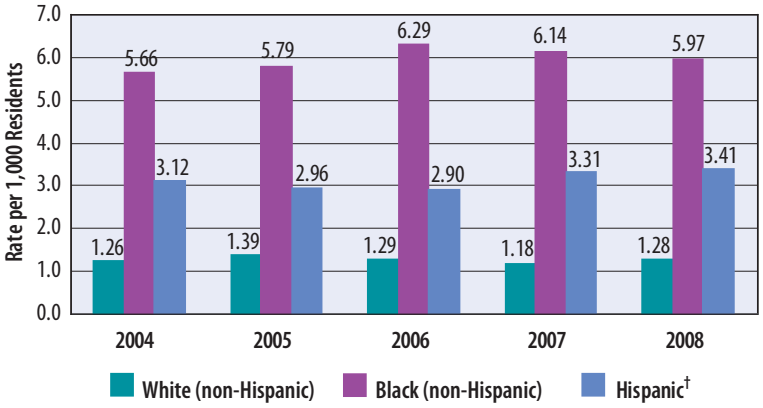
* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- For all age groups under age 65, black (non-Hispanic) residents had higher hospitalization rates than both white (non-Hispanic) and Hispanic residents.
- Among residents age 65 to 84 and those age 85 and older, Hispanic residents had higher hospitalization rates than both black (non-Hispanic) and white (non-Hispanic) residents.

Hospital Admissions

Hospitalization Rate* for Asthma by Race/Ethnicity, Pennsylvania, 2004-2008

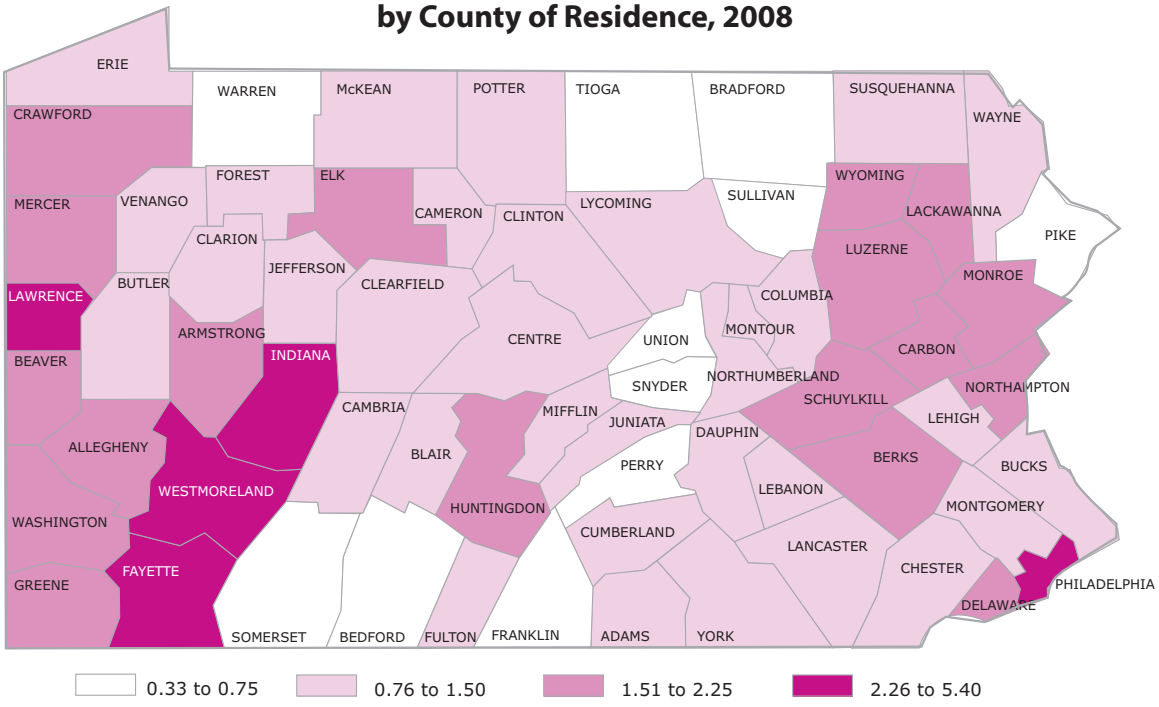


* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- In every year from 2004 to 2008, the asthma hospitalization rate for black (non-Hispanic) residents was about twice as high as the rate for Hispanic residents and more than four times as high as the rate for white (non-Hispanic) residents.
- Asthma hospital admission rates for all race/ethnic groups increased from 2004 to 2008, although there was some fluctuation in the intervening years.

Hospitalization Rates* for Asthma by County of Residence, 2008



* Per 1,000 residents. Rates are adjusted for age and sex differences among county populations. Rates for counties with small populations are very sensitive to small changes in the number of hospitalizations; that is, higher rates may be reflective of minor fluctuations in the number of hospitalizations.

The lowest, county-level hospitalization rate for asthma was 0.33 per 1,000 residents; the highest was 5.40 per 1,000 residents. The statewide hospitalization rate for asthma was 1.92 per 1,000 residents.

Readmissions

The following table and pie chart look at single and multiple readmissions for asthma that occurred within one year of the patient being discharged from an initial hospitalization for asthma. The analysis of readmissions to Pennsylvania hospitals included 20,707 individuals who were initially admitted for asthma during Quarter 3, 2007 through Quarter 2, 2008. These individuals were followed for 365 days to determine how often they were readmitted to a Pennsylvania hospital for asthma. Thus, the analysis included 27,333 total hospitalizations that occurred during Quarter 3, 2007 through Quarter 2, 2009.

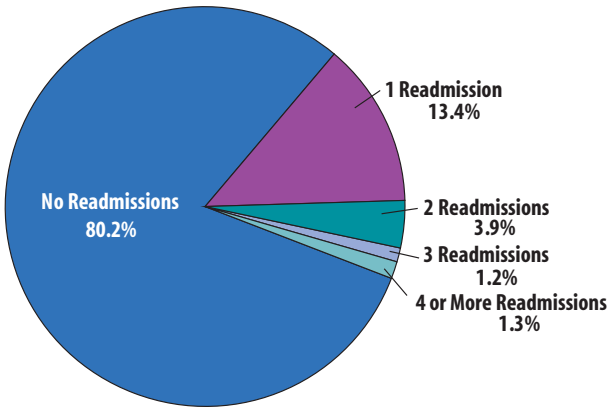
Readmissions* for Asthma to a Pennsylvania Hospital within One Year

Readmissions within...	Number	Percent	Average Length of Stay	Total Days
0–7 days	546	8.2%	4.1	2,242
8–30 days	973	14.7%	3.8	3,744
31–60 days	1,099	16.6%	3.6	3,930
61–90 days	798	12.0%	3.6	2,885
91–120 days	621	9.4%	3.4	2,142
121–180 days	914	13.8%	3.7	3,339
181–365 days	1,675	25.3%	3.6	6,048
Total	**6,626**	**100.0%**	**3.7**	**24,330**

* Includes Pennsylvania and out-of-state residents.

- For the 27,333 hospitalizations for asthma that occurred during Quarter 3, 2007 through Quarter 2, 2009, 6,626 or 24.2% were associated with readmissions within 365 days of discharge from the initial hospitalization.
- Just over half, 51.5%, occurred within 90 days of the initial hospitalization.
- The longest average length of stay was for readmissions that occurred within seven days of discharge from the initial hospitalization.

Patients with Multiple Readmissions* within One Year



* Includes Pennsylvania and out-of-state residents.

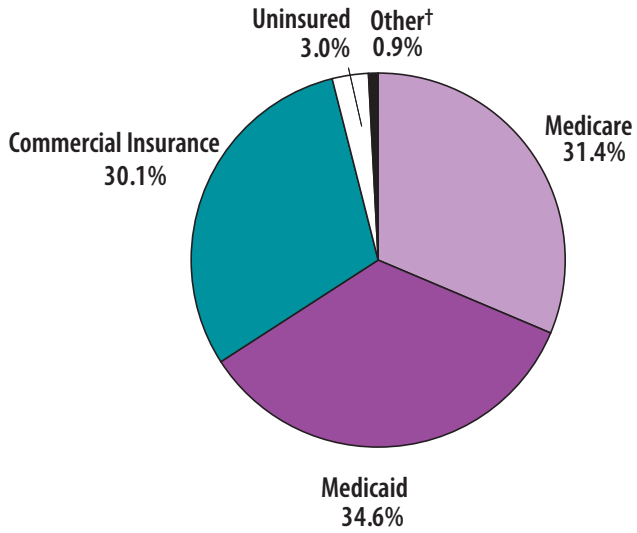
There were 20,707 individual patients that accounted for the 27,333 hospitalizations included in the readmission analysis. Of these 20,707 individual patients:

- 4,101 or 19.8% were readmitted for asthma within one year.
  - 2,768 or 13.4% were readmitted once within 365 days.
  - 1,333 or 6.4% were readmitted more than once.

Hospital Admissions and Payer Type

Asthma hospitalization data by payer sheds light on the financial impact of the disease. The analysis on this page shows that asthma hospitalizations are prevalent among Pennsylvania's Medicaid population. In addition to hospitalizations, payers incur other asthma-related expenditures for pharmacy, emergency room visits and outpatient doctor appointments not included in this analysis.

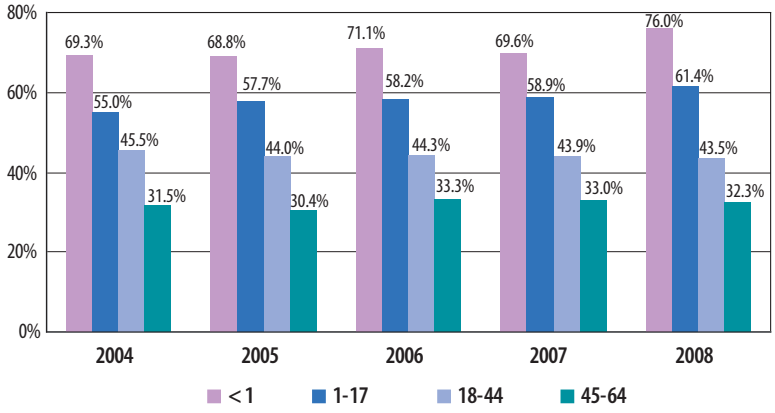
Asthma Hospitalizations* by Payer, Pennsylvania, 2008



* Includes Pennsylvania and out-of-state residents.
† Includes other government payers and hospitalizations where the payer was unknown or designation was invalid or missing.

- Whereas Medicaid was the primary payer for 17.4% of all 2008 hospitalizations in Pennsylvania, it was the primary payer for 34.6% of asthma hospitalizations.
- Medicare and commercial insurers had the next highest percentages at 31.4% and 30.1%, respectively.

Percent of Asthma Hospitalizations* with Medicaid as Primary Payer by Age, Pennsylvania, 2004-2008



* Includes Pennsylvania and out-of-state residents.

- In 2008, Medicaid was the primary payer for 76.0% of all asthma hospitalizations for persons under age one, up from 69.3% in 2004.
- In 2008, Medicaid was the primary payer for 61.4% of all asthma hospitalizations for persons age one to 17, up from 55.0% in 2004.

Medicare Admissions and Payments

In 2007, there were 5,065 asthma hospitalizations for Medicare beneficiaries age 65 and older in Pennsylvania. This analysis includes the 2,791 hospital admissions for which PHC4 was able to match Medicare payment data.

Asthma Hospitalizations* for Medicare Patients, Pennsylvania, 2007

	Number of Hospital Admissions	Average Length of Stay	Total Number of Days	Average Medicare Payment	Total Medicare Payments
Total	**2,791**	**5.1**	**14,333**	**$5,299**	**$14,790,793**
By Age Group					
65-74	986	4.8	4,697	$5,350	$5,275,071
75-84	1,172	5.3	6,261	$5,470	$6,410,547
85+	633	5.3	3,375	$4,905	$3,105,175
By Gender					
Male	723	4.9	3,507	$5,281	$3,818,292
Female	2,068	5.2	10,826	$5,306	$10,972,501
By Race/Ethnicity					
White (Non-Hispanic)	2,334	5.1	11,927	$5,092	$11,885,433
Black (Non-Hispanic)	286	5.3	1,524	$6,471	$1,850,655
Hispanic†	92	5.6	516	$6,676	$614,157
Other	79	4.6	366	$5,577	$440,548

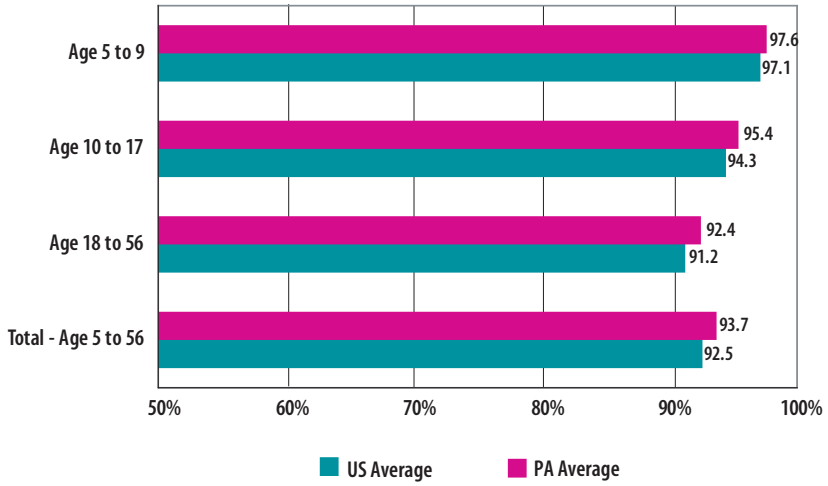
* Includes Pennsylvania and out-of-state residents.
† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- In 2007, Pennsylvania's total Medicare payments for the 2,791 asthma hospitalizations with available payment data were almost $14.8 million. These 2,791 hospitalizations represent only 12.0% of all asthma hospitalizations in 2007.
- Medicare payments for asthma hospitalizations in Pennsylvania averaged $5,299.
- Based on an average Medicare payment of $5,299, total Medicare payments for the 5,065 asthma hospitalizations among Medicare beneficiaries can be estimated at $26.8 million.
- Medicare patients age 85 and older had the lowest average Medicare payment among all the age groups even though their average length of stay was the same as patients age 75 to 84 and longer than patients age 65 to 74.
- Hispanic Medicare patients, who had the longest average length of stay among all race/ethnic groups, had a correspondingly higher average Medicare payment than the other groups.

Staying Healthy with Asthma

For people with persistent asthma, long-term control with medications, such as inhalers (steroids), can help to keep the disease under control on a day-to-day basis. The performance measure reported below is a Healthcare Effectiveness Data and Information Set (HEDIS) measure from the National Committee for Quality Assurance (NCQA). The graph shows state and national comparisons of the percent of commercially insured persons (age 5 to 56) with persistent asthma who were appropriately prescribed medications during 2007. For all age groups, the Pennsylvania average was better than the national average.

Use of Appropriate Medications for Commercially Insured People with Asthma
United States and Pennsylvania, 2007



Note: U.S. and Pennsylvania averages are based on NCQA data. U.S. averages were calculated by NCQA, and Pennsylvania averages were calculated by PHC4.

Chronic Obstructive Pulmonary Disease (COPD)

Chronic obstructive pulmonary disease (COPD) refers to a group of progressive lung diseases that make it difficult to breathe. COPD includes emphysema and chronic bronchitis. It is caused by damage to the lungs over many years, usually from smoking. However, occupational exposure to dusts and chemicals, other indoor and outdoor air pollutants, respiratory infections, and genetic factors also have been linked to COPD.

United States – At a Glance

- COPD is the fourth leading cause of death in the United States.[59]
- It is estimated that more than 12 million people are currently diagnosed with COPD and another 12 million may have COPD but not know it.[60]
- Hospital stays for COPD increased 8% between 1997 (551,000 discharges) and 2007 (593,000 discharges).[61]
- A typical COPD patient in the United States spends about $6,000 more each year on health care than a patient without COPD.[62]

Pennsylvania – At a Glance

- COPD is the state's fourth leading cause of death.[63]
- In Pennsylvania, the age-adjusted mortality rate for COPD is 80% higher than the national average.[64]
- Of the 123,967 Pennsylvania resident deaths in 2007, 6,028 or 4.9% were caused by COPD.[65]
- Hospital stays for COPD fluctuated between 1997 and 2007; the largest increase of 9.9% occurred between 2004 and 2005, and the largest decrease of 6.4% occurred between 2005 and 2006.[66]

COPD Major Risk Factors

- *Smoking*
  - At least one in four continuous smokers will develop COPD.[67]
  - Persistent smokers are six times more likely to develop COPD than non-smokers.[68]
  - Smoking is responsible for an estimated 75% of COPD deaths in the United States.[69]
  - The decreases in rates of mild and moderate COPD in persons age 25 to 54 in the last 25 years reflect the decline in overall smoking rates in the United States since the 1960s.[70]
- *Home/workplace air pollutants*
- *Respiratory infections*
- *Genetics*

} While smoking is the leading COPD risk factor, other risk factors account for up to one in six cases.[71]

RISK FACTOR

Pennsylvania Tobacco Facts

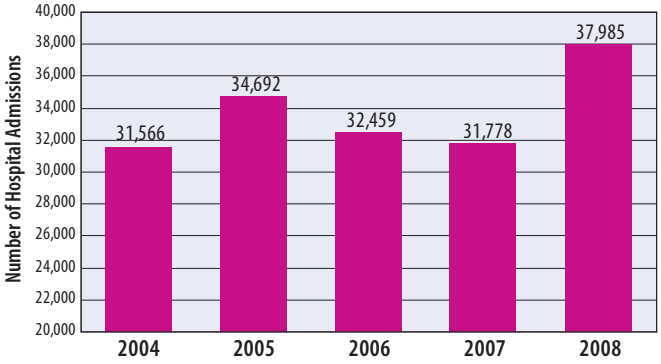
Tobacco use is one of the most preventable causes of disease, disability, and death. It is a major risk factor for chronic respiratory diseases, heart disease, lung cancer and other cancers.

- About 20,000 Pennsylvania adults die each year from smoking-related causes.[72]
- In 2008, approximately 21.3% of Pennsylvania adults were current cigarette smokers, compared to 18.3% of adults nationwide.[73]
- The percentage of Pennsylvania adults who were current smokers decreased from 23.8% in 1998 to 21.3% in 2008.[74]
- In 2008, approximately 29% of Pennsylvania adults age 18 to 29 were current smokers, compared to 26% of Pennsylvanians age 30 to 44, 21% of those age 45 to 64, and 8% of those age 65 and older.[75]
- In 2008, approximately 23% of adult males in Pennsylvania were current smokers, compared to 19% of adult females; approximately 29% of adult males were former smokers, compared to 22% of adult females.[76]
- Significant disparities in smoking rates exist based on age (older Pennsylvanians have lower rates), race (black non-Hispanic adults have higher rates compared to white non-Hispanics), education (increased education is associated with lower rates), income (higher income is associated with lower rates) and insurance status (lack of health care coverage is associated with higher rates).[77]
- Approximately 4% of Pennsylvania middle school students and 18% of Pennsylvania high school students smoke cigarettes.[78]
- Most Pennsylvania high school students who have smoked a whole cigarette did so for the first time between the ages of 13 and 16.[79]
- Every year, more than 16,000 Pennsylvania kids (persons under age 18) become new daily smokers.[80]
- Pennsylvania's annual health costs and productivity losses directly caused by smoking are $5.19 billion and $4.73 billion, respectively.[81]

Hospital Admissions

COPD is a progressive disease, which means it gets worse over time. However, early detection, treatments and lifestyle changes may help alter its course and progression to the point where hospitalizations are not necessary. In 2008, roughly three out of every four (77.2%) COPD hospitalizations among adults in Pennsylvania were considered potentially preventable based on the federal Agency for Healthcare Research and Quality's Prevention Quality Indicators. As COPD primarily affects adults, the analysis only includes hospitalizations for adults age 18 and older with a principal diagnosis of COPD.

Hospital Admissions* for COPD in Pennsylvania, 2004-2008



* Includes Pennsylvania and out-of-state residents.

- Among adults, the number of COPD hospitalizations in Pennsylvania increased 20.3% overall from 2004 to 2008, even though the number fluctuated in the intervening years.
- Between 2007 and 2008, the number of COPD hospitalizations in Pennsylvania increased 19.5%.

COPD Hospitalizations in Pennsylvania, 2008

	Number	Percent	Rate*	Average Length of Stay	Total Days
Total	**37,209**	**100.0%**	**3.84**	**4.9**	**180,653**
By Age Group					
18-44	783	2.1%	0.18	3.6	2,803
45-64	10,741	28.9%	3.15	4.4	46,872
65-84	21,115	56.7%	13.19	5.1	107,238
85+	4,570	12.3%	14.73	5.2	23,740
By Gender					
Male	16,732	45.0%	3.60	4.6	77,682
Female	20,477	55.0%	4.06	5.0	102,971
By Race/Ethnicity					
White (non-Hispanic)	31,149	83.7%	3.85	4.9	152,878
Black (non-Hispanic)	3,947	10.6%	4.31	4.5	17,650
Hispanic†	822	2.2%	2.22	4.6	3,744
Other	1,291	3.5%	4.30	4.9	6,381

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.
† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

Hospital Admissions

Age

- In 2008, more than half (56.7%) of Pennsylvania's COPD hospital admissions were for adults age 65 to 84, even though this age group accounted for 12.9% of the population.
- In Pennsylvania, the shortest average length of stay in 2008 was for persons age 18 to 44 (3.6 days); the longest average length of stay was for persons age 85 and older (5.2 days).
- The likelihood of being hospitalized for COPD was 319% greater among adults age 65 to 84, compared to adults age 45 to 64 – and an additional 11.7% greater among adults 85 and older.

Gender

- In 2008, more women (20,477) were admitted to the hospital for COPD in Pennsylvania than men (16,732).
- In 2008, Pennsylvania's hospital admission rate for COPD was higher for women (4.06 per 1,000 residents) than men (3.60 per 1,000).

Race/Ethnicity

- The vast majority of COPD hospitalizations (83.7%) were among white (non-Hispanic) adults, who made up 83.6% of the state's adult population in 2008.
- In 2008, black (non-Hispanic) adults had a higher hospitalization rate for COPD (4.31 per 1,000 residents), compared to white (non-Hispanic) adults (3.85 per 1,000) and Hispanic adults (2.22 per 1,000).
- White (non-Hispanic) adults had a longer average length of stay (4.9 days), compared to Hispanic adults (4.6 days) and black (non-Hispanic) adults (4.5 days).

- The COPD hospital admission rate for Pennsylvania residents increased 17.8% between 2004 (3.26 per 1,000 residents) and 2008 (3.84 per 1,000).
- From 2004 to 2008, Pennsylvania's COPD hospitalization rate for persons age 85 and older increased 22.6% — the largest increase among the age categories.
- In 2004 and 2007, Pennsylvania's COPD hospitalization rates exceeded national rates in both gender categories and in every age category, except for the 18 to 44 age group.
- From 2004 to 2007, Pennsylvania's total COPD hospitalization rate decreased 0.9%, while the national COPD hospitalization rate increased 3.2%.

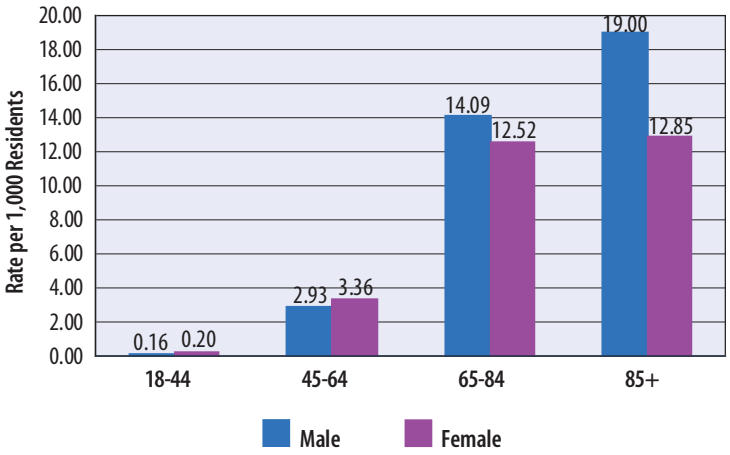
COPD Hospitalization Rates*
Pennsylvania and United States

	2004		2007		2008
	PA	US	PA	US	PA
Total	**3.26**	**2.51**	**3.23**	**2.59**	**3.84**
By Age Group					
18-44	0.17	0.18	0.17	0.18	0.18
45-64	2.64	2.35	2.69	2.45	3.15
65-84	11.49	10.04	11.10	9.99	13.19
85+	12.01	10.24	12.33	10.44	14.73
By Gender					
Male	3.02	2.26	3.08	2.36	3.60
Female	3.47	2.75	3.38	2.81	4.06

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

Hospital Admissions

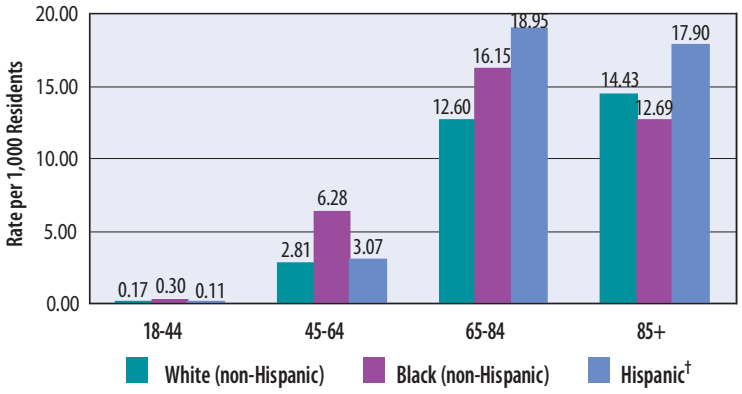
Hospitalization Rate* for COPD by Gender and Age, Pennsylvania, 2008



* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

- Women age 64 and under had higher hospital admission rates for COPD than men age 64 and under.
- Men age 65 and older had higher hospital admission rates for COPD than women age 65 and older.
- In terms of gender, the largest difference in COPD hospital admission rates was in the 85 and older age group.

Hospitalization Rate* for COPD by Race/Ethnicity and Age, Pennsylvania, 2008



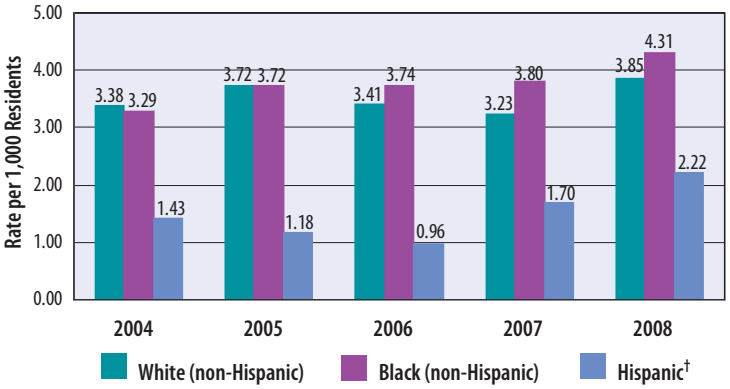
* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- Black (non-Hispanic) residents age 64 and under had higher COPD hospitalization rates than Hispanic and white (non-Hispanic) residents.
- Hispanic residents age 65 and older had higher COPD hospitalization rates than black (non-Hispanic) and white (non-Hispanic) residents.

Hospital Admissions

Hospitalization Rate* for COPD by Race/Ethnicity, Pennsylvania, 2004-2008

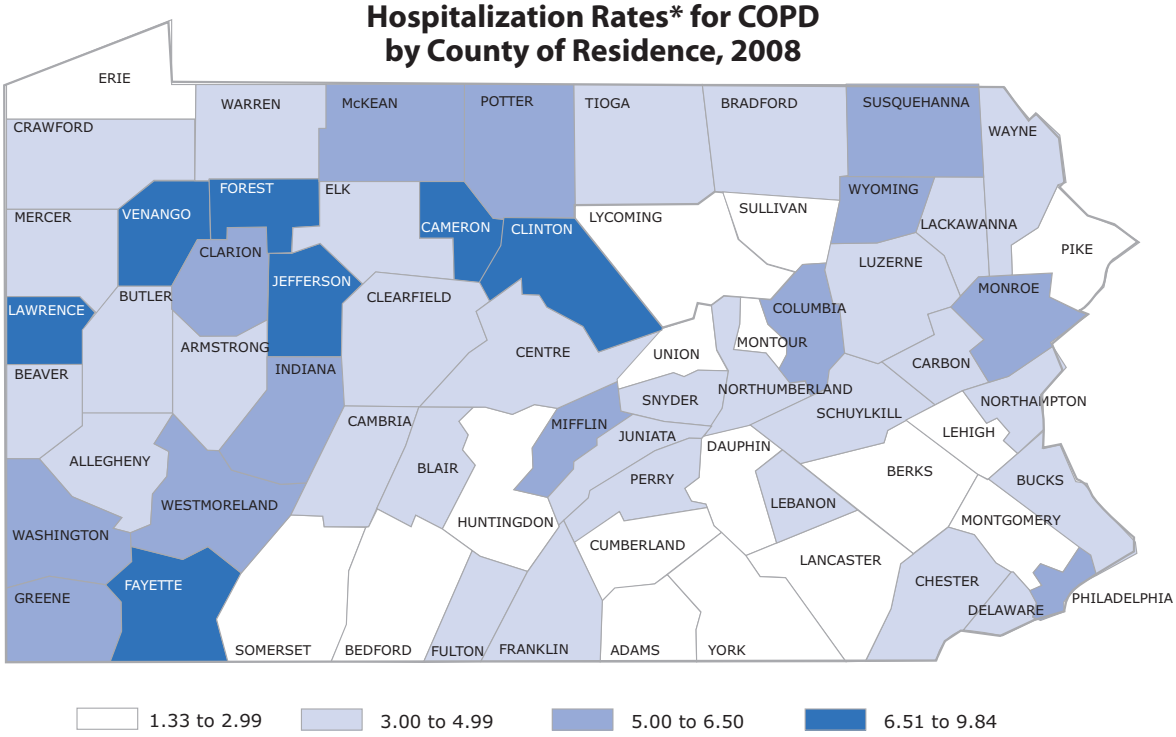


- In every year from 2004 to 2008, the COPD hospitalization rates for black (non-Hispanic) and white (non-Hispanic) residents were notably higher than the rate for Hispanic residents.
- While hospitalization rates for white (non-Hispanic) and Hispanic residents fluctuated between 2004 and 2008, the hospitalization rate for black (non-Hispanic) residents increased each year.

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

Hospitalization Rates* for COPD by County of Residence, 2008



* Per 1,000 residents. Rates are adjusted for age and sex differences among county populations. Rates for counties with small populations are very sensitive to small changes in the number of hospitalizations; that is, higher rates may be reflective of minor fluctuations in the number of hospitalizations.

The lowest, county-level hospitalization rate for COPD was 1.33 per 1,000 residents; the highest was 9.84 per 1,000 residents. The statewide hospitalization rate for COPD was 3.84 per 1,000 residents.

Readmissions

The following table and pie chart look at single and multiple readmissions for COPD that occurred within one year of the patient being discharged from an initial hospitalization for COPD. The analysis of readmissions to Pennsylvania acute care hospitals included 28,199 individuals who were initially admitted for COPD during Quarter 3, 2007 through Quarter 2, 2008. These individuals were followed for 365 days to determine how often they were readmitted to a Pennsylvania hospital for COPD. Thus, the analysis included 41,112 total hospitalizations that occurred during Quarter 3, 2007 through Quarter 2, 2009.

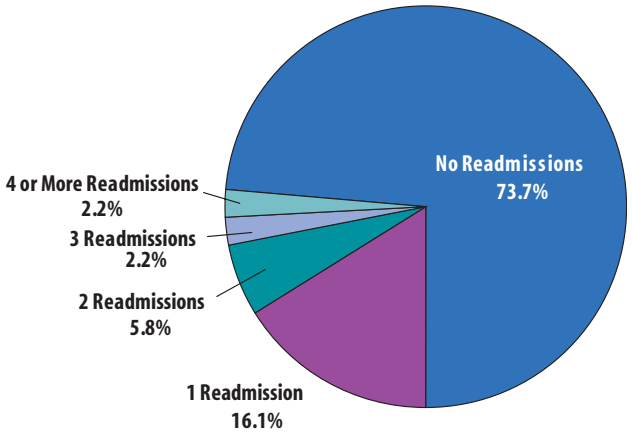
Readmissions* for COPD to a Pennsylvania Hospital within One Year

Readmissions within...	Number	Percent	Average Length of Stay	Total Days
0–7 days	1,163	9.0%	6.0	6,937
8–30 days	2,595	20.1%	5.5	14,368
31–60 days	2,172	16.8%	5.2	11,317
61–90 days	1,513	11.7%	5.1	7,764
91–120 days	1,136	8.8%	5.5	6,274
121–180 days	1,585	12.3%	5.2	8,288
181–365 days	2,749	21.3%	5.1	13,928
Total	**12,913**	**100.0%**	**5.3**	**68,876**

* Includes Pennsylvania and out-of-state residents.

- For the 41,112 hospitalizations for COPD that occurred during Quarter 3, 2007 through Quarter 2, 2009, 12,913 or 31.4% were associated with readmissions within 365 days of discharge from the initial hospitalization.
- The majority, 57.6%, occurred within 90 days of the initial hospitalization.
- The longest average length of stay was for readmissions that occurred within seven days of discharge from the initial hospitalization.

Patients with Multiple Readmissions* within One Year



* Includes Pennsylvania and out-of-state residents.

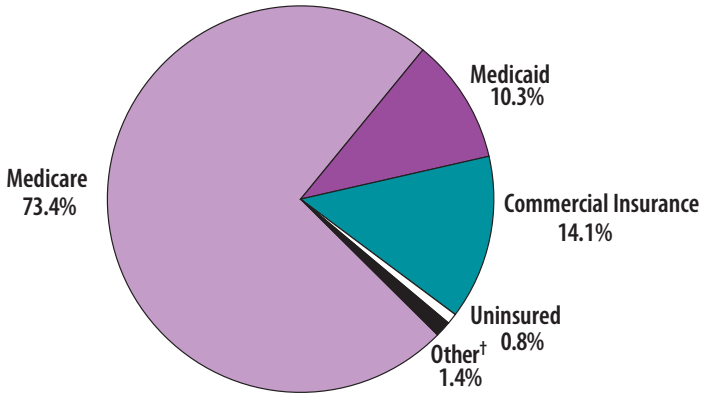
There were 28,199 individual patients that accounted for the 41,112 hospitalizations included in the readmission analysis. Of these 28,199 individual patients:

- 7,415 or 26.3% were readmitted for COPD within one year.
  - 4,548 or 16.1% were readmitted once within 365 days.
  - 2,867 or 10.2% were readmitted more than once.

Hospital Admissions and Payer Type

In 2008, 69.0% of COPD hospitalizations among adults in Pennsylvania were for adults age 65 and older. Thus, it makes sense that the analysis on this page shows that Medicare was the primary payer for almost three out of every four COPD hospitalizations among adults in 2008. Like many chronic conditions, government payers bear the majority of COPD's financial impact.

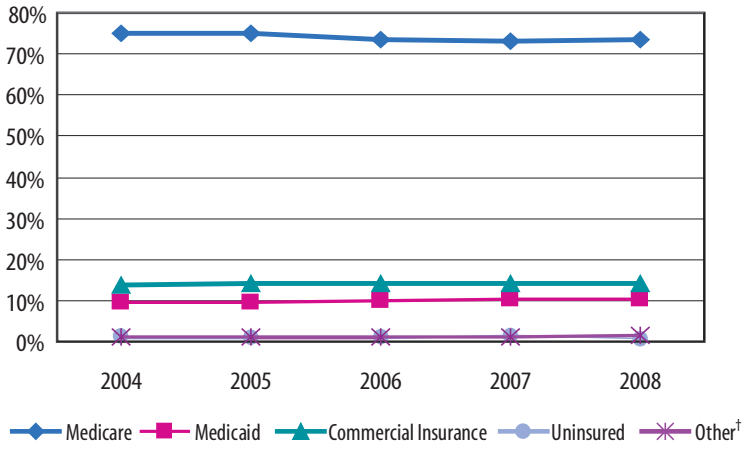
COPD Hospitalizations* by Payer, Pennsylvania, 2008



* Includes Pennsylvania and out-of-state residents.
† Includes other government payers and hospitalizations where the payer was unknown or designation was invalid or missing.

- Whereas Medicare was the primary payer for 50.0% of hospitalizations among adults in Pennsylvania, it was the primary payer for 73.4% of COPD hospitalizations among adults.
- Medicare and Medicaid were the primary payers for 83.7% of COPD hospitalizations among adults.

Percent of COPD Hospitalizations* by Payer, Pennsylvania, 2004-2008



* Includes Pennsylvania and out-of-state residents.
† Includes other government payers and hospitalizations where the payer was unknown or designation was invalid or missing.

- From 2004 to 2008, the percentage of COPD hospitalizations paid for by the various payers remained steady.
- From 2004 to 2008, the percentage of COPD hospitalizations paid for by Medicare never fell below 73.3%.

Medicare Admissions and Payments

In 2007, there were 21,743 COPD hospitalizations for Medicare beneficiaries age 65 and older in Pennsylvania. This analysis includes the 12,782 hospital admissions for which PHC4 was able to match Medicare payment data.

COPD Hospitalizations* for Medicare Patients, Pennsylvania, 2007

	Number of Hospital Admissions	Average Length of Stay	Total Number of Days	Average Medicare Payment	Total Medicare Payments
Total	**12,782**	**5.1**	**64,828**	**$5,735**	**$73,302,588**
By Age Group					
65-74	4,494	4.9	21,951	$5,886	$26,452,224
75-84	5,640	5.2	29,157	$5,765	$32,516,704
85+	2,648	5.2	13,720	$5,413	$14,333,660
By Gender					
Male	5,586	4.9	27,488	$5,830	$32,566,484
Female	7,196	5.2	37,340	$5,661	$40,736,104
By Race/Ethnicity					
White (Non-Hispanic)	11,430	5.1	58,335	$5,642	$64,482,557
Black (Non-Hispanic)	736	5.0	3,700	$7,051	$5,189,564
Hispanic†	231	4.2	980	$5,918	$1,367,082
Other	385	4.7	1,813	$5,879	$2,263,385

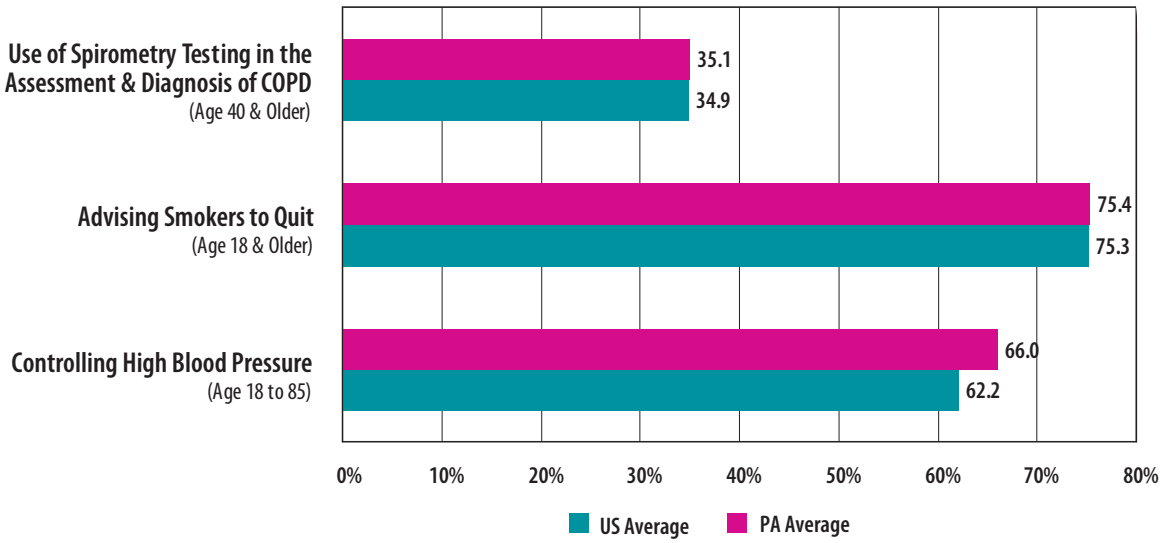
* Includes Pennsylvania and out-of-state residents.
† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- In 2007, Pennsylvania's total Medicare payments for the 12,782 COPD hospitalizations with available payment data were about $73.3 million. These 12,782 hospitalizations represent only 40.2% of all COPD hospitalizations in 2007.
- Medicare payments for COPD hospitalizations in Pennsylvania averaged $5,735.
- Based on an average Medicare payment of $5,735, total Medicare payments for the 21,743 COPD hospitalizations among Medicare beneficiaries can be estimated at $124.7 million.
- Even though Medicare patients age 65 to 74 had the shortest average length of stay (4.9 days), they had the highest average Medicare payment ($5,886) among all the age groups.
- Black (non-Hispanic) Medicare patients had a higher average Medicare payment than white (non-Hispanic) Medicare patients, even though black (non-Hispanic) beneficiaries had a slightly shorter average length of stay than white (non-Hispanic) beneficiaries.

Staying Healthy

Pages 11 and 29 highlighted preventive care practices specific to persons with diabetes and asthma. On this page, spirometry testing is specific to the diagnosis of COPD; however, the other two practices – advising smokers to quit and controlling high blood pressure – are critical in preventing a variety of health problems. The performance measures reported are Healthcare Effectiveness Data and Information Set (HEDIS) measures from the National Committee for Quality Assurance (NCQA). The graph shows the percent of commercially insured adults who were advised, tested, or monitored for each measure in 2007. For each of the three measures, the Pennsylvania average was better than the national average.

Preventive Care Practices for Commercially Insured Persons
United States and Pennsylvania, 2007



Note: U.S. and Pennsylvania averages are based on NCQA data. U.S. averages were calculated by NCQA, and Pennsylvania averages were calculated by PHC4.

Use of Spirometry Testing in the Assessment and Diagnosis of COPD – The main test for COPD is spirometry. It is a test that measures how well a person's lungs are working. The graph shows the percent of adults, age 40 and older, with a new diagnosis of COPD or newly active COPD who received appropriate spirometry testing to confirm the diagnosis in 2007.

Advising Smokers to Quit – Because smoking is a risk factor for COPD, heart disease and many other health problems, getting smokers to quit is a basic prevention effort undertaken by health care professionals. This graph shows the percent of adult smokers, age 18 and older, who were advised to quit smoking during a visit to a health care practitioner in 2007.

Controlling High Blood Pressure – High blood pressure (hypertension) is a major risk factor for a number of diseases and must be closely monitored and controlled. The graph shows the percent of commercially insured adults, age 18 to 85, diagnosed with high blood pressure whose blood pressure was under control in 2007.

Heart Failure

Heart failure is a condition where the heart cannot pump enough blood and oxygen to meet the needs of the body. It does not mean that the heart has stopped beating. Heart failure usually worsens over time as the heart gradually loses its pumping ability and works less efficiently.

United States – At a Glance

- Heart failure affects approximately 5.8 million Americans.[82]
- Every year, about one out of every 100 people over age 65 gets heart failure.[83]
- Every year, there are 670,000 new heart failure cases among adults age 45 and older.[84]
- Hospital discharges for heart failure increased 3% between 1997 (991,000 discharges) and 2007 (1,025,000 discharges).[85]
- Excluding pregnancy, childbirth and newborn infant hospitalizations, heart failure was the second (behind pneumonia) most common principal diagnosis among all U.S. hospital stays.[86]
- Heart failure was the most common principal diagnosis among all U.S. hospital stays for adults 65 and older.[87]
- For 2009, the estimated direct and indirect cost of heart failure in the United States is $37.2 billion.[88]

Pennsylvania – At a Glance

- Hospital discharges for heart failure decreased approximately 5.3% between 1997 (64,696 discharges) and 2007 (61,293 discharges).[89]
- Excluding pregnancy, childbirth and newborn infant hospitalizations, heart failure was the second (behind mood disorders) most common principal diagnosis among all Pennsylvania hospital stays.[90]
- Heart failure was the most common principal diagnosis among all Pennsylvania hospital stays for adults age 65 and older.[91]

Main Causes and Risk Factors of Heart Failure

- ***High blood pressure:*** Most heart failure cases – 75% – are caused by high blood pressure.[92]
- ***Past heart attack***
- ***Coronary artery disease***
- ***Other diseases or infections that damage or weaken the heart muscle or valves***
- ***Congenital heart defects***

RISK FACTOR

High Blood Pressure

Blood pressure measures the force of blood against the artery walls. When a person's blood pressure stays high over time, it is called high blood pressure or hypertension. High blood pressure is a serious condition that can lead to heart failure, heart disease, stroke, kidney failure and other health problems if untreated. In 2007, hypertension was a condition present in 35% of all U.S. hospitalizations.[93]

High Blood Pressure Awareness in Pennsylvania

- In 2007, 28.1% of adults in Pennsylvania reported having high blood pressure, compared to 27.5% nationwide.[94]
- The percentage of Pennsylvania adults who reported having high blood pressure increased from 21.7% in 1997 to 28.1% in 2007.[95]
- Of the Pennsylvania adults who reported having high blood pressure in 2007, 83% also said they were taking blood pressure medication.[96]
- Of the Pennsylvania adults who reported having high blood pressure in 2007, black (non-Hispanic) adults (43%) reported a significantly higher percentage, compared to white (non-Hispanic) adults (28%) and Hispanic adults (17%).[97]

Hypertension Hospitalizations among Pennsylvania Adults, 2008

	Number	Percent	Rate*	Average Length of Stay	Total Days
Total	**12,722**	**100.0%**	**1.31**	**4.4**	**56,123**
White (non-Hispanic)	7,321	57.5%	0.90	4.5	32,664
Black (non-Hispanic)	4,399	34.6%	4.80	4.3	18,995
Hispanic†	508	4.0%	1.37	4.7	2,387
Other	494	3.9%	1.65	4.2	2,077

* Per 1,000 residents age 18 and older. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

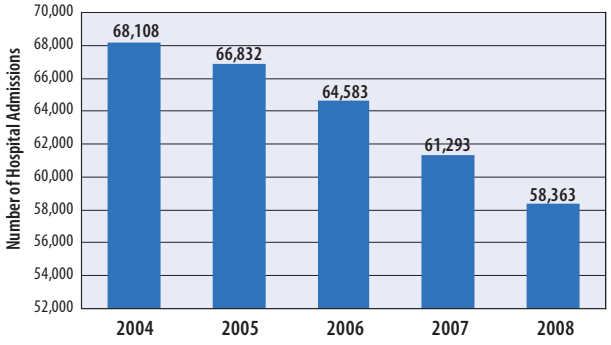
† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- Even though black (non-Hispanic) adults made up 9.5% of Pennsylvania's adult population in 2008, they accounted for 34.6% of hospitalizations for hypertension among adults.
- Black (non-Hispanic) adults had a higher rate of hospitalization for hypertension (4.80 per 1,000 residents), compared to Hispanic adults (1.37 per 1,000) and white (non-Hispanic) adults (0.90 per 1,000).

Hospital Admissions

With early diagnosis and treatment, the quality of life and life expectancy of persons with heart failure can be improved. While heart failure can be managed with medications and by treating the underlying cause of the disease, a heart transplant is the only cure. Still, in 2008, about nine out of every ten (91.2%) heart failure hospitalizations among Pennsylvania adults were considered potentially preventable based on the federal Agency for Healthcare Research and Quality's Prevention Quality Indicators. As heart failure primarily affects adults, the analysis only includes hospitalizations for adults age 18 and older with a principal diagnosis of heart failure.

Hospital Admissions* for Heart Failure in Pennsylvania, 2004-2008



* Includes Pennsylvania and out-of-state residents.

- Among adults, the number of hospital admissions for heart failure decreased 14.3% overall from 2004 to 2008.
- Even with this decrease, heart failure has the highest number of hospital admissions and more hospital days than any other chronic condition in the report.

Heart Failure Hospitalizations in Pennsylvania, 2008

	Number	Percent	Rate*	Average Length of Stay	Total Days
Total	**56,493**	**100.0%**	**5.83**	**5.5**	**312,389**
By Age Group					
18-44	1,489	2.6%	0.34	5.1	7,582
45-64	10,192	18.0%	2.99	5.5	56,066
65-84	29,117	51.5%	18.19	5.6	164,460
85+	15,695	27.8%	50.59	5.4	84,281
By Gender**					
Male	27,469	48.6%	5.91	5.5	150,603
Female	29,023	51.4%	5.76	5.6	161,773
By Race/Ethnicity					
White (non-Hispanic)	44,764	79.2%	5.53	5.6	249,158
Black (non-Hispanic)	8,282	14.7%	9.04	5.3	43,813
Hispanic†	1,297	2.3%	3.50	5.0	6,470
Other	2,150	3.8%	7.16	6.0	12,948

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

** One hospitalization was missing coding designation for gender.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

Hospital Admissions

Age

- In 2008, 79.3% of hospital admissions for heart failure in Pennsylvania were for persons age 65 and older, even though this age group accounted for 15.4% of the population.
- Persons age 85 and older had the highest hospitalization rate for heart failure (50.59 per 1,000 residents) in Pennsylvania, followed by persons age 65 to 84 (18.19 per 1,000).
- The likelihood of being hospitalized for heart failure was 508% greater among adults age 65 to 84, compared to adults age 45 to 64 – and an additional 178% greater among adults 85 and older.

Gender

- In 2008, Pennsylvania's hospital admission rate for heart failure among men (5.91 per 1,000 residents) was higher than the rate among women (5.76 per 1,000).

Race/Ethnicity

- In 2008, black (non-Hispanic) adults had a higher rate of hospitalization for heart failure (9.04 per 1,000 residents), compared to white (non-Hispanic) adults (5.53 per 1,000) and Hispanic adults (3.50 per 1,000).

- Pennsylvania's overall hospitalization rate for heart failure declined 16.2% from 2004 to 2008.
- From 2004 to 2008, the hospital admission rate for heart failure among women in Pennsylvania declined 20.0%, while the rate among men declined 11.9%.
- In 2004, the hospitalization rate for heart failure among men in Pennsylvania was lower than the rate among women, while the reverse was true in 2008.
- In 2004 and 2007, Pennsylvania's hospitalization rates for heart failure exceeded national rates in both gender categories and in every age category, except the 18 to 44 age group.
- From 2004 to 2007, Pennsylvania's total heart failure hospitalization rate decreased 11.5%, while the national heart failure hospitalization rate decreased 10.4%.

Heart Failure Hospitalization Rates*
Pennsylvania and United States

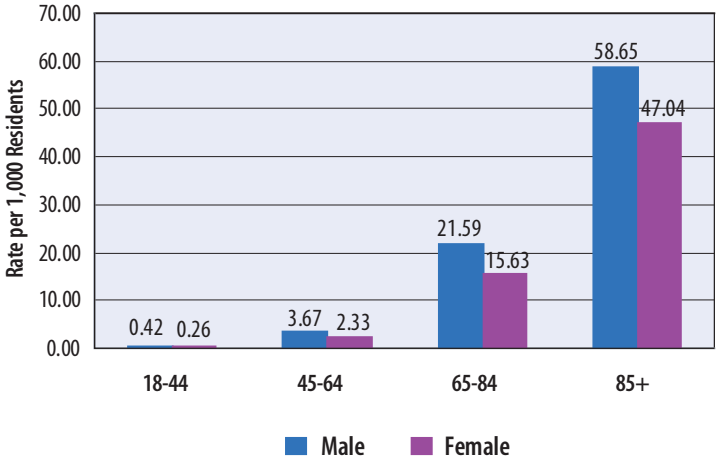
	2004		2007		2008
	PA	US	PA	US	PA
Total	**6.96**	**5.02**	**6.16**	**4.50**	**5.83**
By Age Group					
18-44	0.36	0.38	0.37	0.38	0.34
45-64	3.59	3.39	3.24	3.03	2.99
65-84	23.20	18.82	19.39	15.89	18.19
85+	57.81	47.11	53.01	42.44	50.59
By Gender†					
Male	6.71	4.89	6.17	4.52	5.91
Female	7.20	5.14	6.15	4.48	5.76

* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† For 2008, one hospitalization was missing coding designation for gender.

Hospital Admissions

Hospitalization Rate* for Heart Failure by Gender† and Age, Pennsylvania, 2008

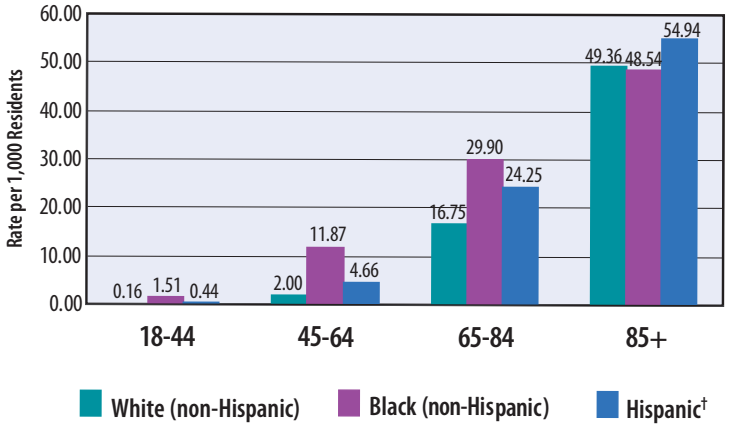


* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† For 2008, one hospitalization was missing coding designation for gender.

- In 2008, the rates of hospitalization for heart failure among men in every age group were higher than the rates among women in every age group.
- Women age 65 to 84 were almost seven times as likely to be hospitalized for heart failure as women age 45 to 64; men age 65 to 84 were almost six times as likely to be hospitalized for heart failure as men age 45 to 64.
- Women age 85 and older were three times as likely to be hospitalized for heart failure as women age 65 to 84; men age 85 and older were more than two and a half times as likely to be hospitalized for heart failure as men age 65 to 84.

Hospitalization Rate* for Heart Failure by Race/Ethnicity and Age, Pennsylvania, 2008



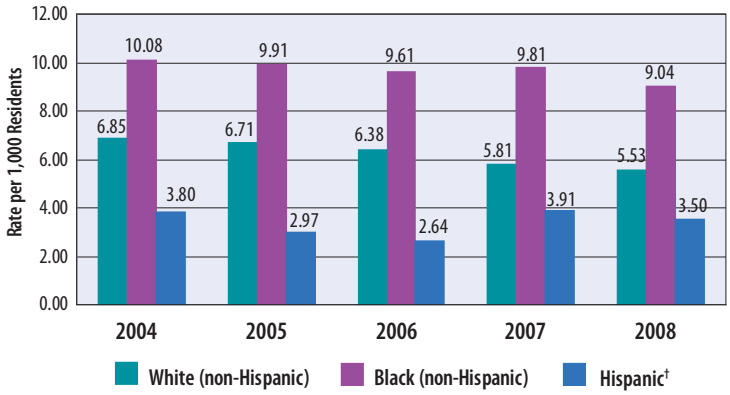
* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- Black (non-Hispanic) residents age 84 and under had higher hospitalization rates for heart failure than Hispanic and white (non-Hispanic) residents.
- Hispanic residents age 85 and older had a higher hospitalization rate (54.94 per 1,000 residents) for heart failure than white (non-Hispanic) residents (49.36 per 1,000) and black (non-Hispanic) residents (48.54 per 1,000).

Hospital Admissions

Hospitalization Rate* for Heart Failure by Race/Ethnicity, Pennsylvania, 2004-2008

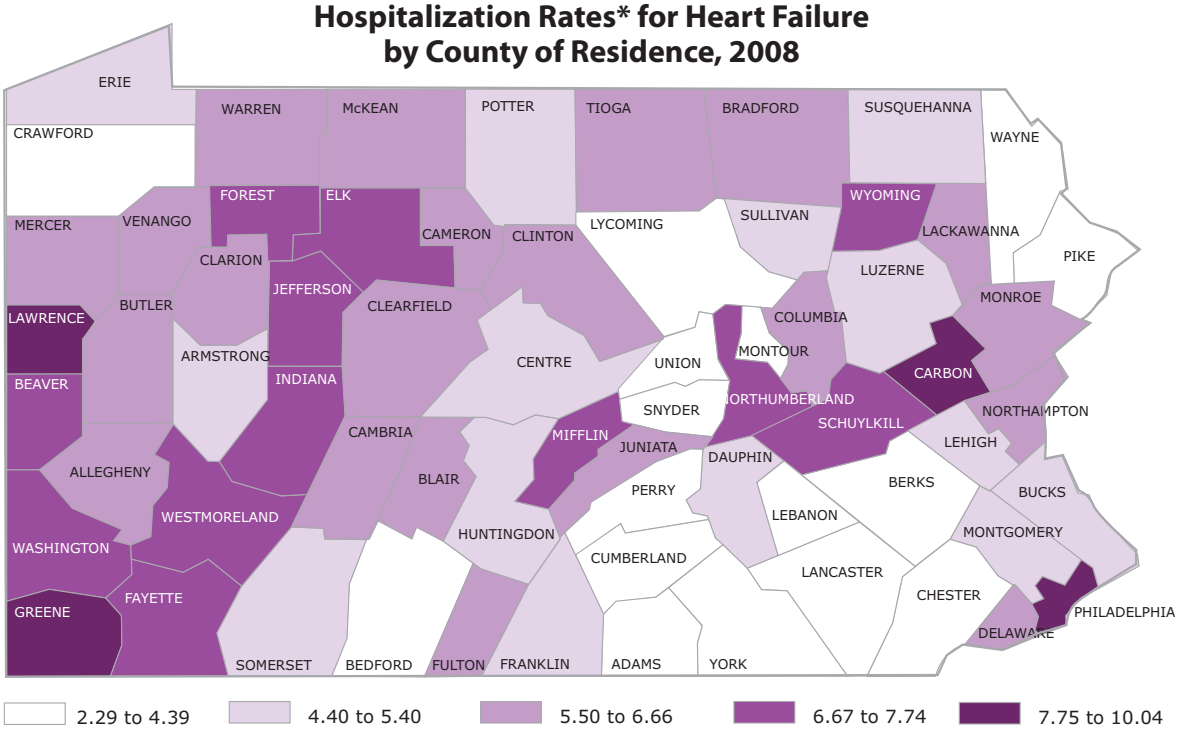


* Per 1,000 residents. Hospitalization rates take into account the proportional differences among segments of the population, such as age, gender and race/ethnicity. The rates for a specific demographic only include residents for that demographic.

† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- In every year from 2004 to 2008, the heart failure hospitalization rate for black (non-Hispanic) residents was higher than the rates for white (non-Hispanic) and Hispanic residents.
- Overall, the hospitalization rates for all race/ethnic groups declined from 2004 to 2008, although there was some fluctuation in the intervening years.

Hospitalization Rates* for Heart Failure by County of Residence, 2008



* Per 1,000 residents. Rates are adjusted for age and sex differences among county populations. Rates for counties with small populations are very sensitive to small changes in the number of hospitalizations; that is, higher rates may be reflective of minor fluctuations in the number of hospitalizations.

The lowest, county-level hospitalization rate for heart failure was 2.29 per 1,000 residents; the highest was 10.04 per 1,000 residents. The statewide hospitalization rate for heart failure was 5.83 per 1,000 residents.

Readmissions

The following table and pie chart look at single and multiple readmissions for heart failure that occurred within one year of the patient being discharged from an initial hospitalization for heart failure. The analysis of readmissions to Pennsylvania acute care hospitals included 44,043 individuals who were initially admitted for heart failure during Quarter 3, 2007 through Quarter 2, 2008. These individuals were followed for 365 days to determine how often they were readmitted to a Pennsylvania hospital for heart failure. Thus, the analysis included 66,870 total hospitalizations that occurred during Quarter 3, 2007 through Quarter 2, 2009.

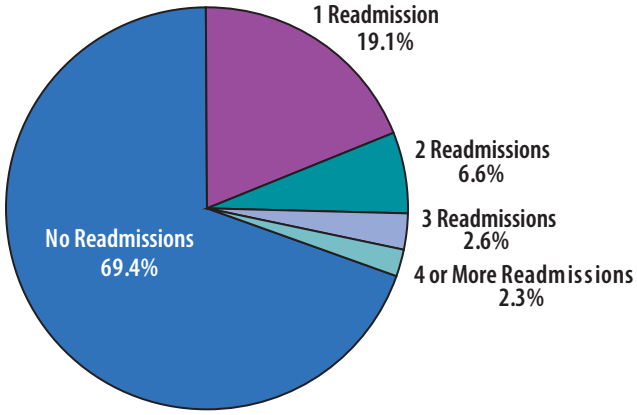
Readmissions* for Heart Failure to a Pennsylvania Hospital within One Year

Readmissions within...	Number	Percent	Average Length of Stay	Total Days
0–7 days	2,726	11.9%	6.9	18,722
8–30 days	5,238	23.0%	6.2	32,621
31–60 days	3,961	17.4%	6.1	24,126
61–90 days	2,623	11.5%	5.8	15,208
91–120 days	1,833	8.0%	5.6	10,355
121–180 days	2,558	11.2%	5.5	13,977
181–365 days	3,888	17.0%	5.4	21,159
Total	**22,827**	**100.0%**	**6.0**	**136,168**

* Includes Pennsylvania and out-of-state residents.

- For the 66,870 hospitalizations for heart failure that occurred during Quarter 3, 2007 through Quarter 2, 2009, 22,827 or 34.1% were associated with readmissions within 365 days of discharge from the initial hospitalization.
- Of these readmissions, 63.8% occurred within 90 days of the initial hospitalization.
- The longest average length of stay was for readmissions that occurred within seven days of discharge from the initial hospitalization.

Patients with Multiple Readmissions* within One Year



* Includes Pennsylvania and out-of-state residents.

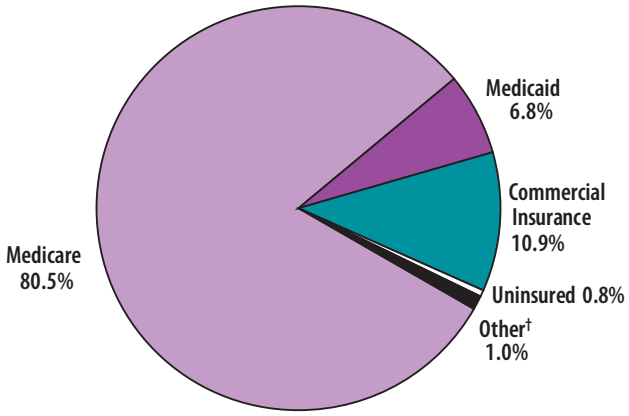
There were 44,043 individual patients that accounted for the 66,870 hospitalizations included in the readmission analysis. Of these 44,043 individual patients:

- 13,482 or 30.6% were readmitted for heart failure within one year
  - 8,404 or 19.1% were readmitted once within 365 days.
  - 5,078 or 11.5% were readmitted more than once.

Hospital Admissions and Payer Type

As previously mentioned on page 43, 79.3% of heart failure hospitalizations among adults in Pennsylvania were for adults age 65 and older in 2008. Thus, it makes sense that the analysis on this page shows that more than 80% of heart failure hospitalizations among adults are paid for by Medicare. The burden of chronic conditions on government payers is once again highlighted.

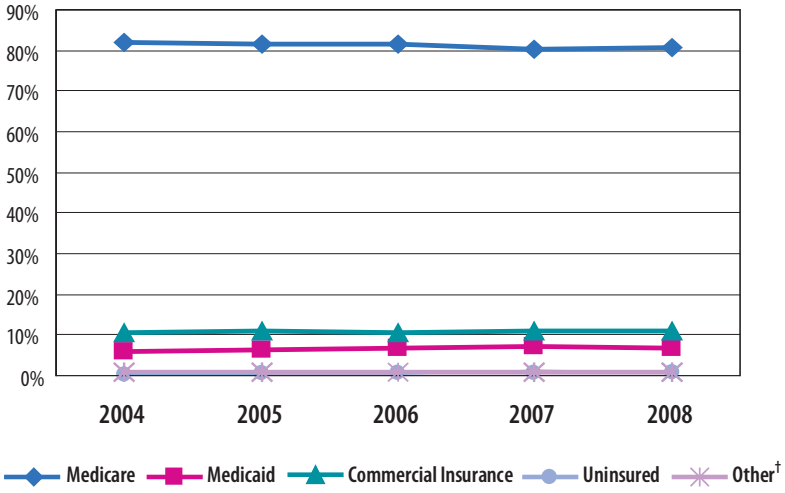
Heart Failure Hospitalizations* by Payer, Pennsylvania, 2008



* Includes Pennsylvania and out-of-state residents.
† Includes other government payers and hospitalizations where the payer was unknown or designation was invalid or missing.

- Whereas Medicare was the primary payer for 50.0% of hospitalizations among adults in Pennsylvania, it was the primary payer for 80.5% of heart failure hospitalizations among adults.
- Medicare and Medicaid were the primary payers for 87.3% of hospitalizations for heart failure among adults.

Percent of Heart Failure Hospitalizations* by Payer, Pennsylvania, 2004-2008



* Includes Pennsylvania and out-of-state residents.
† Includes other government payers and hospitalizations where the payer was unknown or designation was invalid or missing.

- From 2004 to 2008, the percentage of heart failure hospitalizations paid for by the various payers remained steady.
- From 2004 to 2008, the percentage of heart failure hospitalizations paid for by Medicare never fell below 80.1%.

Medicare Admissions and Payments

In 2007, there were 48,166 heart failure hospital admissions for Medicare beneficiaries age 65 and older in Pennsylvania. This analysis includes the 30,376 hospital admissions for which PHC4 was able to match Medicare payment data.

Heart Failure Hospitalizations* for Medicare Patients, Pennsylvania, 2007

	Number of Hospital Admissions	Average Length of Stay	Total Number of Days	Average Medicare Payment	Total Medicare Payments
Total	**30,376**	**5.6**	**169,776**	**$8,176**	**$248,358,005**
By Age Group					
65-74	6,246	5.7	35,303	$9,974	$62,298,130
75-84	12,450	5.7	70,751	$8,564	$106,620,223
85+	11,680	5.5	63,722	$6,801	$79,439,652
By Gender					
Male	13,231	5.5	72,895	$9,063	$119,916,977
Female	17,145	5.7	96,881	$7,491	$128,441,028
By Race/Ethnicity					
White (Non-Hispanic)	26,776	5.6	149,816	$8,012	$214,539,325
Black (Non-Hispanic)	2,129	5.7	12,053	$9,525	$20,278,344
Hispanic†	521	4.8	2,521	$7,582	$3,950,349
Other	950	5.7	5,386	$10,095	$9,589,987

* Includes Pennsylvania and out-of-state residents.
† Internal PHC4 analysis suggests that Hispanic ethnicity may be slightly underreported.

- In 2007, Pennsylvania's total Medicare payments for the 30,376 heart failure hospitalizations with available payment data were almost $248.4 million. These 30,376 hospitalizations represent only 49.6% of all heart failure hospitalizations in 2007.
- Medicare payments for heart failure hospitalizations in Pennsylvania averaged $8,176.
- Based on an average Medicare payment of $8,176, total Medicare payments for the 48,166 heart failure hospitalizations among Medicare beneficiaries can be estimated at $393.8 million.
- Medicare patients age 65 to 74 had higher Medicare payments than Medicare patients age 75 and older.
- Male Medicare patients had a higher average Medicare payment but a shorter average length of stay than female Medicare patients.

Conclusion

The information in this report underscores the need for a sustained focus on chronic disease prevention and control. There are a number of initiatives underway to reduce the burden of chronic conditions in Pennsylvania. These efforts are taking place at the state, regional and local levels – galvanizing the skills and energy of health care providers, government agencies, the private sector, academic institutions and other stakeholders.

For example:

- In 2007, the Chronic Care Management, Reimbursement and Cost Reduction Commission was created to devise a strategic plan for Pennsylvania to improve the quality of care for people with chronic conditions, while reducing avoidable illnesses and unnecessary costs. The plan is centered on the Wagner "Chronic Care Model," a comprehensive approach where primary care practices become patient-centered medical homes so that all patients receive proactive, coordinated care. The plan, which initially concentrated on pediatric asthma and diabetes, has been rolled out in seven regions of the state and involves more than 800 primary care physicians and one million patients.
- In partnership with various stakeholder groups, the Pennsylvania Department of Health develops diabetes and asthma action plans with the purpose of preventing, treating, and managing these chronic diseases.
- The work of the Pittsburgh Regional Health Initiative supports the development of new models of care for chronic diseases, such as COPD, and it examines the problems and lapses of care that lead to hospitalizations and readmissions.
- Within the past year, Thomas Jefferson University in Philadelphia opened its Jefferson School of Population Health, representing the first time a health-sciences university has incorporated programs for master's degrees in Public Health, Health Policy, Healthcare Quality and Safety, and Chronic Care Management.
- After improving congestive heart failure care internally, Geisinger Medical Center in Danville, Hazleton General Hospital, Reading Hospital and Medical Center, and Chester County Hospital now volunteer as Institute for Healthcare Improvement Mentor Hospitals on this topic, providing support, advice, and clinical expertise to other hospitals that need help with their own quality improvement efforts.

Of course, patients with chronic disease also have an important role to play in managing their conditions and modifying personal health behaviors that contribute to disease. Pennsylvanians can improve their own health status by adopting lifestyles that promote prevention, participating in health education and wellness programs, and following self-care management plans.

Looking forward, the report points to ways that Pennsylvania can continue to move ahead with its coordinated efforts on chronic conditions. Important questions are raised and areas for further study are highlighted:

Conclusion

Risk Factors

This report notes rates of several modifiable risk factors, such as tobacco use and obesity. It does not explore how the prevalence of chronic diseases in Pennsylvania is impacted by other environmental and occupational risk factors. Although there has been a dramatic shift to service-based employment, Pennsylvania traditionally has been known as a steel, mining, manufacturing and farming state. Therefore, one of the questions raised is whether Pennsylvania's traditional industries and agriculture have had a residual effect on chronic conditions, especially among retirees.

Readmissions

Readmissions are an important quality indicator to examine because they can significantly impact the quality and cost of hospital care. While this report examines single and multiple admissions for the four conditions, it is also important to know why readmissions occur and what are the additional payments associated with them. Future analysis could focus on how they relate to patient "episodes of care." An episode of care covers all of the treatments received for a health problem from the first encounter with a health care provider until the completion of the last encounter for this problem. It may span emergency treatment through inpatient care to outpatient services.

Variations in Hospitalization Rates

This report found that significant variations in hospitalization rates exist based on race/ethnicity. Black (non-Hispanic) residents tended to have higher rates than white (non-Hispanic) and Hispanic residents. Since some hospitalizations may be preventable with high quality primary and preventive care, such variations can indicate lack of access to care or poor quality care. Identifying differences in hospitalization rates is the first step toward understanding why they occur and then targeting resources and developing strategies to address them.

Geographic Analysis

This study assessed geographic variation in hospitalization rates by county. A further exploration of the reasons for this variation is warranted, as well as an examination of the impact on health care spending. Such research can help improve the efficiency with which health care is delivered.

Payment Data

This report included Medicare payment data in order to call attention to the financial impact of chronic disease. Since the payment data in this report included only Medicare fee-for-service payments, additional analyses that incorporate revenue from other payers and expenditures beyond inpatient hospitalizations are needed to measure the full economic burden of chronic disease.

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Online Resources for Consumers

Listed below are just a few of the online resources about chronic conditions available for consumers.

Centers for Disease Control and Prevention – Chronic Disease
http://www.cdc.gov/chronicdisease/

Pennsylvania Department of Health (1-877-PA-HEALTH)
www.health.state.pa.us

Diabetes

American Diabetes Association
http://www.diabetes.org/

Centers for Disease Control and Prevention – Diabetes
http://www.cdc.gov/diabetes/

Juvenile Diabetes Research Foundation International
http://www.jdrf.org/

National Diabetes Education Program
http://www.ndep.nih.gov/

Asthma

American Lung Association
http://www.lungusa.org/

Asthma and Allergy Foundation of America
http://www.aafa.org/

Centers for Disease Control and Prevention – Asthma
http://www.cdc.gov/asthma/

National Institutes of Health - National Heart, Lung, and Blood Institute
http://www.nhlbi.nih.gov/

Heart Failure

American Heart Association
www.americanheart.org

Centers for Disease Control and Prevention – Heart Disease
http://www.cdc.gov/heartdisease/

National Institutes of Health - National Heart, Lung, and Blood Institute
http://www.nhlbi.nih.gov/

Chronic Obstructive Pulmonary Disease

American Lung Association
http://www.lungusa.org/

Centers for Disease Control and Prevention – COPD
http://www.cdc.gov/copd/

National Institutes of Health - National Heart, Lung, and Blood Institute
http://www.nhlbi.nih.gov/

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The information contained in this report and other PHC4 publications is available online at www.phc4.org. Additional financial, hospitalization and ambulatory procedure health care data is available for purchase. For more information, contact PHC4's Data Requests Unit at specialrequests@phc4.org or 717-232-6787.